Flexible Systems Management

P.K. Suri
Sushil

Strategic Planning and Implementation of E-Governance

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ISSN 2199-8493 ISSN 2199-8507 (electronic)
Flexible Systems Management
ISBN 978-981-10-2175-6 ISBN 978-981-10-2176-3 (eBook)
DOI 10.1007/978-981-10-2176-3

Library of Congress Control Number: 2016946965

Printed on acid-free paper

This Springer imprint is published by Springer Nature
The registered company is Springer Science+Business Media Singapore Pte Ltd.

Dedicated to Our Parents

Preface

Governments across the globe are trying to take advantage from the opportunities offered by Information and Communication Technology based solutions for improving internal functioning and strengthening interfaces with citizens. The phenomenon, termed as e-governance or e-government as per varying country contexts, has been instrumental in the launching of many projects over the years with the intention of addressing the needs of a variety of stakeholders. A number of path-breaking initiatives have been reported in the literature. However, many projects—particularly in the context of developing countries—have failed to mature and deliver as per expectations. In a country like India, the federal government system adds further to the e-governance planning and implementation-related challenges as the complex interplay of situation, actors and processes is influenced by multiple organizations operating at different layers. For example, the mission mode projects conceptualized about a decade back under the National e-Governance Plan (NeGP) of India continue to face serious challenges even during the extended execution phase. Acknowledging that the projects under NeGP could not be implemented as per the planned deliverables and timelines, the Government has formulated yet another programme, viz. 'Digital India' with an astronomical budgetary outlay of INR 1000 billion and a far more ambitious scope. The Government intends to transform its functioning and service delivery mechanism in a big way through the enhanced scope of e-governance under the new programme. However, if the conventional top driven planning and implementation framework is continued to be relied upon, the new mega programme may be perceived as a greater risky proposition as it shall also be subjected to similar challenges during execution phase. For the success of various ongoing or new e-governance projects, it is necessary to take strategic measures based on learning from in-depth cross-case analysis of a few large projects. The research based book intends to bridge this gap related to lack of a synthesized framework for improving performance of e-governance projects. The main proposition of this book is that inadequate emphasis on strategic management aspects during planning and implementation of e-governance projects are the reasons for their unsatisfactory performance.

The book is based on experience gained during planning and execution of e-governance projects in India coupled with an extensive research work based on six national/multi-state level agriculture related projects. The words e-government and e-governance are used interchangeably in the context of this book. Unlike the traditional approach, the performance is viewed in terms of intended project outcomes and analyzed from the perspective of three key stakeholders, viz. planners, implementers and beneficiaries. Further, it explores as to whether the performance is influenced by extent of planning, comprehensiveness of strategy formulation, effectiveness of strategy implementation, changing situation, competence level of actors, and flexibility of processes. A set of significant strategic variables influencing performance have been identified based on independent opinion surveys of the key stakeholders. The variables have been interpreted to conduct a strategic gap analysis of six large projects of national importance. Learning issues from cross-case quantitative and qualitative analyses have been synthesized and brought out in the form of a generalized strategic framework for improving performance.

The book is organized into ten chapters. The first chapter presents general background and evolution of e-governance in India. It discusses important e-governance projects spanning across various government organizations with particular reference to agriculture related projects in the Indian context. It further highlights the key issues dealt with in the book, viz. developing insights about situation–actor–process interplay in e-governance context, exploring suitability of the conventional planning and implementation framework for handling the dynamic context of e-governance, and building strategic alliances across government organizations for effective e-governance.

The low success rates of e-governance projects on the one hand and the underlying opportunities on the other call for deeper insights into the performance of these projects. The importance of devising suitable measures for analyzing expected outcomes of various e-governance projects is discussed in Chap. 2. This chapter brings out a performance construct and demonstrates its application for cross-analyzing performance from the perspectives of three key actor segments, viz. planners, implementers and beneficiaries.

The popularly accessible e-governance literature is dominated by case studies by practitioners and government officials which showcase only project achievements without elaborating gaps related to planning, implementation and performance. Chapter 3 bridges this gap by presenting an empirically validated strategic framework. It further discusses the constituting driver and enabler components, methodology adopted and practical relevance of the framework in terms of implications for government officials and beneficiaries.

With the situational changes due to shift in focus from internal computerization to citizen centricity, new challenges have cropped up in the context of e-governance projects. Chapter 4 deals with ‘Changing Situation’ which has emerged as a driver of e-governance in the synthesized strategic framework. It uses illustrations from various projects and interpretation of analysis based on survey data to explain the

concept in terms of shared mission and vision, accessibility to service, changing user needs and feedback loops, and their relationship with performance.

In India, most of the past or ongoing e-governance initiatives have been undertaken as part of the conventional planning and implementation framework. Chapter 5 explores gaps in the prevailing system and discusses its unsuitability in coping with the dynamic context of e-governance. It explains the measures to be taken for effective strategic planning of e-governance projects. In the synthesized framework, 'Strategic Planning' has emerged as an enabler of e-governance and is perceived in terms of 'Extent of Planning', 'Comprehensive of Strategy Formulation' and 'Flexibility of Processes'. The chapter further discusses these variables and their linkage with performance based on analysis of the three base surveys.

In order to achieve the intended outcomes of a project, the planning has to be supported with effective implementation. 'Strategy Implementation' has emerged as an enabler of e-governance in the synthesized framework. Chapter 6 explores gaps in the prevailing set-up of strategy implementation and uses illustrations from projects and analysis of survey data to explain the significance of constituting variables, viz. 'Effectiveness of Strategy Implementation' and 'Competence level of Actors', and their influence on performance.

Chapter 7 presents three case studies of agriculture related projects. The first case study (Government to Citizens) analyzes AGMARKNET project. It includes highlights of a pilot field study conducted to understand the prevailing strategic gaps in the project. The need of collaborative efforts for building an effective agricultural marketing information system is also addressed here. The second case study (Government to Citizens) analyzes Kisan Call Centre project of the Department of Agriculture and Co-operation (DAC) for providing agricultural information extension support to remotely located farmers. The third case study (Government to Employees) discusses the DACNET project which was launched to usher in e-governance in the widely distributed but disconnected field offices of DAC. The empirically validated frameworks presented in Chaps. 4–6 are interpreted in the context of each of these three case studies using Situation–Actor–Process (SAP) framework. The chapter further brings out measures for improving performance using Learning–Action–Performance (LAP) framework.

Chapter 8 presents case studies of three Government to Business e-governance projects. The first case study discusses the Grapenet system of Agricultural and Processed Food Products Export Development Authority (APEDA). The second case study analyzes the Computerized Registration of Pesticides (CROP) system of Central Insecticides Board and Registration Committee which involved amendment of a legal act. The third case study looks into an Integrated Fertilizers Management Information System (IFMIS) aspired by the Department of Fertilizers (DoF) since 1993. The methodology used for these case studies is the same as indicated in the previous chapter. The Situation–Actor–Process–Learning–Action–Performance (SAP-LAP) framework is used to interpret empirically validated linkages and suggest measures for improving performance in respective cases.

Chapter 9 emphasizes upon the need for building collaborative linkages among various government agencies for effective e-governance. The illustrative context is taken as establishing a sound Agricultural Marketing Information System (AMIS) in India by presenting a strategic alliances based framework linking four different central government organizations, viz. the Directorate of Marketing and Inspection (DMI), the Directorate of Economics and Statistics (DES), the Department of Consumer Affairs (DCA) and the National Horticulture Board (NHB), which have independent systems of collection and dissemination of market information on agricultural produce.

Finally, Chapter 10 presents a way forward for effective e-governance in the form of strategic recommendations based on insights developed through the research conducted and practical experience of e-governance projects.

We take this opportunity to thank all the senior executives, nodal officers, operational staff and other respondents who have spared time for our better understanding about the projects discussed in the book. Special thanks to Rejani Raghu for helping in formatting of the manuscript.

It is hoped that the book will be of interest to the practitioners in government well as corporate who are engaged in planning and implementation of e-governance projects spanning across various layers of government. In Indian context, the learning issues are likely to trigger appropriate corrective measures for generating a better value from the several flagship projects envisaged under the Digital India Programme, Further, it will be of interest to the academic audience who would like to work on the strategic framework and the constituting constructs presented in the book for further improvement. It will also be of interest to business students and application software architects who aspire for a consulting career in the area of e-governance.

New Delhi, India

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P.K. Suri is Professor at and Head of the Delhi School of Management, Delhi Technological University (DTU), New Delhi, India. Prior to joining DTU in 2012, he worked in the Central Government for more than twenty five years. He has been an Indian Statistical Service Officer of 1986 Batch and served in various positions ranging from Research Officer in the Department of Tourism to Senior Technical Director in the National Informatics Centre. He has closely worked with a diverse set of stakeholders related to several organizations and has undertaken extensive field visits across India in the context of planning and implementation of e-governance projects. In particular, he has been the National Co-ordinator of the National Informatics Centre for the challenging e-governance project 'Agricultural Marketing Information Network (AGMARKNET)' System sponsored by the Ministry of Agriculture & Farmers Welfare, Government of India. He obtained his PhD from IIT Delhi, his doctoral work being in e-governance. He has many publications on e-governance in the form of book chapters (including in Springer book series on Flexible Systems Management), national and international conference proceedings, and articles in refereed journals such as *Transforming Government: People, Process and Policy*, *International Journal of Electronic Governance*, *Electronic Government: an International Journal, Global Journal of Flexible Systems Management*, *IIMB Management Review*, to name a few. He is the Editor-in-Chief of *Values-Based Management Journal* of the GIFT Society. He continues to extend IT consulting support to government and has also undertaken such assignments for UN World Tourism Organization and UN Food and Agriculture Organization.

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Chapter 1
Introduction to E-Governance

1.1 General Background

Governments all over the world are in pursuit of Information and Communication Technologies (ICT)-based solutions for facilitating good governance. The phenomenon is popularly known as e-governance or e-government as per varying country contexts. In the recent past, different terms have been coined to re-brand it alongside the emerging technological developments. Some of the buzzwords in this context are joined-up government, whole-of government, one-stop government, connected government and open government; the latest being digital government. Irrespective of the various terminologies used to describe the phenomenon, practitioners across the world continue to experience serious challenges in their efforts to connect government and citizens for achieving good governance. This is particularly so in the context of developing countries. There have been more failures than successes in terms of achievement of intended outcomes. The peculiarity with the ICT-based systems is that they get matured over a period of time with increased participation of end users. Further, due to various operational constraints, the government departments generally prefer 'As-is' computerization of traditionally established systems. For example, even though the National eGovernance Plan (NeGP) and the second Administrative Reforms Commission (ARC) of India emphasized on re-engineering of government processes and rationalization of organizational structures, there are only a limited number of e-governance projects where such an approach could be said to have been methodically adopted. This prevents innovative usage of ICT to improve system performance. It is also experienced that expectations of end users of such systems keep rising as they gradually become accustomed to technology usage and become more and more aware about the power of ICT as being practiced in the corporate sector. As a result, the objectives and scope conceptualized before launching of such projects generally fall short of matching the growing levels of user expectations. With limited project

P.K. Suri and Sushil, *Strategic Planning and Implementation of E-Governance*,
Flexible Systems Management, DOI 10.1007/978-981-10-2176-3_1

resources and rigid governance framework, the government is often found wanting in responding to the emerging demands of citizens.

For example, the mandate for NICNET-based Agricultural Marketing Information System Network (AGMARKNET: www.agmarknet.nic.in *now* www.agmarknet.dac.gov.in)—a farmer centric national e-governance project launched during the Year 2000 in India—was to progressively link 2735 wholesale markets (37 % of about 7000 wholesale markets in India) by the year 2007. The ongoing project, which has so far covered about 3200 markets, is being executed by the National Informatics Centre (NIC) of the Ministry of Communications and Information Technology for the Directorate of Marketing and Inspection (DMI), Ministry of Agriculture and Farmers Welfare (MoAFW) through the Marketing Boards/Directorates in States. After an initial struggle of almost 2 years, the key objective of evolving an ICT-based system for collection and dissemination of country-wide daily commodity prices and arrivals can be said to have been achieved. However, still there are several markets that either report irregularly or do not report at all. Due to issues such as these, continuous co-ordination with involved agencies is required to keep the momentum on.

While the project authorities continued keeping their focus on bringing more and more target markets under the network, several new issues cropped-up during execution which was not part of the defined objectives when the project was launched. Some of these include: How the market information will reach grassroots? Whether the information being reported by markets is authentic? How about enabling commodity transactions over the portal? How small and marginal farmers will be able to draw benefits from such a service? How to ensure single window market information service and avoid duplicities as many states started developing their own web-based systems on similar lines? Since the project was bound by the Tenth Plan approved scheme framework, actions on learning issues had to be postponed to the XI and XII Plan periods. The prevailing government procedures, however, discourage major deviations from the already approved overall framework of the scheme. There is seemingly a need to streamline procedures to meet the new challenges meaningfully. Further, the actors involved are also expected to be geared up to effectively utilize the unprecedented opportunities created by the advances in the field of ICT. It appears to be unlikely that the emerging issues can be diligently handled in the conventional strategic planning and implementation framework in which the project is being executed.

Implementation of ICT-based projects within the boundaries of a government department is relatively easier as the situation, actors and processes are within the control of the concerned department. The context, however, becomes much more complex in the case of e-governance projects where it is generally required to address social, political, administrative, economic, and technical issues simultaneously. Quite often, the problem and solution domains are not limited to a particular department. In a federal government structure, the complexities get further compounded in terms of project ownership if a project is initiated by the central government and is to be implemented with the help of state governments.

In the recent past, several e-governance projects have been taken up at the centre as well as state government levels in India. Massive budgetary allocations were

made for the National e-Governance Plan (NeGP) in India to support certain identified projects to be implemented in mission mode by the respective line Ministries at centre and state government levels. As part of this strategic intervention by the government, some of the initiatives are reported to be successfully implemented in select urban and rural areas. It must, however, be noted that many of the projects taken up in the past or as part of NeGP lost their path midway and could not be scaled up. Some of the Mission Mode Projects (MMPs) could not be even started and a few have not yet been able to offer the intended range of services. The slow progress has apparently defeated the logic of huge budgetary allocations made for this time bound mega plan scheme. As a result, despite all good intentions of the government the so-called IT revolution has hardly brought about any significant improvements in the lives of the downtrodden, which form a substantial part of our population.

The unfinished NeGP has now been subsumed in the NeGP 2.0 or *e-kranti* as part of a highly ambitious 'Digital India Programme' supported with an astronomical budget of about INR 1000 billion. As we try to leapfrog towards highly ambitious goals set for e-governance, the underlying planning and implementation related challenges must necessarily be kept into view as there have been appalling setbacks even in the context of developed countries. For example, the Office of Management and Budget, Federal Government of United States has candidly submitted of having wasted millions of dollars in trying to make use of IT advancements for serving citizens (www.whitehouse.gov/omb/e-gov/, last accessed on 2.6.16). Therefore, while strategizing for 'Digital India', the yawning gaps between what is planned and what actually gets implemented on the ground must be thoroughly analyzed. For this, it is required to probe deeper into planning and implementation aspects of some of the e-governance projects to learn lessons for achieving higher levels of performance. The research work presented in the form of this book is an attempt in this direction.

Recognition of agriculture as a thrust area for ICT intervention in the 'Digital India' programme launched by the Government and the practical experience gained during planning and implementation of the AGMARKNET project have provided the motivation and ground for analyzing a few agriculture-related e-governance projects of national significance besides other important projects for our study. The learning issues presented in this book, are expected to provide a base for improved planning and implementation of e-governance projects.

1.2 E-Governance in India

In India, the central government has been progressively promoting the use of ICT in managing its internal processes through its organization NIC, which was set up in 1976. Till the early 1980s, there was limited in-house use of computers in government organizations. The initial thrust was on data intensive applications such as census, elections, tax administration, large scale surveys and specialized areas such

as defense, planning, research, etc. The government's intent towards collaborative computing can be traced back to the year 1987 when the Planning Commission launched its NICNET programme. Under the programme, the district and state governments as well as central ministries were networked for sharing information in digital mode. However, practically the focus of IT applications continued to be on automation of internal government functions rather than on improving service delivery to citizens (ARC 2008, p. 106). Concerted efforts towards e-governance can be said to have taken only in the year 1998 with the constitution of a National Task Force on IT. Based on one of the breakthrough recommendations of the Task Force, all the government departments were directed to spend 2–3 % of their allotted budget for adopting IT. In February 2000, a High Powered Committee, constituted under the chairmanship of Cabinet Secretary, directed all ministries/departments of the central government to designate a senior officer as IT Manager to act as the focal point for promotion of IT. Subsequently, the Department of Administrative Reforms and Public Grievances (DARPG) came out with a 12 point 'Minimum Agenda of E-governance' to be implemented by all government departments (http://darpg.nic.in). This comprised creation of basic ICT infrastructure, training of employees and use of ICT for improving internal and external interfaces. Every Ministry/Department was asked to prepare a 5-year 'IT Vision' and annual 'Action Plans'. However, in the eagerness to adopt ICT, the government departments seem to have avoided getting entangled with challenging issues like standardization, interoperability, processs re-engineering, etc.; though these were well highlighted in the reports of the said IT Task Force. Implementation approach for accomplishing the minimum agenda of e-governance seem to have been left to the sole discretion of the individual departments. These departments took-up a variety of e-governance projects independently as part of their plan/non plan schemes. Some of these initiatives, particularly in Andhra Pradesh, Tamil Nadu and Chandigarh, emerged as path-breaking initiatives as they demonstrated that significant benefits can be derived from improving accessibility, tackling corruption and giving assistance to deserving groups (Harris 2007).

While taking stock of the slow progress of e-governance in the midst of these isolated path-breaking initiatives, the government felt the need for a coordinated effort in mission mode at the national level by a central government department. This gave birth to National e-Governance Plan (NeGP) in May 2006, with the Department of Information Technology designated as the nodal co-ordinating organization. NeGP initially comprised 27 Mission Mode Projects (MMPs) and 8 support components to be implemented at the central, state and local government levels. The mission mode projects include services around road transport, land records, commercial taxes, employment exchanges, agriculture, civil supplies, treasuries, land registration, policy and education, insurance, excise, banking, income-tax, passport, etc. The MMP portfolio of projects was increased to 31 with the addition of four more projects, viz. Education, Health, Public Distribution System and Posts on 29 July 2011. The three important elements of the service delivery framework include: State-Wide Area Networks (SWANs), about 1.3 lakh Common Service Centres (CSCs) proposed initially as front-end outlets for the

service and State Data Centres across 29 States and 6 Union Territories (DIT 2012, pp. 22–23). The full list of MMPs and components and their implementation status is available at http://mit.gov.in. The government views e-governance as the means to attain the attributes of good governance, viz. transparency, efficiency, responsiveness, cost effectiveness and accountability through application of technology. E-governance is, therefore, being viewed upon as an important vehicle for introducing administrative reforms to improve the quality of life for underserved sections of society and provide more equitable access to economic opportunities across the nation. One major difference from the 'computerization' initiatives of the past is the focus on using ICT for streamlining delivery of services to citizens.

In the recent past, some of the catalytic policy initiatives supporting the promotion of e-governance in India have been: introduction of IT Act 2000, Right to Information Act 2005 and setting up of the second Administrative Reforms Commission in the year 2005. IT Act 2000 has been enacted to provide legal recognition for transactions carried out digitally to facilitate electronic filing of documents with the government agencies (http://www.legalserviceindia.com/cyber/itact.html). Right to Information Act 2005 has been introduced to enable citizens' access to information under the control of public authorities to promote transparency and accountability in the working of every public authority (http://rti.gov.in). The second Administrative Reforms Commission was set up with the intention of revamping the public administration system. The eleventh report of the commission, submitted during January, 2009, stresses upon to achieve a transparent, accountable and efficient governance system in the country. The commission expects the government to prepare a clear roadmap with specific milestones for transforming the citizen–government interaction at all levels to the e-governance mode by 2020 (ARC 2008, pp. i, iii, 166). This strong recommendation of the commission has led to the clearance of "Electronic Delivery of Services Bill" by the Union Cabinet during 2013 as per which the centre and state governments are required to deliver services to citizens in electronic mode.

Other e-governance-related key strategic interventions for strengthening service delivery at grassroots include constitution of Unique Identification Authority of India (UIDAI) and e-Panchayat Project of the Ministry of Panchayati Raj under Bharat Nirman II Programme. The UAIDI is mandated to provide unique identification to residents of India. The unique identification (popularly known as AADHAR) is expected to serve as the basis to ensure efficient delivery of services and act as a tool for effective monitoring of government programmes and schemes. The e-Panchayat project which aims at providing broadband connectivity to all village Panchayats, is expected to boost development at grassroots through bottom-up planning.

As mentioned earlier, the NeGP, which was once considered a flagship government programme, has not delivered as per expectations. Most of the projects launched under NeGP are found to be lacking in terms of necessary re-engineering of underlying processes, use of emerging technologies, application of e-governance standards, localization of contents, etc. Projects initiated under NeGP are, therefore, considered to be performing at sub optimal level (DIT 2015, p. 6). To address these

issues, the government has launched e-Kranti as part of the Digital India Programme. All the ongoing and new MMPs are required to follow the key principles of e-Kranti which are: 'Transformation and not Translation', 'Integrated Services and not Individual Services', Mandatory 'Government Process Reengineering (GPR), 'ICT Infrastructure on Demand', 'Cloud by Default', 'Mobile First', 'Fast Tracking Approvals', 'Mandating Standards and Protocols', 'Language Localization', 'National GIS (Geo-Spatial Information System)', 'Security and Electronic Data Preservation' (DIT 2015, pp. 4–5). All the existing MMPs are to be revamped accordingly under e-Kranti programme. With the addition of 13 more MMPs, the e-Kranti programme comprise 44 MMPs as on December 2015. A summary of these MMPs covering a wide spectrum of services, is presented in Tables 1.1, 1.2 and 1.3.

Table 1.1 Mission mode projects (central government category)

S. No.	Project	Nodal Department/Ministry	Purpose
1	MCA 21 (www.mca.gov.in/MCA21)	Ministry of Corporate Affairs	All registry-related services including filing of documents, registration of companies and public access to corporate information
2	Pension (www.pensionersportal.gov.in)	Department of Pensions and Pensioners' Welfare; Department of Expenditure	Providing pension-related services to citizens
3	Income Tax (www.incometaxindia.gov.in)	Ministry of Finance/Central Board of Direct Taxes	Streamlining transactions of citizens with Income Tax Department. Services include Allocation of Permanent Account Number (PAN), Tax accounting, Taxpayer grievance redressal, Taxpayer correspondence, Online submission and processing of returns, etc.
4	Passport (www.passportindia.gov.in)	Ministry of External Affairs	Streamlining delivery of passport-related services such as application for new passport, renewal of passport, application status tracking, etc.
5	Immigration, Visa Foreigners' Registration and Tracking (IVFRT) (www.boi.gov.in; www.indianvisaonline.gov.in)	Bureau of Immigration, Ministry of Home Affairs	Facilitating the Visa issuance process, immigration function and strengthening the foreigners registration processes for effective tracking of foreigners
6	Central Excise and Customs (www.dor.gov.in; www.cbec.gov.in)	Department of Revenue/Central Board of Excise and Customs	Facilitating trade and industry by streamlining and simplifying excise and customs-related services such as online filing of service tax and excise returns, e-payment of custom duties, etc.

(continued)

Table 1.1 (continued)

S. No.	Project	Nodal Department/Ministry	Purpose
7	Banking (www.financialservices.gov.in)	Banking Industry under the supervision of Department of Financial Services	Improving operational efficiency and integrating core banking solutions across various banks in the country
8	National Population Register (http://www.censusindia.gov.in)	Office of the Registrar General and Census Commissioner, Ministry of Home Affairs	Developing a register of usual residents of India
9	Unique Identification Number (Aadhaar) (http://www.uidai.gov.in)	Unique Identification Authority of India, Ministry of Communications and IT	Providing unique identification to every resident which has been proposed to be primarily used as the basis of efficient delivery of welfare services
10	e-Office (www.darpg.nic.in)	Department of Administrative Reforms and Public Grievances	Improving operational efficiency of government by transitioning to a less paper office through automation of internal fie management processes. This includes usage of work flow and rule-based file routing, quick search and retrieval of files and office orders, digital signatures for authentication, forms and reporting components, etc.
11	Insurance (www.financialservices.gov.in)	Four public sector insurance companies (the National Insurance Company Ltd., the New India Assurance Company Ltd., the Oriental Insurance Company Ltd. and the United India Insurance Company Ltd.) under the supervision of Department of Financial Services	Improving services for customers in the general insurance sector
12	India Posts	Department of Posts	Providing all postal services in the country including postal savings accounts and postal insurance
14	e-Sansad[a]	Parliament of India, Lok Sabha Secretariate	Digitization of Parliament documents, including debates, speeches, committee reports and questions for sharing in public domain
15	Common IT Roadmap for Para Military Forces[a]	Ministry of Home Affairs	e-services for Para Military Forces

[a]New MMPs under e-Kranti

Table 1.2 Mission Mode Projects (State Government Category)

S. No.	Project	Nodal Department/Ministry	Purpose
1	Agriculture (A preliminary version accessible at www.farmers.gov.in)	Departments of Agriculture at centre and state levels	Integrating and up-scaling several disparate ICT initiatives at centre and state levels to improve farmers' access to agriculture related information and services
2	Municipalities (several initiatives by municipalities of cities with more that 1 million population)	Ministry of Urban Development in co-ordination with state governments	Ensuring efficient and effective delivery of municipal level G2C and G2B services to citizens (birth and death registrations, payment of property tax, license fees, solid waste management, etc.) besides transparency and accountability in the functioning of local urban bodies
3	Education (www.mhrd.gov.in)	Ministry of Human Resource Development	ICT for strengthening school education including effective implementation of several flagship schemes of the GoI—Sarva Shiksha Abhiyan, Mid-Day Meal, Rashtriya Madhayamik Shiksha Abhiyan, etc.
4	Land Records (National land Records Modernization Programme) (www.dolr.nic.in)	Department of Land Resources, Ministry of Rural Development	Computerization of land records across states including integration of registration and mutation processes for easy access by citizens and for better land-based development planning by government
5	Road Transport (www.morth.nic.in)	Ministry of Road Transport and Highways	Computerization of Road Transport Offices (RTOs) across states which primarily includes pan-India level standardization of vehicle registration certificates and driving licenses by implementing VAHAN and SARATHI software across the country

(continued)

Table 1.2 (continued)

S. No.	Project	Nodal Department/Ministry	Purpose
6	e-District (deity.gov.in/content/e-district)	Department of Electronics and Information Technology	Computerization and linking of district level government departments to ensure planned developmental activities and delivery of services (certificates such as caste, domicile, income, birth, death; licenses; ration cards; assessment of taxes, utility bills, benefits of social welfare schemes, etc.) at village level through common service centres
7	Health (www.mohfw.nic.in)	Ministry of Health and Family Welfare	Hospital Information Systems, supply chain management for drugs and vaccines, programme management of National Rural Health Mission (NRHM), etc.
8	Public Distribution System (www.pdsportal.nic.in)	Department of Food and Public Distribution	Supply chain management of food grains including movement and storage, fair price shops automation, digitization of beneficiaries' database, etc.
9	e-Panchayat (www.panchayat.gov.in)	Ministry of Panchayati Raj	Computerization of ~ 2.45 lakh Panchayti Raj Institutions (PRIs) for effective delivery of services in villages
10	Treasuries Computerization (www.dor.gov.in; www.finmin.nic.in)	Department of Revenue, Ministry of Finance	Computerization of state treasuries and link treasury systems with other relevant systems across the nation in order to bring transparency in financial system, control state finances and improve cash flow management
11	Employment Exchanges (www.labour.nic.in)	Ministry of Labour and Employment	Upgrading and modernizing employment services rendered through the network of employment exchanges across India to provide easy access to employment-related services and information to job seekers and employers in both organized and unorganized sectors

(continued)

Table 1.2 (continued)

S. No.	Project	Nodal Department/Ministry	Purpose
12	Crime and Criminal Tracking Network & Systems (www.ncrb.gov.in)	National Crime Records Bureau, Ministry of Home Affairs	Creating a comprehensive and integrated system for enhancing the efficiency and effective policing at all levels and especially at the Police Station level
13	Commercial Taxes	Ministry of Finance	Leveraging ICT for automation of all transactions related to commercial taxes
14	e-Vidhaan		Digitization of Vidhan Sabha documents across states, including debates, speeches, committee reports, and questions for sharing in public domain
15	Rural Development	Ministry of Rural Development	A portfolio of rural development schemes including MGNAREGA
16	Women and Child Development	Ministry of Women and Child Development	Integrated Child Development Scheme; Integration with Health MMP

Table 1.3 Mission Mode Projects (Integrated Services Category)

S. No.	Project	Nodal Department/Ministry	Purpose
1	India Portal (www.india.gov.in)	Department of Electronics and Information Technology Department of Administrative Reforms and Public Grievances	Providing a single window unified interface for a variety of information and services through linkage with several government websites. It is the central repository of documents, forms, services, acts, announcements, contact directories, schemes and rules
2	National e-Governance Service Delivery Gateway (NSDG)	Department of Electronics and Information Technology	Providing a standards-based messaging switch for enabling seamless interoperability and exchange of data across heterogeneous applications of different geographically dispersed departments
3	Electronic Data interchange (EDI) for e-Trade	Department of Commerce	Establishing electronic interfaces among trade regulatory and facilitating agencies as well as with the trading community to allow electronic delivery of services

(continued)

Table 1.3 (continued)

S. No.	Project	Nodal Department/Ministry	Purpose
4	e-Procurement	Directorate General of Supplies and Disposal, Ministry of Commerce and Industry	Bringing transparency and efficiency in public procurement
5	e-Courts	Department of Justice, Ministry of Law and Justice	Enhancing judicial productivity and transforming the justice delivery system as affordable, accessible, cost effective, transparent and accountable
6	e-Biz	Department of Industrial Policy and Promotion (DIPP), Ministry of Commerce and Industry	Transforming the business environment in the country by providing efficient, convenient, transparent and integrated electronic services to investors, industries and business throughout the business life cycle
7	Common Service Centres	Department of Electronics and Information Technology	Offering web-enabled e-governance services such as agriculture services, education and training Services, health services, banking and insurance services, entertainment services, commercial services, etc. in rural areas
8	Financial Inclusion[a]	Department of Financial Services	Strengthening Banks and Insurance Services in rural areas
9	National Geographical Information System[a]	Department of Science and Technology	Integrated GIS platform
10	Social Benefits[a]	M/o Social Justice and Empowerment as the leader and other welfare departments as co-owners	Online benefit scheme; Integrated e-services for NGOs
11	Roads and Highways Information System (RAHI)[a]	M/o Road Transport and Highways	Integrated citizen centric services related to roads and highways
12	e-Bhasha[a]	D/o Electronics and Information Technology	Language localization
13	National Mission on Education Through ICT (NMEICT)[a]	Department of Higher Education	Leveraging the potential of ICT in teaching and learning process in Higher Education Institutions
14	Urban Governance[a]	Ministry of Urban Development	Leveraging ICT for improving the quality of urban governance in India

[a]New MMPs under e-Kranti

Source (DIT 2011b, 2015, pp. 11–13), http://india.gov.in/e-governance/mission-mode-projects, last accessed on 5.1.15; http://deity.gov.in/content/mission-mode-projects, last accessed on 5.1.15; http://deity.gov.in/sites/upload_files/dit/files/DPR_on_e-Kranti.pdf, last accessed on 15.5.16

1.3 E-readiness Status of India

The current status of India's e-readiness is reflected in the studies such as e-readiness assessment conducted at the global level in the recent past. For example, the Economist Intelligence Unit of the IBM surveyed world's major economies for their ability to absorb ICT and use it for economic and social benefit. Out of 70 countries surveyed, it has ranked India at 53rd in the 2006 survey report, 54th in 2007 and 2008, and 58 in the years 2009 and 2010 with an e-readiness score of about 4 on a scale of 10. The e-readiness scores of top 10 countries are observed to be above 8 in these survey reports (http://www.ibm.com).

The United Nations E-Government Survey 2008 has ranked the 192 member countries (193 member countries in 2014 Survey) based on a composite index comprising the web measure index, the telecommunication infrastructure index and the human capital index. As per the survey, India's rank has slipped from 87 in 2005 to 113 in 2008 and fell further to 119th position in 2010 and 125th position in 2012. India continues to be ranked low at 118th position as per the survey report of the year 2014. India's overall index measure during 2012 and 2014 was about 0.38 which continues to be less than the word averages of 0.48 and 0.47 in the respective years. The e-government development index (EGDI) of top ten member countries is observed to be above 0.75 during the years 2008 and 2010 and above 0.84 during the years 2010, 2012 and 2014. The EGDI of top 25 countries as per UN survey report for 2014 is shown in Table 1.4.

The findings of global surveys conducted by both IBM and United Nations are found to be consistent in terms of comparative low ranking of India with respect to the top 10 countries. The large difference in EGDI scores of India and the developed nations is reflective of the arduous journey ahead for the developing countries such as India to match the ICT absorption potential of the top ranking countries and make use of the opportunities offered by e-governance on a larger scale. The e-government development scores reported in these surveys also reflect upon the increasing digital distance between developed and developing countries (UN 2008, pp. 19–21; UN 2010, p. 60; UN 2012, pp. 9–13; UN 2014, pp. 13–17).

At the national level, the Department of Information Technology in India has been bringing out e-readiness assessment reports since the year 2003 (DIT 2003, 2004, 2005a, 2006a, 2008, 2011a) through the National Council of Applied Economics Research (NCAER). The latest such e-readiness assessment report for 2011–2012 has grouped various states into different categories as per their e-readiness index as shown in Fig. 1.1.

Despite there being a number of successful pilot projects in different states, their up-scaling in respective states pose a big challenge. For ensuring equal access to opportunities offered by e-governance, it is necessary that all the states attain comparable e-readiness levels (ARC 2008, pp. iv, 62, 106).

Table 1.4 World e-government leaders (very high EGDI) in 2014

Country	EDGI	Rank
Republic of Korea	0.9462	1
Australia	0.9103	2
Singapore	0.9076	3
France	0.8938	4
Netherlands	0.8897	5
Japan	0.8874	6
The United States of America	0.8748	7
The United Kingdom	0.8695	8
New Zealand	0.8644	9
Finland	0.8449	10
Canada	0.8418	11
Spain	0.8410	12
Norway	0.8357	13
Sweden	0.8225	14
Estonia	0.8180	15
Denmark	0.8162	16
Israel	0.8162	17
Bahrain	0.8089	18
Iceland	0.7970	19
Austria	0.7912	20
Germany	0.7864	21
Ireland	0.7810	22
Italy	0.7593	23
Luxembourg	0.7591	24
Belgium	0.7564	25
Very High EGDI Average 0.8368		
World Average 0.4712		

Source UN (2014)

1.4 E-Governance in Agriculture—Significance and Challenges

The contribution of agriculture and allied sector to Indian GDP during 2013–2014 is estimated to be about 13.9 %. Agriculture remains the predominant sector in terms of employment and livelihood in India, even though its share in the national GDP has declined over the years. The sector accounts for employment to more than half of India's workforce. Agriculture contributes significantly to export earnings and is an important source of raw materials as well as of demand for many industries. The sector has gained further significance with the enactment of the National Food Security Act, 2013 which guarantees availability of subsidized food grains to poor people. Growth performance of agriculture has, therefore, important

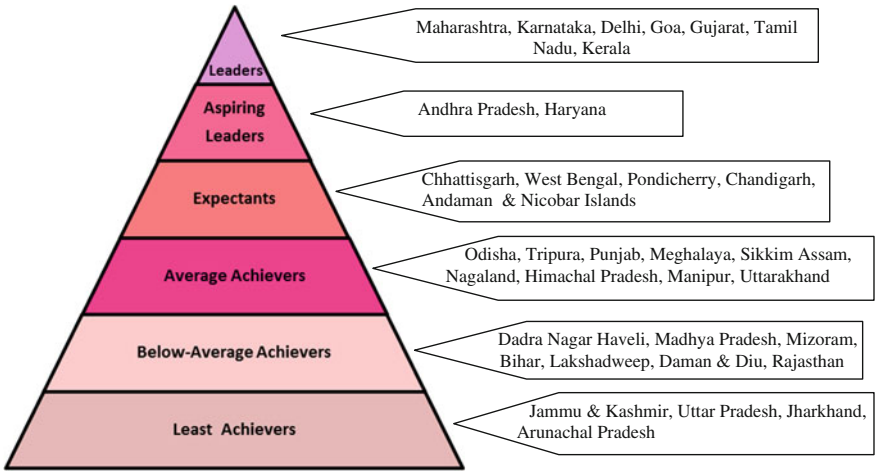

Fig. 1.1 Hierarchical categories for the e-readiness index. *Source* DIT (2011a, pp. 64)

implications for overall growth of the Indian economy. Accordingly, it is being emphasized that the agricultural strategy must focus on the 85 % of farmers, who are small and marginal. These farmers find it difficult to access inputs, credit and extension or to market their output. The Government of India has been attempting to transform the sector by initiating from time to time a series of measures for ensuring competitiveness of Indian agricultural produce in the world market. Thrust is being given on re-orientation of agricultural production and marketing strategies with the objective of enhancing the income levels of farmers.

It has now been well recognized that the Indian farmers need to be empowered with knowledge to meet the challenges of the changing economic scenario. Farmers make critical decisions throughout the crop-life cycle. Information needs of farmers encompass aspects such as choice of inputs (crop varieties and seeds, water, power, fertilizers and pesticides) and market transactions, farm operations (tillage, sowing, water management, fertilizer management, pest management and harvest), post-harvest operations and transactions (storage, transport, marketing, processing, etc.) and others (Moni 2006; Rao 2007; Aker 2011; World Bank 2011, pp. 3–4; Nonso 2012; Magesa et al. 2014). ICT has to play a critical role in the pursuit for the envisioned transformation at the grassroots by meeting the information requirements of the farming community and creating an enabling environment for them.

The National Agricultural Innovation Project (NAIP) of Indian Council of Agriculture Research has recently surveyed select rural areas, which are within the limited geographical scope of a few ICT initiatives in agriculture. The survey reflects that use of mobile phones is gradually becoming popular among farmers for accessing agriculture-related information. However, local knowledge system accessible to farmers still continues to be predominantly based on accumulated

knowledge of input suppliers, credit agencies, extension services and NGOs besides radio and television broadcasts from experts from distant sources. The conventional system is inadequate due to its limitations in terms of lack of comprehensive, relevant and understandable information, lack of decision-support capabilities and high transaction cost. Such limitations can be overcome through an appropriate mix of ICT and conventional methods including field level direct interaction between farmers and experts (Rao 2007; NAIP 2014). Farmers need to be equipped with knowledge about agriculture as per the requirements of emerging market-driven economy. Agriculture-related information is, however, available in pockets with multiple organizations. The information relevant to farmers needs to be integrated and provided to farmers as per their specific needs. ICT can facilitate web-linked interactive databases for empowering farmers with information on weather, natural resources, products in demand, credit, government programmes, farm practices, etc. as is being practiced in developed countries and pilot tested in many developing countries (Rao 2007; World Bank 2011; Aker 2011; IFPRI 2012; NAIP 2014).

In developing countries, majority of population in rural areas depend on agriculture. The catalytic potential of the ICT—the underlying technology on which e-governance services are based—is well recognized. Evidence of the contribution of ICT to agricultural development and poverty alleviation is increasingly becoming available, despite this being a relatively new phenomenon involving many challenges (Stienen et al. 2007; Aker 2011; World Bank 2011; IFPRI 2012; Magesa et al. 2014; NAIP 2014). However, apart from the technical challenges associated with e-governance projects, the additional challenges in the context of agriculture sector include: a large proportion of resource-poor small and marginal farmers in our country, their low literacy levels, agriculture-related government organizations operating in silos at top as well as grassroots, lack of required skills with the government functionaries and beneficiaries, etc. These challenges need to be handled through appropriate e-governance strategies such as intra and inter-organizational collaboration for the intended benefits to accrue to various stakeholders especially the farming community.

The National Agricultural Policy for Farmers, which was announced in 2007, envisioned leveraging ICT in a big way for enhancing the competence level of farming community in India. E-Governance in agriculture has been recognized as a mission mode project. Under the Agriculture Mission Mode Project (AMMP), the central Department of Agriculture (DAC) identified 12 farmers centric services which include information requirements during the crop life cycle (pre-harvest, farming and post-harvest operations) besides fishery, livestock and drought relief management. The project was initially planned to be implemented in a phased manner. In phase I, the project was to be implemented on pilot basis in 7 states (Assam, Himachal Pradesh, Madhya Pradesh, West Bengal, Jharkhand, Karnataka and Kerala) comprising 187 districts and about 1500 blocks before rolling out to other states. During implementation, it was realized that the services envisaged under the project were too complex to be handled at centre government level due to inherent dependencies on

several state government level organizations. After a significant slippage of project schedule, the responsibility of DAC has been scaled down and the project is now transferred to states for implementation as part of e-kranti.

1.4.1 *Agriculture-Related Popular Grassroot ICT Projects in India*

There are a number of development-oriented grassroot ICT projects in India. (For example, one compilation is available at http://www.gdrc.org/icts/ICTD_inside_text_7july.pdf, last accessed on 25.6.2015). It is observed that in most of these projects, agriculture is only a small component. Some of the grassroot projects with focus on agriculture are: Gyandoot, Warana Wired Village project, Information Village project of the M S Swaminathan Research Foundation (MSSRF), e-Sagu, Reuters Market Light, Tata Kisan Kendra of Tata Chemicals Limited, eChoupal of ITC Limited, iShakti of Unilever, iKisan project of the Nagarjuna Group of Companies, Automated Milk Collection Centres of Amul Dairy Cooperatives, Bhoomi (Land Records Computerization in Karnataka), Computer-Aided Administration of Registration Department (Andhra Pradesh), Knowledge Network for Grassroot Innovations—Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI), Paddy Procurement (Chattisgarh), Application of Satellite Communication for Training Field Extension Workers in Rural Areas (Indian Space Research Organization), Tarahaat.com by Development Alternatives Information Network, Mahitiz-samuha (Karnataka), VOICES—Madhyam Communications (Karnataka), Centre for Alternative Agriculture Media (CAAM), etc. (ICTD 2004; Meera et al. 2004; Rao 2004; Dossani et al. 2005; Rao 2007; NAIP 2014).

Most of such initiatives are by NGOs, cooperative bodies and private sector organizations. While the coverage by NGOs and cooperatives is limited by their resource constraints, the private organizations usually operate in select areas which serve their business interests. In general, there is a lack of such initiatives by state agricultural departments. Evidence from field suggests that ICT-based services are progressively helping the rural communities. However, factors such as top-down approach of planning, inadequate addressing of ground realities in project plans, lack of periodic need assessment, lack of contents in local languages, lack of skills with users, etc., are preventing realization of full potential of ICT-based services (Rao 2004; Dossani et al. 2005; IFPRI 2012; Chitra and Shankaraiah 2012; NAIP 2014). Further, such projects in India have not been studied methodically due to which experience gained from such efforts remain un-sharable across the ongoing or new projects (Keniston 2002; Chitra and Shankaraiah 2012; NAIP 2014). Concerns have also been raised about financial viability of such ICT-based projects in India and other developing countries (Dossani et al. 2005; Magesa et al. 2014).

1.4.2 Agriculture-Related National/Multi-state E-Governance Projects in India

It is observed that even before launching of the erstwhile NeGP, concerted efforts have been made by the government to improve service delivery at the grassroots through large scale projects. The important national/multi-state level ongoing agriculture related e-governance initiatives of the central government are summarized in Table 1.5. The summary includes project category, coverage, purpose, key-intended beneficiaries and implementation status. The identification of projects and their summaries are based on study of annual reports of concerned organizations, web sites, internal project documents and discussion with project officials.

Table 1.5 National-level agriculture-related important projects in India

Project and major category	Coverage	Focus/purpose	Key intended users	Implementation status
AGMARKNET www.agmarknet.dac.gov.in (G to C)	All India	Collecting and disseminating market information from Agricultural Produce Wholesale Markets for the benefit of farming community	Farming community, officials of markets, centre and state governments	Operational since 2002
Agricultural Census and Input survey http://agcensus.nic.in (G to G)	All India	Building a comprehensive database on various agricultural parameters (e.g. tenancy status, land use, irrigation status and sources, cropping pattern, consumption of inputs) for providing decision support to planners and policy makers in management of agricultural resources	Officials of central and state governments	Agriculture census (1995–1996) and Input survey (1996–1997): Web based dissemination in 2007. Agriculture census (2000–2001) and Input survey (2001–2002). Web based dissemination in 2008. Agriculture census (2005–2006) in progress

(continued)

Table 1.5 (continued)

Project and major category	Coverage	Focus/purpose	Key intended users	Implementation status
Agricultural Statistics Project (Crop Production and Land Use Statistics Information Systems) http://eands.dacnet.nic.in http://lus.dacnet.nic.in (G to G)	All India	Databases developed based on information received in offline mode from all the districts on land use and crop-wise production. Dissemination through web	Government officials, Researchers	Web-based systems developed; under implementation
Agriculture MMP	Initial scope covered 7 States (Assam, Himachal Pradesh, Karnataka, Jharkhand, Kerala, Madhya Pradesh and Maharashtra)	Twelve clusters of services	Farming community	Initiated in 2011; Under implementation; a farmers' portal (www.farmer.gov.in) envisaged as a single window information service for farmers
AGRISNET (G to G,G to C)	18 States	Networking of district agricultural departments in different states and improving delivery of agriculture related services	Officials of state and district agricultural departments officials and farmers	Under implementation since 2006
Computerized Registration of Pesticides (CROP) (www.cibrc.nic.in) (G to B)	All India	To streamline procedures involved in registration of pesticides as per Insecticides Act, 1968	Pesticides industry and government officials	Operational since 2002
DACNET www.dacnet.nic.in (G to E)	All India	Intranet for messaging, collaboration and implementing e-governance applications	Officials of DAC	Operational since 2005; The applications migrated to upgraded infrastructure recently and URL discontinued
Grapenet www.apeda.gov.in (G to B)	Maharashtra, Karnataka, Andhra Pradesh	Web-based system integrating various stakeholders in the export of grapes	State/district level horticulture officials, labs, exporters, officials at central level	Operational since 2004

(continued)

Table 1.5 (continued)

Project and major category	Coverage	Focus/purpose	Key intended users	Implementation status
Integrated Fertilizers Management Information System (IFMIS) www.fert.nic.in (G to B)	All India	Ensuring adequate supply of good quality fertilizers to farmers at affordable price	Fertilizer companies, government officials of centre and states	Progressively being evolved and enriched as part of successive plans since 1995. Web-based interface for companies operational since December, 2003
Integrated Pest Management http://ppqs.gov.in (G to G)	All India	To promote Integrated Pest Management	District agricultural officers	Web-based system under implementation since 2006
Kisan Call Centre (G to C)	All India	Providing agricultural extension support	Framers	Operational since 2004
mKisan Portal (www.mkisan.gov.in)	All India	Intending to subsumes all mobile based initiatives related to Agriculture and allied sectors	Farmers, officials at Centre, State and district levels	Beta version operational since 2013
National Horticulture Mission www.nhm.nic.in (G to G)	All India	Web-based system for monitoring progress of the mission	Government officials at Centre, State and district levels	Implemented at State level. Reporting at district level under progress
HORTNET (www.hortnet.nic.in) (G to G, G to C)	All India	Web-based system for the beneficiaries to apply for assistance related to horticulture development and view status of their applications	Scheme beneficiaries and Government officials at Centre, State and district levels	Actively being used by some states like Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Telangana

(continued)

Table 1.5 (continued)

Project and major category	Coverage	Focus/purpose	Key intended users	Implementation status
Nav Krishi http://navkrishi.dacnet.nic.in (G to G)	All India	Web-based system to capture and disseminate information on Agricultural Programme Schedules under mass media support by Doordarshan (Television) and All India Radio to strengthen agricultural extension services	Production Centres of Doordarshan (55) and All India Radio (90)	Operational since 2006
Plant Quarantine Information System (PQIS) www.ppqs.gov.in (G to B)	All India	To prevent the entry of exotic pests into the country	Traders, government officials	Operational since 2002
SeedNet (G to G, G to B) www.seednet.gov.in	All India	Online access to seed varieties	Stakeholders in supply-chain of seeds	Operational since 2007

Source www.agricoop.nic.in; DAC (2005a), pp. 127–128, DAC (2006), pp. 73–75; DAC (2007a), pp. 69–71; DAC (2014), p. 58; DIT (2005b), p. 82; DIT (2006b), pp. 89–90; DIT (2007), pp. 67–70; DoF (2003), 47–48; DoF (2007), 67–69, project web sites

From a review of the above projects, it has emerged that though design and development phases for most of the projects have been completed, challenges are generally being faced in the implementation of the projects. Since the study intended to analyze e-governance from beneficiaries' perspective also, only such projects were considered where it can be reasonably assumed that services have started reaching the intended beneficiaries. The basic criteria for selecting a project was, therefore, taken as that the project should have been operational for at least 1 year at the start of the study in 2005 and that the project has nation-wide implications. With these criteria, seven projects were short listed. These were AGMARKNET (G to C), DACNET (G to E), Integrated Fertilizers Management Information System (G to B), Grapenet (G to B), Kisan Call Centre (G to C), Plant Quarantine Information System (PQIS) (G to B) and Computerized Registration of Pesticides (CROP) (G to B). Out of last two G to B projects, study of CROP system

was preferred over PQIS keeping in view its uniqueness in the form of amendment of a legal act before applying IT. Thus, two G to C, one G to E, and three G to B e-governance projects were identified for the detailed study. These projects address both pre- and post-harvest aspects (input and output) of agriculture development.

1.5 Significance of the Book

The book is designed to present a strategic framework for improving e-governance performance. It is based on an in-depth research study taken up with particular reference to agriculture related projects in the Indian context. The book primarily deals with following key issues:

- Like any other management context, e-governance context consists of a "situation" to be managed, an "actor" or a group of actors to deal with the situation and a "process" or a set of processes that respond to the situation and recreate it. The actors in the government domain, by their very position, have limited freedom of choice which tends to restrict their options. The resultant rigid and static processes may fail to cope up with the dynamic e-governance situation. It is, thus, required to develop deeper understanding about the complex interplay of Situation, Actors and Processes in the e-governance context.
- The conventional strategic planning framework, which follows a sequential path, is possibly not capable of handling the dynamic context of e-governance. Gaps in conventional planning, strategy formulation and strategy implementation aspects could possibly be the reasons for unsatisfactory progress of e-governance projects.
- Government is supposed to think in terms of amortization of the huge assets possessed by it. Building strategic alliances across organizations could be a useful strategy to leverage the institutional strengths for tackling the challenges of digital divide and interoperability.

The objectives of this research-based book are as follows:

- To analyze performance of select e-governance projects in the context of study from the perspectives of three key actor segments—planners, implementers and intended beneficiaries.
- To find out as to whether the performance is influenced by extent of planning, comprehensiveness of strategy formulation, effectiveness of strategy implementation, changing situation, competence level of actors and flexibility of processes.
- To propose an empirically validated strategic framework for e-governance projects to enhance the performance.

1.6 Concluding Remarks

Government organizations are fundamentally created for achieving social objectives. With assured budgetary allocations, these organizations have no compulsion to generate revenue for their survival. There are, however, growing concerns about intended benefits not reaching the target beneficiaries as planned. Government organizations are, therefore, increasingly being expected to be performance oriented. E-governance projects are investment intensive and prone to risks of failures due to the complexities involved. The performance of e-governance is expected to improve with the application of relevant lessons from strategic management during planning and implementation phases. In the next chapter, performance of e-governance is analyzed from the perspective of key-related stakeholders, viz. planners, implementers and intended beneficiaries.

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Chapter 2
Measuring E-Governance Performance

2.1 Introduction

The potential of e-governance for improving internal efficiency and strengthening of interfaces with citizens is well recognized by governments across the globe. Its effective realization, however, demands overcoming of several challenges. These challenges generally relate to system and technology, processes, organizational issues, legal issues, security, citizen relationship management, inter-departmental collaboration and integration, building public-private partnerships, change management, etc. Of late, there has been a growing concern among several governments about low levels of acceptance of the e-governance services despite huge investments being made world-wide. On the other hand, while a large number of projects are finding it difficult to meet their intended purpose, the few successful projects amply demonstrate the benefits accruing to different stakeholders through effective use of ICT. The discouraging results pose a challenge to probe deeper into the performance aspects of these projects from the viewpoints of key stakeholders.

Most of the published literature on e-governance performance is based on qualitative analysis of specific contexts. Though, in the recent past, studies supported with empirical analysis are being regularly reported in e-governance literature, e-governance performance measures based on perspectives of key stakeholders belonging to different projects are generally lacking. In this chapter, we propose a construct and apply it for analysing e-governance performance from the viewpoints of government employees and end users in the context of the identified projects.

2.2 Key Stakeholders and Value from E-Governance

E-governance projects are generally characterized by involvement of a number of actors both internal and external to the owner organization. According to Freeman (1984, pp. 24–27, 52–55), it is important to account for key stakeholders while

P.K. Suri and Sushil, *Strategic Planning and Implementation of E-Governance*,
Flexible Systems Management, DOI 10.1007/978-981-10-2176-3_2

pursuing for organizational objectives. Though there are many stakeholders associated with large e-governance projects, the prominent ones include employees in government organizations and the service users of government services which have been the focus of many scholarly studies (Axelsson et al. 2013). The government employees can be further broadly categorized into key decision makers and the line mangers. Actors in the former category are responsible for planning and are usually the driving forces behind projects. The line managers generally act as implementers. For example, e-governance stakeholders are classified as providers and recipients of services (Gouscos et al. 2007). It has been suggested that service offerings through e-governance ought to generate additional value and benefits to stakeholders should be measureable. E-governance projects, therefore, need to be studied from the view point of benefits accruing to key stakeholders. Based on insights developed by analysing strategic gaps in an ongoing national level AGMARKNET project (Suri 2005), we have categorized stakeholders as planners, implementers and beneficiaries for further analysis.

It is observed that the key strategic objectives of e-governance projects in both developed and developing countries are linked to improving governance. Of late, scholars as well as the policy documents of international agencies like the World Bank and UNDP have been emphasizing on leveraging e-governance for bringing reforms in government system. It has been emphasized that focus of e-governance projects should be on efficient and transparent service delivery, enabling citizens' right to information, facilitating their participation in governance, etc. This approach to e-governance is adopted by many projects around the world (Sahraoui 2007). For example, in the Indian context, the erstwhile Planning Commission (Now NITI Aayog) and the Administrative Reforms Commission view e-governance as the means to attain attributes of good governance, viz. transparency, efficiency, responsiveness, cost effectiveness and accountability through application of technology (Planning Commission 2007a, b, p. 231; Planning Commission 2013, pp. 294–295; ARC 2008, pp. 60, 176). In order to arrive at a suitable measure for assessing performance of e-governance in the background of this study, it is necessary to develop an understanding about e-governance contribution and e-governance assessment.

2.3 Contributions of E-Governance

Benefits of e-governance in terms of easy accessibility to authentic and comprehensive service, saving of time and cost, enhanced transparency, better interactivity, improved responsiveness, better monitoring and control, decision-making, etc. have been discussed in many studies. Some of these are summarized in Table 2.1.

We refer to some of these articles subsequently while defining the performance variables.

Table 2.1 E-governance contributions

Author	Contributions
Tsohou (2014)	Enables public administrations to offer an increased portfolio of public services to citizens, businesses or other public agencies in an efficient and cost-effective manner
Suri (2014)	Can play a catalytic role in improving government service delivery at the grassroots by plugging gaps in the related processes
Lindgren (2013)	Improves citizens' opportunities to interact with government authorities; increases government authorities' efficiency by reducing the number of manual routines; increases democracy through greater governmental transparency
Planning Commission (2013)	Facilitates attaining attributes of good governance, viz. transparency, efficiency, responsiveness, cost effectiveness and accountability
Wang and Chen (2012)	An effective means to transform government functions, improve administrative efficiency and promote the openness of government affairs and meliorate public service
Valdes et al. (2011)	Improves the efficiency of service delivery through interconnected networks, encourages citizen participation; increases the transparency of administrative processes
UN (2008, xii)	Can significantly contribute to process of government transformation towards a leaner, more cost-effective government; can facilitate communication and improve the coordination of authorities at different tiers of government; and can enhance the speed and efficiency of operations by streamlining processes, lowering costs, improving research capabilities and improving documentation and record keeping
Luna-Reyes et al. (2007)	Collaborative e-Government contributes in the form of technical, organizational and political benefits
Harris (2007)	Prime focus of Government of India for e-governance is for greater efficiency, transparency, accessibility, accountability and reduction in procedural complexities that breed corruption
Evans and Yen (2006)	Facilitates information support to decision makers enabling them serve citizens in a more timely, cost-efficient and cost-effective manner; facilitates better coordination among different layers of government as well as government and beneficiaries
Grant and Chau (2005)	Develops and delivers high quality, seamless and integrated public services; enables effective constituent relationship management; and supports the economic and social development goals of citizens, businesses, and civil society at local, state, national and international levels
Jaeger (2005)	Promotes public participation in government
Tan et al. (2005)	Improves transparency, accountability, public participation
Zwahr et al. (2005)	Creatively destroys conventional governance institutions and transforms functioning
Bhatnagar (2004)	e-governance can have a direct impact on (a) reducing the number of intermediaries that citizens need to interact with in order to get

(continued)

Table 2.1 (continued)

Author	Contributions
	a government service; (b) improving government ability to monitor and (c) disclosing information about government processes and public budget spending to citizens
	Provides citizens and governmental agencies with a convenient, cost-efficient and cost-effective way to access required government information and public services
OECD (2003)	E-Government improves efficiency and services, helps in achieving specific outcomes, can be a major contributor to reform enables greater engagement with citizens and helps building trust between government and citizens
CDT (2002)	E-Government provides greater access to government information; promotes civic engagement by enabling the public to interact with government officials; makes government more accountable by making its operations more transparent and thus reducing the opportunities for corruption; and provides development opportunities, especially benefiting rural and traditionally underserved communities
Heeks (2001)	Three main contributions of e-governance: (a) improving government processes (*e-administration:* cutting process costs, managing process performance, making strategic connections in government, creating empowerment); (b) connecting citizens (*e-citizens or e-services:* talking to citizens, listening to citizens, improving public services); and (c) building external interactions (*e-society:* working better with business, developing communities, building partnerships)
Maio et al. (2000)	Constant improvement of service delivery, participation of constituents and improved governance
World Bank (www.worldbank.org/egov)	Serves different ends such as better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management
UNESCO (www.unesco.org)	Improving information and service delivery, encouraging citizen participation in the decision-making process and making governance more accountable, transparent and effective

2.4 Assessment of E-Governance

The evolving concept of assessing e-governance initiatives is attracting scholars from diverse disciplines. The purpose of some of the initial assessment frameworks was limited to developing an understanding at a broader level. For example, Layne and Lee (2001) proposed a four-stage framework in which levels of maturity were viewed as 'Catalogue', 'Transaction', 'Vertical Integration' and 'Horizontal Integration'. This framework has been adopted or closely resembles many other staged models for e-governance implementation (Yildiz 2007), for example, UN

E-government Survey categorizes the stages as 'Emerging', Enhanced', 'Transactional' and 'Connected' (UN 2014). Grant and Chau (2005) proposed a generic framework to represent e-governance vision and implementation that would be applicable across different governments. The framework includes strategic focus areas (SFAs) mapped to one or more key functional areas (KFAs). While conceptual frameworks such as these serve the purpose of assessing e-governance services at a broader level, further instruments are required to analyse specific systems. Andersen and Henriksen (2005) have argued that the majority of e-government studies have not focused on outcomes.

The traditional financial appraisal measures such as 'Return on Investment', 'Internal Rate of Return', 'Net Present Value' and 'Payback' are relatively easy to define in a manufacturing environment but can be misleading when applied to study outcomes in e-governance context. These measures do not support the accomplishment of socio-economic and socio-political goals that generally characterize e-governance projects. To address this limitation, it has been proposed to use an outcome-based approach by considering hard as well as soft measures such as value sharing, capabilities, interactions and orientations (Gupta and Jana 2003; eGEP 2006; Lawson-Body et al. 2008; Esteves and Joseph 2008; Andersen et al. 2010). For example, the conceptual framework proposed by Esteves and Joseph (2008) is based on three dimensions, viz. *maturity levels* (innovative leaders, visionary followers, steady achievers, platform builders), *stakeholders* (citizens, employees, businesses, governments, IS/IT personnel, special interest groups) and *assessment levels* (technological, strategic, organizational, operational, services, economic).

However, most of these assessment frameworks are either yet to be tested in real-life situations or are relevant for only such few projects which have reached e-governance maturity (Karunasena and Deng 2012). A few more empirical studies are based on single case study involving a narrow group of citizens who use Internet for structured applications such as paying taxes (Wang and Liao 2008; Saha et al. 2012).

In Indian context, a few relevant research studies have emphasized on taking into account the governance aspects in performance measures (Mitra and Gupta 2008), pre-defining effectiveness parameters of e-governance programmes and cautiously managing factors of change for giving real benefits to stakeholders (Kumar 2009), managing continuity and change forces and linking it to strategic outcomes for better value creation through e-governance (Nasim and Sushil 2010) and analysing e-governance performance from multi-perspectives (Suri and Sushil 2011).

In order to showcase exemplary e-governance initiatives, the Department of Administrative Reforms and Public Grievances initiated an award scheme in the year 2009 (www.darpg.gov.in, last accessed on 24.12.2015). The projects awarded during 2015 are shown in Box 2.1.

Box 2.1
(Source: www.darpg.gov.in)

The projects awarded by DARPG in 2015 are under the following categories:
Category I—Excellence in Government Process Re-engineering
Category II—Outstanding Performance in Citizen-Centric Service
Category III—Innovative Use of Technology in e-Governance
Category IV—Incremental Innovations in existing Projects
Category V—Best District Level Initiative in Citizen-Centric Service Delivery through ICT
Category VI—Innovative use of GIS Technology in e-Governance
Category VII—Innovative use of Mobile Technology in e-Governance
Category IX—Innovative use of ICT by Central Government PSUs
Category X—Innovative Use of ICT by State Government PSUs/Cooperatives/Federations/Societies
Category XI—Outstanding e-Governance Initiative by Academic and Research Institutions
Category XII–Use of ICT for Development by Non-Government Institutions

National Awards for E-Governance

Category	Project name	Organization
I.	TDS Reconciliation Analysis and Correction Enabling System (TRACES)	Directorate of Income Tax
	e-Initiatives in Commercial Taxes	Finance Department, Government of West Bengal
II.	Passport Seva Project	Ministry of External Affairs, Govt. of India
	Kanyashree Prakalpa Portal Kanyashree online	Department of Women Development and Social Welfare, Govt. of West Bengal
III.	Suraksha Setu-Safe City Surat	Office of the Commissioner of Police, Surat, Gujarat
	Force Deployment Software	Office of Chief Electorate Officer, Bihar and National Informatics' Centre, Bihar
IV.	AGRISNET-Farm Crop Management System (FCMS)	Department of Agriculture, Govt. of Tamil Nadu
	e-Procurement	Industries Department, Industries Commissionerate, Gujarat

(continued)

(continued)

Category	Project name	Organization
V.	Effective Vehicles Database Management to Trace the owners of Unclaimed Vehicles Lying in Police Stations	Mandya District Police, Home Department, Karnataka
	e-Panchayat	District Reasi, Jammu and Kashmir
VI.	Geographic Information System Project	Chhattisgarh infotech and biotech Promotion Society (CHiPS), Dept. of Information Technology, Chhattisgarh
	Application of Remote Sensing and GIS Technology in Sericulture Development	Central Silk Board, Ministry of Textiles, Government of India, Bangalore, Karnataka
VII.	State Highway Development Projects	Karnataka Public Works, Ports & Inland Water Transport Department
	SMS Based Failed Distribution Transformer Information and Management System	Madhya Pradesh Kshetra Vidyut Vitaran Co. Ltd. (Govt. of MP Undertaking)
VIII.	SAMVIDA	Rural Development Department, Govt. of Bihar & National Informatics' Centre, Bihar
	e-Governance Training and Certification	Government of Maharashtra
IX.	SAMPARK	Information Technology and Services Dept., Bharat Heavy Electricals Limited (BHEL), Bhopal, Madhya Pradesh
X.	ANMOL	State Child Protection Committee, Bhopal, Madhya Pradesh
	Quarry Management System (QMS)	Tamil Nadu Minerals Limited, Tamil Nadu
XI.	e-Jaalakam	Department of Economics, St. Teresa's College, Kerala
XII.	TCS Financial Inclusion Project	Tata Consultancy Services
	Kushal	A CREDAI Pune Metro Initiative

Source www.darpg.gov.in

For the purpose of this study, it was considered appropriate to rely upon the detailed evaluation reports of a few well-recognized e-governance projects such as AKSHYA, BHOOMI, Computer-Aided Administration of Registration Department (CARD), e-Procurement Exchange, e-Seva, Fast Reliable Instant Efficient Network for Disbursement of Services (FRIENDS), GYANDOOT, Karnataka Valuation and e-Registration (KAVERI), Lokvani, Nagarpalika. The evaluation reports throw light on significance of bringing reforms through e-governance and also highlighted by the commission setup to bring administrative reforms (ARC 2008). A summary is presented in Appendix A. Though the current status of these projects may be

different, the aforesaid studies conducted in the past provide valuable insights on performance aspects in terms of governance reform-related benefits. Performance of the evaluated projects is considered satisfactory as these projects have focused on easy accessibility to services, saving of cost and time while seeking services, extending authentic and transparent services by following an integrated approach, facilitating interactions and decision-making, better tracking of service requests and complaints, etc. These studies, however, have not attempted a comparative performance analysis from the perspectives of providers and recipient of services.

2.5 Conceptualization of Performance Variables

The proposed construct for measuring e-governance performance is based on knowledge developed about deliverables of six agriculture-related projects identified for the study. It is kept into view to consider only those aspects which are relevant to planners, implementers and beneficiaries belonging to the selected projects. The conceptualized performance macro-variable with its constituting micro-variables is explained below:

2.5.1 Macro-variable

This variable is conceptualized to capture realization of benefits expected from a project. In each of the selected projects, the benefits are expected to accrue in terms of efficiency, transparency, interactivity and decision support which are described here.

2.5.2 Micro-variables

The conceptualized micro-variables are described as follows:

Efficiency The IT-enabled government processes are expected to simplify procedures, execute faster, minimize use of papers and save costs while communicating with government. The enhanced efficiency is captured through this variable.
Transparency The variable encompasses transparency aspect of a service. An e-governance service is expected to bring transparency in government-controlled operations. A government service has to be trustworthy, thorough, unbiased and accessible without any difficulty to end users.
Interactivity An e-governance service targeting citizens is expected to facilitate interactions at various levels, i.e. within constituting units of a government

department, with other departments associated with the service and with recipient of the service. The variable is conceptualized to capture such interactions.
Decision support Digitization of services and online transactions contribute to better decision-making, monitoring and control at the level of officials as well as beneficiaries, which is captured through this variable. For example, a farmer who has online access to commodity prices/arrivals information and storage facilities can monitor prevailing prices, store his produce or select a market for selling his produce when conditions are favourable. This micro-variable reflects better decision support in terms of improved planning and decision-making

Mapping of these variables with reviewed literature and project evaluation reports is presented in Table 2.2.

The performance constructs have been subjected to factor and reliability analysis and found to be satisfying the validation criteria. The validated performance constructs have been used for further analysis.

2.6 Generalized Multi-perspective Performance Analysis

Tables 2.3 and 2.4 present an F-test-based comparative analysis of performance perceived by the three actor groups considered for the study. The three means are found to be statistically different with the macro-level relationships revealed as (Suri and Sushil 2012).

$$\begin{aligned}\text{PerformanceMean}(\text{Planners}) &> \text{PerformanceMean}(\text{Implementers}) \\ &> \text{PerformanceMean}(\text{Beneficiaries}).\end{aligned}$$

Similar tests are applied to compare the perceptions of the three groups about performance in terms of micro-variables. Further, the four constituting variables are subjected to similar test. The micro-level analysis reveals that

- In terms of efficiency and transparency, e-governance has contributed more at the level of planners followed by implementers and beneficiaries in that order.
- In terms of interactivity, e-governance has contributed more at the level of planners when compared with implementers and beneficiaries. The interactivity-related benefits are perceived to be same at the levels of implementers and beneficiaries.
- In terms of decision support, the planners and implementers are drawing more benefits from e-governance as compared to the beneficiaries.

The observed average performances for beneficiaries, implementers and planners are found to be 0.5, 0.6 and 0.7, respectively, which is indicative of gaps at various levels (Figs. 2.1 and 2.2).

Table 2.2 Variables conceptualized for assessing performance of e-governance project

Performance aspect	Micro aspects	Author (Year)	Projects (Appendix A)
Efficiency	Fast execution of core process/improved Service Delivery	UNESCO, Lindgren (2013), Scott et al. (2011), Andersen et al. (2010), Mofleh et al. (2009), Esteves and Joseph (2008), UN (2008), Planning Commission (2013), Evans and Yen (2006), Bannister (2002), Heeks (2001), Maio et al. (2000)	AKSHYA, BHOOMI, CARD, e-Procurement Exchange, e-Seva, GYANDOOT, Lokvani, Nagarpalika
	Simplification of procedures	UNESCO, Karunasena and Deng (2012), Mofleh et al. (2009), UN (2008), Harris (2007), Bannister (2002), Maio et al. (2000)	e-Procurement Exchange, BHOOMI, CARD, e-Seva, FRIENDS, KAVERI, Nagarpalika
	Reduced paper work	Karunasena and Deng (2012), UN (2008), Planning Commission (2007ab), Altameem et al. (2006), Evans and Yen (2006), Heeks (2001)	e-Procurement Exchange, e-Seva, GYANDOOT, KAVERI, Nagarpalika
	Reduced communication cost	UN (2008), Planning Commission (2013), Evans and Yen (2006), Vassilakis et al. (2004), Heeks (2001)	e-Procurement Exchange, e-Seva FRIENDS, GYANDOOT, KAVERI
Transparency	Reliable information delivery	Karunasena and Deng (2012), Andersen et al. (2010), OECD (2003), Bannister (2002)	BHOOMI, CARD, KAVERI, Nagarpalika
	Comprehensive information delivery	Karunasena and Deng (2012), Bhanagar (2004)	AKSHYA, KAVERI
	Easy access to information	World Bank, Alawneh et al. (2013), Karunasena and Deng (2012), Scott et al. (2011), Esteves and Joseph (2008), Harris (2007), Danziger and Andersen (2002), Bannister (2002)	BHOOMI, CARD
	Fairness	UNESCO, Harris (2007), Planning Commission (2007a, b), Tan et al. (2005), OECD (2003), Bannister (2002)	e-Procurement Exchange, e-Seva, FRIENDS

(continued)

Table 2.2 (continued)

Performance aspect	Micro aspects	Author (Year)	Projects (Appendix A)
Interactivity	Improved interaction (with internal actors, actors belonging to other related organizations, beneficiaries and government as per the respondent category)	UNESCO, Word Bank, Lindgren (2013), Karunasena and Deng (2012), Valdes et al. (2011), Gauld et al. (2010), Andersen et al. (2010), Mofleh et al. (2009), Esteves and Joseph (2008), UN (2008), Evans and Yen (2006), Jaeger (2005), Tan et al. (2005), Bhatnagar (2004), OECD (2003), Bannister (2002), Heeks (2001), Maio et al. (2000)	CARD, e-Procurement Exchange, FRIENDS, Lokvani
Decision support	Improved planning and decision-making	UNESCO, Andersen et al. (2010), Evans and Yen (2006), Bannister (2002)	BHOOMI, e-Procurement Exchange, GYANDOOT, KAVERI, Nagarpalika
	Better Monitoring and control	Andersen et al. (2010), Bhatnagar (2004)	BHOOMI, e-Procurement Exchange, KAVERI, Lokvani, Nagarpalika

Adapted from (Suri and Sushil 2012)

Table 2.3 One-way ANOVA (Performance X Actor Group)

PERF						
	Sum of squares	df	Mean square	*F*	Sig.	
Between groups	1.233	2	0.616	17.121	.000	
Within groups	10.045	279	0.036			
Total	11.278	281				

Table 2.4 Post hoc tests (Performance X Actor Group)

Multiple comparisons						
Dependent variable: PERF						
LSD						
		Mean difference (I−J)	Std. error	Sig.	95 % confidence interval	
(I) Group	(J) Group				Lower bound	Upper bound
Planner	Implementer	0.0993[a]	0.03656	0.007	0.0273	0.1713
	Beneficiary	0.1914[a]	0.03548	0.000	0.1216	0.2613
Implementer	Planner	−0.0993[a]	0.03656	0.007	−0.1713	−0.0273
	Beneficiary	0.0921[a]	0.02440	0.000	0.0441	0.1402
Beneficiary	Planner	−0.1914[a]	0.03548	0.000	−0.2613	−0.1216
	Implementer	−0.0921[a]	0.02440	0.000	−0.1402	−0.0441

[a]The mean difference is significant at the 0.05 level

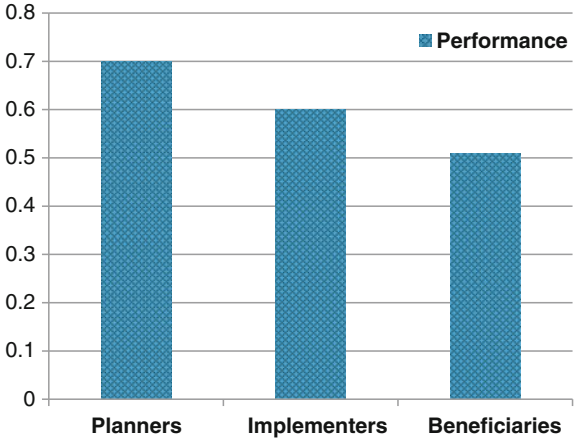

Fig. 2.1 Perceived e-governance performance (Macro-level)

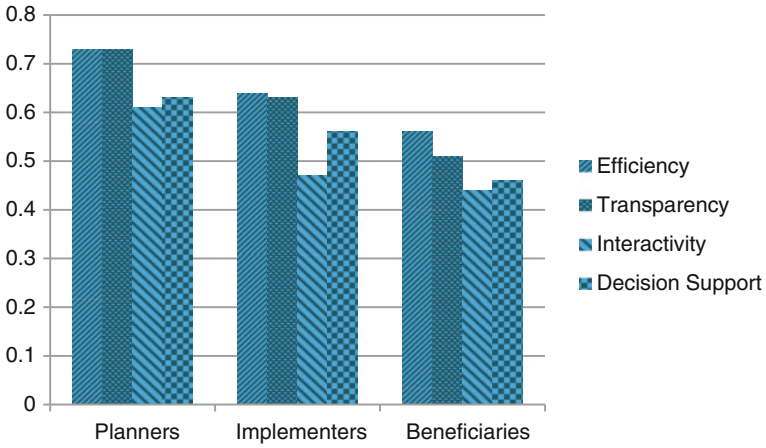

Fig. 2.2 Perceived e-governance performance (Micro-level)

The gaps in perceptions about e-governance performance clearly reflect better adoption of ICT facilities at the level of planners when compared with implementers. This suggests for strengthening infrastructure at the operational level and encouraging the officials involved in implementation to regularly upgrade their skills. Further, the services do not seem to be reaching the beneficiaries to the desired extent. The beneficiaries need to be sensitized about e-governance services with a focused approach. Access to services needs to be smoothened by creating multiple delivery channels suiting to the background and needs of the beneficiaries.

2.7 Concluding Remarks

The potential of e-governance for reforming governance system needs to be leveraged by various government organizations, particularly those belonging to the developing world. Keeping in view the past trend of dismal performance of e-governance projects, it is important to devise instruments to measure performance of projects which can be used by the practitioners for reviewing projects from this perspective. This chapter has brought out a performance measure which has been applied to analyse performance from the viewpoints of key actors types identified for the study. It has been found that there are perception gaps among providers and recipient of e-governance services. The next chapter would present a synthesized strategic framework for improving e-governance performance, followed by its implementation considerations. The framework is based on a synthesis of qualitative and quantitative analyses performed as part of the study.

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Chapter 3
A Strategic Framework for Improving E-Governance Performance

3.1 Introduction

The popularly accessible literature on e-governance is dominated by case studies by practitioners, and government publications which generally showcase only project achievements with lesser emphasis on gaps in planning, implementation and project performance. In such publications, action-oriented recommendations for improving services are often not backed up with required empirical base. In Indian context, even though a few empirical studies have been undertaken in the recent past to review e-governance projects, most of these have analysed projects individually using univariate analysis approach. There is a general lack of studies based on cross-case analysis. Furthermore, in any management context, including e-governance, there are several planning and implementation-related strategic variables at play. In particular, linkages between these strategic variables and their influence on performance remain unexplored in the context of e-governance projects. To bridge this gap, we present an empirically validated strategic framework which can be used by the practitioners for taking measures for improving the performance of e-governance projects. Various constituting components are also explained. The methodology adopted to arrive at this strategic framework is described subsequently. This is followed by discussion on practical relevance of the proposed framework in terms of implications for government officials and beneficiaries associated with e-governance projects.

3.2 Synthesized Recommended Framework

The synthesized strategic framework for improving the performance of e-governance projects is presented in Fig. 3.1. The framework is arrived at by converging qualitative and quantitative analyses of six agriculture-related e-governance projects (Suri 2009). It is pertinent to point out here that the focus of

P.K. Suri and Sushil, *Strategic Planning and Implementation of E-Governance*,
Flexible Systems Management, DOI 10.1007/978-981-10-2176-3_3

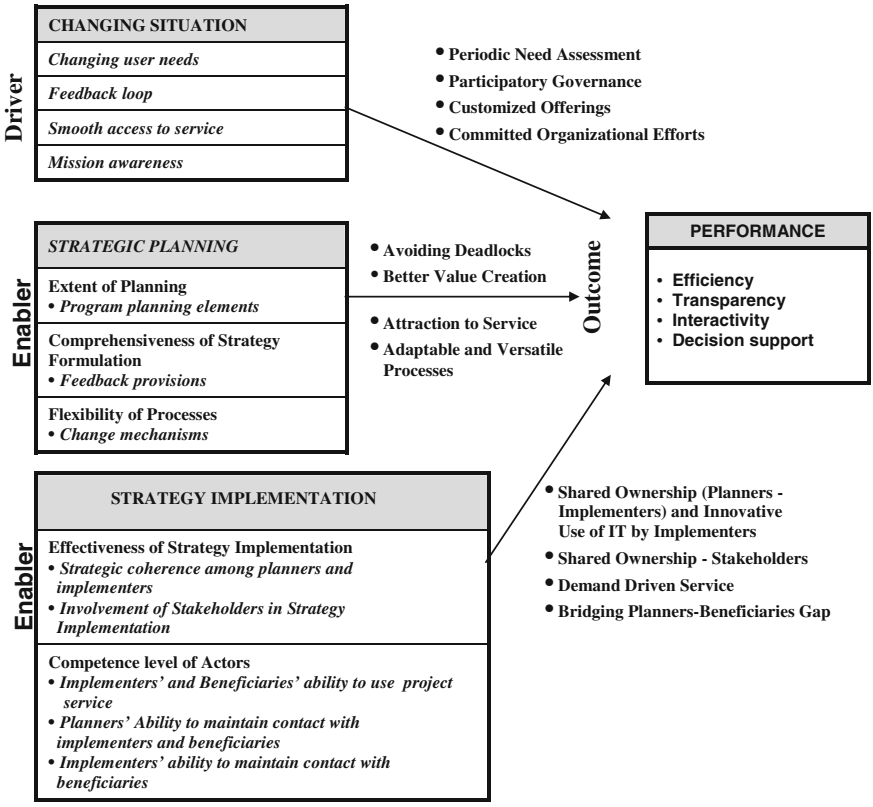

Fig. 3.1 Synthesized recommended strategic framework

the base study being on managerial issues, the technology-related aspects have not been considered in the analysis which has led to the evolution of this framework. The quantitative analysis led to identification of 17 significant strategic variables which influence performance of e-governance (Chap. 4, Fig. 4.3; Chap. 5, Fig. 5.4; Chap. 6, Fig. 6.4). The quantitative analysis also brought out four micro-level frameworks depicting the influence of identified strategic variables on the constituent variables of performance, viz. efficiency, transparency, interactivity and decision support (Appendix B). The validated empirical relationships between independent strategic variables and the dependent performance variables have been interpreted in the context of different projects. The synthesis of interpretation of case studies led to 21 elemental-level synthesized interpretations, some of which are repetitive. The 12 distinct synthesized interpretations are identified (Tables 3.1, 3.2 and 3.3). These most frequently occurring interpretations, depicted along the links in the framework, explain the manner in which the project performance is influenced by the corresponding independent strategic variables. The associated significant independent variables are reorganized as 'Drivers' and 'Enablers' for

Table 3.1 Interpretation of links for improving performance (base survey–planners)

Strategic variable	Interpretation of linkage to performance	Frequency (number of projects)	Synthesized interpretation
Program planning elements (PPE)	Avoiding deadlock like situations	6	Avoiding deadlocks
Provision for obtaining feedback (FDPROV)	Better value creation	6	Better value creation
	Attraction to service	6	Attraction to service
Change mechanisms (CM)	Adaptable processes	5	Adaptable and versatile processes
	Versatile processes	5	
Ability to maintain contact with implementers and beneficiaries (CNTP)	Better insights of planners about ground realities	6	Bridging planners–beneficiaries gap
	Improved planning and strategy making based on field inputs	6	
Planners' level feedback loop (FDLP)	Participatory governance	5	Participatory governance
	Emergent strategy based on inputs from stakeholders	4	Customized offerings
Changing user needs (CHN)	Periodic assessment of stakeholders' needs	4	Periodic need assessment

improving performance. The synthesized recommended strategic framework for improving performance (Fig. 3.1) is thus based on empirically validated relationships (Chap. 4, Fig. 4.3; Chap. 5, Fig. 5.4; Chap. 6, Fig. 6.4) and the synthesized interpretation of relationships for improving performance (Appendix D).

In the synthesized framework, changing situation is seen as driver, whereas strategic planning and strategy implementation are seen as enablers of e-governance project performance (outcome). The framework is discussed as follows.

3.2.1 Changing Situation (Driver)

The 'Changing Situation' has been tested as predictor of performance in case of planners, implementers as well as beneficiaries. The first embedded micro-variable, perception about 'Changing user needs (CHN)', is a dominant variable influencing performance in case of planners and implementers (Chap. 4, Fig. 4.3). Its influence on performance in the context of planners is interpreted as 'Periodic Need Assessment' (Table 3.1) and in the context of implementers as 'Customized Offerings' (Table 3.2). The second embedded micro-variable, 'Feedback loop (FDL)', is a dominant variable influencing performance in case of all three actor

Table 3.2 Interpretation of links for improving performance (base survey implementers)

Strategic variable	Interpretation of linkage to performance	Frequency (number of projects)	Synthesized interpretation
Strategic coherence among planners and implementers (STCO)	Shared ownership between planners and implementers	6	Shared ownership (planners–implementers) and innovative use of IT by implementers
	Innovative IT usage at operational level	5	
Involvement of stakeholders in strategy implementation (INSTSI)	Shared ownership with stakeholders	6	Shared ownership (stakeholders)
	Addressing stakeholders' concerns	5	
	Project sustainability	4	
Ability to use service (ABS)	Project ownership by implementers	6	Shared ownership (planners–Implementers) and innovative use of IT by implementers
Ability to maintain contact with beneficiaries (CNTI)	Bridging the gap between planners and beneficiaries	6	Bridging planners–beneficiaries gap
	Assessment of service delivery through implementers	5	
Changing user needs (CHN)	Customized offerings based on changing needs	6	Customized offerings
Implementers' level feedback loop (FDLI)	Feedback mechanism through implementers	6	Customized offerings
	Customized Service Offerings	6	
Smooth access to service (SAS)	Involvement of implementers with project	6	Participatory governance
Mission Awareness (MAW)	Committed organizational effort through shared mission	6	Committed organizational effort

types (Chap. 4, Fig. 4.3). Its influence on performance in the context of planners and beneficiaries is interpreted as 'Participatory Governance' (Tables 3.1, 3.2 and 3.3), whereas in case of implementers it is interpreted as 'Customized Offerings' (Table 3.2). The third micro-variable, 'Smooth access to service (SAS)' is a dominant influencing variable in case of implementers and beneficiaries (Chap. 4, Fig. 4.3). It is interpreted as influencing performance in terms of 'Participatory

Table 3.3 Interpretation of links for improving performance (base survey–beneficiaries)

Strategic variable	Interpretation of linkage to performance	Frequency (number of projects)	Synthesized interpretation
Ability to use project service (ABS)	Need base service	5	Demand-driven service
Beneficiaries' level feedback loop (FDLB)	Participation of beneficiaries in governance	5	Participatory governance
	Improved user access interfaces based on feedback of beneficiaries	4	Customized offerings
	Customized service offering	4	
	Attraction of beneficiaries to service (considered against FDPROV because of higher frequency)	4	Attraction to service
Smooth access to service (SAS)	Participation in governance	5	Participatory governance
	Attraction of beneficiaries to service (considered against FDPROV because of higher frequency)	4	Attraction to service

Governance' in case of implementers and beneficiaries (Tables 3.2 and 3.3). The last micro-variable, 'Mission awareness (MAW)' is related to implementers (Chap. 4, Fig. 4.3) and is interpreted as influencing performance in terms of 'Committed Organizational Efforts' (Table 3.2).

3.2.2 Strategic Planning (Enabler)

Strategic planning encompasses three macro-variables pertaining to planners. These macro-variables, viz. 'Extent of Planning (EXPLN)', 'Comprehensive of Strategy Formulation (COMPSF)' and 'Flexibility of Processes (FP)', have been tested as predictors of performance (Chap. 5, Fig. 5.4). Within the respective macro-variables, the dominant micro-variables 'Program planning elements (PPE)', 'Provisions for obtaining feedback (FDPROV)' and the 'Change mechanisms (CM)' in processes are found to be influencing performance (Chap. 5, Fig. 5.4). Their links with performance are interpreted as 'Avoiding Deadlocks', 'Better Value Creation', 'Attraction to Service' and 'Adaptable and Versatile Processes', respectively (Table 3.1).

3.2.3 Strategy Implementation (Enabler)

Strategic Implementation encompasses the macro-variables 'Effectiveness of Strategy Implementation (EFFSI)' and 'Competence level of Actors (CL)' which have been tested as predictors of performance (Chap. 6, Fig. 6.4). Within 'Effectiveness of Strategy Implementation', the dominant micro-variables 'Strategic coherence among planners and implementers (STCO)' and 'Involvement of stakeholders in strategy implementation (INSTSI)' are found to be influencing performance (Chap. 6, Fig. 6.4). Their links with performance are interpreted as 'Shared Ownership (Planners-Implementers) and Innovative use of IT by Implementers' and 'Shared Ownership (Stakeholders)', respectively (Table 3.2).

Within 'Competence level of Actors (CL)', the dominant micro-variables influencing performance (Chap. 6, Fig. 6.4) are identified as (i) 'Ability to use project service (ABS)' (by implementers) and (by beneficiaries), with respective links to performance interpreted as 'Shared Ownership—Stakeholders' (Table 3.2) and 'Demand Driven Service' (Table 3.3), (ii) 'Planners' ability to maintain contact with implementers and beneficiaries' (Table 3.1) and (iii) 'Implementers' ability to maintain contact with beneficiaries' (Table 3.2) with performance links identified for both as 'Bridging Planners-Beneficiaries Gap' (Tables 3.1 and 3.2).

3.2.4 Performance (Outcome)

Performance of e-governance projects is the outcome variable as per the research objectives. Performance of projects has been conceived in terms of efficiency, transparency, interactivity and decision support as per the context of the book. It has been found that the three groups have difference of opinion about the project performance (Chap. 2, Sect. 2.6). The government officials may tend to opine in favour of higher project performance to justify the investments made or they may be actually drawing more benefits from the e-governance efforts as compared to target beneficiaries. The influence of independent macro-/micro-variables on performance macro-/micro-variables has been studied from the perspectives of planners, implementers and beneficiaries. The synthesized recommended strategic framework (Fig. 3.1) presents an integrated view for improving performance from the perspectives of all the three actor types. The perceptions of these different actor segments about benefits accruing from a project should synchronize and these need to be of highest order. The commonalities in macro-/micro-level validated relationships based on the opinion surveys of planners, implementers and beneficiaries (Chap. 4, Fig. 4.3; Chap. 5, Fig. 5.4; Chap. 6, Fig. 6.4) in conjunction with interpretive linkages brought out in Tables 3.1, 3.2 and 3.3, throw light on improving performance from the perspectives of these different actor groups.

From the planners' perspective, improved feedback loop (FDLP) at their level is expected to improve the efficiency, interactivity and decision support aspects of performance through 'Participatory Governance' and 'Customized Offerings'. Their better perception about 'Changing user needs (CHN)' is expected to improve performance in terms of efficiency, interactivity and decision support through the link 'Periodic Need Assessment'. 'Coverage of program planning elements (PPE)' is expected to contribute towards better transparency by 'Avoiding Deadlocks' like situations in projects. 'Change mechanisms (CM)' in processes is expected to result in improved transparency and decision support by ensuring adaptable and versatile processes.

From the implementers' perspective, 'Strategic coherence among planners and implementers (STCO)' is expected to improve performance in terms of efficiency, transparency and decision support through 'Shared Ownership (Planners-Implementers)' and 'Innovative use of IT by Implementers'. Their better perception about 'Changing user needs (CHN)' is expected to improve performance in terms of transparency, interactivity and decision support through 'Customized Offerings'. Their 'Smooth access to service (SAS)' is expected to improve performance in terms of efficiency and transparency through 'Participatory Governance'. Implementers' awareness about project mission (MAW) is expected to enhance performance in terms of improved efficiency and transparency through 'Committed organizational efforts'. Their 'Ability to remain in contact with beneficiaries (CNTI)' is expected to contribute in terms of improvement in transparency and interactivity through 'Bridging Planners-Beneficiaries Gaps'. 'Involvement of stakeholders in strategy implementation (INSTSI)' is expected to improve performance in terms of interactivity and decision support through 'Shared ownership with stakeholders'. Implementers' level feedback loop (FDLI) is expected to contribute to interactivity aspect through 'Customized offerings'.

From beneficiaries' perspective, 'Smooth access to service (SAS)' is expected to improve performance in terms of transparency and interactivity through 'Participatory Governance' and 'Attraction to Service'. Their 'Ability to use project service (ABS)' is expected to improve performance in terms of efficiency, transparency and decision support through 'Demand Driven Service'. Improvement in 'Beneficiaries level feedback loop (FDLB) ' is expected to improve the efficiency, interactivity and decision support aspects of performance through 'Participatory Governance', 'Customized Offerings' and 'Attraction to Service'.

3.3 Framework Implementation Considerations

The implementation of the synthesized strategic framework is discussed here from the perspective of the three key actor groups, viz. planners, implementers and beneficiaries. The implementation considerations are in terms of respective identified strategic variables.

3.3.1 Planning-Level Considerations

Planners need to keep in view the expected outcome from an e-governance project while preparing project plan. The performance parameters should be clearly identified in terms of expected improvement in efficiency, transparency, interactivity and decision support. These aspects must be prioritized as per their relevance in the project situation and metrics for measuring them need to be defined for assessing the outcome from time to time. An e-governance project plan has to be adaptable and effective for ensuring better performance. Adequate consideration of program planning elements (affected societal sectors, objectives, needs, activities, constraints, alterables, objective measures, activity measures and agencies) in the plan will help in avoiding deadlock like situations in the projects. Adequate provision need to be kept for obtaining feedback from internal and external actors as it will attract these actors to use the service and create better value for all from the project efforts. Planners need to consider introducing change mechanisms in the e-governance processes. The processes conceived for this book are preparation of project plan, capacity building, content development, content delivery and management of change. Effective change mechanisms are expected to improve performance by making these processes more versatile and adaptable. Further, for better performance of an e-governance project, planners need to be alert about changing needs of beneficiaries through periodic assessment of their needs; they need to remain in contact with implementers and beneficiaries for bridging planners–beneficiaries gap, and they need to act on feedback from beneficiaries and other stakeholders for customized service offerings and ensuring participatory governance.

3.3.2 Implementation-Level Considerations

Effective implementation of strategy is expected to improve performance of an e-governance project. There has to be coherence among planners and implementers in terms of clarity of directions from planners to implementers, frequent progress reviews by seniors, defining service timelines in the action plan, ensuring that implementers are able to meet the targets to their satisfaction, ensuring collective efforts of planners, implementers and supporting vendors, and keeping provision for regular skill up-gradation of implementers as per their requirements. With this, performance is expected to improve through shared project ownership between planners and implementers, and innovative use of IT by implementers. It is required to ensure adequate involvement of stakeholders during implementation as their owning up of project is expected to improve performance. Implementers need to be fully aware of project mission as shared mission is expected to improve performance through committed organizational efforts. It is further required to ensure implementers' smooth access to service, their ability to use service, maintaining contact with beneficiaries and implementing feedback mechanisms through them.

These measures are expected to improve performance in terms of participatory governance, shared project ownership and innovative use of IT, bridging planners–beneficiaries gaps and customized offerings, respectively.

3.3.3 Beneficiaries-Level Considerations

It is required to ensure smooth access of the beneficiaries to the services offered by an e-governance project. This is expected to improve performance through participatory governance. Further, the beneficiaries need to be sensitized for enabling them to use the service features, provide feedback to the project authorities and pursue for follow-up action by the government. These measures are expected to improve performance of a project in terms of demand-driven service, participatory governance and customized offerings, respectively.

3.4 Methodology for Developing Strategic Framework

Developing strategic insights into planning and implementation aspects of the e-governance projects is always a challenging task owing to lack of studies from independent sources on such aspects of a project. This may often lead to wrong conclusions about the performance of e-governance. It was, therefore, required to design our analysis carefully to arrive at a strategic framework for improving performance from the perspective of key actor groups.

The study focused on three broad categories of actors associated with a typical e-governance project: (i) a small group of senior government officers who are responsible for planning and strategy formulation, (ii) a relatively larger group of middle and lower level government officers entrusted with the responsibility of implementation of planned strategy and (iii) a much larger group of the intended beneficiaries of a project. Among the three categories, actors belonging to the first two groups have defined roles in a given project setting whereas actors in the third group are the end users of the service emanating from the project. Actors belonging to third group are concerned only with the effectiveness of service delivery in terms of their making best use of it as per their requirements. Intricacies involved in the project execution are of no relevance to them. The competence levels of all the three categories of actors are expected to be different due to their very positions in a project. It was, therefore, necessary to keep the distinct nature of respondents into view while designing the empirical part of the study which aimed at relating performance of e-governance with extent of planning, comprehensiveness of strategy formulation, effectiveness of strategy implementation, changing situation, competence level of actors and flexibility of processes.

It has been attempted to methodically handle the complexities introduced in the study due to different groups of actors and projects belonging to different organizations. The strategic framework for improving e-governance performance has been arrived at by following an evolutionary approach based on convergence of qualitative and quantitative analysis. The steps involved are as follows:

- Identification of research variables, development of conceptual frameworks for improving e-governance performance and formulation of hypotheses for empirical validation.
- Opinion survey of planners, implementers and beneficiaries.
- Empirical validation of the conceptual frameworks and identification of significant strategic variables in the form of a synthesized empirical framework for improving performance.
- Qualitative analysis of the six identified e-governance projects.
- Interpretation of synthesized empirical framework in the context of each of the projects and synthesis of interpretations based on cross-case analysis (explained below in detail).

3.4.1 Interpretation in Case Studies and Synthesis of Interpretations

The six identified e-governance projects have been analysed using Situation-Actor-Process-Learning-Action-Performance (SAP–LAP) framework (Sushil 2000, 2001, 2009). The convergence of qualitative and quantitative analysis is achieved using Interpretive Matrix Tool (Sushil 2005). The steps taken for synthesizing the learning are described as follows:

- In each case study first the project evolution and actor–process linkages are analysed by studying changing situation and developing actor–process matrices based on situation–actor–process (S–A–P) framework. Next, as part of learning–action–performance (L–A–P) synthesis of each case study, the validated relationships between significant strategic variables and project performance have been interpreted for improving performance. The interpretations are based on learning from S–A–P analysis, micro-level validated relationships and the related observed values of variables from the three base surveys. L–A–P synthesis has led to development of 17 interpretive matrices (Appendix D) encompassing variables pertaining to planners, implementers and beneficiaries as per context of each case (three matrices for each project except for DACNET Intranet project, where implementers and beneficiaries are treated as same).
- The elemental-level interpretations (expected benefits) which have emanated from L–A–P synthesis of each case are compiled in variable-wise matrices with columns as six projects and rows as similar interpretations. Each cell in such a matrix either contains an interpretation or is blank. This has led to 17 matrices

with respect to six significant variables pertaining to planners, eight to implementers and three to beneficiaries.

- The synthesized interpretations are arrived at on the basis of frequently occurring interpretations of linkages of respective strategic variables to performance. For this, three frequency tables are prepared from the above 17 matrices and organized actor category-wise. Interpretations which are specific to less than four projects are not considered to ensure that final synthesized interpretation is based on most common interpretations. Thus, only such interpretations with frequency count 4 or more (that is variable-wise common interpretations in four or more projects) are included in the frequency tables. The synthesized interpretations are presented in Tables 3.1, 3.2, and 3.3.

3.5 Concluding Remarks

In this chapter, a synthesized conceptual framework has been presented for enhancing the performance of e-governance projects in the context of the present book. The framework is based on both qualitative and quantitative analyses which shall be discussed in the subsequent chapters. Also implementation considerations in respect of the empirically validated framework have been presented to facilitate its implementation from the perspectives of planners as well as implementers. The next chapter discusses 'Changing Situation' which has been found to be influencing performance and seen as a driver of e-governance in the generalized framework.

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Chapter 4
Changing Situation: A Driver of E-Governance

4.1 Introduction

Government organizations in India have been progressively trying to improve their functioning by making use of the advancements in the field of Information and Communication Technology. In the traditional approach of computerization, the thrust of organizations used to be on improving internal government operations. However, with the emergence of web and mobile technologies, various organizations started visualizing beyond organizational boundaries to create ICT-enabled channels for connecting with stakeholders. Accordingly, the scope of computerization, which was previously limited to only internal operations, got vastly enhanced in terms of strengthening of interfaces with citizens to serve them better. The resultant situational changes brought in new challenges having social, political, economic, administrative and technical implications due to which many of the newly launched citizen centric initiatives could not deliver services as planned. A few projects, however, could reportedly overcome the emerging challenges successfully and matched the expectations of citizens. Such popular projects, though less in numbers, amply justify the relevance of strategic management principles in the context of e-governance projects. It is observed that these popular e-governance projects are characterized by committed organizational efforts achieved through the instruments of shared mission and vision. In such e-governance initiatives, the project authorities ensured to establish channels for making the intended services accessible to the target beneficiaries. Further, they were responsive to the changing needs of beneficiaries by encouraging regular feedback from them. The learning from these projects has led to conceptualization of macro-variable 'Changing Situation' which is likely to influence performance of e-governance projects. Its constituent micro-variables, viz. changing levels of mission and vision awareness, smooth access to service, changing user needs and presence of feedback loop are defined as follows:

P.K. Suri and Sushil, *Strategic Planning and Implementation of E-Governance*,
Flexible Systems Management, DOI 10.1007/978-981-10-2176-3_4

Mission awareness Project officials are expected to contribute better if they have similar understanding about the project mission. The variable captures awareness level among government officials about the purpose for which the project has been initiated.
Vision awareness The variable captures awareness level among government officials about the roadmap of the project.
Smooth access to service Users who are privileged to have better means of accessing a service are likely to be more inclined to use the service and take more advantage from it as compared to those who have poor access to a service. This micro-variable captures the extent to which an e-governance service is accessible in a smooth/uninterrupted fashion to the respondent.
Changing user needs The expectations of users from an ICT-based service keep rising as they become accustomed to using it. This variable captures the extent to which needs of users are changing as per perception of government officials.
Presence of feedback loop ICT-based services generally get evolved over a period of time. Constant feedback from users is important for improving the service. This variable captures extent of feedback loop in a project. The relevant questions in this context are to what extent an actor provides feedback on the specific e-governance service and to what extent action is taken on such feedback by actors operating at higher levels.

All the above five micro-variables pertaining to 'Changing Situation' are used in case of planner and implementer level analysis. In case of beneficiaries, 'Changing Situation' is represented by 'Smooth access to service' and 'Presence of feedback loop', keeping into view wide variations in the project-wise nature of beneficiaries and their different context compared to that of government officials.

The genesis of the macro-variable 'Changing Situation' and the constituting micro-variables is discussed below under the subsections 'Significance of shared mission and vision', 'Access to service', 'Changing user needs' and 'Feedback loop'. This is followed by analysis of the observed values of the macro- and micro-variables based on three independent surveys conducted as part of the study.

4.2 Significance of Shared Vision and Mission

Importance of carefully crafted mission and vision statements for binding the employees together has been well emphasized in the strategic management literature. Meticulously crafted vision and mission statements can act as unifying threads for infusing a sense of ownership and strategic focus among the diverse segments of actors while contributing towards accomplishments of organizational goals and objectives.

Organizations with shared mission and vision imbibed among the employees have exhibited better performance as compared to the organizations where this aspect is ignored. The concept is applicable at project level as well. Success of any project demands committed and coherent efforts from different types of involved actors. These actors, who may be internal as well as external to an organization, need to act in harmony towards the same strategic direction. For this, they need to be repeatedly sensitized and trained about the project mission and vision.

Projects with ambiguous vision and mission statements are prone to aimless drifting and frittering away of scarce resources. In the context of e-governance, it is observed that many projects either do not have well-defined mission and vision statements or such statements may be prepared solely by the senior management without necessarily undertaking in-depth research about the underlying social cause and intensely deliberating about the proposed initiative by forming an association of the related actors. Projects which are based on the concept of creating shared value for the involved actors are expected to flourish and sustain as compared to those where the ownership is not institutionalized.

Large e-governance projects involve a number of actors due to which there are several intra- and inter-organizational dependencies. These dependencies act as deterrents in the effective realization of the targeted project deliverables. There may be resistance to transformation sought through cross-organizational collaboration. Usually, this is due to reluctance of the involved actors in accepting new roles and responsibilities to implement the redesigned systems. To illustrate such dependencies in the context of agriculture, let us analyse the AGMARKNET project which aims at empowering the farming community with market information. A suggestive list of actors with whom synergetic linkages are required to be built for creating relevant contents and achieving wider dissemination of market information is presented in Sect. 7.3 of Chap. 7 (Tables 7.1 and 7.2).

It may be observed that even though the project is sponsored by one organization, viz. the Directorate of Marketing and Inspection, its intended goal can be achieved only through collaborative efforts of several organizations. The project ownership, through shared mission and vision, has to be first instilled into internal actors, viz. various functional divisions and field units of DMI. The efforts in this direction have to be further intensified by vigorously pursuing for synergetic linkages with other identified organizations. The internal and external stakeholders, bonded through shared mission and vision, are expected to initiate the required coherent actions for generating maximum value from the project. Some of the specific steps undertaken in the AGMARKNET project for binding the internal and external stakeholders are summarized as below:

- Basic IT training programmes for market personnel.
- State level stakeholders' workshops and awareness programmes.
- Regional level sensitization workshops for DMI field offices.
- Involving DMI field offices to report local market trends based on AGMARKNET.

- Project review meetings with State Marketing Boards/Directorates over video conferencing.
- Incentives for regularly reporting market personnel.

It was experienced that such measures surely contributed in terms of improvement in number of reporting markets over the period. However, the scale and intensity of these measures kept varying as per different perceptions and priorities of the successive heads of the sponsoring organization and their counterparts at the state levels. Therefore, not much headway could be made in terms of developing synergetic relationships with various other stakeholders based on shared mission and vision. Due to this gap, some of the states developed their own agricultural marketing information systems on similar lines ignoring the fact that their market information needs can be easily met through customized reports by enriching AGMARKNET database. A similar situation of organizations having independent market information systems is prevalent at the centre government level also as discussed in detail subsequently (Chap. 9). It can, therefore, be said that the desired level of shared mission and vision among the concerned actors is yet to be achieved in the context of AGMARKNET project which may affect its progress.

Actors belonging to a project sponsoring organization or those who are external to it get gelled together through shared mission and vision if they sense that the project has potential to generate value for them. For example, employees of an organization who are accustomed to traditional manual systems do welcome such IT-based interventions which help in improving their own functioning. The Grapenet project of APEDA is a good example of an e-governance project which signifies the importance of shared mission and vision. APEDA was entrusted with the responsibility of streamlining the procedures involved in the grapes exported to the European Union by integrating the stakeholders involved. To achieve this within the prescribed time limit, the project nodal officer of APEDA organized a series of workshops during the initial period for sensitizing the organizations involved as well as the intended project beneficiaries. Besides educating the participants about their roles and responsibilities in the new system, these workshops served the purpose of convincing the respective actors about the associated benefits likely to be accrued to them (Chap. 8, Table 8.2).

The success of Grapenet project, which is based on cross-organizational synergetic relationships, is suggestive of existence of much higher level of shared mission and vision among the associated stakeholders as compared to the AGMARKNET project.

4.3 Access to Service

Unlike developed nations, accessibility to public services by the people at large is comparatively a major issue in developing countries such as India. A large proportion of the population remains deprived of the benefits planned for them as part

of various government welfare schemes in India. This gap was consistently acknowledged by the erstwhile Planning Commission in the successive plan documents. Its approach paper for the twelfth plan period had critically pointed out that the benefits of mega programmes were not reaching the target deprived sections of society due to the prevailing weak government service delivery mechanism (Planning Commission 2011, pp. 11–12, 126–134). E-governance provides a great opportunity to bridge this continuing gap in our delivery mechanism.

There are quite a few pilot projects which have demonstrated accrual of benefits to the people at grassroots by enabling their access to agriculture-related services using ICT. Some of these successful initiatives in India, which are prominently referenced in literature, have been mentioned earlier (Chap. 1, Sect. 1.3).

The citizen centric popular e-governance projects are characterized by distinct features in terms of creating an enabling environment by ensuring beneficiaries' access to service and their ability to use the service. The literacy level of the people in rural areas being low, their accessibility to service is achieved either directly or through intermediaries in the form of service centre operators or domain experts or even educated people in villages who can motivate local communities. Such successful projects in agriculture sector are, however, scarce and operating only in small pockets where local administration and communities have actively participated.

One of the rare citizen centric projects which could be successfully implemented on a much larger scale is the computerization of paddy procurement and public distribution system in the state of Chhattisgarh during 2007–2008. The project involved computerization of the entire food grain supply chain from procurement of paddy from 1532 purchase centres for transportation to 10,416 fair price shops for further distribution to 3.7 million ration card holders. The project could be effectively implemented by the Chhattisgarh State Unit of the National Informatics Centre with the support of six different organizations involved in food grain management, viz. Department of Food, Marketing Federation, Chhattisgarh State Civil Supplies Corporation, Food Corporation of India, Central Cooperative Bank and Primary Agricultural Cooperative Societies. Local community participated actively to overcome several challenges including daily data entry and bridging the gap of last mile connectivity by physically taking data on motor cycles for updation back and forth between standalone systems at procurement points and the connected servers at block headquarters. About 1 million paddy growers are benefitted from the system. The farmers were made payment without delay at procurement points through computer-generated cheques. Citizens' accessibility to track the movement of food grains was achieved through an SMS-based monitoring system which brought transparency in the procurement and distribution operations (http://csi-sigegov.org/egovernance_pdf/26_216-223.pdf, last accessed on 25.6.15).

Another important initiative is the Kisan Call Centre (KCC) of the union Ministry of Agriculture and Farmers Welfare which has been launched to address the issue of farmers' accessibility to farming-related information. KCC, which is based on call centre model, aims at establishing a technology-enabled agricultural extension system in the country. Farmers are routed to the nearest call centre when

they dial a toll free number 1800-180-1551 through landline or mobile phones to get answers to their queries (Chap. 7, Sect. 7.4).

Initiatives to improve accessibility of farmers to welfare services are still at preliminary stage of implementation in different states. Situation Assessment Surveys conducted by NSSO have found that farmers predominantly rely on word of mouth to access agriculture-related information. Use of mobile phones and other media to access such information is usually limited to progressive farmers only (NAIP 2014; NSSO 2014).

Recognizing the potential of ICT to connect with the people at the grassroots, the Government of India has taken a few important initiatives in the recent past to improve their accessibility to public services. The following key initiatives are expected to have far-reaching implications on the governance system in India in terms of accessibility and acceptability of public services at the grassroots level:

- Setting up common service centres to serve as front-end delivery points for extending services to about 6 lakh villages in the country.
- Launching of e-Panchayat Mission Mode Project under NeGP which aims to connect about 2.5 lakh Panchayats in the country through National Optical Fibre Network and automate their functioning (www.panchayat.gov.in, www.bbnl.nic.in).
- Issuing of unique identification (UID) number (popularly called AADHAR) to each resident of the country. Besides identification of the residents, the primary use of UID is in efficient delivery of welfare services (www.uidai.gov.in).
- Launching of Mobile governance (m-governance) initiative which aims to leverage wireless and new media technology platforms, mobile devices and applications for delivery of public information and services to all citizens and businesses. The idea is to exploit the growing penetration of mobile phones in the country for inclusive development by enhancing the accessibility to public services by the citizens especially those in the remote rural areas. Various government departments have already started experimenting with delivering public services using short message service (SMS), unstructured supplementary service data (USSD), interactive voice response system (IVRS), cell broadcast service (CBS), location-based service (LBS) and mobile applications installed on mobile phones (www.mgov.gov.in).
- Formulation of standard web guidelines for compliance by various government departments. These are on the lines of guidelines issued by world wide web consortium to ensure universal access to the web-based applications by people belonging to different sections of the society including those who are differently abled (web.guidelines.gov.in, www.w3.org).

The envisioned situational change at grassroots through such ICT powered interventions is perceived to revolutionize the manner in which citizens interact with government system. However, the key lies in their effective and timely implementation by overcoming the associated challenges. In particular, in the context of citizens' accessibility to public services and their engagement with

government, the challenges to be overcome include localization of the contents and user applications besides capacity building of the masses in terms their awareness level and access skills.

4.4 Changing User Needs

Assessment of needs or requirement analysis is an important component of system development process. It has been well established that gaps in the requirement analysis phase have serious implications on the subsequent phases of the system development life cycle. Besides cost and time overruns, these gaps become a major cause of non-acceptability of the systems due to users' dissatisfaction. E-governance projects generally involve a large number of stakeholders. Contrary to traditional applications built for users within an organization or specific partnering organizations along a supply chain, the web-based citizen centric services may be used by several such user types who were not identified and hence not approached during the requirement analysis phase. Further, inadequate resources and unrealistic timelines set during the planning phase may act as deterrents for conducting a formal survey of the cross section of the target beneficiaries to capture and analyse their present and future needs. Therefore, in practice need assessment is generally based on experience of only a small group of planning and implementation-level officials within the government system. In general, there is hardly any emphasis on validating the assessment made with the ground truth. Such an approach usually fails to capture the intended outcomes of a system from the perspective of beneficiaries. Successful e-governance projects are characterized by a thorough assessment of needs based on interaction with a cross section of stakeholders and prioritization of requirements conveyed through a realistic roadmap of the proposed system. Studies have found that many of the e-governance projects have not been able to deliver the intended results due to inadequate thrust given on need assessment from the perspective of various stakeholders.

In Indian context, more than half of the population earn livelihood from agriculture and allied activities. About 85 % of the farmers in India are categorized as small and marginal farmers with their operational holdings being less than 2 ha. Stakeholders in the farming sector need information related to pre- as well as post-harvest phases, as discussed in Sect. 1.3 of Chap. 1 of this book. Some of such information needs keep changing due to the unstructured and dynamic nature of the problem areas in the agriculture sector. The expectations of users from e-governance applications also increase as they become accustomed to the usage of these applications and become familiar with the potential of technology. This encourages the enlightened users to take advantage from the emergent opportunities due to ongoing reforms in the agriculture sector. For example, with the legal recognition of warehouse receipts under the national warehousing receipts system (www.wdra.nic.in), the farmers, particularly the progressive farmers, shall be looking beyond the ICT-enabled easy access to market information from

AGMARKNET. In the emerging environment, they shall be requiring information about storage infrastructure where they can store their produce safely and obtain a receipt which should be recognized by banks for granting loans or traders for doing business. A further requirement could be easy access to prospective buyers of their produce through an ICT-based interactive platform. It has been experienced that any e-governance system addressing the needs of several stakeholders evolves over a period of time. There is always a possibility of gaps in such systems as no requirement study can be labelled as complete. Further, there may be prevailing operational constraints which might have forced compromising with the scope of services emanating from a project at the time of its launch. Such operational constraints—which may be related to technology, people or procedures—may become less relevant with the passage of time. It is due to these reasons that periodic assessment of changing user needs need to be an essential component of any e-governance project for ensuring its sustainability.

4.5 Feedback Loop

An effective customer response system is an integral part of high-performing customer focused business organizations. Treating citizens as consumer of public services, an e-governance project is expected to be performing well, if it is responsive to the concerns of end users. Feedback from citizens can be either in the form of complaints or suggestions for service improvement. Irrespective of the nature of feedback, such inputs need to be thoroughly analysed as these may have implications on expectations from a system in terms of functional and non-functional requirements. A feedback-driven system keeps aligning structures and processes for the betterment of deliverables and gradually gets transformed into a citizens centric service. Feedback-based learning is, therefore, essential for constant improvement of an e-governance system.

In the corporate world, automated tools to analyse direct feedback from customers or their reviews posted on social media or capturing relevant details by tracking their online sessions are commonly being used to offer customized products or services. There are examples from across the globe where feedback systems in public services have been efficiently implemented on similar lines. Examples include SeeClickFix and FixmyStreet mobile phone apps being used in the United States and the United Kingdom where the concerned government departments promptly respond to complaints of potholes, graffiti and illegal dumping lodged using these apps. A few cities where Internet call centres enabled feedback loops have been effectively implemented are Barcelona, Buenos Aires, Muscat, Rio de Janeiro, Seoul and Ulaanbaatar (World Bank 2016).

Such practices are usually missing or inefficiently implemented in the context of e-governance projects in India. The traditional setup of government departments in India is not tuned for handling massive feedback from public. In most cases, the government–citizen interfaces are inefficiently implemented in outsourcing mode. Citizens are often required to deal with call centre operators who are pre-mandated to give only routine stock replies and are usually not authorized to connect the caller with the government officer responsible for the service. The disconnect of public officials caused due to abruptly introduced profit-oriented intermediaries dilutes the very essence of service-oriented approach with which the government officials are expected to deliver. The prevailing approach of deploying feedback system in outsourcing mode needs improvement from service perspective.

A related example is the 'Online Public Grievance Lodging and Monitoring System' of the central Department of Administrative Reforms and Public Grievances (DARPG). The grievance redress guidelines mentioned on the portal (www.pgportal.gov.in) stresses upon the central and state-level organizations to treat the complaints received from public as valuable feedback for reforming the respective systems. These guidelines, however, do not seem to have been adopted in letter and spirit by government departments at different levels. Apparently, there is a disconnect between the DARPG and the respective organizations where the grievances lodged by the citizens are forwarded. Due to lack of monitoring of the action taken on the grievances, the aggrieved citizens are forced to shuttle between one or more departments depending upon the nature of complaint. A review of the complaints received at the Prime Minister's Office (PMO) has made the Principal Secretary to the Prime Minister to direct DARPG for revamping their system. The upgraded system needs to classify each grievance by various parameters, track follow-up action and provide complainants a tool to track redressal. The system should also reach under-privileged people through the national network of common service centres. DARPG has also been asked to identify senior officers who shall be analyzing and supervising the system (HT 2014).

A meticulously designed feedback system on the above lines is found to be in place in some of the popular e-governance projects. In such cases, the project authorities have been conscious about the significance of feedback-based learning loops for bringing the concept of continuous improvement in projects. For example, in the Chhattisgarh paddy procurement project, feedback system was implemented through call centre as well as web. The complaints received were immediately transferred to the concerned officer who was responsible for taking action and respond to the complainant. The action taken by the responding officer was regularly monitored at higher levels.

In certain situations, despite having adverse feedback about an ongoing computerized service, a government department may be helpless in bringing changes in the existing system due to the associated legal hurdles. For example, in the case of

initial version of Computerized Registration of Pesticides (CROP) project (Chap. 8, Sect. 8.3), which computerized 'As is' processes, the status of applications of prospective pesticides manufacturers was not known to them till their applications got sequentially scrutinized from administrative, legal and technical perspectives by all the respective officials. This was as per the ordered workflow laid down in the Insecticides Act 1968. At times, it used to take about 2 years for the cycle to complete and the applicant to know that the proposal got rejected for trivial reasons which could have been addressed at initial stage itself. Despite having strong feedback about the inherent inefficiency in the system, corrective action could not be taken because the processes were protected by a legal act. It took considerable time and persuasive efforts before the Act was modified to pave the way for revamping of the entire system in which the applicant was duly enabled to track the application status till the last stage.

Apart from feedback from beneficiaries and other external stakeholders, e-governance projects need to be supported by an internal feedback system as well. In a layered government setup, it is the implementing officers who are positioned closer to beneficiaries as compared to planners of a service. Therefore, implementers are expected to be more familiar with the local situations. This first hand field level knowledge needs to be regularly tapped for the e-governance systems to be in harmony with the ground realities. However, in the present setup, the role of field level government officials is solely limited to implementation of directions received from the headquarters.

Formulation of national programmes without developing knowledge about ground realities through relevant feedback from field level has often led to many failures. Such lapses have happened even when the programmes are conceptualized and monitored at the apex level in government. An example from the recent past is the ambitious Direct Benefits Transfer (DBT) scheme of the central government. The scheme targeting poor people was hurriedly launched on 1 January 2013 apparently due to political compulsions. To the embarrassment of the government, the geographical spread of the DBT scheme had to be reduced from 43 districts to 20 districts covering only 7 schemes instead of the planned 34 schemes. While reviewing the status of the scheme in a meeting with District Magistrates, the then Prime Minister acknowledged that the scheme is facing difficulties which were not anticipated at the conceptualization stage. It was realized that many of the initially identified districts did not have required banking and IT infrastructure in place. Further, several of the target beneficiaries did not have AADHAR numbers which was expected to be an essential requirement for their identification and linkage with bank accounts (Hindu 2013). The scope of DBT was, thus, required to be aligned with only those districts which were expected to qualify for these three essential prerequisites for implementing the scheme.

The conventional method of sensing field environment based on ad hoc inputs from field officers by physically calling them at headquarters has lost relevance in the context of e-governance systems which are expected to influence lives of

millions. E-governance systems have to be robust and agile to achieve transformation of government functioning. For this, government departments need to extensively promote use of modern technology-based feedback channels alongside face-to-face personal interactions which have their own significance. To remain constantly connected with the grassroots, facilities such as web-based high definition video conferencing services, which can seamlessly integrate with laptops, desktops, tablets, smart phones, etc. even in low bandwidth environment, need to be extensively utilized.

4.6 Reflections from Survey of Actors

4.6.1 Univariate Analysis and Regression Summary

The descriptive statistics and regression summary in respect of the variable 'Changing Situation' in the context of planners, implementers and beneficiaries are presented in Tables 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, Figs. 4.1 and 4.2. Based on regression analysis, the dominant micro-variables constituting 'Changing Situation' in the case of planners are revealed as perception about 'Changing user needs' and 'Feedback loop'. In the case of implementers, the dominant variables are found to be 'Mission awareness', 'Smooth access to service', 'Changing user needs' and 'Feedback loop'. Beneficiary-related dominant variables are found to be 'Smooth access to service' and 'Feedback loop'.

4.6.1.1 Micro-variables of Effectiveness of Strategy Implementation

It is observed that in the case of planners, the means of first four micro-variables constituting the 'Changing Situation' are quite consistent and fall in the 'very large extent' range. The corresponding quartile values also reflect such a pattern of response in general. The coefficients of variations are also reasonably low

Table 4.1 Descriptive statistics for micro-variables of changing situation (Base Survey: Planners)

Planners											
Variable	*N* Valid	Mean	SE (Mean)	SD	CV (%)	Range	Min	Max	Percentiles		
									25	50	75
Changing situation (CSP)	**36**	**0.80**	**0.02**	**0.12**	**15.00**	**0.45**	**0.51**	**0.96**	**0.70**	**0.80**	**0.93**
Mission awareness (MAW)	36	0.88	0.03	0.15	17.26	0.50	0.50	1.00	0.75	1.00	1.00
Vision awareness (VAW)	36	0.88	0.03	0.16	18.70	0.50	0.50	1.00	0.75	1.00	1.00

(continued)

Table 4.1 (continued)

Planners											
Variable	*N* Valid	Mean	SE (Mean)	SD	CV (%)	Range	Min	Max	Percentiles		
									25	50	75
Smooth access to service (SAS)	36	0.91	0.02	0.14	14.91	0.50	0.50	1.00	0.75	1.00	1.00
Changing user needs (CHN)	36	0.78	0.03	0.21	26.55	0.75	0.25	1.00	0.75	0.75	1.00
Planners' level feedback loop (FDLP)	36	0.53	0.04	0.23	43.24	0.96	0.04	1.00	0.42	0.56	0.74

Table 4.2 Regression summary (Planners: Changing situation X performance)

(i)

Model summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.748[a]	0.559	0.546	0.11530
2	0.790[b]	0.625	0.602	0.10793

(ii)

ANOVA[c]

Model		Sum of squares	*df*	Mean square	*F*	Sig.
1	Regression	0.572	1	0.572	43.062	0.000[d]
	Residual	0.452	34	0.013		
	Total	1.024	35			
2	Regression	0.640	2	0.320	27.470	0.000[e]
	Residual	0.384	33	0.012		
	Total	1.024	35			

(iii)

Coefficients[f]

		Unstandardized coefficients		Standardized coefficients	*t*	Sig.
Model		B	Std. error	Beta		
1	(Constant)	0.408	0.049		8.318	0.000
	FDLP	0.558	0.085	0.748	6.562	0.000
2	(Constant)	0.263	0.076		3.469	0.001
	FDLP	0.509	0.082	0.682	6.204	0.000
	CHN	0.218	0.090	0.265	2.408	0.022

[a]Predictors: (Constant), FDLP
[b]Predictors: (Constant), FDLP, CHN (Excluded Variables: MAW, VAW, SAS)
[c]Dependent Variable: PERF
[d]Predictors: (Constant), FDLP
[e]Predictors: (Constant), FDLP, CHN
[f]Dependent Variable: PERF

Table 4.3 Descriptive statistics for micro-variables of changing situation (Base Survey: Implementers)

Implementers											
Variable	*N* Valid	Mean	SE (Mean)	SD	CV (%)	Range	Min	Max	Percentiles		
									25	50	75
Changing Situation (CSI)	**107**	**0.61**	**0.02**	**0.17**	**27.87**	**0.78**	**0.18**	**0.95**	**0.50**	**0.60**	**0.70**
Mission awareness (MAW)	107	0.72	0.02	0.24	33.50	1.00	0.00	1.00	0.50	0.75	1.00
Vision awareness (VAW)	107	0.61	0.02	0.25	41.31	1.00	0.00	1.00	0.50	0.75	0.75
Smooth access to service (SAS)	107	0.64	0.02	0.26	39.86	1.00	0.00	1.00	0.50	0.75	0.75
Changing user needs (CHN)	107	0.56	0.02	0.24	42.86	1.00	0.00	1.00	0.50	0.50	0.75
Implementers' level feedback loop (FDLI)	107	0.48	0.02	0.22	45.66	1.00	0.00	1.00	0.38	0.50	0.63

Table 4.4 Regression summary (Implementers: Changing situation X performance)

(i)				
Model summary				
Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.646[a]	0.418	0.412	0.13452
2	0.712[b]	0.508	0.498	0.12427
3	0.734[c]	0.539	0.525	0.12085
4	0.746[d]	0.557	0.539	0.11909

(ii)						
ANOVA[e]						
Model		Sum of squares	*df*	Mean square	*F*	Sig.
1	Regression	1.362	1	1.362	75.276	0.000[f]
	Residual	1.900	105	0.018		
	Total	3.262	106			
2	Regression	1.656	2	0.828	53.615	0.000[g]
	Residual	1.606	104	0.015		
	Total	3.262	106			
3	Regression	1.758	3	0.586	40.124	0.000[h]
	Residual	1.504	103	0.015		
	Total	3.262	106			

(continued)

Table 4.4 (continued)

(ii)

ANOVA[e]

Model		Sum of squares	*df*	Mean square	*F*	Sig.
4	Regression	1.815	4	0.454	32.004	0.000[i]
	Residual	1.447	102	0.014		
	Total	3.262	106			

(iii)

Coefficients[j]

		Unstandardized coefficients		Standardized coefficients	*t*	Sig.
Model		B	Std. error	Beta		
1	(Constant)	0.266	0.041		6.462	0.000
	MAW	0.467	0.054	0.646	8.676	0.000
2	(Constant)	0.217	0.040		5.476	0.000
	MAW	0.309	0.062	0.427	5.014	0.000
	SAS	0.254	0.058	0.372	4.362	0.000
3	(Constant)	0.170	0.042		3.995	0.000
	MAW	0.275	0.061	0.381	4.497	0.000
	SAS	0.247	0.057	0.363	4.374	0.000
	CHN	0.135	0.051	0.184	2.642	0.010
4	(Constant)	0.151	0.043		3.531	0.001
	MAW	0.251	0.062	0.347	4.070	0.000
	SAS	0.239	0.056	0.351	4.281	0.000
	CHN	0.108	0.052	0.148	2.078	0.040
	FDLI	0.118	0.058	0.147	2.016	0.046

[a]Predictors: (Constant), MAW
[b]Predictors: (Constant), MAW, SAS
[c]Predictors: (Constant), MAW, SAS, CHN
[d]Predictors: (Constant), MAW, SAS, CHN, FDLI (Excluded Variable: VAW)
[e]Dependent Variable: PERF
[f]Predictors: (Constant), MAW
[g]Predictors: (Constant), MAW, SAS
[h]Predictors: (Constant), MAW, SAS, CHN
[i]Predictors: (Constant), MAW, SAS, CHN, FDLI
[j]Dependent Variable: PERF

Table 4.5 Descriptive statistics for micro-variables of changing situation (Base Survey: Beneficiaries)

Beneficiaries

Variable	*N* Valid	Mean	SE (Mean)	SD	CV (%)	Range	Min	Max	Percentiles		
									25	50	75
Changing situation (CSB)	**139**	**0.42**	**0.02**	**0.24**	**57.14**	**1.00**	**0.00**	**1.00**	**0.25**	**0.38**	**0.63**
Smooth access to service (SAS)	139	0.50	0.02	0.28	56.51	1.00	0.00	1.00	0.25	0.50	0.75
Beneficiaries' level feedback loop (FDLB)	139	0.35	0.02	0.28	81.17	1.00	0.00	1.00	0.00	0.38	0.50

Table 4.6 Regression summary (Beneficiaries: Changing situation X performance)

(i)

Model summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.588[a]	0.345	0.340	0.16591
2	0.640[b]	0.410	0.401	0.15807

(ii)

ANOVA[c]

Model		Sum of squares	*df*	Mean square	*F*	Sig.
1	Regression	1.988	1	1.988	72.216	0.000[d]
	Residual	3.771	137	0.028		
	Total	5.759	138			
2	Regression	2.360	2	1.180	47.233	0.000[e]
	Residual	3.398	136	0.025		
	Total	5.759	138			

(iii)

Coefficients[f]

		Unstandardized coefficients		Standardized coefficients	*t*	Sig.
Model		B	Std. error	Beta		
1	(Constant)	0.299	0.029		10.440	0.000
	SAS	0.426	0.050	0.588	8.498	0.000
2	(Constant)	0.273	0.028		9.718	0.000
	SAS	0.335	0.053	0.462	6.285	0.000
	FDLB	0.204	0.053	0.284	3.862	0.000

[a]Predictors: (Constant), SAS
[b]Predictors: (Constant), SAS, FDLB
[c]Dependent Variable: PERF
[d]Predictors: (Constant), SAS
[e]Predictors: (Constant), SAS, FDLB
[f]Dependent Variable: PERF

indicating that even across the projects, the variation in responses has been low, which seems to be reasonable as planners are centrally located and function from respective headquarters where the projects are conceptualized. These senior officers get better opportunities to participate in related seminars/workshops/meetings and answering project-related queries which include Parliament Questions. As such, their perception levels about changing needs of citizens (CHN) are expected to be relatively higher as compared to implementers. Each of these four micro-variables is represented by a corresponding question. The senior officers in general are found to be highly aware about project mission (MAW) and vision (VAW) and they experience smooth access to the project-based service (SAS). They are of the view that the expectations of beneficiaries from the project are changing (CHN) to a large extent.

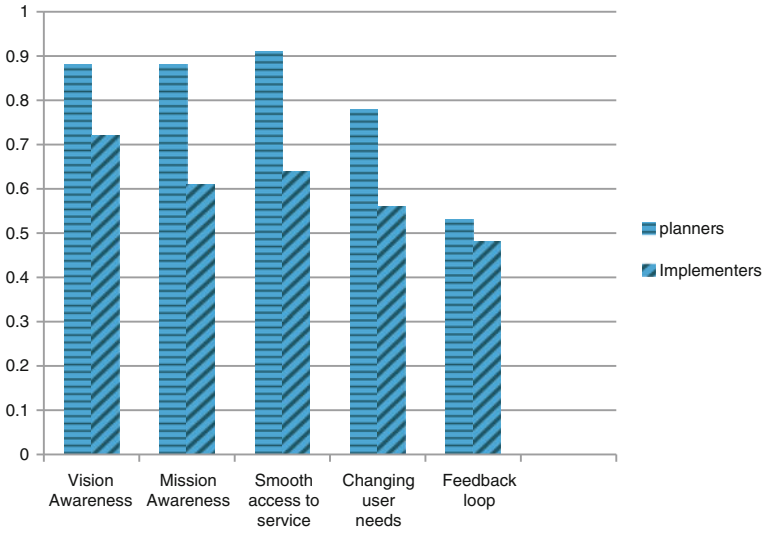

Fig. 4.1 Micro-variables of changing situation (Base Survey: Planners and Implementers)

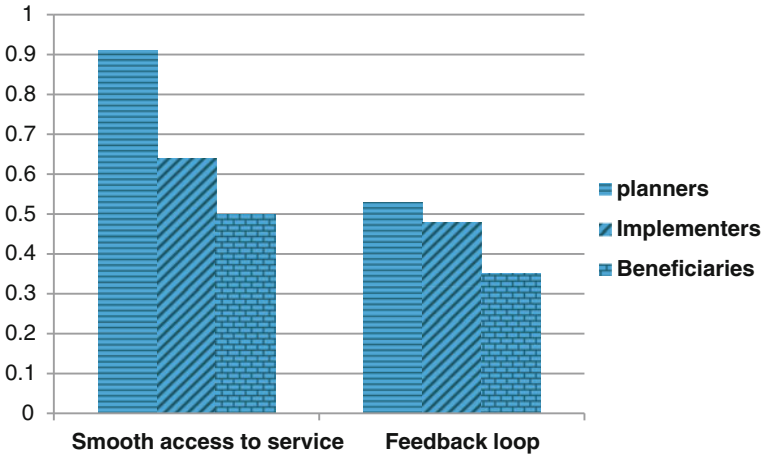

Fig. 4.2 Varying levels of access to service and feedback Loop (Base Survey: Planners, Implementers and Beneficiaries)

The mean value of the fifth micro-variable, viz. 'Planners' level feedback loop (FDLP)', falls in the medium extent range. Its coefficient of variation is relatively higher which is due to variation across the projects. Analysis of questions pertaining to FDLP reveals that the internal and external actors belonging to related organizations as well as the actual beneficiaries provide feedback to a medium extent. Among these, the mean values of feedback received from external actors and

beneficiaries are comparatively much lesser. This throws light on the important role to be played by implementers in establishing linkages with related organizations and beneficiaries and bridge the gap between planners and external entities for establishing a sound feedback mechanism in the context of e-governance projects. The implementers operate at a level closer to the beneficiaries. Even if the beneficiaries, particularly the farming community, are not in position to provide feedback to senior level project authorities, the gap can be filled by the implementers of respective projects. The strategy for building a feedback mechanism should, therefore, consider active involvement of implementers to accomplish the task. On the action front, it is revealed that the headquarters are able to take action on feedback to a medium extent. This asks for creating a separate group in projects for managing the citizens' response for constantly improving the performance of e-governance.

In the implementer category, the observed means of first three micro-variables, as presented in Table 4.3, are consistent and belong to the 'large extent' range implying thereby that their awareness level about project mission, vision and their access to service is observed to be of large extent. The mean values of 'Changing user needs (CHN)' and 'Implementers' level feedback loop (FDLI)' are observed to be belonging to the medium extent range. However, in general all these means are lower than the means of corresponding micro-variables in the planner category. The reason for this could be attributed to distant locations of implementers in general leading to their inadequate interactions with the planners and other related organizations. The lower values of first three micro-variables, when compared with planners, reflect their comparatively lesser awareness levels about project mission and vision besides lesser level of accessibility to the project service. In particular, awareness level about project vision and mission among implementers is found to be 44 and 22 % lower than the respective awareness levels of planners. Their access to service is 42 % less smooth when compared with planners. The marginally higher value of FDLP, as compared to FDLI, is suggestive of the presence of a better feedback loop as per planners. However, both mean values belong to medium range which is suggestive of considerable scope for improving the feedback loop system at both planners' and implementers' levels. The implementers are expected to maintain constant touch with beneficiaries. However, this does not seem to be the practice. The implementers perceive that user needs are changing to a medium extent unlike planners who feel that the user needs are changing to a large extent. This difference in perceptions of planners and implementers is due to expectedly better appreciation of changing user needs by the planners for reasons explained previously.

The relatively higher coefficient of variations of the respective micro-variables pertaining to implementers when compared with planners is explained by the geographical spread of the implementers. The same holds true in the case of respective micro-variables of beneficiaries when compared with implementers and planners as the geographical spread of beneficiaries is much wider.

In case of beneficiaries, the means of two micro-variables constituting the 'Changing Situation' are distinctly different. The mean value of smooth access to service (SAS) is observed as of medium extent and feedback loop as per

beneficiaries (FDLB) is of a small extent. Similar pattern of response is reflected by the corresponding quartile values also. As per the survey, they provide feedback to a small extent and the action taken on such feedback is also to a small extent only. Their access to service is of 82 % lower level than planners and 44 % lower than the implementers. The high values of coefficient of variation are explained by the project practices and the geographical spread of beneficiaries.

4.6.2 Multivariate Analysis

In the synthesized framework (Chap. 3, Fig. 3.1), 'Changing Situation' has emerged as a driver of e-governance. At the macro-level, the variable is observed to be influencing performance from the perspectives all the three categories of respondents, viz. planners, implementers and beneficiaries who were surveyed as part of the study. Out of various variables constituting 'Changing Situation', the dominant variables influencing performance have been identified using step-wise regression. The analysis based on the three independent opinion surveys has revealed such dominant variables influencing performance as 'Feedback loop' in case of all the three actor groups, viz. planners, implementers and beneficiaries, 'Changing user needs' in case of planners and implementers, 'Mission awareness' in case of implementers and 'Smooth access to service' in case of implementers and beneficiaries. These linkages are shown in Fig. 4.3.

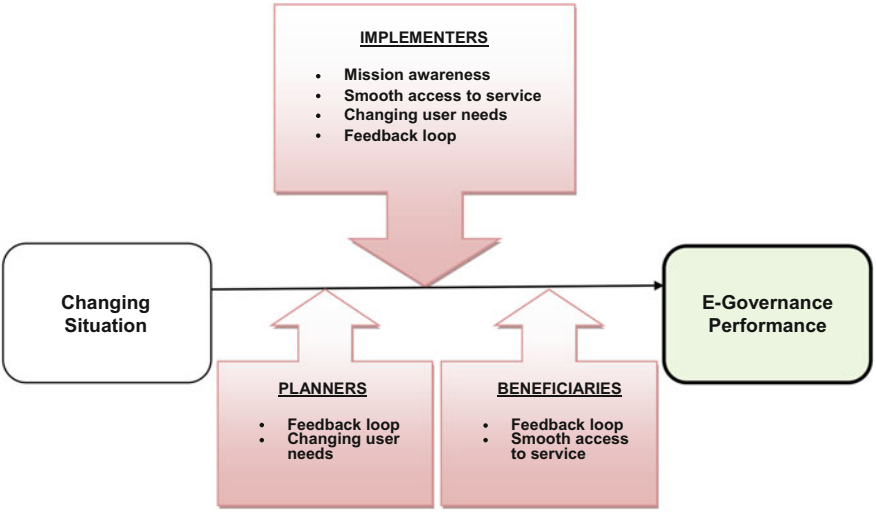

Fig. 4.3 Dominant 'Changing Situation' variables influencing performance (Base Surveys: Planners, Implementers, Beneficiaries)

Regression analysis is also performed by taking performance micro-variables, viz. 'efficiency', 'transparency', 'interactivity' and 'decision support' as independent variables (Appendix C). The identified relationships are interpreted in the context of six projects (Appendix D) based on which the synthesized strategic framework has been evolved (Chap. 3, Fig. 3.1).

4.7 Concluding Remarks

In this chapter, 'Changing Situation' which has emerged as a driver of e-governance in the synthesized framework (Chap. 3, Fig. 3.1) has been discussed. Suitable project-based illustrative examples have been cited to explain the concept in terms of shared mission and vision, accessibility to service, changing user needs and feedback loops. The three independent surveys covering planners, implementers and beneficiaries have provided the base for analyzing and interpreting the observed values of the variables constituting 'Changing Situation' in the context of respective actor groups. The next chapter discusses significance of strategic planning for effective e-governance.

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Chapter 5
Strategic Planning: An Enabler of E-Governance

5.1 Introduction

Most of the past or ongoing e-governance initiatives in India have been undertaken as part of the conventional planning and implementation system. The traditional top-down system, however, does not seem to be suitable for handling the dynamic context of e-governance. In government setup, organizations at centre as well as state levels generally rely upon the experience of a few senior officers for the purpose of planning and strategy formulation. The operational level staffs are mostly not involved in strategic discussions. These functionaries, who possess rich knowledge about ground realities, usually avoid contradicting the views of seniors even when they are asked to participate in the strategic discussions. As such, the prevailing hierarchical setup does not encourage free exchange of ideas among employees. For strategic planning to be effective, it is required to conduct extensive deliberations with various stakeholders. This should include even opponents of the proposed initiative to get divergent views. Such a structured approach is usually not followed in government organizations. If an e-governance initiative requires collaborative efforts between centre and state governments, the federal setup of government system in India adds further to the complexities. Due to inherent limitations of the system such as these, an effective approach for strategic planning is generally found wanting in most of the e-governance projects (Suri and Sushil 2012a, b; Suri 2016a).

In the synthesized framework (Chap. 3, Fig. 3.1), strategic planning has emerged as one of the enablers of e-governance. It is viewed to be based on three macro-variables, viz. 'Extent of Planning', 'Comprehensiveness of Strategy Formulation' and 'Flexibility of Processes'. These are defined as follows in terms of their corresponding micro-variables:

P.K. Suri and Sushil, *Strategic Planning and Implementation of E-Governance*,
Flexible Systems Management, DOI 10.1007/978-981-10-2176-3_5

5.1.1 Extent of Planning

This variable captures depth of coverage of various elements in the plan as suggested by program planning methodology for complex projects (Hill and Warfield 1972), involvement of stakeholders in project planning, service orientation of project plan and possibility of modifying an approved project plan. Its constituent micro-variables are as follows:

Coverage of program planning elements The micro-variable encompasses important aspects of project planning such as affected societal sectors, needs, constraints, alterables, objectives, objective measures, activities, activity measures and agencies involved.

Involvement of stakeholders in planning This micro-variable covers extent to which project specific stakeholders are involved in the planning process.

Timelines for services This micro-variable captures service orientation of the project plan, i.e. whether the timelines for progressively introducing more services for beneficiaries are defined in the plan.

Modifiable project plan/scheme The variable captures adaptability of the planning process, i.e. extent to which an approved plan is changeable.

5.1.2 Comprehensiveness of Strategy Formulation

The variable captures strategy formulation-related aspects which are considered essential for realization of an e-governance plan. These are viewed as involving stakeholders in strategy formulation, making provisions for addressing stakeholders' concerns, re-engineering of processes, redefining of roles and responsibilities and devising mechanisms for obtaining feedback on service. Accordingly, it is conceptualized to consist of following micro-variables:

Involvement of stakeholders in strategy formulation The variable deals with the recommended practice of undertaking extensive consultations with stakeholders during strategy making before venturing into implementation phase.

Provision for stakeholders' concerns This variable deals with clarity about value accruing to stakeholders and measures to assess the same.

Processes re-engineering This variable deals with thrust given on re-engineering of processes before automation.

Redefining of roles and responsibilities This variable deals with redefining of roles of concerned actors and assignment of new responsibilities to them as part of the project.

Provision for obtaining feedback The variable deals with importance given to making provisions for capturing feedback from actors belonging to the department owning the service (officials at headquarters and field level), external actors belonging to other related organizations and project beneficiaries.

5.1.3 Flexibility of Processes

This variable captures existence of options, change mechanisms and adaptability of processes to changing situations. The processes conceived for the study are preparation of project plan/Expenditure Finance Committee (EFC)/Standing Finance Committee (SFC) memorandum, capacity building, content development, content delivery and management of change. The constituent variables, viz. 'Options', 'Change mechanisms' and 'Adaptability to situation' (Suri 2016b) are as follows:

Options An important feature of a flexible process is that it has more than one options. A rigid process does not provide for any additional option. For example, the data transfer from markets in the AGMARKNET project was a rigid process during the early stages of the project. Markets were permitted to use only Government's network—NICNET for reporting data. With limited reach of NICNET, many of the markets could not submit market data on daily basis. In many instances, market personnel had to go to NICNET centre in District Headquarters to report data. The reporting from markets improved remarkably when it was permitted to use connectivity from any Internet service provider.

Change mechanisms A flexible process is characterized by existence of change mechanisms which perform the role of levers for changing a rigid process to a flexible process. In the illustration given above, it took almost 2 years to amend the approved project plan as per which only NICNET was to be used for data transfer. Clearly, the process of modifying an approved plan lacked change mechanism.

Adaptability to situation A flexible process easily adapts to a changed situation. For example, when the markets were permitted to use any network, their improved response reflected adaptability of data reporting process.

To present a comprehensive view to the readers, the genesis of these macro-variables along with the respective embedded micro-variables are discussed below under the sub-sections 'Suitability of Conventional Planning Approach to e-governance projects', 'Significance of Environment Analysis in e-governance', 'Planning for Service Delivery', 'Strategic Importance of Stakeholders in e-governance', 'Strategic Importance of Collaborations in e-governance', 'Need for Refining Structures and Processes' and 'Significance of Feedback System'. This is followed by analysis of the survey data corresponding to the conceptualized variables pertaining to strategic planning.

5.2 Suitability of Conventional Planning Approach to E-Governance Projects

Inadequate planning has been identified as one of the reasons for low success rates of e-governance projects (Heeks 2006. p. 110). It often leads to conceptualization of too optimistic e-governance projects based on over-ambitious milestones. Such

unrealistic milestones act as strategic barriers to effective e-governance (Lam 2005). Comprehensive strategic planning that first considers need for change and then prescribes actions makes e-governance initiatives more effective (Koh et al. 2006). The traditional approach of planning followed in the public sector does not appear to be suitable for e-governance planning as the aspired e-transformation of government functioning requires considerable strategic thinking (NECCCS 2000). Conventional planning often prevents strategic thinking as planning is more about analysis, whereas strategic thinking is more about synthesis (Mintzberg 1994). Planning in federal government systems like the one prevalent in India is linearly causal and follows Newtonian approach. Such a system assumes clearly defined system boundaries, treats planning as a one-time exercise, assumes slow changes in environment, relies primarily on top level executives for planning and assumes less intelligent functionaries at lower levels who are entrusted with plan execution (Pandey 2004, pp. 237–246). In hierarchical government system, there are multiple organizational layers that must be penetrated through to translate a plan into action. This prevents smooth flowing of top level objectives to lower levels (Chakravarty 1987, pp. 41–42; Chircu and Lee 2005). In Indian context, several scholars of development economy as well as the Planning Commission itself have pointed out limitations of the existing top-down system which has prevented the benefits to reach the target beneficiaries. Broadly, the limitations have been identified as inclination of planners toward macro-issues; seeking uniform solutions for different problems (Sovani 1994, pp. 78–79; Saxena 2001); lack of planning for plan implementation (Kabra 1997, pp. 150–154); one-time approach, lacking feedback-based learning and improvement (Bhaya 1997, pp. 91, 114–115; Planning Commission 2007a, p. 99); multi-layered hierarchical structures (Planning Commission 2001, pp. 31–33; Planning Commission 2007b, p. 225); lack of talent and capacity at grassroots; schemes/projects with overlapping objectives, etc. (Planning Commission 2007b, p. 225; Planning Commission 2002b, p. 186; ET 2015).

There are several centrally sponsored schemes being implemented through the state governments. The central government has little or no direct control over the performance of such schemes as these are governed by states. Several shortcomings in the execution of these schemes, particularly the lack of horizontal and vertical integration, have been critically pointed out in the successive plan documents and audit reports.

For example, recently the Comptroller and Auditor General of India (CAG) has pointed out serious gaps related to poor implementation of the Rashtriya Krishi Vikas Yojana (RKVY) which was launched during XI plan period to revitalize the agriculture sector and was in operation from 2007 to 2012. The scheme was fully funded by the centre government and implemented exclusively through the state governments. The structure of RKVY emphasized on bottom-up planning and the state governments were advised to work out their agricultural plans based on district plans. States were given the freedom to decide different kinds of agriculture-related projects which address the local requirements. Based on an extensive audit review, the CAG has observed that “In most of the states, the projects under the scheme

suffered from poor planning that gave little attention to details in implementation. Even the implementation was poor". It has further pointed out that most of the 7700 projects, currently being executed under the scheme, have been launched without undertaking pilots. The sub-optimal performance of these projects causes non-reaching of intended benefits at the grassroots despite substantial investments. This reflects limitations of the planning and implementation framework of government schemes. In the context of e-governance in India, several government organizations functioning with specific mandates took up a variety of e-governance projects independently as part of their departmental schemes following one of the break-through recommendations of the National Task Force on IT constituted in the year 1998. Subsequently, while taking stock of a few path breaking isolated efforts but slow pace of e-governance implementation, the government realized the need for a mission mode effort in this direction which gave birth to the National e-governance Plan (NeGP) (www.mit.gov.in) as has been discussed in Chap. 1.

It can, therefore, be said that most of the efforts for implementing e-governance in India are being carried out as per the existing planning and implementation framework. Gartner Research Group had evaluated various components of the National e-governance Plan (NeGP) and expressed serious concerns about its effective implementation even when the plan was just announced (Harris 2007). One-time static plans seem to be deficient in anticipating future requirements and are, therefore, apparently incapable of handling emerging project requirements. Analysing strategic planning in the context of the corporate sector, it has been argued that only 10 % of formal strategic planning gets realized. The remaining 90 % remains unrealized. In its place, what actually gets implemented is the outcome of ad hoc initiatives taken by managers to handle changing environment (Pietersen 2002, pp. 44–45). Mintzberg (1994) used the term 'emergent strategy' to describe the realized pattern which was never intended but gets reflected in the actions taken one by one which converge in time in some sort of pattern. Unlike the corporate sector, implementing agencies in government domain seemingly does not appear to have flexibility to deviate from approved framework for handling emerging situations. e-governance projects evolve over a period and at times they require instant corrective measures. Such projects, being conceived and implemented as part of the traditional planning and implementation framework, are thus expected to be affected by limitations of the overall system (Suri and Sushil 2012). The prevailing framework of strategic planning is required to deal with dynamic nature of e-governance projects. Past studies conducted for enterprises in the corporate world provide useful insights in this regard. For example, a study by Bensaou and Earl (1998) has revealed that unlike Western companies, which seemed to be spending considerable energies without much success in aligning IT strategy with business strategy, the Japanese companies do not believe in developing special IT strategies. These companies simply link IT investment decisions to performance improvement goals. This fosters emergence of new ideas based on learning by doing and strategy gets evolved in small steps. The authors have illustrated the case of Seven–Eleven Japan where each of the incremental improvements was driven by an operational objective to satisfy a customer need. Weekly meetings were held with field counselors to get

operational feedback. IT is used as just one of the competitive levers to achieve operational objectives. Such companies rarely experience IT problems as they follow the logic of 'strategic instinct rather than strategic alignment' while making IT investments. The process of planning and strategy making should, therefore, be reflective, participatory and emergent as opposed to traditional analytic, directive and planned (Mintzberg 1994; Upton and Staats 2008), which requires active involvement of operational level staff, beneficiaries as well as other stakeholders during project planning.

Apparently, the underlying development goals of e-governance can be achieved by adopting a true participatory approach. However, participation in these projects is generally practiced in a controlled manner with top-down approach. Instead, the approach should be based on empowerment of participating people with emphasis on outcomes of participation (Heeks 1999b).

5.3 Significance of Environmental Analysis in E-Governance

In any managerial context including that of e-governance, strategy formulation needs to begin with analysis of external environment and identification of internal strengths and weaknesses. The analysis determines the ability of an organization to make best use of opportunities and avoid threats (Schoemaker et al. 2013). An organization should have ability to sense changes in environment and respond by replacing outdated plans with a renewed strategy. This can be ensured by holding regular brainstorming sessions for getting inputs from a diverse set of stakeholders during the course of a project. Assimilation of views from different stakeholders helps in identifying emerging trends (Pietersen 2002, pp. 46–47, 48–50). Such learning issues from corporate world are useful in e-governance context also as project plans may become irrelevant with time due to situational changes. It has been found that a number of projects in India have run into unexpected difficulties or deteriorated from their stated original goals (Keniston 2002). The success of any technology intervention through e-governance depends on internal and external environment of government (Gupta et al. 2004, pp. 118–119). Gaps between proposed design and current realities are common in many projects. Therefore, it is required to remain updated with changing requirements of end users and other stakeholders. Remaining aware of changing expectations of citizens and responding to their needs is critical for maintaining relevancy of the services offered (Malhotra et al. 2008, pp. 216–216).

It also needs to be kept in view that changing requirements have implications on the software solution designed for an e-governance application. A balanced approach has to be adopted for minimizing gaps in design and actual conditions. An evolutionary approach of software development which does not freeze the requirements and let the software evolve incrementally with progressive involvement of stakeholders seems to be the appropriate methodology which suits the dynamic environment of e-governance.

5.4 Planning for Service Delivery

It is revealed from a study of popular e-governance projects in India that planning of such projects is characterized by thorough assessment of needs, clarity about objectives, identification and involvement of stakeholders in planning, performance measures, etc. (Appendix A). However, keeping in view the complexities involved, it is important that detailed deliberations are encouraged and a systems approach adopted while planning for e-governance projects. It is well established in literature that plans for complex projects should accord due importance to the program planning elements, viz. affected societal sectors, assessment of needs, objectives, activities, constraints, alterables, objective measures, activity measures and agencies (Hill and Warfield 1972). Stakeholders need to be involved from the very start of the project for ensuring their commitment through clearly defined and acceptable objectives with measurements and enhancing development outcomes (UNDP 2001).

The requirements of target beneficiaries may grow as they become acquainted with technology usage (Gupta et al. 2004, p. 111). Prompt deliverables through strictly defined short-term implementation cycles help in avoiding possibility of irrelevancy of the services by accommodating changing user needs. The thrust of e-governance being on service delivery, it is also required to include timelines for services in the plan. Recognizing that e-governance projects have long gestation periods, the NeGP also emphasized for defining of service levels with timelines by the line departments in their programme plans. This, however, could not be implemented effectively as is apparent from the delay in implementation of many MMPs.

The context of e-governance being dynamic, an e-governance programme plan need to be modifiable so as to incorporate changes in environment or new responsibilities of government employees which emerge with time (Chidurala et al. 2001, p. 17; Heeks 2006, pp. 64–65). There is a growing tendency among organizations to outsource various activities involved in the system development life cycle of e-governance projects due to lack of in-house resources. Such dependence on external players adds to the complex nature of life cycle of these projects. It is, therefore, important that methods for continuous performance monitoring and auditing are also evolved while planning for service delivery through e-governance.

5.5 Strategic Importance of Stakeholders in E-Governance

The basic idea of stakeholder theory is that those who can affect or can be affected by an outcome when pursuing an organizational objective should be accounted for (Freeman 1984, pp. 24–27, 52–55). In e-governance context, service offerings need to create added value and measurable benefits to their stakeholders. E-governance

services, therefore, necessitate closer working relationships between stakeholders. Development of meaningful and effective relationships between central government, individual government agencies and users of e-government services requires strategic planning and considerable change management (Lam 2005). Roadmap to e-governance initiatives should, therefore, start with a statement of stakeholders' requirements (Okot-Uma 2004). Emphasis on stakeholders' requirements needs to be given during design, development and maintenance phases of the e-governance initiatives (Pardo et al. 2000). 'Stakeholders Participation' has been identified as a factor of effectiveness of e-governance programmes (Kumar et al. 2004, pp. 256–264) as this helps in ensuring their continued commitment.

Quite often an e-governance project involves a very large number of stakeholders who are affected by it. Inclusion of stakeholders and their requirements, as recommended by several authors, should not, however, be interpreted as an argument in favour of setting up an ambitious project scope. Large scope increases the risk of failure. It is, therefore, important to define an implementable scope for a project in consultation with stakeholders.

Concerns of stakeholders should be managed with due diligence for sustenance of a project and achieving better results. For example, findings of an e-governance study in Ireland (Scott et al. 2004) have concluded that strategies should support the process of managing stakeholder relations in order to reduce the risk of stakeholder conflict and ensure the success of e-governance initiatives. The priorities of stakeholders with respect to an organization may change over time. Relationships with them need to be re-assessed from time to time in terms of power, legitimacy and urgency (Scholl 2005). A study of e-filing system of Inland Revenue Authority of Singapore has demonstrated the importance of strategic convergence of stakeholders' interest in an e-governance architecture which is serving both the public agency and its stakeholders. The study reflects the growing need of viewing strategic stakeholder management as an important competitive imperative of e-governance (Tan et al. 2005). Projects listed in Appendix A(b) reflect that the design of Lokvani, BHOOMI, e-Procurement Exchange and CARD projects emphasized on effective management of stakeholders.

5.6 Strategic Importance of Collaborations in E-Governance

Collaboration as a strategy is commonly practiced in the corporate world to gain fast access to resources, assets and competencies for sustaining competitiveness. Contrary to this, public sector organizations traditionally operate in silos and have a far different decision-making environment. Instances of interorganizational collaboration among such entities are rare. Several scholars have pointed out that the situation is no different in the e-governance context where projects generally have one-to-one correspondence with government departments, overlooking the fact that

there may be multiple agencies independently dealing with the same subject. A collaborative approach is needed to generate better value from e-governance in terms of standards to facilitate interoperability, sharing of information and technology resources, creating synergies in service offerings, software reuse and back office integration (Luna-Reyes et al. 2007). Intra- and inter-organizational collaboration is essential to realize the ultimate benefits of e-governance through service integration (Layne and Lee 2001). However, there is a general tendency for e-government to replicate traditional government—"perpetuating the functional insularity" (Marche and McNiven 2003). Effective collaborative relationships among multiple organizations require a supporting institutional framework (Dawes and Perfontaine 2003). Cross-organizational process and information system integration barriers are seen in literature as the most significant challenge for realizing fully integrated e-government services (Weerakkody et al. 2006).

While collaboration can lead to better service from the government for its citizens, better decision-making and improved government processes as well as generation of effective cooperation between the government and the private sector, the issue of how collaboration takes place determines the success or failure of an e-governance initiative. For example, an analysis of Malaysian Electronic Government initiative has revealed that the important factors for collaboration are clearly defined responsibilities, jointly agreed outcomes, mutual trust, shared vision and free communication (Ithnin and Ibrahim 2004, pp. 128–135). Another study has identified interorganizational collaboration and trust among partners as important factors for value creation-based collaborative digital government initiative in Mexico. Existing institutional arrangements (laws, regulations and government policies), organizational structures and managerial processes have been found as inhibiting factors for collaboration and trust among partners. The study has further brought out that these factors influence the characteristic of e-government in any country context and thwarted the progress in Mexico also after the initial encouraging results (Luna-Reyes et al. 2007). Pfitzer et al. (2013) have discussed the importance of co-creation in generating social and business value by involving different stakeholders. One of illustrations given by the authors is an initiative taken Mars to raise cocoa yield of the farms in the Ivory Coast to help the farming community. Mars brought together about two dozen organizations including government, international development agencies, NGOs, universities, multi-national companies, etc. and hired experts from World Bank to yield the initiative. One of the success factors in the e-Seva and e-Procurement Exchange projects is stated to be interdepartmental coordination. In case of Gyandoot project, which was conceptualized and successfully implemented by the then district collector, it has clearly emerged that the sustainability of the project may depend on effectiveness of interdepartmental collaboration (Appendix A).

5.7 Need for Refining Structure and Processes

Learning from past studies conducted for business entities confirm improved results when application of information technology is linked with redesigning of processes (Davenport and Short 1990). The context of government is, however, different. Government system comprises several independent organizations with specific mandates and stakeholders to deal with (Weerakkody et al. 2011; Gong and Janssen 2012). Like in many other countries, public administration in India is highly bureaucratized where organizational structures are hierarchical and decision-making is a slow top-down process. On the positive side, there is a visible change in the emergent thinking of Indian government as efforts are being put, particularly at the centre government level and in a few proactive states, to do away with complex procedures, discard age old acts and laws which have become irrelevant in present day context and involve citizens in policy making. The process of change is, however, slow as there is a general tendency in a typical government organization to continue with structures and processes established over the years. Studies have, therefore, recommended for incremental changes in government process as part of organizational-level strategy.

In order to realize full potential of information technology, government organizations need to avoid the easier path of automating the existing processes if such an approach does not add any value from the perspective of users. Organizations must essentially undertake process analysis as part of its e-governance programme and keep the needs of its stakeholders into view while designing the new processes. It may also be required to bring changes in organizational structure and reassign responsibilities for aligning with the changed processes. Further, organizations in government setup are interdependent when viewed from the perspective of service delivery to citizens. Therefore, if an e-governance service launched by a department is dependent on other departments, the underlying processes have to be collectively owned and interdependent tasks performed in a cohesive manner. Such an approach shall trigger integration of related databases maintained by the respective departments which is a prerequisite for delivering services in an efficient manner. This is a major challenge to be overcome to achieve joined-up government.

While re-engineering government processes, care must be taken to keep the processes flexible. Leeuw and Volberda (1996) define flexibility as the "degree to which an organization possess a variety of actual and potential procedures, and the rapidity with which it can implement these procedures, in order to increase the control capability of the management and improve the controllability of the organization over the environment".

Flexibility equips an organization to handle uncertain situations (Shi and Daniels 2003). It enhances competitiveness (Sharma et al. 2010) and smoothens organizational transformation to achieve higher levels of performance (Sushil 2015, 2016, pp. 3–19). As discussed above organizations in a government system are interdependent. For such a system to be adaptable to change, it is essential to introduce flexibility in the underlying processes (Gong and Jenssen 2012). A flexible process

is characterized by more options, existence of change mechanisms and adaptability to change (Sushil 2000a, b, pp. 51–68). An e-governance system based on flexible processes is quick in responding to changing needs of end users.

Services such as issuing of passports (e-Passport Seva) and driving licenses (SARATHI), registration of companies (MCA21) and e-Procurement Exchange taken up under the erstwhile NeGP (now e-kranti) are good examples of IT-induced changes in organizational structures and processes for creating better value for the beneficiaries.

5.8 Significance of Feedback System

One of the major lacunae in the conventional government service delivery system through various schemes has been pointed out as lack of timely inputs from field during implementation of various welfare schemes (Bhaya 1997, pp. 114–115). In the absence of regular flow of outcome-related credible data from field, it is difficult to assess that benefits are actually reaching the deserving beneficiaries. The Planning Commission of India (now NITI Aayog) is still grappling with this issue. As such, an effective feedback system should be an essential component of any e-governance project offering services for citizens. Learning from feedback provides the base for improving processes associated with service delivery (Chadwick 2003). Regular feedbacks from end users also help in improving quality of the databases at backend as has been argued in past in the context of information systems (Orr 1998). This contributes towards sharing reliable information with the beneficiaries (UNDP 2001) which enhances credibility of the services offered. Constant feedback from consumer of services during implementation is crucial for organizational-level changes and adaptability (Hrebiniak 2005, pp. 53–54). It also brings cohesiveness in organizations and improves performance (UN 2008, p. 66; Upton and Staats 2008).

A meticulously designed feedback system keeps provision for encouraging the beneficiaries to regularly share their experience with the service (UN 2008, pp. 53–54). This could be in terms of a process designed for promptly acting upon the feedback and informing back about the action taken. It has to be kept in view that the beneficiaries of an e-governance system may be from different backgrounds. Therefore, the design of services offered should be flexible enough to accommodate inputs shared by the beneficiaries based on their experience.

In projects like e-Seva, e-Procurement Exchange, BHOOMI, Nagarpalika and GYANDOOT (Appendix A), the management was careful for devising a sound feedback system for constantly improving services based on learning issues. In these cases, implementing units were motivated to report deficiencies in systems and scaling-up of projects was taken up only after gaining enough experience from execution on pilot basis.

5.9 Reflections from Survey of Actors

5.9.1 Univariate Analysis and Regression Summary

The analysis of observed values based on the survey conducted reveals medium levels of 'Extent of Planning', 'Comprehensiveness of Strategy Formulation' and 'Flexibility of Processes', in the projects studied. The medium extent values of extent of planning and comprehensiveness of strategy formulation are indicative of lesser emphasis being given on these aspects and gaps therein. The lesser value of flexibility measure is reflective of rigidity of conceived processes (Sect. 5.1) in the e-governance projects in general. The relatively large values of coefficient of variation in these two variables are apparently due to nature of the approved project/scheme framework and the practices followed in different projects. The constituting micro variables are discussed in more detail in terms of descriptive statistics and regression analysis based on survey data.

5.9.1.1 Micro-variables of Extent of Planning

Of the four micro-variables constituting the Extent of Planning (EXPLN), coverage of program planning elements (PPE) is observed to be contributing more to the macro-variable as compared to the other three as reflected in Table 5.1 and Fig. 5.1. PPE is also found to be the significant variable influencing performance as reflected in the regression analysis summarized in Table 5.2. A deeper insight into this micro-variable reveals that in general the planning process has addressed the aspects—affected societal sectors, objectives, activities and agencies involved.

Table 5.1 Descriptive statistics for extent of planning (Base Survey: Planners)

Variable	*N* Valid	Mean	SE (Mean)	SD	CV (%)	Range	Min	Max	Percentiles		
									25	50	75
Extent of Planning (EXPLN)	36	0.54	0.03	0.15	27.78	0.58	0.30	0.88	0.40	0.52	0.65
Coverage of program planning elements (PPE)	36	0.63	0.03	0.15	24.13	0.58	0.31	0.89	0.53	0.63	0.74
Involvement of stakeholders in planning (INSTP)	36	0.52	0.03	0.19	37.05	0.71	0.21	0.92	0.37	0.52	0.63
Timelines for services (TFS)	36	0.57	0.04	0.24	41.47	1.00	0.00	1.00	0.50	0.50	0.75
Modifiable project plan/scheme (MDS)	36	0.42	0.05	0.28	65.90	1.00	0.00	1.00	0.25	0.38	0.75

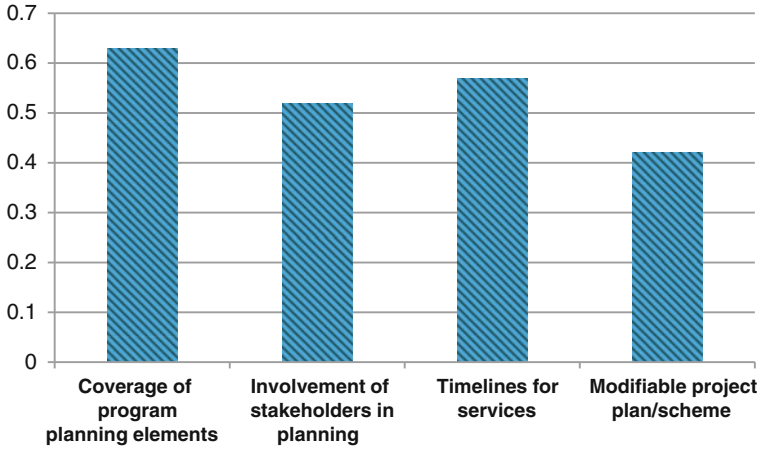

Fig. 5.1 Micro-variables of extent of planning (Base Survey: Planners)

However, assessment of needs of different affected societal sectors, constraints involved in project execution, identification of alterables, objective measures and activity measures have not been adequately emphasized upon at the planning stage. The means of other three micro-variables are quite consistent. The overall medium

Table 5.2 Regression summary (Extent of planning X performance)

(i)

Model summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.606[a]	0.367	0.348	0.13810

(ii)

ANOVA[b]

Model		Sum of squares	*df*	Mean square	*F*	Sig.
1	Regression	0.376	1	0.376	19.719	0.000[c]
	Residual	0.648	34	0.019		
	Total	1.024	35			

(iii)

Coefficients[d]

		Unstandardized coefficients		Standardized coefficients	*t*	Sig.
Model		B	Std. error	Beta		
1	(Constant)	0.274	0.099		2.753	0.009
	PPE	0.686	0.154	0.060	4.440	0.000

[a]Predictors: (Constant), PPE (Variables Excluded: INSTP, TFS, MDS)
[b]Dependent Variable: PERF
[c]Predictors: (Constant), PPE
[d]Dependent Variable: PERF

extents of 'Involvement of stakeholders in planning (INSTP)', 'Timelines for services (TFS)' and 'Modifiable project plan/scheme (MDS)' reflect relatively lesser importance given to these micro-variables at the planning stage. The 'Extent of Planning (EXPLN)' in e-governance projects is expected to improve by giving due emphasis on its constituting micro-variables.

5.9.1.2 Micro-variables of Comprehensiveness of Strategy Formulation

It is observed from Table 5.3 and Fig. 5.2 that the constituting variables of comprehensiveness of strategy formulation (COMPSF) are having consistent average values which fall in the medium extent range, i.e. (0.4–0.6). This clearly reflects upon weaknesses in the practices generally being followed in government departments with respect to formulation of strategy for e-governance projects. This may be due to lack of expertise to diligently apply strategic measures in projects or the senior management is not adequately sensitized to give due attention to practices such as environment scanning, involving stakeholders in formulating strategy and acknowledging their concerns, process re-engineering, redefining roles and responsibilities as per new requirements and creating a mechanism for addressing feedback from end users. Further, there is high level of variation among these values as reflected in the coefficient of variation and range values shown in Table 5.3. This is due to projects like CROP and Grapenet in which strategy formulation-related aspects discussed here were given required consideration (Chap. 7). For example, in CROP project, the Insecticides act was amended to redesign the inflexible processes and in Grapenet, a process for monitoring residuals of pesticides in grapes was designed and implemented by involving stakeholders.

Out of conceptualized six micro-variables which constitute the macro-variable, 'Comprehensiveness of Strategy Formulation', the micro-variable 'Provision for feedback' has been identified as the significant micro-variable influencing performance as reflected in the regression summary presented in Table 5.4. Feedback-related response given by planners indicates that there is sound mechanism for interaction between headquarters and field offices. However, mechanisms for regularly interacting with the end users or with other organizations related to service delivery are generally lacking (Appendix B).

5.9.1.3 Micro-variables of Flexibility of Processes

In the context of study, the observed average values of 'Flexibility of Processes (FP)' and its constituting variables fall in the medium extent as shown in Table 5.5 and Fig. 5.3. The observed means of responses to the questions related to micro-variables 'Options', 'Change mechanisms' and 'Adaptability to situation' fall

Table 5.3 Descriptive statistics for comprehensiveness of strategy formulation (Base Survey: Planners)

Variable	*N* Valid	Mean	SE (Mean)	SD	CV (%)	Range	Min	Max	Percentiles		
									25	50	75
Comprehensiveness of Strategy Formulation (COMPSF)	36	0.47	0.03	0.19	40.42	0.67	0.18	0.85	0.32	0.44	0.64
Environment scanning (ESC)	36	0.46	0.03	0.18	40.19	0.75	0.13	0.88	0.28	0.50	0.50
Involvement of stakeholders in strategy formulation (INSTSF)	36	0.41	0.03	0.19	45.35	0.69	0.12	0.81	0.26	0.39	0.54
Provision for stakeholders' concerns (STC)	36	0.54	0.03	0.20	37.82	0.75	0.25	1.00	0.38	0.50	0.75
Processes re-engineering (PRE)	36	0.42	0.06	0.35	82.04	1.00	0.00	1.00	0.00	0.50	0.75
Redefining of roles and responsibilities (ROL)	36	0.51	0.05	0.29	56.91	1.00	0.00	1.00	0.25	0.50	0.75
Provision for obtaining feedback (FDPROV)	36	0.50	0.04	0.24	47.57	0.92	0.08	1.00	0.33	0.50	0.67

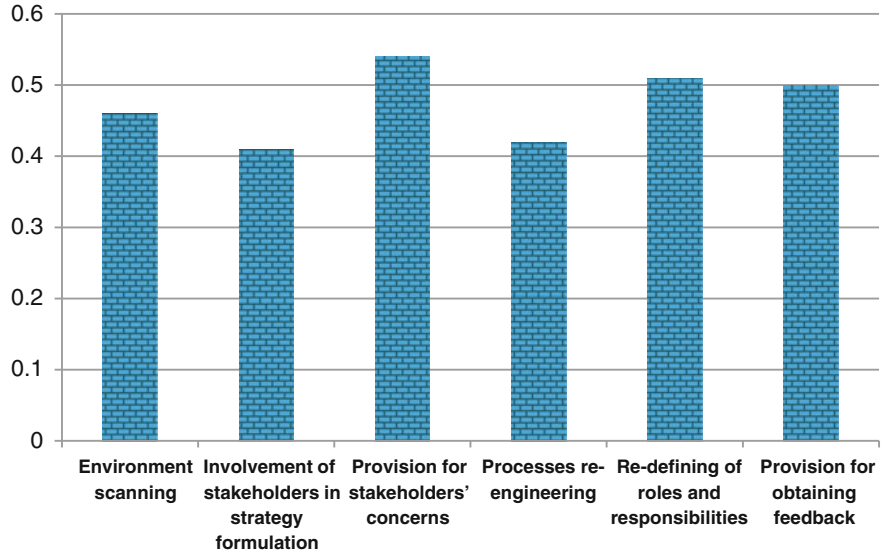

Fig. 5.2 Micro-variables of comprehensiveness of strategy formulation (Base Survey: Planners)

Table 5.4 Regression summary (Comprehensiveness of strategy formulation X performance)

(i)

Model summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.730[a]	0.534	0.520	0.11855

(ii)

ANOVA[b]

Model		Sum of squares	*df*	Mean square	*F*	Sig.
1	Regression	0.547	1	0.574	38.895	0.000[c]
	Residual	0.478	34	0.014		
	Total	1.024	35			

(iii)

Coefficients[d]

		Unstandardized coefficients		Standardized coefficients	*t*	Sig.
Model		B	Std. error	Beta		
1	(Constant)	0.441	0.049		9.470	0.000
	FDPROV	0.530	0.085	0.730	6.237	0.000

[a]Predictors: (Constant), FDPROV (Variables Excluded: ESC, INSTSF, STC, PRE, ROL)
[b]Dependent Variable: PERF
[c]Predictors: (Constant), FDPROV
[d]Dependent Variable: PERF

Table 5.5 Descriptive statistics for micro-variables of flexibility of processes (Base Survey: Planners)

Variable	*N* Valid	Mean	SE (Mean)	SD	CV (%)	Range	Min	Max	Percentiles		
									25	50	75
Flexibility of Processes (FP)	36	0.46	0.03	0.15	32.61	0.77	0.08	0.85	0.36	0.43	0.55
Options (OPT)	36	0.49	0.04	0.23	47.01	0.90	0.10	1.00	0.30	0.43	0.69
Change mechanisms (CM)	36	0.42	0.03	0.18	42.06	0.80	0.05	0.85	0.30	0.35	0.55
Adaptability to situation (ADP)	36	0.47	0.03	0.17	35.94	0.75	0.10	0.85	0.35	0.50	0.59

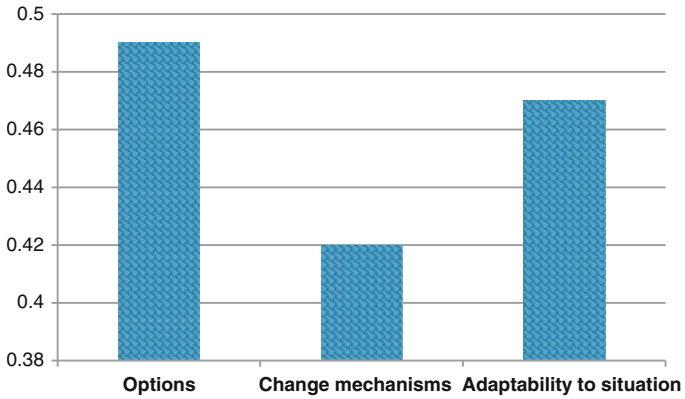

Fig. 5.3 Micro-variables of flexibility of processes (Base Survey: Planners)

in small or medium extent ranges. An analysis of these observed values reveals serious gaps in terms of rigidness of the conceived processes. In general, there is lack of flexibility with respect to modification of an approved plan scheme or project proposal, motivation of employees for upgrading related skills, feedback-based enrichment of published contents, integration of cross-organizational back-end databases for effective service delivery and preparedness of the departments for adopting e-governance. Further, as reflected in Table 5.6, 'Change mechanisms (CM)' has been identified as the significant variable influencing performance. Its interpretation in the context of different projects is presented in Appendix D.

Table 5.6 Regression summary (Flexibility of processes X performance)

(i)

Model summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.647[a]	0.418	0.401	0.13237

(ii)

ANOVA[b]

Model		Sum of squares	*df*	Mean square	*F*	Sig.
1	Regression	0.429	1	0.429	24.460	0.000[c]
	Residual	0.596	34	0.018		
	Total	1.024	35			

(iii)

Coefficients[d]

		Unstandardized coefficients		Standardized coefficients	*t*	Sig.
Model		B	Std. error	Beta		
1	(Constant)	0.440	0.058		7.643	0.000
	CM	0.631	0.128	0.647	4.946	0.000

[a]Predictors: (Constant), CM (Variables Excluded: OPT, ADP)
[b]Dependent Variable: PERF
[c]Predictors: (Constant), CM
[d]Dependent Variable: PERF

5.9.2 Multivariate Analysis

All the three macro-variables conceptualized for planners, viz. 'Extent of Planning', 'Comprehensiveness of Strategy Formulation' and 'Flexibility of processes' are observed to be influencing performance as revealed by the macro-level regression analysis. Within the respective macro-variables, the dominant variables influencing performance have been identified as 'Extent of planning', 'Provision for obtaining feedback' and 'Change mechanisms'. These linkages, based on the regression analysis, are shown in Fig. 5.4.

In order to enrich the case analysis, regression analysis is also performed by taking performance micro-variables, viz. 'efficiency', 'transparency', 'interactivity' and 'decision support' as independent variables (Appendix C). The identified relationships are interpreted in the context of six projects (Appendix D) which form the basis of the synthesized strategic framework (Chap. 3, Fig. 3.1).

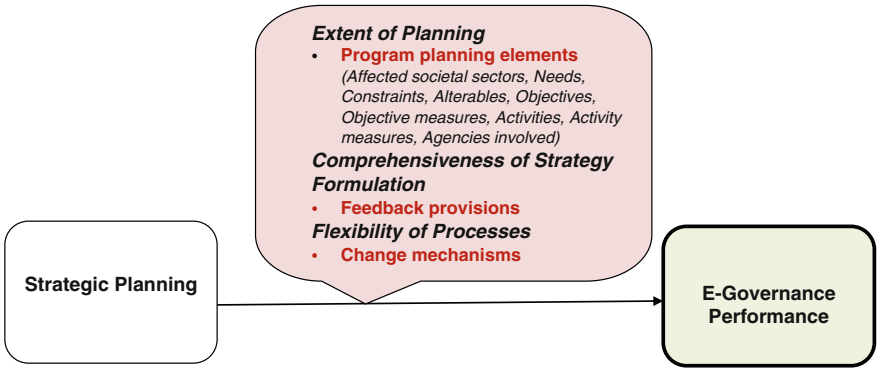

Fig. 5.4 Dominant 'Strategic Planning' variables influencing performance (Base Survey: Planners)

5.10 Concluding Remarks

In this chapter, significance of the conceptualized macro- and micro-variables pertaining to strategic planning has been discussed in the study context. It has been further attempted to explore gaps in the conventional system of planning and strategy formulation. The gaps are analysed in terms of observed values of these variables based on responses of planners associated with agriculture-related e-governance projects surveyed as part of the study. The analysis reflects upon the corrective measures to be taken for effective strategic planning which has emerged as an enabler of e-governance projects. The next chapter would discuss significance of strategy implementation for effective implementation of e-governance.

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Chapter 6
Strategy Implementation: An Enabler of E-Governance

6.1 Introduction

As has been discussed in Chap. 1, implementation of e-governance projects involves overcoming of several challenges. In the past, a large number of the e-Government projects have been either total or partial failures, particularly in the context of developing countries. Several authors have attributed the large scale failure of e-governance initiatives in developed as well as developing countries to their techno-centric focus. The observation has been found to be true in Indian context also as a large number of projects appear to be technology focused and lack citizen-centricity (ARC 2008, pp. 24, 59, 176).

Failure of IT projects is found to be common in the corporate sector as well where many organizations have struggled to adopt IT effectively. As per an estimate published in the year 2004, about 75 % of the IT projects in these organizations were abandoned or failed to deliver expected results (Feld and Stoddard 2004). The Standish Group Chaos annual survey reports, covering a wide spectrum of industries and federal organizations, have been bringing out similar alarming statistics in respect of IT projects (www.standishgroup.com).

Empirical studies on implementation of information systems reflect that planning has to be supported with effective implementation to get the intended results. Furthermore, the learning issues which emerge during implementation may ask for development of new applications which might not have been conceptualized during planning. For example, a survey of 163 firms revealed that only 24 % of the projects suggested in their strategic plans could be actually initiated and 38 % of the systems initiated by these firms were not part of their original plans (Lederer and Sethi 1988). Several such past studies have emphasized on implementation mechanisms such as top management and user's continued commitment during implementation, an effective review and feedback system, adequate resources for implementing plans, commitment to change, etc., for successful implementation of IT projects. Effective implementation of IT, whether in government or in corporate sector, is more of a

P.K. Suri and Sushil, *Strategic Planning and Implementation of E-Governance*,
Flexible Systems Management, DOI 10.1007/978-981-10-2176-3_6

management issue than a purely technology issue. "Making IT work demands the same things that other parts of the business do—inspired leadership, superb execution, motivated people, and the thoughtful attention and high expectations of senior management" (Feld and Stoddard 2004).

Based on the analysis conducted as part of this study, 'Strategy Implementation' has emerged as another enabler of e-governance. It is viewed to be based on macro-variables 'Effectiveness of strategy implementation' and 'Competence level of actors' which are defined as follows in terms of their respective micro-variables:

6.1.1 Effectiveness of Strategy Implementation

This variable is conceived as to what extent the existing operational environment facilitates realization of the crafted strategy. It is conceived to be composed of aspects such as involvement of stakeholders in strategy implementation, involvement of senior leadership and review of implementation from top level, effective communication of strategy, empowerment of operational staff, motivation of manpower, etc., which are organized as following four micro-variables based on factor analysis:

Strategic Coherence among Planners and Implementers (STCO) The construct reflects balance between planning and implementation constituting of items: clarity of directions from headquarters, progress review by seniors, encouragement to point out shortcomings, service timelines in action plan, satisfactory meeting of targets, extra efforts by headquarters, extra efforts by implementers, satisfactory support by vendors and provision for skill up-gradation as per needs.

Emergent strategy environment (ESE) The variable reflects an execution environment which empowers implementers to handle emerging situations locally with lesser dependence on headquarters. The realized strategy is, therefore, a sum total of the gradual actions taken by operational units. It comprises of four items, viz. involvement of implementers in planning, delegation of power to implementers, flexibility to deviate from procedures and Incentives to them for better performance.

Resources for strategy implementation (RES) The variable represents resources required for strategy execution. It comprises of two items, viz. adequate manpower to support implementation and adequate budget to support implementation.

The fourth micro-variable comprises only one item, viz. "involvement of stakeholders in strategy implementation" and is thus named accordingly (INSTSI).

6.1.2 Competence Level of Actors

This variable captures ability of actors to use the project specific e-governance service, their ability to make use of available computing facilities and demonstrating contact leadership, i.e. maintaining constant touch with actors operating at

lower layers (Suri 2016). The three constituting micro-variables identified to capture operational competence of actors are explained as follows:

Ability to use project service The variable captures to what extent an officer is equipped to use the service offered. The related questions are to study the extent of familiarity with various features of the service and ability to use these features.

Ability to use computing facilities The related questions are to what extent the government official is able to use computers for e-mail, Internet browsing, word processing, interacting with government and interacting with industry.

Ability to maintain contact This variable captures how far a government official is able to demonstrate contact based leadership quality. The planners are asked about the extent to which they are able to maintain direct contact with implementers and beneficiaries. The implementers are asked the extent to which they are able to maintain direct contact with beneficiaries. In case of beneficiaries, competence level is measured only in terms of their "ability to use project service" for the reasons explained while defining the micro-variables of 'Changing Situation'.

The genesis of above mentioned macro-variables and the constituting macro-variables are discussed here in terms of the following implementation related successful strategies identified by the study:

- Involvement of Senior Leadership.
- Motivation of Operational Staff.
- Empowerment of Operational Staff.
- Effective Communication.
- Competence of Actors.
- Involvement of Stakeholders in Implementation.
- Building Collaborative Relationships through Strategic Alliances.

The above aspects, which are found to be relevant to the context of our study, are explored in more detail as follows.

6.2 Involvement of Senior Leadership

Committed involvement of senior management during implementation is important for project success (Jiang et al. 1996; Fowler and Walsh 1999; Sabherwal et al. 2006) as their active support motivates greater user participation. With frequent progress reviews by the senior management during implementation phase, several other actors operating at different organizational layers gets sensitized about the chosen strategy. This facilitates integration of planning and implementation (Premkumar and King 1994). Further, past empirical studies on information

systems suggest that lack of adequate resources for implementation of the plan is a significant problem that affects effectiveness of planning system (Goodhue et al. 1988, Tait and Vessaey 1988). Successful execution requires alignment of supporting elements with the chosen strategy and provision of adequate human and capital resources for implementation (Premkumar and King 1991, 1994). This can be ensured only with the involvement of senior management as they have a decisive role in the allocation of resources.

In the context of corporate sector, studies have pointed out that there are several companies who have created numerous legacy systems which operate in silos and fail to generate expected integrated value for the business system. This is attributed to unconstructive involvement of senior management (Feld and Stoddard 2004). A survey of 500 senior business and technology executives, which was conducted to understand root causes behind companies' IT problems, revealed that the best performing companies make business executives responsible for key IT initiatives and use governance principles that cut cross organizational lines (Shpllberg et al. 2007). In another survey, it was found that the Japanese companies are able to achieve organizational bonding and prevent IT from being isolated by making senior executives in-charge of IT as well as key functions such as planning and finance (Bensaou and Earl 1998).

Role of senior management in the effective implementation of IT-based applications is increasingly being recognized in government organizations also. In the context of e-governance at state government levels, a study of evaluation reports reflect the catalytic role played by political leaders and senior management in the implementation of BHOOMI, CARD, GYANDOOT, FRIENDS and e-Seva projects through frequent monitoring and reviews. Special emphasis by the senior management on providing adequate resources for project implementation is reflected in FRIENDS, CARD, AKSHYA, e-SEVA and e-Procurement Exchange projects (Appendix A(b)).

For effective implementation of e-governance at the national level, one of the key issues to be addressed by the senior management is the issue of interoperability. The mission mode e-governance projects are expected to address this issue as their focus is on integrated service delivery instead of computerization of individual departments. For example, several agriculture related organizations have to collaborate for effective implementation of services envisaged under Agriculture Mission Mode Project. Senior management of different departments related to agriculture has a significant role to play in IT enablement of such citizen centric services which span across the departments. Their focus need to be on integration of core processes which cut across organizations instead of concentrating on respective individual department specific services which may only partially fulfil the requirements of the intended beneficiaries.

6.3 Motivation of Operational Staff

E-governance provides an opportunity to change the work culture of government organizations. For this to happen, employees need to be motivated to undergo the change process and adapt to organizational goals. In general, government employees are accustomed to working in the conventional manner. Rewards work as incentives for changing the mindset of such employees and encouraging them to adopt the technology driven changes in their working system (Garvin 1993). Therefore, for strategy execution to succeed, measurement and reward system should support the strategy.

There are ample examples in the corporate sector which demonstrate that rewards act as powerful tools for mobilizing organization-wide commitment for successful strategy execution (Thompson et al. 2005, pp. 399–400). For instance, in the case of Burlington Northern and Santa Fe Railroads, a formerly disorganized IT culture could be transformed into a high performing cohesive IT culture by motivating employees of the merged organization. The inspired employees, who underwent reorganization through a new set of processes, could collectively contribute to achieve the goal of developing the largest integrated real-time rail information system in the world (Feld and Stoddard 2004).

The evaluation reports of FRIENDS and GYANDOOT projects (Appendix A (b)) reveal that enthusiasm of operational staff was one of the reasons of success of these projects. The project authorities in FRIENDS project could infuse a sense of fulfilment among the employees by providing better service conditions. The GYANDOOT project faced tough resistance from local politicians and bureaucrats who perceived a loss of power as the new service delivery system bypassed them. However, the project authorities could keep the motivation of kiosk managers high through incentives in the form of cash awards besides regular contact and training. Stakeholders can be motivated through rewards to support a reform oriented information system. A relevant example is India's public sector railway system which was launched to reform railways reservations through computerization. The likely large-scale resistance from clerical staff could be averted through incentives to employees in the form of a motivating working environment (Heeks 1999a, p. 89). Compensations should be designed so as to motivate both individual and team performances (Loo 2002). In the national level AGAMRKNET project, State Marketing Board of Punjab introduced a reward system by felicitating the nodal officers of APMCs who regularly report daily market information for dissemination in public domain. As a result, the performance of markets of Punjab in terms of data reporting got considerably improved. This practice was subsequently adopted at the national level by providing incentives to the regularly reporting markets. In certain project settings, employees may get self-motivated if they are convinced about value creation in terms of simplification of their assigned tasks through IT intervention.

6.4 Empowerment of Operational Employees

Effective implementation of strategy demands a simultaneous view of planning and execution, especially in a rapidly changing environment. Strategy implementation generally takes longer time than planning and strategy formulation. Unforeseen challenges usually crop up during the execution period. Strategy execution needs to be adaptive to respond to such unforeseen events. Strategy making has, therefore, to be a dynamic process based on learning from implementation (Pietersen 2002, pp. 46–47). For this, those responsible for execution may be made part of planning and formulation process (Lee and Bai 2003; Hrebiniak, 2005, pp. 8–10). Managers need to be empowered to handle "unexpected crises and deviation from plan". Their ability to do so is found to be positively correlated with implementation success (Rosacker and Olson 2008).

Leaders are supposed to create conditions to do away with hierarchical thinking in organizations and let strategy emerge naturally through collective thinking in a facilitating environment. Top–down controls need to be removed in order to encourage divergent views and there has to be flexibility in strategy development and implementation (Pietersen 2002, pp. 48–50; Schoemaker et al. 2013; Pascale and Sternin 2015). Since the examples of such practices being followed in government set-up are rare, lessons need to be drawn from the studies conducted in the corporate sector which highlight such practices.

It is important to adopt a participatory approach to achieve the underlying development goals of e-governance. However, participation in these projects is generally practiced in a controlled manner with top–down approach. Instead, the approach should be based on empowerment of participating people with emphasis on outcomes of participation (Heeks 1999b). For example, in the CARD project, a core team of field officers was groomed which was empowered to meet the senior project authorities to suggest improvement. In GYANDOOT, kiosk operators were encouraged to regularly meet District Collector to provide feedback. Similar practices are visible in BHOOMI and e-Procurement exchange projects also (Appendix A(b)).

6.5 Effective Communication

For execution to succeed, the operational components of a strategy need to be well defined and communicated down to the organization (Hrebiniak, 2005, pp. 86–87). Having adequate communication channels is one of IS implementation success factors (Pinto and Slevin 1987; Jiang et al. 1996). The IT plan of an organization needs to be communicated to all the employees to ensure their better support to e-governance initiatives (Koh et al. 2006). Employees often resist change or accept the need for redirecting organizational efforts if they fail to absorb organizational mission and vision. It is, therefore, important that these are vigorously

communicated to all the employees particularly if an organization is intending to move towards a newly chosen path (Thompson et al. 2005, pp. 6–7, 40–41) as is being expected through e-governance initiatives by various government organizations.

One of the methods to reduce communication gaps among people working at different tiers of government could be to involve them in preparing mission statements for the respective tiers keeping in mind the citizens they serve and as well as the goals and objectives of the organization as a whole (Gupta et al. 2004, pp. 109–112). For example, evaluation reports of BHOOMI, CARD, e-Procurement exchange, FRIENDS and GYANDOOT projects (Appendix A(b)), reflect that the challenges of resistance to change for fear of losing authority, indifferent attitude of existing government employees and ownership issues could be overcome by organizing a series of sensitization and training programmes for employees as well as other stakeholders. During the initial stage of the ongoing AGMARKNET project, very few markets used to share daily market information for enriching the central database. The disturbing trend continued for about two years after the project was launched in the year 2000. The in-flow of information could be improved only after a communication plan was put in place by constituting suitable committees at the centre and state levels. A series of interactive sessions were held with field units over video conferencing and by organizing several workshops in the states to address the operational issues. A performance monitoring system was devised to rank the progress of different states in terms of monthly data reporting. There was a remarkable improvement in the reporting of daily information by markets after the communication plan was effectively implemented.

6.6 Competence of Actors

Human capital has been identified as one of the three prerequisites of realizing the potential of e-governance as a development tool besides minimum level of technological infrastructure and e-connectivity for all (UN 2003). Competencies needed for e-governance can be divided into four main components, viz. systems development competencies, project/change management competencies, intelligent customer competencies and operational competencies (ability to operate and maintain e-Government systems and basic computer literacy skill). The requirements of new competencies create a gap between the competencies possessed by the staff and those they need (Heeks 2006, p. 101). The importance of building human capacities in terms of necessary knowledge and skills to conceptualize, initiate, implement and sustain various e-governance initiatives across the three-tier federal structure in India—the Union, State and Local Bodies/Authorities—is well recognized. The key areas for capacity building have been identified as policy making, institutional arrangements, access to professional expertise and outcome monitoring. Various training programmes are suggested to build required capacities. These include e-gov champions, chief information officers, chief technology officers, users in

government departments and external users (Das and Chandrashekhar 2006). It is, however, to be kept into view that the existing manpower may not be readily deployable in e-governance projects. Employees need to be receptive and willing to update their skills regularly throughout their careers (Nandan 2008, pp. 44–50, World Bank: 2016, p. 32). According to Gartner Industry Research, skills and receptiveness of the government officials will pose a huge challenge for the intended capacity development for dealing with the massive transformation of government business processes and practices envisaged under NeGP.

Acknowledging that the most states are ill equipped in terms of personnel and the skill-sets needed for implementing e-governance in its true service oriented spirit, the e-governance division of the Department of Electronics and Information Technology of the Government of India has launched a special scheme to bridge these wide ranging gaps related to capacity building. As part of this drive, it is being attempted to strengthen the institutional framework in the states by setting up State e-governance Mission Teams (SeMTs). SeMTs are expected to address several challenges such as aligning projects to the essence of e-governance, bringing standardization and consistency across various initiatives, change management, process re-engineering, optimizing cost and resource utilization, project and programme monitoring, etc., (http://deity.gov.in/content/capacity-building-scheme. Accessed on 9.7.15). In particular, emphasis has been laid on training existing government employees on general use of computers (e-mail, word processing, spreadsheets, Internet, etc.) as well as capacity building of actual beneficiaries, especially in terms of enhancing their awareness level about the services (Harris 2007).

While capacity building programme in the context of e-governance is still at its infancy stage, general IT training of government officials in India is already an ongoing process under different programmes. Officials at various levels have been getting IT training through programmes conducted by the National Informatics Centre (NIC) as well under departmental programmes. This is as per the emphasis laid in the minimum agenda of e-governance being implemented in various departments (http://darpg.nic.in). Effectiveness of such trainings for making use of the ICT infrastructure created in various departments needs to be explored through independent surveys. Such an independent evaluation will help in fine-tuning of approach for capacity building in the ongoing projects or the new initiatives in pipeline, particularly for the communities at grassroots, under the 'Digital India' programme as announced in the Union Budget 2016.

The resource poor farmers in developing countries such as India continue to rely more on personal contacts for farming related information as compared to other sources. According to a recent national survey, only about 20 % of the agricultural households in India rely on radio/TV/newspapers/Internet for agriculture related technical advice. The rest continue to obtain such information from other sources such as extension agents, progressive farmers, NGOs, etc. The statistics reflect the challenges involved in making the large farming community in India accustomed to use of media including Internet (NSSO 2014). Inadequately skilled citizens act as barriers to e-governance (Marche and McNiven 2003). Besides connectivity for all, intensive training and sensitization of intended beneficiaries need to be an essential

component of an e-governance initiative, especially in cases where the target beneficiaries belong to illiterate community.

The evaluation of AKSHYA and KAVERI projects (Appendix A(b)) in India illustrates the importance of training of actual beneficiaries on the usage of services. In a successful USAID project in Guatemala, farmers themselves were trained to download market prices information and disseminate further among the peer group (UNDP 2001). An evaluation of community telecentres in Uganda has revealed that "constant sensitization of the community, as opposed to a one-shot sensitization exercise for creating awareness and sense of telecentre ownership among the local communities is crucial for the success and sustainability of such initiatives" (Kyabwe and Kibombo 1999). The success of service delivery at grassroots through common service centres in India, therefore, depends on how effectively the Village Level Entrepreneurs (VLEs) owning these centres are trained on the relevant services (https://www.csc.gov.in, last accessed on 4.6.2016).

The important role played by 'e-Champions' in successful e-governance projects is emphasized in many studies. The citizen centric nature of e-governance projects implies that lessons have to be learnt from strategies adopted by customer-centered-organizations in the corporate sector. A key strategy of such organizations is to build direct contact with employees and customers unlike the old model where a facilitative leader used to sit back, gave directions and empowered others to do the work. Employees accept leadership styles that are effective at change management and innovation in contrast to directive leadership styles. For success of e-Government initiatives, it is essential to select suitable 'e-leaders' who will take steps to evaluate demand and work closely with citizens and businesses to provide the services most useful to them (Loo 2002; Gouscos et al. 2007).

The successive UN Global e-Government Surveys have been emphasizing on ranking countries by measuring the willingness and ability of a state not only to provide relevant information and quality services, but also in terms of e-participation, i.e. engaging citizens in a dialogue in the process of service delivery and in public policy making through use of the Internet (http://unpan3.un.org). For achieving this, it is essential that the actors involved, particularly the end users, possess the required competencies as otherwise the opportunities created by technology may lead to greater inequality in a society (Word Bank 2016, p. 18).

6.7 Involvement of Stakeholders in Implementation

The importance of stakeholders in e-governance has been discussed previously (Chap. 5, Sect. 5.5). Observing that in the past very few initiatives can self-sustain once the initial donor-funding is withdrawn, UNDP has recommended that stakeholder participation should be ensured right from the project start as well as in ongoing monitoring and feedback (UNDP 2001). Another study has found that committed vendor support improves IT effectiveness in government offices (Gupta et al. 2007). Past studies conducted in the context of information systems support

the significance of involving stakeholders. Tait and Vessey (1988) found that user involvement during design and implementation has positive effect on system success. An empirical study of public sector information systems revealed that "communication, consultation and active listening to all stakeholders" during the project life cycle is significantly and positively correlated with project implementation success (Rosacker and Olson 2008). 'Client Consultation' has been identified as one of the success factors in the implementation of information systems in corporate sector as well (Pinto and Slevin 1987; Jiang et al. 1996).

It is observed that almost all the reviewed popular projects (Appendix A(b)) involved key stakeholders in implementation. Projects like AKSHYA, e-Procurement Exchange, KAVERI and Nagparlika intensively engaged users in developing contents. The practice of actively engaging all stakeholders during various project stages, is an important feature of the successfully implemented Grapenet project. Grapenet project, which has immensely helped growers and exporters of grapes in India, is one of the rare cases where concerned government departments at centre and state levels have effectively collaborated—with APEDA as nodal organization—for establishing an integrated supply chain for grapes.

6.8 Building Collaborative Relationships Through Strategic Alliances

The strategy of building collaborative relationships among related government departments has been successfully practiced in Gyandoot, FRIENDS, e-Procurement Exchange and e-Seva projects (Appendix A(b)). The importance of cross-agency collaborations for effective e-governance has been emphasized by many authors. However, the discussion on how to establish and maintain such collaborations is limited (Hu et al. 2006). Government organizations operate with limited resources under several constraints inherently imposed by the system. Keeping in view their constrained operational environment, a logical way of implementing e-governance appear to be identifying departments related to a service and developing value creation based cross linkages on the lines of strategic alliances being practiced in the corporate (Suri and Sushil 2006). However, it is important to be aware of the underlying issues concerned with strategic alliances before suggesting such a strategic path in e-governance context.

Alliances are commonly practiced in the fast paced business world where companies are under constant pressure of competitive forces. An alliances is a loosely evolving relationship among partners which lie somewhere between joint ventures and, mergers and acquisitions. The relationship is trust based and open ended. The partnering companies do not expect measured returns from shared commitments. They feel stronger together instead of operating independently (Ohmae 1989).

An alliance is defined as "the sharing of capabilities between two or more firms with the view of enhancing their competitive advantage and/or creating new business without losing their respective strategic autonomy" (Lasserre 2005, pp. 97–132). Companies get attracted for forming an alliance as they get an opportunity to package their resources, assets and competencies to create better value through joint efforts. The resulting advantages include enhanced organizational capabilities, creation of new strategic resources, reduced risks, better ability to compete, etc., (Wheelen and Hunger 2004, pp. 127–128; Thompson et al. 2005, p. 172; Kaplan et al. 2010). However, alliances need careful nurturing as their failure rate is high. Asymmetry of efforts, cultural conflict, compromising with core values, temptation for early results and getting disturbed about returns of partners due to wrong measurements are some of the identified reasons of alliance failure (Hamel et al. 1989; Ohmae 1989; Kanter 1994; Kaplan et al. 2010). Alliances are not likely to last long when partners tactfully join with an extractive agenda of acquiring capabilities from each other. Life of such alliances tends to get limited by the time period of acquisition cycle. On the contrary, an alliance generally lasts longer when the partners have a venturing agenda and join with a strong strategic intent of creating a new business value (Lasserre 2005, pp. 97–132). Alliances are likely to be successful when the partners are highly selective and their focus is on creating specific value for a particular competitive benefit. Other factors include expertise and motivation of partners for continued learning from each other without loosing their proprietary competencies (Hamel et al. 1989; Hipkin and Naude 2006).

The benefits foreseen from an alliance need to be constantly monitored and corrective interventions made if needed. Management of alliances is influenced by the interplay of situation, actors and processes which need to be evaluated from time to time (Likhi 2009). Since value generally accrues outside an alliance, focus of strategic alliances in e-governance context should primary be on creating value for end users and citizens. Unlike business firms, the functioning of government organizations is bound by their respective mandates. These organizations do not have to compete for their survival. However, with reforms becoming a priority agenda in emerging economies like India, government organizations have to learn implementable lessons from the corporate to work out cross-organizational strategic alliances in order to fully exploit the opportunities offered by e-governance for the benefit of citizens.

6.9 Reflections from Survey of Actors

6.9.1 Univariate Analysis and Regression Summary

The observed values of variables and summary of regression analysis based on surveys, are discussed as follows:

6.9.1.1 Micro-Variables of Effectiveness of Strategy Implementation

Out of four micro-variables constituting effectiveness of strategy implementation, the two variables, viz. 'Involvement of Stakeholders during Strategy Implementation (INSTSI)' and 'Strategic Coherence among Planners and Implementers (STCO)' are found to be significantly influencing performance of e-governance as reflected in the regression analysis summary (Table 6.2). The observed means (Table 6.1) reflect that in these projects, the stakeholders are involved to a medium extent during implementation of the strategy (INSTSI). The measure of coherence among planners and implementers is also observed to be of medium extent.

To measure coherence, opinion of implementers was sought about clarity of directions from headquarters, progress review by seniors, encouragement by seniors to point out shortcomings in the plan/strategy, defining of service timelines in the action plan, meeting of targets to the satisfaction of implementers, extra efforts being put by the actors involved during project execution, satisfactory support by vendors and provision for skill up-gradation of operational staff as per needs. An analysis of means of corresponding set of questions (Appendix B(b)) reveals that in general the implementers have been consistent in their replies with their average responses to respective questions falling in the medium extent range. These responses indicate that in general the existing planning and strategic framework

Table 6.1 Descriptive statistics for effectiveness of strategy implementation (Base Survey: Implementers)

Variable	*N* Valid	Mean	SE (Mean)	SD	CV (%)	Range	Min	Max	Percentiles		
									25	50	75
Effectiveness of strategy implementation (EFFSI)	107	0.43	0.01	0.12	27.90	0.69	0.15	0.83	0.34	0.42	0.51
Involvement of stakeholders in strategy implementation (INSTSI)	107	0.54	0.02	0.17	30.66	0.81	0.15	0.96	0.43	0.54	0.68
Strategic coherence among planners and implementers (STCO)	107	0.48	0.02	0.16	33.33	0.92	0.00	0.92	0.39	0.47	0.61
Emergent strategy environment (ESE)	107	0.33	0.02	0.17	51.21	0.75	0.00	0.75	0.19	0.31	0.44
Resources for strategy implementation (RES)	107	0.36	0.02	0.18	48.80	0.88	0.00	0.88	0.25	0.38	0.50

Table 6.2 Regression summary (Implementers): Competence level of actors X performance

(i)

Model summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.585[a]	0.342	0.335	0.14301
2	0.641[b]	0.411	0.399	0.13595

(ii)

ANOVA[c]

Model		Sum of squares	d*f*	Mean square	*F*	Sig.
1	Regression	1.115	1	1.115	54.497	0.000[d]
	Residual	2.147	105	0.020		
	Total	3.262	106			
2	Regression	1.340	2	0.670	36.242	0.000[e]
	Residual	1.922	104	0.018		
	Total	3.262	106			

(iii)

Coefficients[f]

		Unstandardized coefficients		Standardized coefficients	*t*	Sig.
Model		B	Std. error	Beta		
1	(Constant)	0.296	0.044		6.748	0.000
	STCO	0.637	0.086	0.585	7.382	0.000
2	(Constant)	0.208	0.049		4.269	0.000
	STCO	0.444	0.099	0.407	4.486	0.000
	INSTSI	0.334	0.096	0.317	3.490	0.001

[a]Predictors: (Constant), STCO
[b]Predictors: (Constant), STCO, INSTSI (Excluded Variables: ESE, RES)
[c]Dependent Variable: PERF
[d]Predictors: (Constant), STCO
[e]Predictors: (Constant), STCO, INSTSI
[f]Dependent Variable: PERF

does not assure the required strategic coherence among planners and implementers (STCO) in these projects.

The means of other two micro-variables are distinctively different as they belong to the small extent category unlike the medium level means of first two micro-variables. This distinct pattern is also visible across their respective quartile values. The average responses to questions belonging to micro-variable representing emergent strategic environment (ESE) reveal that implementers are poorly represented in the planning process and that it is to a small extent that they are permitted to deviate from approved scheme framework to meet the emerging project requirements or rewarded for better performance. Delegation of powers to implementers is also found to be of medium extent with the average value falling

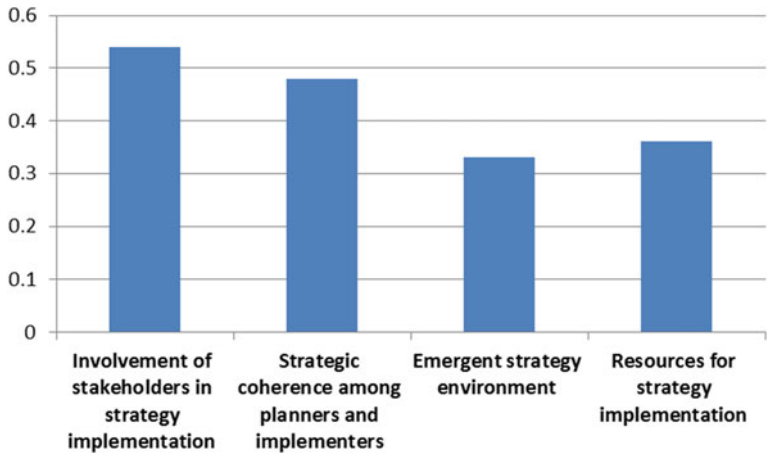

Fig. 6.1 Micro variables of effectiveness of strategy implementation (Base Survey: Implementers)

close to the lower class limit of the medium extent range. The implementers feel that the resources available to them (RES) are serving the purpose of strategy implementation to a medium extent. Organization of implementation as per their own ideas is constrained by limited budgetary (medium extent) and manpower (small extent) resources. The medium or small level individual averages of these micro-variables strongly indicate the major concerns to be addressed for ensuring effectiveness of strategy implementation while implementing e-governance projects (Figure 6.1).

6.9.1.2 Micro-Variables of Competence Level of Actors

The micro-variables "Implementers ability to use project service", "Beneficiaries ability to use project service", 'Planners ability to maintain contact with implementers and beneficiaries', and 'Implementers ability to maintain contact with beneficiaries' are found to be significantly influencing performance of e-governance based on regression analysis presented in Tables 6.5, 6.6 and 6.8. The mean of the micro-variable, viz. "Ability to use project service (ABS)" is observed to be belonging to the 'very large extent' range in the case of planners. The means pertaining to questions related to ABS, viz. familiarity with features of service and ability to use the features are also belonging to the same range. In the case of implementers, the mean of this micro-variable belongs to the 'large extent range'. The means pertaining to the related questions are also belonging to the same range. Thus, competence levels of both planners and implementers in terms of ability to use services offered by the project are found to be reasonably high as shown in Table 6.3, Table 6.4 and Fig. 6.2.

Table 6.3 Descriptive statistics for competence level of actors (Base Survey: Planners)

Variable	*N* Valid	Mean	SE (Mean)	SD	CV (%)	Range	Min	Max	Percentiles		
									25	50	75
Competence level of actors (CLP)	36	0.76	0.02	0.14	18.42	0.50	0.50	1.00	0.66	0.75	0.88
Ability to use project service (ABS)	36	0.89	0.02	0.14	16.11	0.50	0.50	1.00	0.75	1.00	1.00
Ability to use computing facilities (ABC)	36	0.80	0.02	0.14	18.10	0.50	0.50	1.00	0.71	0.83	0.90
Ability to maintain contact (CNTP)	36	0.59	0.04	0.27	44.84	1.00	0.00	1.00	0.41	0.63	0.75

Table 6.4 Descriptive statistics for competence level of actors (Base Survey: Implementers)

Variable	*N* Valid	Mean	SE (Mean)	SD	CV (%)	Range	Min	Max	Percentiles		
									25	50	75
Competence level of Actors (CLI)	107	0.55	0.02	0.17	30.91	0.72	0.20	0.92	0.42	0.54	0.68
Ability to use project service (ABS)	107	0.66	0.02	0.22	33.74	0.75	0.25	1.00	0.50	0.75	0.75
Ability to use computing facilities (ABC)	107	0.57	0.02	0.21	36.13	0.90	0.10	1.00	0.40	0.60	0.70
Ability to maintain contact (CNTI)	107	0.40	0.03	0.27	66.06	1.00	0.00	1.00	0.25	0.50	0.50

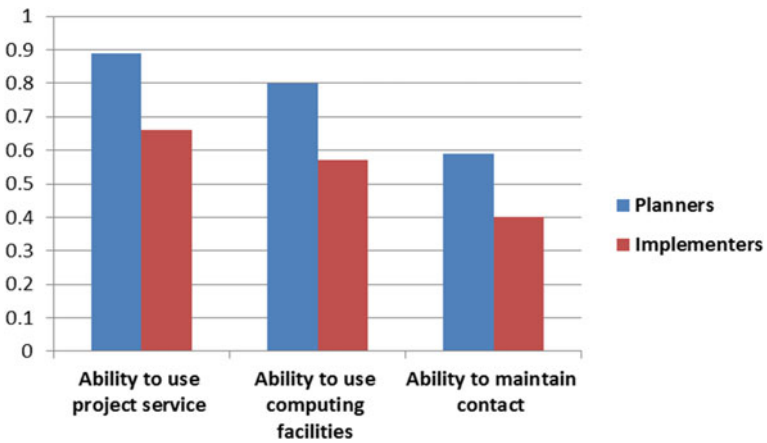

Fig. 6.2 Micro variables of competence level of actors (Base Surveys: Planners and Implementers)

Table 6.5 Regression summary (Implementers): Competence level of actors X performance

(i)

Model summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.595[a]	0.354	0.335	0.13951
2	0.668[b]	0.447	0.413	0.13105

(ii)

ANOVA[c]

Model		Sum of squares	*df*	Mean square	*F*	Sig.
1	Regression	0.363	1	0.363	18.630	0.000[d]
	Residual	0.662	34	0.019		
	Total	1.024	35			
2	Regression	0.458	2	0.229	13.325	0.000[e]
	Residual	0.567	33	0.017		
	Total	1.024	35			

(iii)

Coefficients[f]

		Unstandardized coefficients		Standardized coefficients	*t*	Sig.
Model		B	Std. error	Beta		
1	(Constant)	0.476	0.058		8.282	0.000
	CNTP	0.382	0.089	0.595	4.316	0.000
2	(Constant)	0.740	0.124		5.946	0.000
	CNTP	0.457	0.0889	0.712	5.132	0.000
	ABC	−0.387	0.165	−0.326	−2.353	0.025

[a]Predictors: (Constant), CNTP
[b]Predictors: (Constant), CNTP, ABC
[c]Dependent Variable: PERF
[d]Predictors: (Constant), CNTP
[e]Predictors: (Constant), CNTP, ABC
[f]Dependent Variable: PERF

In the case of planners, the mean of micro-variable, viz. "Ability to maintain contact with implementers and beneficiaries (CNTP)", is observed to be of medium extent only. The average values pertaining to constituent questions about their ability to maintain direct touch with field/operational level staff and beneficiaries also belong to the medium range. This hints at considerable gap in the prevailing set-up in terms of distant leadership being practiced in the case of e-governance projects which needs to be bridged for improving the performance of e-governance. Similarly, in the case of implementers, the observed mean of the micro-variable "Ability to maintain contact with beneficiaries (CNTI)" belongs to the medium extent range with the value being the lower class limit. The observed value reflects the gaps with respect to implementers' ability to interact with the beneficiaries. As

Table 6.6 Regression summary (Implementer): Competence level of actors X performance

(i)

Model summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.612[a]	0.374	0.368	0.13943
2	0.650[b]	0.422	0.411	0.13461

(ii)

ANOVA[c]

Model		Sum of squares	*df*	Mean square	*F*	Sig.
1	Regression	1.221	1	1.221	62.796	0.000[d]
	Residual	2.041	105	0.019		
	Total	3.262	106			
2	Regression	1.377	2	0.689	38.007	0.000[e]
	Residual	1.885	104	0.018		
	Total	3.262	106			

(iii)

Coefficients[f]

		Unstandardized coefficients		Standardized coefficients	*t*	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	0.286	0.042		6.752	0.000
	ABS	0.479	0.060	0.612	7.924	0.000
2	(Constant)	0.271	0.041		6.570	0.000
	ABS	0.406	0.063	0.520	6.424	0.000
	CNTI	0.157	0.053	0.238	2.940	0.004

[a]Predictors: (Constant), ABS
[b]Predictors: (Constant), ABS, CNTI (Excluded Variable: ABC)
[c]Dependent Variable: PERF
[d]Predictors: (Constant), ABS
[e]Predictors: (Constant), ABS, CNTI
[d]Dependent Variable: PERF

Table 6.7 Descriptive statistics for competence level of actors (Base Survey: Beneficiaries)

Competence level of actors (CLB)	139	0.56	0.02	0.27	48.21	1.00	0.00	1.00	0.38	0.63	0.75
Ability to use project service (ABS)	139	0.56	0.02	0.27	48.21	1.00	0.00	1.00	0.38	0.63	0.75

in the case of planners, this gap needs to be addressed for improving the project performance.

The average value of "Ability to use computing facilities (ABC)", is found to be belonging to the 'very large extent' range in the case of planners and 'medium extent range' in case of implementers. The mean values of questions related to ABC

Table 6.8 Regression Summary (Beneficiaries): Competence level of Actors X Performance

(i)

Model summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.657[a]	0.431	0.427	0.15459

(ii)

ANOVA[b]

Model		Sum of squares	*df*	Mean square	*F*	Sig.
1	Regression	2.484	1	2.484	103.959	0.000[c]
	Residual	3.274	137	0.024		
	Total	5.759	138			

(iii)

Coefficients[d]

		Unstandardized coefficients		Standardized coefficients	*t*	Sig.
Model		B	Std. error	Beta		
1	(Constant)	0.231	0.031		7.571	0.000
	ABS	0.503	0.049	0.657	10.196	0.000

[a]Predictors: (Constant), ABS
[b]Dependent Variable: PERF
[c]Predictors: (Constant), ABS
[d]Dependent Variable: PERF

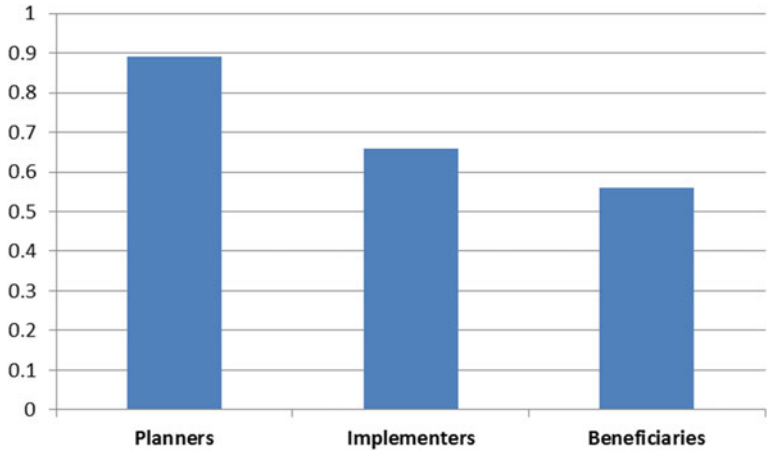

Fig. 6.3 Ability to use project service (Base Surveys: Planner, Implementers and Beneficiaries)

reflect that both planners and implementers are able to make use of the available infrastructure for using e-mail, Internet, word processing and improving their productivity to a 'very large extent' and 'large extent', respectively, and interacting

with government agencies. Ability to use computers for interacting with government and industry is rated as of large and medium extents, respectively, by the planners. Corresponding values in respect of implementers have been observed as of medium levels.

The overall differences in the means of constituting micro-variable suggest the difference in competency levels of planners, implementers and beneficiaries (Tables 6.3, 6.4 and 6.7). For example, comparing the three groups of actors in terms of "Ability to use project service (ABS)", the competency level of planners is observed to be higher than that of the implementers, which in turn is observed to be higher than that of the beneficiaries (Fig. 6.3).

6.9.2 Multivariate Analysis

The regression analysis has revealed that the macro-variable conceptualized for implementers, viz. 'Effectiveness of Strategy Implementation', is found to be influencing performance. Further, 'Competence level of Actors' is found to be influencing performance in case of planners, implementers as well as beneficiaries.

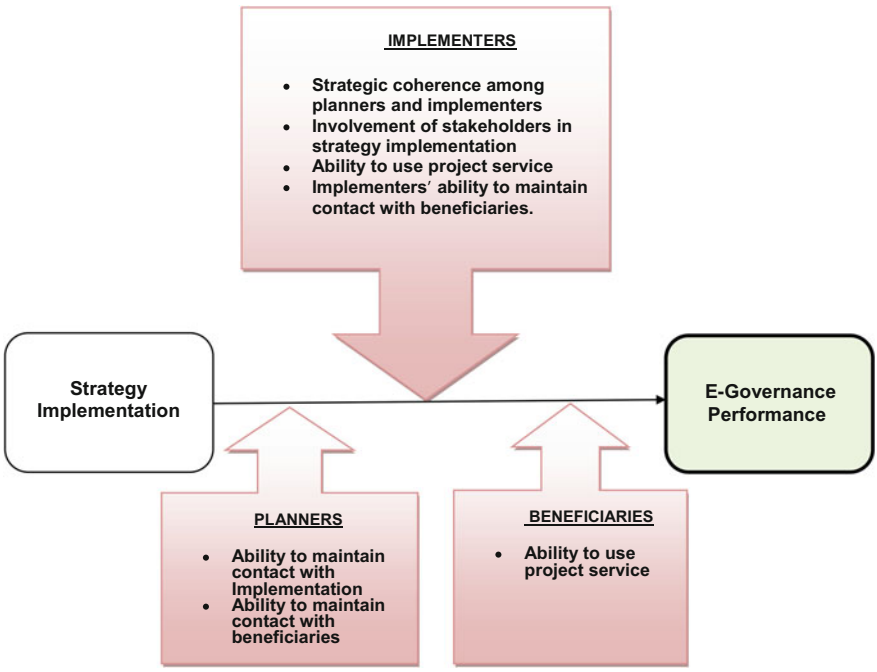

Fig. 6.4 Dominant 'strategy implementation' variables influencing performance (Base Survey: Planners)

Within the respective macro-variables, the dominant variables influencing performance have been identified as 'Strategic coherence among planners and implementers', 'Involvement of stakeholders in strategy implementation', 'Implementers and beneficiaries ability to use project service', 'Planners ability to maintain contact with implementers and beneficiaries', and 'Implementers abilities to maintain contact with beneficiaries'. These linkages, based on the regression analysis, are shown in Fig. 6.4 The regression analysis is also performed by taking performance micro-variables, viz. 'Efficiency', 'Transparency', 'Interactivity', and 'Decision support' as independent variables (Appendix C). As done in the case of 'Changing Situation' and 'Strategic Planning', the identified relationships are interpreted in the context of six projects (Appendix D) which form the basis of the synthesized strategic framework (Chap. 3, Fig. 3.1).

6.10 Concluding Remarks

In this chapter, significance of the conceptualized macro- and micro-variables pertaining to strategy implementation has been discussed in the study context. Gaps in the prevailing set-up of strategy implementation have been analyzed in terms of observed values of these variables based on implementation related responses of planners, implementers and beneficiaries associated with agriculture related e-governance projects surveyed as part of the study. The analysis has thrown light on variation in competence levels of planners, implementers and beneficiaries. It has further reflected upon lack of coherence among planners and implementers while implementing e-governance projects in the existing system. The chapter has provided the base for steps to be undertaken for bridging gaps among planners, implementers and beneficiaries. Such an approach is essential for effective strategy implementation which has emerged as another enabler of e-governance projects. In the next chapter, two G-C and one G-E projects are qualitatively analyzed using SAP-LAP framework.

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Chapter 7
Case Studies of Agriculture Related G to C and G to E Projects

7.1 Introduction

The chapter presents case studies of two Government to Citizens (G to C) and one Government to Employees (G to E) e-governance projects. The first case study (G to C) analyzes AGMARKNET project. It includes highlights of a pilot field study conducted to understand the prevailing strategic gaps in the project. The need of collaborative efforts for building an effective agricultural marketing information system is also addressed here by bringing out a strategic alliances-based conceptual framework among four related central government departments. This is followed by interpretation of the empirically validated frameworks (Chap. 4, Fig. 4.3; Chap. 5, Fig. 5.4; Chap. 6, Fig. 6.4) for improving the performance of AGMARKNET project. The second case study (G to C) analyzes Kisan Call Centre (KCC) project of the Department of Agriculture and Cooperation (DAC) for providing agricultural information extension support to remotely located farmers. The project attempts to leverage upon the increased accessibility to landline and mobile phones in rural areas for extending expert advice to farmers using the call centre approach. The third case study (G to E) discusses the DACNET project which was launched to usher in e-governance in the distributed but disconnected field offices of DAC. The study attempts to understand the underlying issues which need to be addressed to achieve aspired synergy among these offices despite establishment of collaborative technology infrastructure under the project. As in the case of AGMARKNET, the empirically validated frameworks are interpreted in the contexts of KCC and DACNET projects also for suggesting measures to improve performances of respective projects.

P.K. Suri and Sushil, *Strategic Planning and Implementation of E-Governance*,
Flexible Systems Management, DOI 10.1007/978-981-10-2176-3_7

7.2 Methodology for the Case Studies

The study methodology involves developing an understanding about the project by obtaining evidence from multiple sources (Yin 2003: pp 97–101, 2009: pp 114–116). This included inputs from secondary sources, viz. study of project-related documents such as project plan, tender documents, requirement specification documents, operational guidelines, user manual, annual reports and write-ups related to project domain and relevant contents available on the websites. This was supplemented with in-depth discussions conducted with the respective project nodal officers to understand the evolution of the projects and the underlying issues therein. SAP-LAP framework (Sushil 2000a, 2001, 2009, 2016) is used to conduct the case studies and Interpretive Matrix tool (Sushil 2005) used to achieve convergence of qualitative and quantitative analysis as recommended by Yin (2003: pp 109–112, 138–139, 2009: pp 132–135). The Interpretive Matrix portrays the elemental interpretations for all validated links between independent and dependent variables. It brings out the manner in which the independent variables influence the dependent variables under consideration. In each case study, first the project evolution and actor-process linkages are analyzed by studying changing situation and developing actor-process matrices based on Situation-Actor-Process (S-A-P) framework. The qualitative analysis is conducted to reflect upon planning and implementation-related challenges associated with large e-governance projects. Next, the insights developed through the project-specific observed mean values of the questionnaire items, as obtained from three independent opinion surveys of planners, implementers and beneficiaries (Appendix B (a)–(c)), have been discussed. This is followed by an interpretation of the empirically validated frameworks in terms of Learning-Action-Performance (L-A-P) arising from the description of influence of the significant strategic variables on the project performance. Key learning issues are reflected and actions suggested for improving performance in each case environment. The description of significant variables is based on synthesis of understanding developed through S-A-P analysis, project-specific observed sample values of the variables as obtained from the three base surveys, and the empirically validated micro-level relationships between independent and dependent variables with respect to planners, implementers and beneficiaries. The interpretations are presented in the form of three matrices for the respective actor segments. The elemental-level interpretations of expected benefits from the actions on respective strategic variables, in the context of each of the six projects, are finally synthesized to arrive at a generalized strategic framework based on cross-case analysis as presented in Chap. 3. The methodology adopted for case studies can thus be summarized as

- Developing understanding about the project through primary and secondary sources.
- S-A-P analysis in terms of project evolution and actor-process linkages.

- Observations based on sample values obtained from the three independent surveys of planners, implementers and beneficiaries in the case context.
- L-A-P synthesis based on S-A-P analysis and interpretation of empirically validated framework.

In order to validate the proposed actions with the real-life situation, the projects have been revisited and a summary of key developments in the post-study period is presented. It may be seen that some of the actions proposed as part of L-A-P synthesis of respective projects (Appendix D) are reflected in the initiatives taken in the recent past by the respective project authorities.

7.3 Case Study 1: AGMARKNET

The agricultural marketing system in India is undergoing significant metamorphosis to meet the challenges posed by surplus crop production and liberalized trade environment. As market-oriented economic development proceeds, Indian farmers in rural areas continue to experience great disparity in income compared with other sectors. There are about 7000 agricultural produce wholesale markets (APWMs) in India where the farmers bring their produce for selling. The farmers often fall prey to middlemen due to lack of knowledge about market information. As part of the reforms initiated in the agricultural marketing sector, the need for establishing a sound Agricultural Marketing Information System in the country has been strongly felt since long (DAC 2002). Access to latest market information is expected to bring farmers in better bargaining position and get remunerative prices for their produce besides empowering them to utilize emerging trade opportunities. Knowledge about market trends also helps farmers in deciding about production strategies, i.e. which crop to grow and when to grow. Other marketing participants like traders, processors, consumers, etc., require market information for different purposes, e.g. taking decisions related to selling and procurement, transportation, etc. Market information is of immense value to the government also for keeping a close watch on the demand–supply situation and taking appropriate strategic decisions for maintaining the balance. Government also intervenes in markets to assure a minimum support price for select commodities through direct procurement. Accordingly, the Directorate of Marketing and Inspection (DMI), Ministry of Agriculture & Farmers Welfare, initiated the project AGMARKNET during March 2000 for capturing and disseminating market information through WWW for the use of farming community by progressively networking various APWMs. The ongoing project, is a typical example of intricacies involved in implementing an e-governance project in a federal government set-up.

7.3.1 Brief Description of the Project

The activities involved in the ongoing project can be broadly categorized as establishment of computing facilities at markets and their networking, capacity building of market personnel for using the computing facilities, application and database development, and a portal service on market information. Each market node has been equipped with a client system and Internet connectivity. The market personnel are expected to collect daily commodity arrivals and prices information from different auctions. The information is compiled and fed into the AGMARKNET application software. The initial version of the application was designed to operate in offline mode keeping in view the overall poor connectivity scenario in the rural areas. Its key features included application customization by markets as per their specific needs with respect to seasonwise commodities transacted, local units of transactions and local languages; transmission of daily market information to headquarters; consolidation of data received and its uploading on database server through an automated interface. The central database has been web enabled for disseminating daily market information. With the advancement of technology, the features of the market-level application were enhanced from time to time which is discussed in the following sections.

The portal http://agmarknet.dac.gov.in (earlier http://agmarknet.nic.in), developed as part of the project, aims at providing "single window" service to cater to the market information needs of farmers and other stakeholders. Important categories of portal contents include prices and arrivals (daily market prices and arrivals, weekly/monthly price trends, future prices from national commodity exchanges, international prices, etc.), grades and standards, commodity profiles, mandi (market) profiles and market reforms related initiatives/schemes. Besides farmers, various other segments of users which are expected to be benefited from the information service include processors, exporters, policy makers, academic organizations, government agencies, etc. Efforts are also on to evolve a GIS-based national atlas of agriculture markets and dissemination of information in local languages. The project gains significance with the thrust being given by the government to establish a pan-India e-trading portal by creating a unified agricultural marketing system in the country (www.enam.gov.in, last accessed on 4.6.2016).

7.3.2 S-A-P Analysis

A description of situation, actor and process aspects of AGMARKNET is discussed below for better understanding of the readers about planning and implementation-related challenges in large e-governance projects. The progress is analyzed in chronological sequence till the conclusion of the main study. Key developments in the subsequent period are summarized after the S-A-P analysis.

7.3.2.1 Situation Analysis

The project situation is categorized into Pre-Implementation, Implementation and Expansion Phases.

Pre-Implementation Phase

The Pre-Implementation Phase is further classified into following subphases:

March 2000: Project Approval—the project was entrusted to NIC as a central sector scheme approved by the Planning Commission for networking 170 wholesale markets and 40 State Marketing Boards/Directorates (SMBs) in the country.

April 2000–August 2000: Shaky Start—which was characterized by uncertainties due to inadequate NICNET infrastructure to serve remotely, located markets. The rigid procurement procedures and relying on multiple vendors approach were also found to be unsuitable for the rural centric project.

September 2000–November 2000: Breaking the Deadlock—efforts were made during the period to do away with the established practice of involving multiple vendors in procurement of equipment and operationalization. A single vendor approach was suggested to avoid system integration related issues in rural areas. Equipment suppliers could finally be reduced from 5–3 and purchase orders were placed. Application development was taken up in parallel.

December 2000–December 2001: Back to Deadlock Mode—during which the project suffered further setbacks. The major ISPs in the public sector, who were approached centrally, expressed inability in supplementing NICNET to connect markets in rural areas. Other major hurdles which drastically slowed down the project progress included logistical constraints in supply of equipment, non-readiness of several sites and backtracking from supply commitments by one of the vendors.

Implementation Phase

January 2001–December 2002: Constant Upstream Swimming—While foundation for the project was still being built, expansion to further 600 markets was approved during March 2002. It was attempted to adopt appropriate remedial measures based on learning from initial struggle. The functional strategy was modified by taking measures such as adopting a single vendor approach; permitting markets to obtain Internet connectivity from any local ISP and allowing them to enrich commodity list as per local requirements (initial commodity list covered only 27 commodities prescribed centrally by DMI). These remedial measures introduced the much desired flexibility in a complex project environment. Despite these changes, issues like selection of unimportant markets by states, non-availability of ISPs, non-readiness of sites for installing computers and transfer of trained personnel still kept emerging. A one-day workshop was organized on 22 February 2002 for working out strategies for strengthening AGMARKNET during 10th plan period (2002–2007). The workshop was represented by senior officers of 17 states. Expansion to 2000 more markets was approved.

Major Expansion (2003–2005)

Even after about 18 months since the project was initiated, the average number of markets reporting data (about 10) was still far lees than satisfactory. Average number of responding markets still being negligible, a project monitoring framework was

devised to address the issue. It comprised State level Project Monitoring Committee, National level Standing Committee and Department level daily Monitoring. The constant efforts by the implementing agencies resulted in relatively increased number of markets sharing data for dissemination. The implementation hurdles continued alongside project expansion as about 1300 markets were still not reporting daily market information out of about 2100 markets connected by the middle of 2005. However, keeping into view importance of the project, AGMARKNET was included in the select list of national e-governance projects reviewed at Cabinet Secretary level. Organizations like IBM, Microsoft, Indian Farmers Fertilisers Cooperative Limited (IFFCO), National Multi-Commodity Exchanges, mobile phone operators and kiosk operators in rural areas started showing interest for collaborations.

A strategic gap analysis of the project was conducted during January–April 2005 in the form of a pilot study (Suri 2005) covering two major markets in Delhi, viz. Azadpur (wholesale market of fruits and vegetables) and Narela (wholesale market of cereals). The learning issues which emerged from the study and the actions proposed for project strengthening are presented in Boxes 7.1 and 7.2 and Tables 7.1 and 7.2. The study findings were formally submitted to the DMI for taking corrective measures. These findings can serve as critical inputs for plugging gaps in the existing system and initiating strategic actions for integrating the project with the recently launched 'National Agricultural Marketing' project aiming at a unified e-platform for agricultural trade in India.

Box 7.1
Key Learning Issues based on the Pilot Study

AGMARKNET is a unique initiative where ICT has been leveraged for capturing and sharing daily information from various agricultural markets spread across the country. The following key learning issues which emerged from the pilot study, however, need to be addressed for its strengthening:

Market Selection

Despite guidelines from DMI, some of the states have been recommending markets which do not have proper infrastructure/access to Internet connectivity which leads to non-response.

Procurement, System Integration, Post-Installation Support

Though the 'Open Tender Process' provide a transparent mechanism for selecting vendors, the procedures involved act as deterrent in adhering to time schedules. Separate open tenders in different phases have created a situation of different vendors operating in the same state due to which it is required to deal with multiple vendors.

Monitoring System and Review

Many states seem to be ignoring the importance of regular performance reviews of markets as emphasized in the project operational guidelines.

Resources

The manpower resources in terms of lean implementation teams of both DMI and NIC do not match with the growing expectations from the expanding project.

Information Sharing

DMI expects all related organizations to share information for disseminating through the portal. However, contribution aspired from these organizations is unlikely in the absence of any interorganizational collaborative arrangement. Some of states, e.g. Karnataka, Andhra Pradesh, Telangana, Maharashtra and Madhya Pradesh have initiated their own state-level projects on similar lines and the practice is likely to be followed by other states also. The project authorities will have to deal with the emerging issue of harmonization with other state-level portals.

Local languages support

The central team has to depend on the state implementing agencies for translation support, which is delaying localization of the service contents.

Utility of Service

Though the project is progressing reasonably well in terms of the defined objective of progressively connecting markets for information exchange, it cannot be said with certainty that it is serving as per expectations of various stakeholders.

Access Barrier

The Internet-based delivery model is not enough. The last-mile service delivery issue needs to be duly addressed for widening the reach of AGMARKNET.

Content Enrichment

Apart from daily commodity prices and arrivals information, it is required to disseminate information on various aspects of agricultural marketing. Several agencies which deal with agricultural marketing can play a vital role in AGMARKNET content enrichment.

Multiple agencies with Similar Mandate

There are multiple organizations (both at central and state level) involved in collection of market prices. For example, at the central level three such agencies are Directorate of Economics and Statistics, National Horticulture Board and Department of Consumer Affairs apart from DMI. With the emergence of AGMARKNET, such duplicative efforts are avoidable.

Source: Adapted from Suri (2005)

Box 7.2
Key Strategic Recommendation based on the Pilot Study

The *organizational-level strategic recommendations* include:

- Sensitizing stakeholders through shared vision and mission and strategic objectives.
- Outsourcing of non-core activities.
- Mobilizing implementing agencies through appropriate control measures as well as reward instruments.
- Large-scale campaigns for spreading awareness at grassroots level.
- Exploring strategic alliances for bridging the digital divide and enriching portal contents.
- Progressive introduction of e-trading, promoting AGMARKNET as a signalling system for decision makers at central and state government levels, etc.

The *functional-level strategic recommendations* include:

- Addressing interoperability and security issues.
- Localization of contents.
- Regular conduction of impact studies.
- Periodical assessment of portal in terms of usability factors.
- Creation of citizen response groups at various levels.
- Value addition by publishing analytical reports to facilitate planning and decision-making at various levels.

Source: Adapted from Suri (2005)

Table 7.1 Suggested agencies for making strategic alliance for content enrichment

Agency	Expected benefits
Commodity directorates Commodity boards	Updated commodity profiles; effective monitoring of the prices/arrivals situation for respective commodities
National Institute of Agricultural Marketing	Enrichment of portal with market research studies carried out by the Institute
Indian Agricultural Statistics Research Institute, Directorate of Economics & Statistics	Value addition with statistical analysis of market information
Indian Council of Agricultural Research	Latest crop research information on the portal
National Horticulture Board, Agricultural and Processed Food Products Export Development Authority, Marine Products Exports Development Authority, Indian Institute of Packaging, National	Access to agricultural marketing promotional initiatives taken by other organizations; strengthening of forward linkages

(continued)

Table 7.1 (continued)

Agency	Expected benefits
Agricultural Cooperative Marketing Federation of India Ltd., National Cooperatives Development Council, National Dairy Development Board, National Bank for Agriculture and Rural Development, State Trading Corporation, World Trade Council, Tribal Cooperative Marketing Development Federation of India Ltd., Export Promotion Councils, Small Farmers Agribusiness Consortium and other such related organizations	
Inter Ministerial Group Agriculture, Commerce, Consumer Affairs, Food, Food Processing Industries, Health, Rural Development	Instant sharing of decisions (by other Ministries) which have impact on agricultural marketing
Commodity Exchanges	Access to future prices information; implementation of e-trading through such agencies
International Organizations, e.g. Food and Agriculture Organization, Codex Alimentarius Commission	Access to information on quality and food safety standards and international market trends

Source Adapted from Suri (2005)

Table 7.2 Suggested agencies for making Strategic Alliances for breaking the internet barrier for widening the reach

Agency	Expected benefits
Mobile Phone Operators Commodity Boards	Access to millions of users without any further investment by the government
National/State level Institutes of Agricultural Marketing National/State level Institutes of Rural Development	Awareness among farmers and market functionaries visiting the institute; awareness through publications in local languages
Indian Farmers Fertilisers Cooperative Limited (IFFCO) and other such agencies	IFFCO has about 37,000 farmers' cooperatives, ~500 farmers service centres; planning to diverse into e-commerce; installing farmers' friendly kiosks at strategic locations. Cooperatives in rural areas can play a major role in widening the reach of AGMARKNET
Krishi Vigyan Kendras Directorate of Extension field offices	Direct access to farmers
Kissan Call Centre	Direct access to farmers through toll free number 1551 or 1800-180-1551
Agri-Clinics Common Service Centres (CSCs)	Reaching to the rural masses
Agencies running information kiosks in rural areas	
Small Farmers Agribusiness Consortium	Integration with 'National Agriculture Marketing' e-Platform
All India Radio Local Newspapers Doordarshan and Cable TV networks	Conventional means have much wider reach and are more popular

Source Adapted from Suri (2005)

Continued Thrust on Project Expansion (May 2005–2008)

Completion of X Plan

Efforts for geographical expansion of the project continued during the period. By the end of X plan period, the project expanded to 2748 markets. However, due to unresolved implementation-related issues discussed previously, the number of markets reporting data continued to be low. Project implementation required constant persuasive efforts. The measures taken for strengthening the project during the period can be categorized as conduction of an evaluation study, enhancement of application features, organization of capacity building and awareness programmes, and efforts for widening the service reach. The key developments during the period are summarized as follows:

Third Party Project Evaluation

An evaluation study of the project was entrusted to the College of Agribusiness Management (CABM) by the Directorate of Marketing and Inspection (DMI) as per the mandatory requirement for continuing the project during XI plan period (2007–2012). The CABM surveyed 105 markets and interviewed various market participants. The study report, submitted during 2007, emphasized on enriching contents and taking steps for mass publicity and dissemination of information. The study reported a few instances of farmers getting benefit from the service. However, for achieving larger impact through the project, CABM recommended outsourcing of the project activities to some suitable private agency (CABM 2007). Most of the other suggestions made in the evaluation study were in harmony with the strategic actions proposed in the pilot study conducted as part of this research conducted by the authors during 2005.

Application Enhancement

The market-level application was redesigned using Microsoft Messaging Queues architecture to overcome bandwidth-related limitations and improve data reporting–receiving interface. New modules were developed to facilitate web-based performance monitoring of markets in terms of data reporting days, quality of data, preparing market profiles for hosting on the portal, non-readiness of sites, personnel trained, etc. Other key features introduced during the period included market trend reports, dissemination of market prices and arrivals information in ten Indian languages and interfaces to capture data in batch mode from such markets which were reporting data to state-level portals in the context of Andhra Pradesh, Karnataka, Madhya Pradesh and Maharashtra.

Capacity Building and Awareness Programmes

Repeat training programmes were organized for market personnel throughout the country. The National Institute of Agricultural Extension Management (MANAGE) was engaged to organize workshops for training extension workers. Eighteen such workshops were conducted during the period. An AGMARKNET Yatra (publicity campaign) was organized in the state of Madhya Pradesh through a Non-Government Organization for spreading awareness among farmers.

Collaborative Efforts for Widening Service Reach

Arrangement was made to disseminate important market trends through the Television network under Mass Media scheme of the DAC. Forwards Market

Commission volunteered to install 500 electronic display boards in major markets and Infrastructure Leasing & Financial Services Ltd. approached DMI to work out for disseminating market information through the common service centres being established under the national e-governance plan.

Approval for Project Continuation during XI and XII Plan Periods

XI Plan Period: 2008–2012

AGMARKNET project emerged as a flagship project of DAC due to its unique feature of disseminating daily market information in respect of several markets. The project won recognition at national and international levels. For example, it was selected as one of the finalists under economy development category in the Stockholm Challenge Award Contest 2006. Many research institutions, agribusiness firms, consultants, banks, etc., started showing interest in market information available on the portal. Based on the recommendations of the evaluation study, the project was approved for continuation during XI plan period. However, owing to budgetary constraints, expansion was approved for only 500 more markets. Further, DMI was advised to streamline the project operations by the end of the plan period and make the project self-sustainable by outsourcing the operations to a suitable agency (DMI 2008). The project reached 3241 wholesale markets by the end of XI Plan.

XII Plan Period: 2012–2017

Expansion of project to the remaining 3,700 markets was approved so as to connect all the agricultural produce wholesale markets in the country (~7000) during the period. Distinguishing features of the approved plan include: providing mobile phones to markets for disseminating data, decentralization of equipment purchase, installation of electronic display board in each market under the ongoing scheme of the Forward Market Commission; exploring alternate channels such as SMS/Voice mail/mobile apps, etc., for disseminating market information to the farmers by collaborating with telecom players, technical institutes, etc.; enhance monetary incentives @ INR 1000/= per month for the market personnel and state nodal officers if they report data for more than 20 days in a month.

Actor-Process Linkages

The key project processes and associated actors are presented below in Table 7.3.

The above analysis reveals that the project involves a complex interplay among multiple actors and processes as depicted in Fig. 7.1. Some of the processes are handled by multiple actors belonging to different organizations. Timely completion of such processes is more of a management issue than a technological one.

7.3.2.2 Summary of Key Developments in the Post-Study Period

- With improvement in Internet connectivity, a web-based system has been introduced during 2014 for data reporting by markets. Provision is also being made to enable data reporting by market officials using mobile phones.
- Efforts are being made to introduce e-auctions in the markets of pilot states, viz. under the Agriculture Mission Mode Project of DAC. This shall lead to an

Table 7.3 Key actors and processes interplay in AGMARKNET project

S. No.	Processes	Actors
1	Formulation of project plan scheme	DMI
2	Formulation of state-level proposals	SMBs
3	Sanctioning of proposals	DMI, DAC
4	Procurement	NIC (Hqrs), Vendors
5	System integration, internet connectivity	Vendors
6	Training of market personnel	DMI, NIC (Hqrs), NIC state and district units
7	Operationalization at markets	DMI field offices, NIC state and district units, SMBs, Markets, Vendors
8	Data preparation and reporting	Markets
9	Data collation and validation	DMI Hqrs
10	Database and portal maintenance	National coordinating unit (NIC)
11	Portal enrichment	DMI (Hqrs, regional and field offices), SMBs, Markets, NIC (Hqrs)
12	Contents preparation in local languages	DMI (Hqrs, regional and field offices), SMBs, NIC
13	Project monitoring and review	DMI, NIC, SMBs
14	Market led extension activities	SMBs
15	Preparation of GIS-based atlas	NIC, NIAM, SMBs
16	Wider dissemination	SMBs, Markets, DMI, NIC
17	Project monitoring and control	NIC, DMI, DAC, SMBs

effective price discovery mechanism and dissemination of reliable market information.

- A new user access interface has recently been introduced for improving the market information service.
- Efforts are constantly being put to improve quality of daily commodity prices and arrivals information reported by the markets.
- A mechanism has been evolved for registration of farmers to get commodity/market specific information on their mobile phones.
- A project National Agriculture Market (NAM) has been launched by the Prime Minister on 24 April 2016 under which 21 markets in eight states have been linked to enable transparent trading across these markets on a uniform platform. The project, aiming to create a pan-India electronic trading platform, is being executed by Small Farmers' Agribusiness Consortium under the supervision of

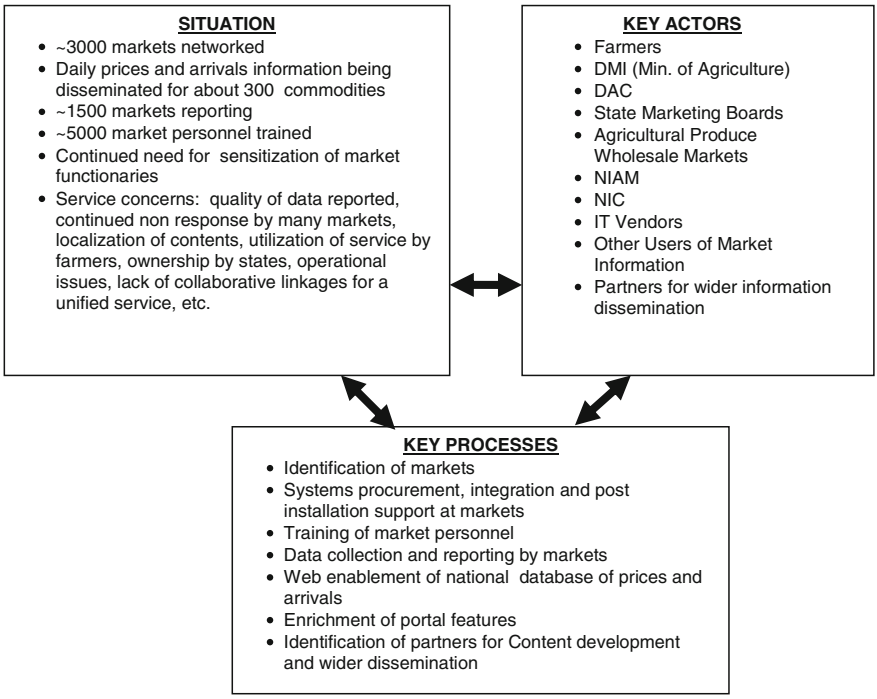

Fig. 7.1 Situation-actor-process interplay in AGMARKNET project

Ministry of Agriculture and Farmers Welfare. The target is to link 585 markets across the willing states by March 2017. Agriculture being a state subject in India, the success of this initiative of centre government will depend on active cooperation from different states (www.enam.gov.in, last accessed on 4.6.2016).

7.3.3 Observations from Opinion Surveys and L-A-P Synthesis

It is learnt from the S-A-P analysis that despite the complexities involved, the AGMARKNET project has created opportunities for strategic collaboration with related organizations belonging to both central and state governments as well as corporate sector. However, not much headway could be made towards building strategic alliances around the project for creating value in the form of usability of contents and widening of service reach to the grassroots. Even though, there is evidence that the service in public domain is being used by entities like agribusiness firms, consultants, banks, research institutes, etc., the project's core purpose of

serving the farming community still remains partially achieved. It is observed that still about 40 % markets do not fulfil the requirement of reporting data on daily basis. This reflects continued existence of gaps in the existing planning and implementation framework.

The sample observed values in respect of respondents belonging to AGMARKNET project are discussed here as per the contexts of planners, implementers and beneficiaries. The survey of planners (Appendix B (a)) revealed that the present and future requirements of beneficiaries, objectives, activities and agencies involved have been adequately addressed during planning (large to very large extent). However, there has been inadequate emphasis (small to medium extent) on expected constraints, alterables and performance measures. It is to a small extent that SWOT-like analysis was conducted before finalizing the project strategy. Such gaps explain the deadlock-like situations during the initial phases of the project. The project is a part of the plan scheme wherein planning is a one-time exercise. The planners have opined that it is difficult to modify the plan during course of its implementation (negligible extent). Though there is clarity about benefits accruing to stakeholders (large extent), measures to assess these benefits are lacking (close to small extent). Involvement of stakeholders during planning, strategy formulation and implementation is found to be of medium extent. This could be the reason for continued lack of ownership by state governments and other stakeholders. It is also observed that roles and responsibilities of actors have been redefined to a large extent in this project (e.g. market-level functionary is now required to report data for sharing in public domain). The planners feel that re-engineering of processes (e.g. capturing data from distant markets using ICT) has been done to a medium extent. There is inadequate provision to get feedback from beneficiaries (medium extent) due to which feedback from beneficiaries is observed to be of small extent.

The survey of implementers (Appendix B (b)) reflected that field units have limited resources (small extent) for project implementation, performance-based incentives are of small extent, their involvement in planning was to a small extent and coherence among planners and implementers is observed to be of medium extent. The survey of beneficiaries (Appendix B (c)) reflected that their input to project authorities for project improvement and actions of authorities on such inputs are of negligible extents.

The three independent surveys reflect difference of opinions about the project performance among the government officials and beneficiaries. Project performance, as perceived by planners (large extent), is found to be marginally more (9 %) than the performance level perceived by implementers (large extent). Project performance, as perceived by farming community (medium extent), is found to be the least among the three actor segments—75 % lower than planners' perception and 61 % lower than implementers' perception.

Interpretation of Validated Frameworks

The validated frameworks (Chap. 4, Fig. 4.3; Chap. 5, Fig. 5.4; Chap. 6, Fig. 6.4) are now interpreted for further improving the performance of AGMARKNET system from the perspectives of planners, implementers and beneficiaries. For each category, first it is attempted to describe the learning based on synthesis of S-A-P analysis and the observed values of significant variables. This is followed by learning-based suggestive actions for improving the project performance (L-A-P). The micro-level validated relationships between independent significant variables and the dependent performance variables (Appendix C) as well as context of the project are kept into view while doing L-A-P synthesis. Finally, elemental-level interpretations, conveying expected benefits are arrived at based on understanding of the context developed through S-A-P analysis and L-A-P synthesis. The actorwise interpretive matrices showing observed values of macro-/micro-level project specific observed performances, significant variables, L-A-P synthesis and elemental-level interpretations are presented in Appendix D (a)–(c).

7.4 Case Study 2: Kisan Call Centre

Public extension has played a major role in increasing production and productivity in agriculture and allied sectors in India. In the past, extension workers were mostly involved in dissemination of technology information. In the changing agricultural scenario, agriculture extension is expected to play a catalytic role in enhancing the competitiveness of farmers at domestic as well international levels. Agriculture is supposed to be knowledge intensive and demand driven, which in turn requires reorientation of extension–farmers linkages. In the recent past, the situation assessment survey of farmers conducted by the NSSO revealed major challenges facing agricultural extension in India with regard to access and quality of information (NSSO 2003: p 7). Though the situation seems to have improved to some extent in terms of dissemination of knowledge (NSSO 2014), the extension system of the state agricultural departments continue to be the weakest link in the chain between agricultural researchers and the farmers. This is particularly so in the context of small and marginal farmers located in remote rural areas. It is increasingly being realized through pilot projects that judicious use of ICT can facilitate revitalization of the agricultural extension system in the country (NAIP 2014). The essential prerequisites for this are development of contents of local relevance and ICT infrastructure to enable access of such contents at the grassroots. Kisan Call Centre (KCC) is an important national initiative in this direction aiming to bridge the gaps in the traditional agricultural extension system in India. The study attempts to go deeper into this ambitious project of DAC.

7.4.1 Brief Description of the Project

The KCC project is an attempt to synthesize the ICT and the agricultural technology to deliver online extension support to farmers by facilitating their direct virtual contact with the agricultural extension personnel and experts. It aims at leveraging ICT for overcoming the constraints of distance and time in providing extension services to the farmers through professionally managed call centres. So far, the KCCs have been set up at 14 locations covering all the States and UTs and queries of farmers are being answered in 22 languages. The application workflow (DAC-TCIL 2005; TCIL 2003, 2007; DAC 2014; http://www.iksl.in/KCC) is outlined in brief as follows:

- The call centre receives the queries of farmers at a toll free number 1551 or 1800-180-1551.
- The Call Centre Agent (Level 1 (L1) support) records the name, address, contact details, query details, etc., and maintains a query–response database.
- In case, the L1 support is not able to answer the query, the information regarding caller's identity and query is conveyed to the designated expert (L2 support) and the caller is referred in a conference call mode to the expert. The response of expert to the caller is simultaneously recorded by the L1.
- In the eventuality of L2 not being able to answer the query, the same is escalated to the concerned organization under DAC (L3) who is expected to arrange the answer and post the same within 48 h to the farmer. The L1 support would then change the call status from pending to closed.
- The call centre operates on 24 × 7 basis from 6:00 AM–10:00 PM. During the non-working hours of L1 support, the queries are recorded in voice mail (Interactive Voice Response System). The answers to recorded queries are sent by post within 48 h. The query–response database is updated at relevant stages and used for generating MIS reports.
- The KCC call escalation process has been restructured twice during April 2011 and October 2014 with an emphasis to involve (i) State Agricultural Department right from Block to State level, (ii) State Agricultural Universities and KVKs, and (iii) Common Service Centres (CSCs). The CSCs are expected to follow a similar process of call escalations (Fig. 7.2). The revised call escalation process is under implementation.

There are several challenges involved in the project due to multiplicity of actors involved and a wide-ranging information needs of farmers. S-A-P analysis of the project is presented in the following section for developing better understanding about the project.

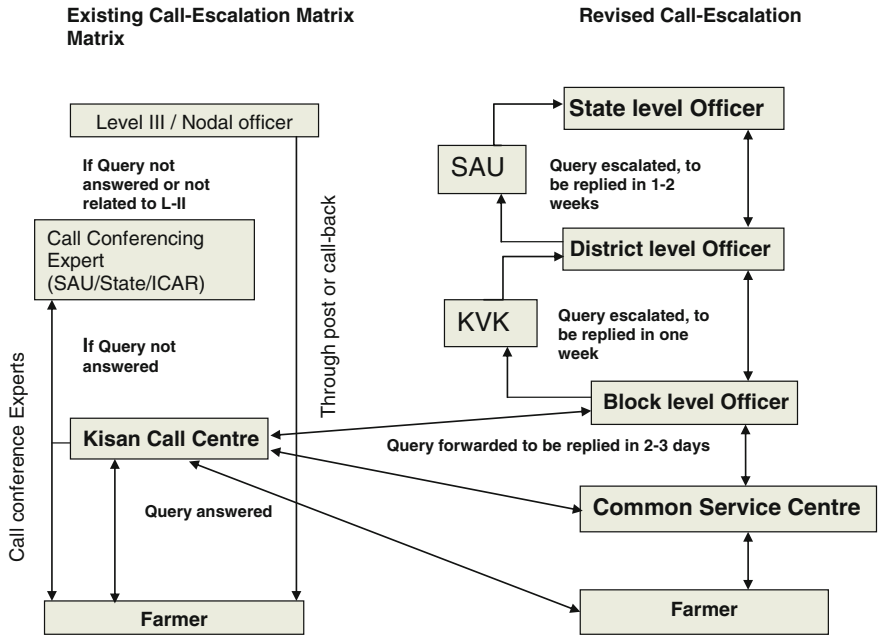

Fig. 7.2 Call escalation matrix of Kisan call centre (*Source* http://agricoop.nic.in)

7.4.2 S-A-P Analysis

A description of situation, actors and process aspects of the Kisan call Centre project is presented below. The project progress is analyzed in chronological sequence till the conclusion of the main study. Key developments in the subsequent period are summarized after the S-A-P analysis.

7.4.2.1 Situation Analysis

The project situation is broadly categorized into four phases: '*Launching of KCC in January, 2004*', '2004–2007: Implementation with Limited Resources', '2007: Evaluation of Project' and '2007–2008: Project Expansion amidst Continued Implementation Hurdles'. Each of the phases is described below which is followed by a summary of key developments and challenges being faced in the subsequent period till 2015.

Launching of KCC in January, 2004

The national-level KCC project was approved on the recommendation of a small team of senior officers of DAC. The team had briefly studied a similar operational system in Hyderabad (Andhra Pradesh now Telangana) and felt the need for a nation-wide replication. Apparently, there was urgency for early launching of the

farmer centric project due to political reasons. To avoid usual delays associated with sanctioning of a new plan scheme, the required budgetary support was extended from an existing plan scheme of DAC—'Strengthening/Promoting Agricultural Information Systems'. The procedural intricacies of open tender system were also avoided by outsourcing the project to a government undertaking—Telecommunications India Limited (TCIL)—on turnkey basis. TCIL selected an operator for setting up twelve call centres to cover the entire country with 21 languages to start with. The activities undertaken to achieve this included routing of about 20,000 telephone exchanges, recruitment of call centre agents, advertising across the country, nomination of nodal agencies and L2 experts for proper functioning of KCC, providing knowledge support/reference material and computer training to the L1 agents and subject matter training by DAC experts to L1 agents. TCIL could accomplish the technology-related tasks within about a month from mid-December 2003 to mid-January 2004 with the support of the hired operator. The time period was, however, not sufficient for addressing non-technological aspects such as capability building and sensitization of implementing units. Despite these apparent gaps, KCC was launched on 21 January 2004 as scheduled.

2004–2007: Implementation with Limited Resources

As per the project plan, the Directorates (L3) were expected to regularly interact with related state government departments as well as local farmers. The Directorates were also required to constantly monitor the performance of call centres and arrange regular training/workshops for the L1 and L2 officials to address the gaps. In practice, it is quite obvious that the L3-level organization would have found it difficult to cope up with the tasks involved without any additional resources.

Realizing the bottlenecks involved in implementation, DAC formed a committee to evaluate the functioning of call centres. The DAC team felt that the scheme has been immensely successful in meeting the needs of farmers (The team had formed its views based on discussion with government officials only.) There were, however, suggestions from the state governments to improve the knowledge base available with call centre agents for handling the farmers' queries in accurate and consistent manner. Need was also felt for taking corrective measures by increasing budgetary allocation for the project. Accordingly, it was attempted to transform the KCC project into a separate centre sector scheme during July 2004. The proposed new centre sector plan scheme emphasized upon the need for strengthening of the ongoing project through effective utilization of the telecommunication roll out in the country. The proposal attempted to justify that the project can provide 'service on demand' facility to the farming community. The proposed modifications in the new scheme include suggestions such as organizing regular training for operators; enhanced budget for call charges and hiring of more call centres; development of a web-based knowledge management system for the use of stakeholders; advertisement campaigns in villages; and setting up a panel of experts to verify the correctness of replies given to farmers. The project had, however, to be continued with limited budgetary resources as part of the ongoing scheme of IT Division due to non-acceptance of the new scheme by the erstwhile Planning Commission.

2007: Evaluation of Project

The department got the KCC project evaluated through Administrative Staff College of India (ASCI) to enable its continuation in the eleventh plan period (2008–2012). Based on a survey of caller farmers in select states, the evaluation revealed that farmers having medium to large size land holdings were more satisfied with the service as compared to small farmers. The major reasons for dissatisfaction were found as impracticality of advice rendered by L1 agents due to their obsolete knowledge, improper assessment of situation without physically accessing the problem area, inability to comprehend local accents and dialects, difficulties in contacting L2 experts and inability of small farmers to access the service. The study has emphasized on increasing the number of call centres and integration with other telecom operators (ASCI 2007). The overall findings of the study helped DAC for justifying expansion of the project during 11th plan period without bringing about any major changes in the implementation framework.

As per another independent investigative analysis conducted during this period, about 85 % callers to KCC were repeat callers indicating limited reach of the service; about 30 % calls received by KCC are from urban areas on matters such as home gardening and pet caring; and KCC suffered 50 % attrition every month due to which project authorities are forced to compromise on eligibility criteria of L1 operators (Jaitly 2007).

2007–2008: Project Expansion amidst Continued Implementation Hurdles

During the period, the project continuation was approved as part of an existing plan scheme of IT Division. It was attempted to expand the scope by incorporating some of the corrective measures suggested in the project evaluation report. The measures reflected in a subsequent request for proposal document floated by the TCIL included setting up a separate KCC for each State/UT; making the service available from 6:00 AM to 10:00 PM throughout the year; enhancing monthly remuneration of the L1 agents; and extending toll free service access through other telecom operators in addition to telecom operators under government, viz. BSNL and MTNL (TCIL 2007). It was learnt from the project officials that implementation of expanded project involved several difficulties. These included setting up call centres at new locations identified by the DAC, technical issues such as configuration of the then existing 1551 toll free number at the exchanges of other telecom operators, ineffective use of the MIS system, etc.

The Situation-Actor-Process interplay in the Kisan Call Centre Project is presented in Fig. 7.3.

7.4.2.2 Summary of Key Developments in the Post-Study Period

- ICAR, State Agricultural Departments and Agricultural Universities are constantly being requested by the DAC to:
  - identify scientists who shall exclusively work in close coordination with the KCC project operators and make themselves available to answer farmers queries on a roster basis

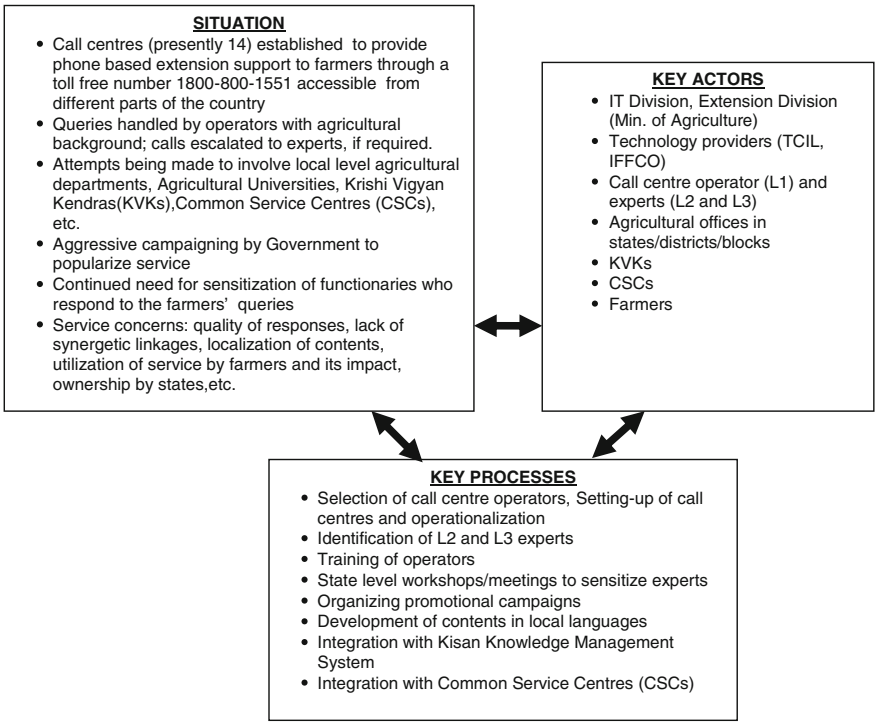

Fig. 7.3 Situation-actor-process interplay in Kisan Call Centre project

  - develop agriculture-related contents in local languages for dissemination in the form of guide books, booklets and voice advisories
  - escalate unresolved queries of farmers to the district/block levels
  - facilitate roll out of KCC through common service centres
  - organize workshops to sensitize agriculture officers at various levels
  - effectively monitor the project in terms of quality of responses given
  - provide state specific farmer related information such as seed varieties, availability of inputs, list of dealers, etc., for Kisan Knowledge Management System (http://dackkms.gov.in) progressively being developed by the DAC
  - integrate state-level KCCs in Madhya Pradesh, Andhra Pradesh and Kerala with the central KCC

- The DAC engaged IFFCO Kisan Sanchar Limited and a revamped service was launched during May 2014 (see Box 7.3).
- A major advertisement campaign was launched through newspapers, television and radio to popularize KCC among farmers.
- A Kisan Knowledge Management System (KKMS) is progressively being enriched to facilitate correct, consistent and quick replies to the queries of

farmers and capture all the details of their calls and responses given, has been developed (http://dackkms.gov.in). The Kisan Call Centre (KCC) Agents working at various KCC locations throughout the country can access specific contents of this system whereas other contents are published for open access.

Though the number of calls received by the KCC has reportedly increased due to such vigorous promotional efforts, the impact of the service also needs to be assessed through independent surveys.

Box 7.3 IFFCO Kisan Sanchar Limited (IKSL) was selected by the Department of Agriculture and Cooperation (DAC), Ministry of Agriculture (MoA), Government of India, to manage the KCC services. The services were relaunched on 1 May 2014 by IKSL. The Call Centre Agents have been redesignated as Farm Tele Advisors (FTAs). The restructured and revamped KCCs are strengthened with the following technological features:

- Voice/Media Gateways (IPPBX-based decentralized system).
- Dedicated MPLS leased line network with dedicated bandwidth.
- Call barging (which allows silent monitoring of live calls); 100 % call recording and call reply.
- SMS to caller farmers providing a gist of advisories given to them on phone.
- Voice mail system for recording farmer's queries during idle time of KCC or during call lines busy, with provision for call back to the caller.
- Soft phones in every personal computer with caller ID facility.
- Playing location specific seasonal advisories when the call lines are busy.
- Facility of video conferencing at each KCC for interaction of KCC agents with the Divisional/Zonal Level Officers of the State Agriculture and allied departments as well as online monitoring of the working of KCCs.

Source: (DAC 2014; http://www.iksl.in/KCC, last accessed on 9.6.15)

7.4.3 Observations from Opinion Surveys and L-A-P Synthesis

It is learnt from the S-A-P analysis that the KCC project authorities have attempted a novel way to leverage ICT for linking extension experts with farmers and making the agricultural extension information reach the remotely located farmers. However, with the present approach, the intended purpose of this important initiative may remain

unfulfilled. An analysis of live calls received by KCC reveals that KCC still has a limited user base, viz. about 12,000–14,000 calls per day (http://dackkms.gov.in, accessed on 10.06.15) which is quite low when compared with free phone calls-based access made available to millions of farmers in the country and its aggressive publicity made by the government. It is observed that DAC has straightaway ventured into outsourcing mode of project execution without first developing relevant internal strength in the conceptualized ICT-based method of service delivery. Such a path of outsourcing IT operations without developing "right sourcing capabilities" has been found unsuccessful even in the context of corporate sector (Shpllberg et al. 2007). The project authorities have preferred to hire a new set-up of ICT infrastructure ignoring the existing ICT resources of DAC and state agricultural departments. Further, there are a large number of actors belonging to different agriculture related institutions whose commitment is essential for realizing the core project purpose. The key government officials involved in implementation are already having different responsibilities as per respective mandates of their organizations/divisions. It is, therefore, vital for the project that the implementation framework appropriately supports the strategy conceived by planners.

The sample observed values in respect of respondents belonging to KCC project are now discussed as per the contexts of planners, implementers and beneficiaries. The survey of planners (Appendix B (a)) reveals that though the affected societal sectors, objectives, activities and agencies have been addressed from large to very large extent in the plan, the coverage of present and future requirements of beneficiaries, constraints, alterables and defining of performance measures has been of medium extent. Such gaps are on expected lines as the project seem to have been launched in a hurry in outsourcing mode, as discussed in S-A-P analysis.

The possibility of modifying the project plan during the course of implementation was observed to be towards small extent. As per the observed data, the involvement of extension workers and Krishi Vigyan Kendras (Agriculture Science Centres) has been of small extent during project planning, strategy formulation and strategy implementation. Thus, the strength of traditional agricultural extension set-up, based on physical contacts and knowledge base of existing extension scientists/field workers, appear to have been ignored as per observed data. The seniors have played a dominant role in deciding about project mission (near very large extent). The operational staff and other stakeholders were involved from small to medium extents while deciding the mission. Provision for obtaining feedback from internal actors is found to be of a medium extent. Such a provision in respect of beneficiaries is observed to be of small extent. Planners are able to maintain contact with implementers to a large extent and with beneficiaries to a medium extent. The flexibility in processes of preparation of project plan, content delivery and management of change are observed to be close to small extent range. The flexibility of processes of capacity building and content development are observed to be of medium extent.

The survey of implementers (Appendix B (b)) reflect that field units have limited manpower and budgetary resources (negligible to small extents) for project implementation, performance-based incentives are close to small extent.

Implementers feel that their involvement in planning was to a medium extent and coherence among planners and implementers is observed to be of small extent. Ability of implementers to maintain contact with beneficiaries is found to be close to small extent. Implementers are reporting feedback to seniors to a large extent and the same is being addressed to a medium extent (close to small extent range). The observed values discussed here reflect lack of project ownership by implementing offices of DAC.

The survey of beneficiaries (farmers) (Appendix B (c)) reflected that they were able to access and make use of the application to a medium extent. They provided feedback to project authorities to a small extent and according to them, the authorities took action on such feedback to a small extent.

The three independent surveys reflected difference of opinions about the project performance among the planners, implementers and beneficiaries (farmers) though this difference was found to be marginal between implementers and beneficiaries. Project performance as perceived by implementers (medium extent) was found to be marginally more (9 %) than the performance level perceived by farmers (medium extent). Project performance as perceived by planners (large extent) was found to be 25 % more than performance perceived by implementers. In numerical terms, it was observed that:

Performance (Planners) > Performance (Implementers) > Performance (Beneficiaries).

Interpretation of Validated Frameworks

The validated frameworks (Chap. 4, Fig. 4.3; Chap. 5, Fig. 5.4; Chap. 6, Fig. 6.4) are now interpreted for further improving the performance of KCC system from the perspectives of planners, implementers and beneficiaries. The interpretation of validated relationships is done keeping in view the project specific observed values of performance variables (Appendix D (d)–(f)) and influencing significant variables, micro-level validated relationships (Appendix C) and S-A-P analysis as explained in Sect. 7.4.2. The interpretive matrices are presented in Appendix D (d)–(f).

7.5 Case Study 3: DACNET

The central Department of Agriculture and Cooperation (DAC) has 27 subject divisions, 5 attached offices and 22 subordinate offices with several field offices located across the country. These offices are engaged in agriculture development-related coordination with state-level agencies and implementation of central sector schemes. DACNET project was conceived to introduce e-governance in the widespread offices (categorized as 40 Directorates and 132 field offices as per DACNET project) of the DAC. The G to E initiative was taken following the instructions issued to various departments by the erstwhile Planning Commission and the Department of Administrative Reforms and Public Grievances during 1998 for developing in-house e-governance capabilities in terms of ICT infrastructure and applications. Prior to DACNET, most of the computerization activities in DAC

were limited to only few of its central divisions (such as Agriculture Census Division, Plant Protection Division, Finance, Directorate of Marketing and Inspection, Directorate of Economics and Statistics). In general, the information exchange between headquarters and Directorates/Field units was mostly through conventional means, i.e. post, fax and phone. The project was awarded a bronze medal under the 'Manthan Award 2005'.

7.5.1 Brief Description of the Project

DACNET project of DAC aimed at establishing Intranet for messaging, collaboration and implementing e-governance applications by establishing ICT infrastructure and implementing application software systems in the 172 offices of DAC. The key issues which were expected to be addressed by the project included qualitative enhancement in the work culture by introducing better transparency and workflow automation, streamlining the existing methods and practices, faster and reliable information dissemination and exchange across the Ministry and their directorates and field unit, greater integration and use of data and optimum utilization of available resources including office stationary (NIC 2003b; NIC 2005, pp. 19–20).

The project deliverables included (NIC 2003a):

- Networking of Directorates and field units for Internet and Intranet access;
- Establishment of a LAN with a Server and 5 PCs in each Directorate and a PC client system with modem in each field office;
- IT empowerment of employees through training programmes; and
- Strengthening e-governance applications in Directorates and field units.

Under the project, websites have been developed for all the Directorates. These are accessible through DACNET portal (http://dacnet.nic.in). An Intranet application 'INTRADAC' was developed to facilitate content development and sharing among field offices and headquarters. The project also involved development of Directorate specific applications to strengthen e-governance. Some of these applications relate to weekly weather watch, crop prospects, plant quarantine, farm machinery, etc. The nation-wide ICT infrastructure established under the project for the DAC includes centrally located high end servers connected to NICNET for enabling round the clock web-based access to hosted applications. The directorates and field offices were connected to Internet either through NICNET (Network of Government of India) or through any local Internet service provider (ISP).

The Intranet for DACNET, which is the core of the project, was based on Microsoft Share Point Portal Server, Exchange Server, SQL Server and Business Application Server. A series of training programmes were conducted under the project to equip the officials of DAC to make effective use of the facilities provided.

7.5.2 S-A-P Analysis

An analysis of situation, actors and processes of DACNET project is presented below. The progress is analyzed in chronological sequence till the conclusion of the main study. Key developments in the subsequent period are summarized after the S-A-P analysis.

7.5.2.1 Situation Analysis

The situation is broadly categorized into: '2000–2001: Genesis of DACNET', 'May, 2002–December, 2002: Capability Building Programmes', 'January, 2002–April, 2004: Procurement, Delivery and Installation of Systems', 'January, 2003–December, 2004: Requirement Analysis and Application Development, '2004–2005: Project Completion as Perceived by DAC Offices' and October 2006 to December 2006: Evaluation of DACNET.

2000–2001: Genesis of DACNET

NIC proposed an IT plan to the Department of Agriculture and Cooperation during January 2000 for launching a Centrally Sponsored Scheme "NICNET based Agricultural Informatics and Communication (AGRISNET)" in the country. The proposal was to network DAC and its attached offices/field units and several state government agricultural offices up to the block level. The plan was subsequently transformed by DAC into a scheme—"Strengthening/Promoting Agricultural Information Systems". DACNET project was approved during 2001 as part of this scheme to network subordinate and attached offices of DAC. The execution responsibility was entrusted to NIC.

May 2002–December 2002: Capability Building Programmes

NIC organized a series of training programmes across the country during the period May 2002–December 2002. The training component was outsourced to Electronics Research & Development Centre of India (ER&DCI) and Regional Computer Centres (RCCs). The training, which comprised of four modules (office productivity tools, database design and analysis, decision support systems, and geographic information system) each of 5 days' duration, was conducted well in advance before installation of systems. The stated intention was to raise the capability level of officials to contribute in system analysis, design and development process besides enabling them to operate and maintain computers.

January 2002–April 2004: Procurement, Delivery and Installation of Systems

NIC followed an open tender system as per government procedures for procuring the hardware and software items. The tendering process took considerable time (about 12 months) due to a variety of items to be procured and complex tendering procedures. Considerable coordinated efforts were involved in system delivery and integration at locations spread throughout the country. The entire hardware and system software integration took about 28 months against the projected 18 months. Bottlenecks faced included non-readiness of certain sites and dependence on multiple vendors.

January 2003–December 2004: Requirement Analysis and Application Development

NIC organized an internal workshop with its state-level project coordinators during March 2003 to discuss the implementation approach. Subsequent to the workshop, preliminary requirement analysis was conducted by NIC for all the offices and priority applications were identified for development. It was decided that besides developing directorate specific applications, a few already developed general packages (computerized dairy register, payroll and accounting, inventory management, personnel information management, telephone billing, etc.) will be customized for all the offices.

The overall architecture envisaged developing an Intranet for DAC and its Directorate and field units (172). The contents of the Intranet were expected to be regularly enriched through the directorate specific applications to achieve effective coordination among all DAC offices for better planning and decision support (NIC 2003a).

2004–2005: Project Completion as perceived by DAC Offices

Project completion certificates submitted by some of the offices are accessible at http://dacnet.nic.in/certificates.asp. A review of these reflect that most of the offices have perceived deliverables under the project as establishment of ICT facilities, implementation of generic applications like payroll and diary register, and development of websites. Only a few Directorates like Oilseeds, Wheat, Marketing and Inspection have mentioned about applications developed specific to the Directorates. No such report could be seen which mentioned about development of application interfaces with the 'INTRADAC'—the DACNET Intranet portal. This could be due to inappropriate understanding of the intended purpose of the project by the Directorates and Field units.

October 2006–December 2006: Evaluation of DACNET

Following the advice of the Expenditure Finance Committee, the IT division of DAC got the project evaluated through IIM Calcutta (IIM 2007). The study was conducted with a limited scope to serve the evaluation objectives set by DAC. As such, it has not been attempted by the consultants to analyze project performance in terms of generally intended outcomes of e-governance or to identify significant strategic variables influencing the performance. The study, however, serves the purpose of investigating gaps between intended and realized project deliverables.

7.5.2.2 Key Actors and their Responsibilities

The roles of key actors involved in the DACNET project are outlined in brief as follows:

IT Division

The IT Division of DAC is responsible for IT enablement of various activities of the DAC in coordination with other subject divisions and their field offices. The Division takes external support from organizations such as NIC in handling IT-related matters due to lack of in-house IT capabilities in the DAC. The division also interacts

with state agriculture departments, Department of Electronics and Information Technology and other suitable agencies for promoting e-governance in agriculture.

Subject Divisions

Each functional division of DAC deals with specific agriculture related subjects such as seeds, plant protection, marketing, extension, agriculture census, trade, etc. These divisions are responsible for formulating central-level agricultural development schemes and their implementation across the country in coordination with state agricultural departments. Each subject division nominated a nodal officer to interact with respective field units of the DAC, IT Division and NIC for coordinating DACNET project.

Project Nodal Officers of DAC

The nodal officers of DAC possess agricultural domain knowledge in respective areas. Most of them do not possess any experience in dealing with IT related issues.

Directorates and Field Offices

The directorates and field offices of DAC are spread all over the country. These offices support the subject divisions of DAC in the implementation of schemes and other activities of national concern, e.g. plant quarantine related matters.

Employees of DAC Directorates/Field Offices

Most of the employees in DAC offices covered under DACNET project had no prior experience of working on computers. The project aimed at empowering them with ICT tools for better execution of organizational activities. Employees are expected to assist in preparation of SRS, development of applications and enrichment of Intranet of DAC (INTRADAC).

National Informatics Centre

The Agriculture Informatics Division at NIC headquarters conceptualized, designed and implemented the DACNET project. The central DACNET team was responsible for coordinating with NIC State units for project activities.

NIC State Units/District Units

An officer at NIC State unit was designated as State DACNET Coordinator. The officer was entrusted with the responsibility of coordinating with State-level DAC offices and NIC district units for requirement analysis, design, development and implementation of the project at DAC state-/district-level offices.

Vendors

Both hardware and software vendors selected by NIC played an important role in this project due to the thrust given on establishing ICT infrastructure.

Regional Computer Centres (RCCs) and Electronic Research & Development Centre of India (ER&DCI)

The training component of the project was outsourced by NIC to these organizations who designed the course material in consultation with central project team of NIC.

Table 7.4 Actor-Process Linkages in the DACNET

S. No.	Process	Actors	Remarks
1	Formulation and approval of project proposal	NIC, DAC	Emphasis primarily on establishing ICT infrastructure at DAC directorates/field offices to usher in e-governance
2	Finalization of overall framework, hardware and software technology component and selection of vendors	NIC, vendors	Based on deliberations involving vendors and NIC central team
3	Capability building	ER&DCI, RCCs, Employees, NIC Centre/State coordinators	One time training. In general, uniform modules designed for all the offices
4	Hardware and system software integration (directorates/field offices)	Vendors, NIC national/state coordinators	Sophisticated ICT infrastructure established based on collaborative technology framework of Microsoft (Share Point Portal)
5	Hardware and system software integration (central coordinating unit)	Vendors, NIC national coordinator	
6	Requirement analysis, design, development of applications/website for directorates/field offices	NIC state coordinator, respective DAC offices	Requirement studies conducted independently for different offices. Automation of internal workflows/integrated SRS based on redesigning of internal and cross-agency workflows not covered at this stage
7	Requirement analysis, design and development of applications/website (synthesis for entire DAC)	NIC national coordinator	Applications developed for few offices. Gaps remained with respect to non-completion of an integrated SRS and ineffective use of collaborative tools for developing workflow-based common repositories
8	Content development and management	Development by DAC central-/state-level nodal officers, management by NIC national/state coordinators	Constant updating of contents supposed to be the responsibility of respective DAC offices. In practice, the officers relied on NIC support due to lack of required skills
9	Content dissemination		Through INTRADAC and DACNET sites maintained by NIC central coordinating unit

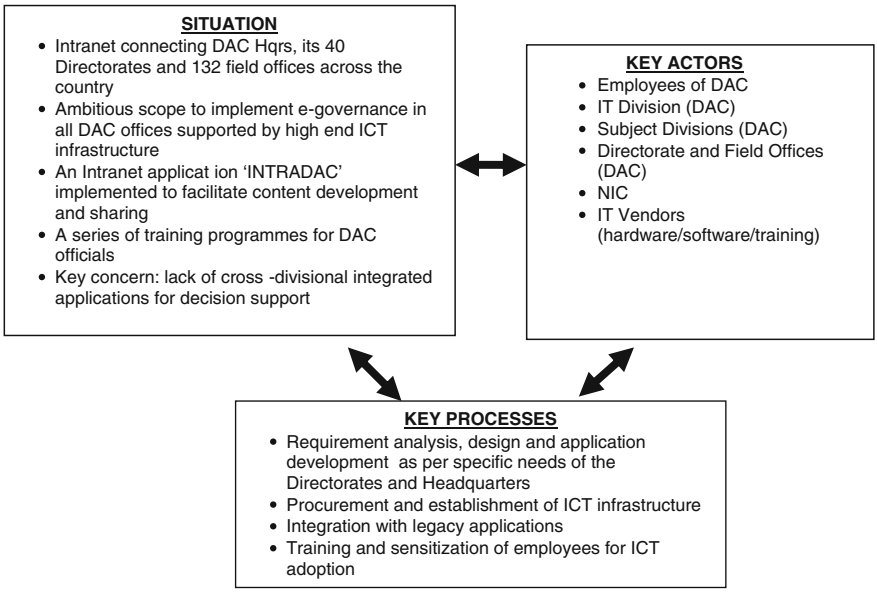

Fig. 7.4 Situation-actor-process interplay in DACNET project

7.5.2.3 Actor-Process Linkages

The key processes and associated actors in the DACNET project are identified based on study of project documents and discussion with project officials. The linkages are synthesized and presented in Table 7.4.

The Situation-Actor-Process interplay in the DACNET Project is presented in Fig. 7.4.

7.5.2.4 Summary of Key Developments in the Post-Study Period

The project has served the purpose of bringing e-culture in the DAC Directorates and field units. Many websites and applications specific to the Directorates have been developed under the project. However, effective utilization of the DACNET infrastructure to develop collaborative applications across the Directorates could not be achieved during the life cycle of the project. The websites and applications developed under the project have now been migrated to upgraded infrastructure for the purpose of achieving a unified portal service.

7.5.3 *Observations from Opinion Surveys and L-A-P Synthesis*

The sample observed values in respect of respondents belonging to DACNET project are discussed here. An analysis of responses received from planners and implementers (Appendix B (a) and (b)) as part of the empirical study reflect that these officials had smooth access to computers and Internet and were extensively using these facilities (Reported access levels are of very large and large extents in respect of planners and implementers, respectively). DACNET project thus appears to have adequately equipped various offices of the DAC with ICT infrastructure. The surveyed officials, however, felt that the project has not adequately helped in the improvement of their routine office work (planners: medium extent; implementers: small extent). It is observed that contrary to the aspiration, the collaborative application tool INTRADAC could not be used effectively. The familiarity of implementers with features of this application was found to be of medium extent and their ability to make use of these features was found to be of small extent. Only 25 % of the implementers felt that they could prepare contents for sharing through INTRADAC and just 6 % respondents possessed the required skills to upload the contents on the collaborative platform.

Coverage of programme planning elements in the project plan was found to be of medium extent. SWOT like analysis was conducted to a small extent. Adequate emphasis on expected constraints, alterables and performance metrics (small extents of observed values) would have facilitated adoption of a more practical approach for utilizing the ICT infrastructure for meeting directorate specific needs as well as synergetic information flows among DAC offices through INTRADAC. The project mission was decided by senior officers (very large extent) whereas the involvement of operational staff in this aspect is found to be of small extent. The planners were found to be cognizant about the changing requirements and expectations from the project. However, the approach of computerizing office activities without any process re-engineering (negligible extent) or changes in roles and responsibilities (small extent), lack of mechanisms for obtaining feedback (small extent) and taking actions on feedback (small extent) prevented effective deployment of collaborative ICT tools and realization of intended benefits. Flexibility in processes of preparation of project plan, capacity building, content development, content delivery and management of change was observed to be ranging from negligible to medium extent. Change mechanisms in the processes are found to be of small extent which is reflected in continued persistence with paper-based correspondence among offices despite the availability of a platform to facilitate digital workflows.

It is further observed that coherence among planners and implementers, and involvement of key stakeholders during project implementation were both of medium extents. This is indicative of gaps in planning and implementation, and inadequate contribution of stakeholders during implementation. Implementers were able to use the project service to a medium extent and their project related inputs were addressed to a medium extent. Overall project performance was perceived to

be of medium extent by planners and large extent (close to medium) by implementers, respectively. The observed values of their opinion about project success were also of similar extents with marginal variation. The relationship observed is Performance (Implementers) > Performance (Planners). These values are reflection on different expectations from the project by planners and implementers.

Interpretation of Validated Frameworks

Interpretation of validated frameworks (Chap. 4, Fig. 4.3; Chap. 5, Fig. 5.4, Chap. 6, Fig. 6.4) is now done from the perspectives of planners and implementers (here beneficiaries as well). As in the previous cases, the interpretation is done keeping in view the project specific observed values of performance variables (Appendix D (g) and (h)) and influencing significant variables, micro-level validated relationships (Appendix C) and S-A-P analysis of the project. The interpretive matrices are presented in Appendix D (g) and (h).

7.6 Concluding Remarks

The three projects discussed in this chapter have leveraged ICT in novel ways and also exemplify its networking potential. Each of the projects has been analyzed using S-A-P framework. The learning issues from qualitative analysis coupled with interpretation of empirically validated frameworks have led to elemental-level interpretations explaining the links between identified strategic variables and performance. The next chapter performs SAP-LAP analysis of 3 G to B projects, viz. Grapenet, Computerized Registration of Pesticides and Integrated Fertilizers Management Information System.

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Chapter 8
Case Studies of Agriculture Related G to B Projects

8.1 Introduction

The chapter presents case studies of three G to B e-governance projects. The first case study discusses the Grapenet system of Agricultural and Processed Food Products Export Development Authority (APEDA) which helped the organization in successfully meeting the challenge of a likely ban by the European Union (EU) on import of grapes from India. APEDA has focused on building synergetic relationships among actors involved in the supply chain of grapes before applying ICT. Grapenet exemplifies power of ICT in bringing out a single window service for the beneficiaries by integrating capabilities of different agencies. The second case study analyses the Computerized Registration of Pesticides (CROP) system of Central Insecticides Board and Registration Committee. The organization first re-engineered the processes involved in registration of pesticides by amending a legal act. Both the cases illustrate the significance of streamlining government procedures before applying ICT. The third case study looks into an Integrated Fertilizers Management Information System (IFMIS) aspired by the Department of Fertilizers (DoF) since 1993. The intended deliverables are yet to be realized despite the ICT infrastructural capabilities and applications developed for the purpose. The DoF is following an approach of IT-Plans based budgeting for the project for quite a long period. An attempt is, therefore, made here to analyse these successive plans and identify gaps in planned deliverables and their actual realization. It is further attempted to look deeper into one of the actor-process linkages and bring out a suggestive criteria for prioritizing applications when an e-governance project involves multiple actors as in the case of IFMIS. The methodology used for these case studies is the same as indicated in Chap. 7 (Sect. 7.2).

P.K. Suri and Sushil, *Strategic Planning and Implementation of E-Governance*,
Flexible Systems Management, DOI 10.1007/978-981-10-2176-3_8

8.2 Case Study 4: Grapenet

India is the second largest producer of fruits and vegetables in the world. However, its share in the world market is negligible. With the advent of the World Trade Organization, and signing of Agreement on Sanitary and Phytosanitary (SPS) Measures, various member countries have put in place the SPS Measures to protect human, animal and plant health from risks arising from disease causing organisms. SPS Measures impose limitations in the form of Maximum Residue Limits (MRLs) for different pesticides used in various agricultural commodities. These measures also apply to fruits and vegetables. The SPS Measures are deterrent in export of fresh fruits and vegetables to the EU countries. The limits prescribed by the EU countries are often stricter than the generally acceptable international standards as prescribed by the Codex Alimentarius Commission. In the context of developing countries, such as India, besides SPS requirements there are additional complexities in the form of fragmented and inefficient pre- and post-harvest supply chains due to weak infrastructure (World Bank 2007, pp. 21–31; DAC 2007a, p. 37; DAC 2013, pp. 1–7). In particular, there are multiple stakeholders belonging to government and private sectors which are involved in the export of agricultural produce. It is important that these stakeholders operate in a coherent and synergetic manner to remain competitive in the global market. This case study discusses the successful meeting of the challenge posed by EU countries in the form of a likely ban on import of grapes from India for want of a proper system to monitor and control pesticides residues in grapes. APEDA—an organization under Ministry of Commerce in India—took the responsibility of establishing the desired system in the limited timeframe enforced by the EU. The following sections first briefly describe the workflow of the ICT-based Grapenet system, which got evolved during the process which is followed by a SAP-LAP analysis of the system.

8.2.1 Brief Description of the Project

Grapenet is a web-based software system for facilitating export of fresh grapes from India to European Union. It is first of its kind initiative in India that has put in place an end-to-end system for monitoring residues of pesticides, achieve product standardization and facilitate tracing back from retail shelves to the farm. It is achieved through various stages, viz. registration of farms, sampling, testing, certification and packing. The software system integrates all the stakeholders in the supply chain of grapes export. Before implementation of Grapenet, the exporter had to interact with individual agencies independently to ensure compliance with the regulatory procedures. Information flow among participating agencies was also manual and hence error prone besides time consuming. The administrative delays also had adverse affect on the quality of the grapes to be exported. Grapenet was implemented after the regulatory, compliance and monitoring procedures were put in place. The

modules facilitating workflow in the web-based Grapenet system include—Registration of grape farms, Residue analysis and monitoring, Consignment creation, Certificate of AGMARK grading and Phytosanitary certification (http://apeda.gov.in/apedawebsite/Grapenet/Hortinet.htm, last accessed on 10.7.15).

The Grapenet system was awarded National E-Governance Gold Icon award for 2007–2008 by the Department of Administrative Reforms and Public Grievances.

8.2.2 S-A-P Analysis

The situation, actors and process aspects of the Grapenet system are analysed below in chronological sequence till the conclusion of the main study. Key development in the subsequent period is summarized after the S-A-P analysis.

8.2.2.1 Situation Analysis

The project situation is broadly categorized into four phases: "Pre-grapenet Period: Casual approach for Exporting Grapes", "May, 2003—The Damaging Event that laid the foundation of Grapenet", "2003—Regulatory System for Export of Fresh Grapes" and "2004 onwards: Evolution of Grapenet System". Each of the phases is described below.

Pre-grapenet Period: Casual Approach for Exporting Grapes

Testing of export oriented grapes was made mandatory in India in the year 2000 when stringent procedures were laid down in EU for the registration of agro-chemicals and monitoring of the presence of pesticides residues in food. However, despite incompatibility of standards, the EU continued trade with India as pesticide residue problem was found to be common with grapes imported from other countries also (World Bank 2007, pp. 61–65). The occasional cautioning signals from EU seem to have been taken casually by India and there was no serious attempt to address the issue of pesticides residues in grapes. The ICT intervention at this stage was limited to a web-based system developed by APEDA which facilitated submission of sample details by approved laboratories and settlement of their subsidy claims.

May 2003—The Damaging Event that Laid the Foundation of Grapenet

A Dutch importer got the imported grapes tested in a local private lab following a commercial dispute with an Indian exporter. The importer issued an advertisement reporting violation of EU norms. The Dutch authorities found that majority of the 28 containers of Indian grapes violated permissible residual norms for methomyl insecticide. A follow-up alert on EU Rapid Alert System damaged the reputation of Indian agricultural export industry and caused much embarrassment to Indian Government (World Bank 2007, pp. 61–65). To avoid recurrence of such damaging events, APEDA had to vigorously pursue for establishing a comprehensive residue monitoring system in the country for export oriented grapes.

2003—Regulatory System for Export of Fresh Grapes

There are multiple stakeholders involved in the supply chain of grapes export, which include both central and state government organizations besides the private sector. For ensuring a coordinated effort from these separate entities, APEDA felt it necessary to understand the underlying issues in detail before attempting a common interactive platform for all concerned. A series of intensive discussion meetings were held with stakeholders to devise a regulatory system. It emerged that the grape export from India to the EU suffered from limitations such as inappropriate farm registration system, improper sampling system for conducting analysis, no surveillance system in the pre- and post-harvest phases, lack of awareness about quality and safety-related aspects among stakeholders, rapid changes in Maximum Residue Limits (MRL) values by the EU, infrastructural constraints like limited testing capabilities of laboratories, ad hoc laboratory analysis procedures, fragmented supply chains due to lack of synergetic linkages among government and private sector organizations and complex procedures leading to multiple visits of exporters to different government offices.

To overcome these, APEDA devised a regulatory system which clearly spelt out the standard procedures to be followed by all the involved actors. APEDA trained the stakeholders to fulfil the requirements of regulation, co-opted various monitoring agencies in the government and private sector and generated the necessary documentation trail for the importers. The new regulatory system called "Regulation of Export of Fresh Grapes from India through Monitoring of Pesticides Residues" [popularly termed as Residues Monitoring Plan (RMP)] was devised for implementation in the following season, i.e. during 2003–2004 season. APEDA kept fine tuning the system by streamlining procedures based on practical learning and feedback from stakeholders during the implementation process. The amendments in RMP procedures documents are published on APEDA website from time to time and serve as guiding framework for different stakeholders. Broadly, the procedures are summarized as: registration of farms with the District Agriculture/Horticulture Offices (DAO), farm inspections by agriculture/horticulture field officers, inspection and registration of all grape export packing houses by APEDA, pre-harvest pesticide residue testing from each registered farm, AGMARK quality certification for each consignment after ensuring conformity with standards prescribed in Fruits and Vegetables Grading and Marking Rules—2004, Phyto Sanitary Certification (PSC) for each consignment and retest for pesticides residues in the ex-packhouse grape consignments by the National Research Centre Grapes (APEDA 2005, 2006, 2007, 2014).

2004 Onwards: Evolution of Grapenet System

Compliance of the RMP document involved interaction among several actors besides exchange of several documents at various levels. Particularly, the exporters had to interact with individual agencies independently to ensure compliance with the regulatory procedures. The IT enablement of regulation, compliance and monitoring components of RMP was thus attempted to eliminate inefficiencies of the manual system. Grapenet was evolved in an iterative fashion over a period of

time. The evolution of Grapenet, in terms of increasing order of functionalities, is presented in Appendix E. The analysis is based on study of successive RMP documents, and discussion with the IT team leader and project officials.

8.2.2.2 Actor—Process Linkages

The key processes, associated actors and the gradual changes which led to implementation of Grapenet are compiled and presented in Table 8.1.

The Situation-Actor-Process interplay in the Grapenet Project is presented in Fig. 8.1.

8.2.2.3 Value Accrued from Grapenet

Grapenet is based on integrated capabilities of related departments of central and state governments, and private sector entities. The system appears to have generated value for all the involved actors as summarized in Table 8.2.

With the successful implementation of Grapnet, APEDA has been attempting to extend the concept to more commodities such as pomegranate, mango and okara. The system which is under implementation with enhanced scope in terms of additional fruits and vegetables is given the name 'Hortinet'.

8.2.3 Observations from Opinion Surveys and L-A-P Synthesis

S-A-P analysis of Grapenet project reveals the importance of streamlining procedures and adopting a collaborative approach for implementing e-governance projects involving multiple organizations. APEDA has banked upon the domain-specific knowledge of related central and state government departments as well as private sector to integrate the fragmented supply chain of export oriented grapes. In the corporate sector, ICT has emerged as an inseparable part of supply chain management. However, building such linkages in government system requires persistent deliberations with partnering agencies as exemplified by APEDA. Iterative scope enhancement, based on learning from previous iterations, has emerged as a better approach for implementing e-governance projects. APEDA has let the scope of Grapenet grow incrementally based on emerging functional requirements for improving the processes involved in export of grapes.

The sample observed values in respect of respondents belonging to Grapenet project are discussed here as per the contexts of planners, implementers and beneficiaries. The survey of planners (Appendix B (a)) has revealed that the present and future requirements of beneficiaries, objectives, activities, expected constraints, performance measures and agencies involved have been adequately addressed during

Table 8.1 IT enablement of key processes in Grapenet

Process	Actor(s)	Workflow (Pre-grapenet)	Incremental changes
Farm/plot registration	SHDs/Farmers	Independent manual subsystems in States	Uniform coding scheme introduced in the centralized system which facilitated an integrated registration system across states
Farm/plot inspection and recommendation for sampling	SHDs, Labs	Inspection carried out by SHD at the time of registration and during crop cycle. Suitable farms/plots recommended for sample collection by labs	Number of mandatory inspections for a farm/plot reduced to two. Additional inspection to be made only in the event of heavy pest/disease outbreak. A web based interface provided to SHDs to report only essential inputs for the use of labs
Pesticides residue testing	Labs, NRL, DMI, PSC, Exporters APEDA	NRL gives recommendations on use of pesticides. Grapes are analysed by accredited labs and evaluated as per the norms fixed by EU countries. Failed samples retested by NRL before issuing internal alerts to all stakeholders. This involved exchange of bulky documents. Further, labs used to maintain test results locally as well as on the APEDA database which caused duplicate efforts	The transactions among actors have been progressively automated. Labs now use only Grapenet to record test results and maintain backup locally
Settlement of subsidy claims	Labs, APEDA	Submission of voluminous physical documents	Web based submission of test reports
Issuing certificate of AGMARK grading	DMI, Labs, Pack houses, Exporters	Labs used to provide residue analysis reports to DMI DMI field offices used to conduct consignment inspection at pack houses and submit reports for issue of CAG Exporter used to apply to DMI for CAG in prescribed forms along with test report, consignment inspection report and grading charges	First, labs were authorized to conduct consignment inspection at pack houses. Subsequently, labs were authorized to issue CAG. Grading charges are now collected by labs on behalf of DMI. DMI's role redefined as supervisory

(continued)

Table 8.1 (continued)

Process	Actor(s)	Workflow (Pre-grapenet)	Incremental changes
Issuing of PSCs	PSC Authority, DMI, Labs	Labs provide residue analysis reports to respective PSC authorities. DMI field offices provide consignment inspection report and CAG copy to PSC authorities Exporter applies to PSC authority for PSC certificate in prescribed forms along with test report, consignment inspection report, CAG and required charges	Procedure still continued with the exception that required inputs are accessible online to PSC authorities. They are, however, reluctant to the suggestion of authorizing labs for issuing PSCs
Application Status Tracking	All actors	Through inspection of physical records	All actors are given roll based access to the web site

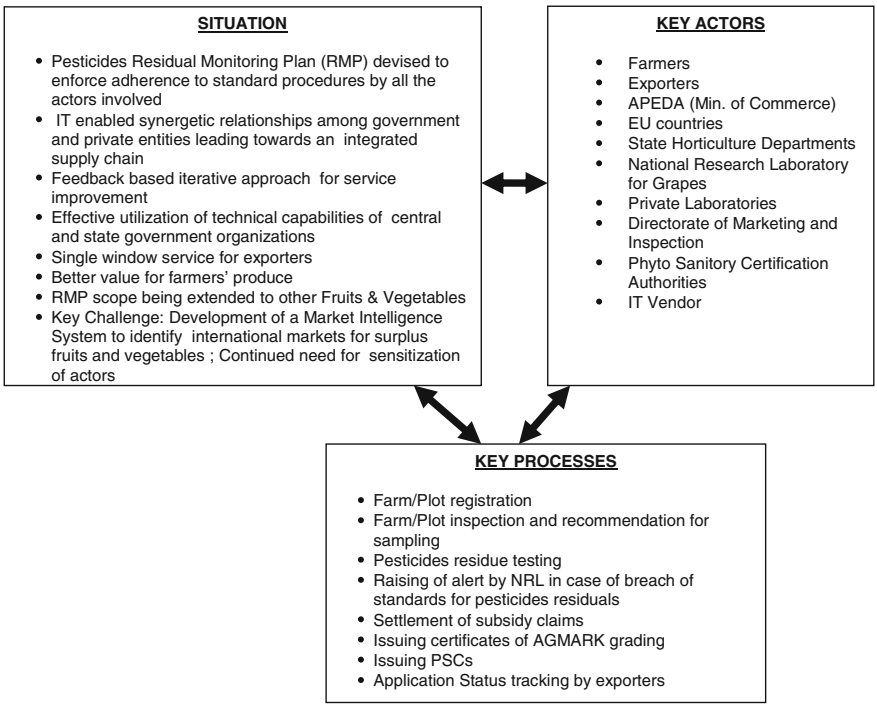

Fig. 8.1 Situation-actor-process interplay in Grapenet project

Table 8.2 Apparent benefits to key actors in Grapenet system

Actor	Specific benefits
APEDA	Emerged as an active organization of Government of India which has set an example for other developing countries for ensuring traceability up to farm level. In the process, it has demonstrated the potential of ICT as a glueing tool for building synergetic relationships among different entities
SHDs	Better service delivery through improved interface with exporters/farmers
NRL	Recognition at national and international level as it emerged as the nodal agency in India which could effectively monitor proficiency of private labs in handling the critical issue of maintaining MRLs of pesticides in exportable grapes
Labs	Enhanced credibility at international level with the trust shown over them to carry out government functions of sensitive nature, e.g. issuing of CAG
DMI	Utilization of technical capability of the organization. With the acceptability of DMI's quality certification for the grapes, the EU is demanding compulsory certification for all the fruits and vegetables imported from India
PSC Authorities	Effective implementation of quarantine procedures in export of grapes as well as other fruits and vegetables
Exporters	Improved business value. IT enabled single window access to government service
Farmers	Gradually getting sensitized about challenges of globalization. Expectedly getting better value for exportable grapes
Logicstat	Enhanced credibility in executing complex e-governance projects

project planning (large to very large extent). APEDA has stressed upon thorough study of internal and external environment (large extent) through structured deliberations with exporters, laboratories, Phytosanitary and AGMARK certification-related government organizations (large extent). There was adequate clarity about benefits accruing to different stakeholders and measures for assessing the same (very large extent). The residue monitoring plan is modifiable (very large extent) based on inputs from field during its implementation. Roles and responsibilities of actors have been redefined to a large extent and processes have been re-engineered to a very large extent. The survey results reveal that involvement of operational staff and stakeholders in deciding about project mission was of medium extent. The involvement of seniors on this aspect is observed to be of very large extent. This may be due to the fact that Grapenet has been enforced by central government with APEDA as regulating authority. The mechanisms for feedback from beneficiaries and other actors are observed to be adequate (large to very large extent). It is observed that the planners are adequately aware about the changing needs of beneficiaries (very large extent) and take actions for improving the service to a very large extent. The planners are also able to maintain contact with beneficiaries and implementing units to a large extent. The processes of preparation of project plan, capacity building, content development, content delivery and management of change are observed to be flexible to a large extent as revealed from the survey.

The survey of implementers (Appendix B (b)) reflects that field units have limited resources (small to medium extent) for project implementation,

performance-based incentives are of small extent. Implementers feel that their involvement in planning was to a medium extent and coherence among planners and implementers is observed to be of medium extent. Ability of implementers to maintain contact with beneficiaries and reporting of feedback by them to seniors are found to be of medium extents. These values, ranging from small to medium extent, are indicative of the scope for improvement in project ownership by implementers. While interpreting these observed values, it also needs to be kept in view that the implementation of RMP has made the operational agencies more accountable and transparent and as such they may be reluctantly involved in project execution.

The survey of beneficiaries (exporters) (Appendix B (c)) reflects that they are able to access and make use of the application features to a large extent. They provide feedback to project authorities to a medium extent and according to them, the authorities take action on their feedback to a medium extent.

The three independent surveys reflect that the three actor segments perceive the Grapenet system to be performing at large extent or above. These groups, however, slightly differ in their perceptions in terms of efficiency, transparency, interactivity and decision support though the differences among implementers and beneficiaries are marginal. Among planners and implementers, differences are with respect to all the four aspects with the former expressing better performance. Similar pattern is observed while comparing average values pertaining to planners and beneficiaries. Comparing overall performance averages in numerical terms, it is observed that:

$$\text{Performance(Planners)} > \text{Performance(Implementers)} > \text{Performance(Beneficiaries)}.$$

Interpretation of Validated Framework

The validated frameworks (Chap. 4, Fig. 4.3; Chap. 5, Fig. 5.4; Chap. 6, Fig. 6.4) are now interpreted from the perspectives of planners, implementers and beneficiaries. The interpretations of validated relationships are based on project-specific observed values of performance variables and influencing significant variables, micro-level validated relationships (Appendix C) and understanding developed through S-A-P analysis of the project. The interpretive matrices, in the form of L-A-P synthesis, are presented in Appendix D (i–k).

8.3 Case Study 5: Computerized Registration of Pesticides (CROP)

The agriculture sector in India is facing challenges from shrinking and degradable natural resource on the one hand and rising demand due to increasing population and per capita income, and growing demand from industry on the other. Agricultural protection technology has to play a crucial role in Indian agriculture as the sector continues to suffer huge pre and post-harvest losses (ICAR 2007, pp. 3–6,

10–11). It has been estimated that about 20–30 % of the total food production in India, worth about INR 450,000 million, is lost due to pests and diseases (Standing Committee 2012, p. 7). Chemical pesticides play a major role in controlling the outbreak of pests and diseases and preventing crop losses before and after harvesting. Keeping in view their toxic nature, manufacturing and trade of pesticides are regulated by the Government through Insecticides Act, 1968. The act is administered through the Department of Agriculture and Cooperation, Ministry of Agriculture and enforced by the State Governments. According to the act, the manufacture, import, export and use of chemical pesticides can be initiated only after proper registration and a close scrutiny of the data about bioefficacy and safety to human beings, wild life, birds, domestic animals, beneficial parasites and predators. This case study discusses ICT-induced streamlining of the complex procedures involved in implementation of the Insecticides Act. The CROP system is described in brief in the following section before conducting its S-A-P analysis.

8.3.1 Brief Description of the Project

The registration of pesticides is carried out under three categories, viz. 9(3) and 9 (3b) for first time registration and 9(4)/Mee Too for already registered products. To assist the implementation of this Act, there are two high-powered bodies, viz. the Central Insecticides Board and the Registration Committee (CIB and RC) at the Central Government level. These are the advisory as well as decision-making bodies in respect of all matters relating to pesticides. One of the major functions of the Registration Committee is to grant permission for manufacturing, trading and distribution of pesticides. The committee examines the proposals received from entrepreneurs from administrative, legal and technical viewpoints. Applicants, whose proposals are accepted, are granted permission in the form of certificates. The certificate issued by CIB is a pre-requisite for an entrepreneur to approach any state government for obtaining licence for actual manufacturing. With increase in demand for pesticides, the number of registration requests to the CIB and RC kept growing every year. It used to take about 2 years for the committee to respond to a registration request due to limited resources and rigorous registration procedures as per the Insecticides Act. This was causing unrest among manufacturers as well as state governments. CIB and RC realized that the conventional method of registration needs to be replaced with a more flexible and automated system. The CROP system was initiated for streamlining the registration procedures of Mee Too category of pesticides to start with. The system is operational since the year 2002.

The important system modules in the initial version implemented for the Mee Too category included Application Processing, Preliminary Scrutiny, Application Status Rn eporting, Certificates Issuance, Product Database, and Generation of MIS reports. The product database developed under the project maintains information about pesticides companies and their applications, current label, leaflet and certificate of pesticides registered by CIB and RC. The interface for applicants is

through the web site http://cibrc.gov.in, from which they can access status of their applications. The website is regularly updated to disseminate product directory, crop-wise recommendations, minutes of meetings of Registration Committee and other registration related information.

The key challenges faced in automating the registration process included legal implications of modifying the existing system as the processes involved were part of a government act; reluctance of middle/operational level officers to share domain knowledge to facilitate computerization programme; and resource constraints for building detailed database of registered products. The challenges were overcome through joint efforts of CIB, RC and NIC. The system based on improved processes helped both the industry and the government authorities (Standing Committee 2002, pp. 10–19, 25, 32–41; NIC 2002, 2014; DAC 2014, p. 76). The benefits included:

- Faster disposal of registration cases (delivery time reduced from about 2 years to about 3 months).
- No queue jumping in application processing.
- Reduction in deficiency cases.
- Transparency in the registration process.
- Verification about genuineness of company registered for specific pesticide.
- Better utilization of limited expert resources due to elimination of duplicative efforts involved in the processing of already registered pesticides.
- Better interface with manufacturers, traders, extension workers and farmers by enabling online access to application status, deficiencies, recommended pesticide usage, etc.
- Superior enforcement of regulatory measures in the case of temporary registrations granted for limited period.
- Uniformity and quality in printing of labels, leaflets and certificates for different pesticide products.

A SAP-LAP analysis of the Mee Too category of pesticides is presented below for the period till the year 2010. The scope of this registration system was later extended to cover all categories of pesticides. Some of the actions, proposed here as part of L-A-P analysis (Appendix D (l–n)), also got implemented in the subsequent period. The present status of the system in terms of these additional functionalities is also presented as part of S-A-P analysis.

8.3.2 S-A-P Analysis

A situation analysis along with actors and processes involved in pesticides registration and their interplay is brought out as follows in chronological sequence till the conclusion of the main study. Key developments in the subsequent period are summarized after the S-A-P analysis.

8.3.2.1 Situation Analysis

The changing situation in the context of pesticides registration is categorized into Pre-Computerization and Post-Computerization Phases.

Pre-computerization (Manual Registration)

The registration process during the period involved manual processing of documents received from the prospective entrepreneurs. Each fresh application accompanied a bulky set of documents mentioning the details of the product to be manufactured/traded. The statutory and sensitive nature of these documents required the application contents to be thoroughly scrutinized for approved specifications as well as for typographic errors. Documents were routed manually from desk to desk in a sequential manner. Interaction between applicants and the registering authority used to be through conventional means, i.e. post/fax/phone.

Limitations

The conventional system was incapable of handling a large number of applications efficiently due to following reasons:

- Applications pertaining to 'already registered products' category was also subjected to rigorous scrutiny. These efforts, even though repetitive, were mandatory as per the procedures stipulated in the act.
- Applications were processed manually. Status could be communicated to an applicant only after completion of the scrutiny cycle. CIB and RC used to take about 2 years to process an application due to shortage of staff to scrutinize growing number of applications.
- There was lack of transparency with regard to status of applications. The Applicants would not know the outcome till all the experts have given their comments. There were instances when even after prolonged waiting by applicants, their applications were finally rejected on account of minor deficiencies such as typographical errors.

Post-computerization (2001 Onwards)

The post-computerization phase can be categorized into following sub-phases:

Conventional Approach: January 2001–June 2001

It was attempted to computerize the registration of Mee Too category of pesticides to start with. The IT team could not develop deeper understanding about the processes due to inadequate involvement of domain experts. A comprehensive requirements analysis study could not be conducted. An application prototype of the existing workflow was developed to facilitate movement of digitized documents from desk to desk over Local Area Network (LAN). The initially proposed IT-based solution focused on automation of existing processes as it is. It did not take note of the redundancies involved in the conventional method of registration.

Limitations

The application prototype, based on existing workflow, was simply an IT-based replica of the prevailing inefficient system of registration. The scientists of the CIB and RC were not convinced about any performance gains from the proposed IT-based system on the lines of the prototype developed.

Innovative Approach: July 2001–June 2002

The prototype-based approach for application development helped the IT team in obtaining timely feedback from the domain experts. The IT team was strengthened by a new team leader who possessed knowledge about both IT and agriculture. An in-depth study of the existing system was carried out keeping the focus on identifying activities which could be re-engineered for expediting the registration process. Repeat training programmes were arranged for scientists and staff during the period for sensitizing them about the benefits of the computerization programme and enhancing their IT knowledge. This facilitated better contribution from the scientists at the system study stage. It was found that building a database of approved specifications of already registered products can help in avoiding the repetitive efforts involved in examining Mee Too category proposals. Association of Pesticide Manufacturers provided required support for building the database and the scientists took extra effort for scrutinizing and freezing the database. Secretary (CIB) played an important role in getting the Pesticide Registration Act amended. In the modified system, only the necessary application fee and bare minimum information is sought from the applicants seeking approval for manufacturing pesticides belonging to Mee Too category.

Value Generated

The initial version of the system, operational since 2002, fulfilled the complete needs of Mee Too category of registration and partial needs of new pesticides registration under 9(3,3b). Benefits accrued to stakeholders, due to improved processes, are as mentioned previously under the Sect. 8.3.1.

July 2002–Dec 2007: Prolonged Continuance with Initial System Scope

The heavy backlog of pending applications was removed. The officials of CIB and RC started recognizing the benefits resulting from application of IT in their routine work. This resulted in better coordination between the domain experts and IT team to meet the emerging requirements. The functionalities of various modules of the CROP system were further incrementally improved during the period. However, the scope of the system could not be enhanced to cover remaining categories of pesticides despite the growing demand for the same by the industry. One reason for this has emerged as change in leadership due to completion of the tenure of the then Secretary (CIB and RC) who was enthusiastically taking the cause of improving the registration service.

July 2007 Onwards: Towards an Integrated Approach

The continued undesirable practices in registration of pesticides caught the attention of the new Divisional Head who took charge during July, 2007. A national task force for improving pesticides registration was set up during the same month. The task force categorically highlighted lack of transparency and the general perception of commercial interests influencing the process of registration. It

recommended for quick and transparent registration process for all categories and the need for ensuring fair scrutiny of proposals by following strict procedures (DAC 2007b). Based on the recommendation of the Task Force, it was decided to have an integrated system to strengthen Pesticides Registration services and Quality Control of Pesticides. The task was entrusted to NIC keeping in view the past project experience of the organization. The integrated system is operational since the year 2011.

8.3.2.2 Actor—Process Linkages

The key processes in the CROP system and their linkages with actors are brought out in Table 8.3.

As observed from the above analysis, processes at Sl. Nos. 5, 9 and 10 in the system are dependent on a number of external actors. CIBRC is required to build effective collaborative arrangements with these actors for efficient execution of these processes. Figure 8.2 presents the Situation-Actor-Process interplay in the CROP project.

8.3.2.3 Summary of Key Developments in the Post-study Period

The CROP system which initially focused on Me Too category pesticides only, has eventually emerged as a secured and comprehensive web-based system for faster delivery of all registration services in an integrated manner. Considerable advancement in web technologies since the inception of the project has made it possible to include features such as:

- Online filing of application and submission of required documents.
- Integration with e-Payment gateway for payment of registration fee.
- Automation of workflow of the approval process.
- Issuance of digitally signed registration certificates.
- Management of documents related to registration.
- Online Intranet search facility (Document Management System).
- Automatic e-mail alerts for applicants during approval process and online access to applicant specific status and deficiency reports.
- Printing of labels and leaflets from web, etc.

8.3.3 Observations from Opinion Surveys and L-A-P Synthesis

S-A-P analysis of CROP project reveals that better value can accrue from e-governance efforts if the traditionally established rigid government procedures are refined before application of IT. In the CROP project, this involves amendment of a

Table 8.3 Key processes and actors in CROP project

S. No.	Process	Post-computerization (Me too category: 2002–2011)	Post-computerization (All categories: 2011 onwards)	Actors
1	Recording of application details	Database creation in offline mode	Automatic database creation through online applications	Applicants, CIB
2	Preliminary scrutiny by administration and legal sections	Manual	Manual	CIB
3	Technical scrutiny by scientists (subject experts)	Manual; comments made available to applicants only after completion of scrutiny cycle	*Registered pesticides* Technical scrutiny not required *New pesticides* Instant access to comments at every stage	CIB
4	Application tracking	Status updated in batch mode and published on web site for access by applicants	Intranet based workflow application to facilitate instant status updates and publishing. Applicants to get alerts through e-mail and SMS	Applicants, CIB
5	Deficiency reporting and applicants' clarifications	*Registered pesticides* Reduced number of deficiencies due to scrutiny limited to preliminary stage only *New pesticides*[a] Improved feedback system	Web based application to enable automation of deficiency related transactions with individual applicants in a secured fashion	CIB, CIL, CGHS, ICAR, Applicants
6	Submission of scrutinized applications to Registration Committee for approval	Automated summary report for (Mee Too category) based on criteria prescribed by RC from time to time	Automated summary report for all categories	CIB, RC
7	Issuing of certificate with approved product leaflet and label	Computer generated certificates and despatch status (Mee Too category) published on web site	Coverage of all pesticides	CIB
8	MIS reports	Access over Intranet for internal use	Access being extended to applicants also	CIB, PPQS, DAC, Applicants

(continued)

Table 8.3 (continued)

S. No.	Process	Post-computerization (Me too category: 2002–2011)	Post-computerization (All categories: 2011 onwards)	Actors
9	Submission of registration certificate copies with approved product leaflets and labels to concerned state	Improved quality of certificates due to pre-printed stationery with colour schema for different categories	Coverage of all pesticides and improved document management system	States, CIB
10	Dissemination of information pertaining to banned pesticides, crop-wise recommended usage, minutes of the RC and matters related to act.	Conventional efforts augmented with structured information accessible through web	Coverage of all pesticides	CIB, RC, CIL, CGHS, PPQS, CGHS, ICAR, States, EAs

[a]In case of new pesticides, the sample is sent to the CIL for technical scrutiny and field testing. In parallel, the scientists of CIB and RC also examine the specifications proposed in applications. The comments, however, are finalized only after feedback from the CIL. In the upgraded system, intermediate as well as final comments can be accessed by the applicants through Internet

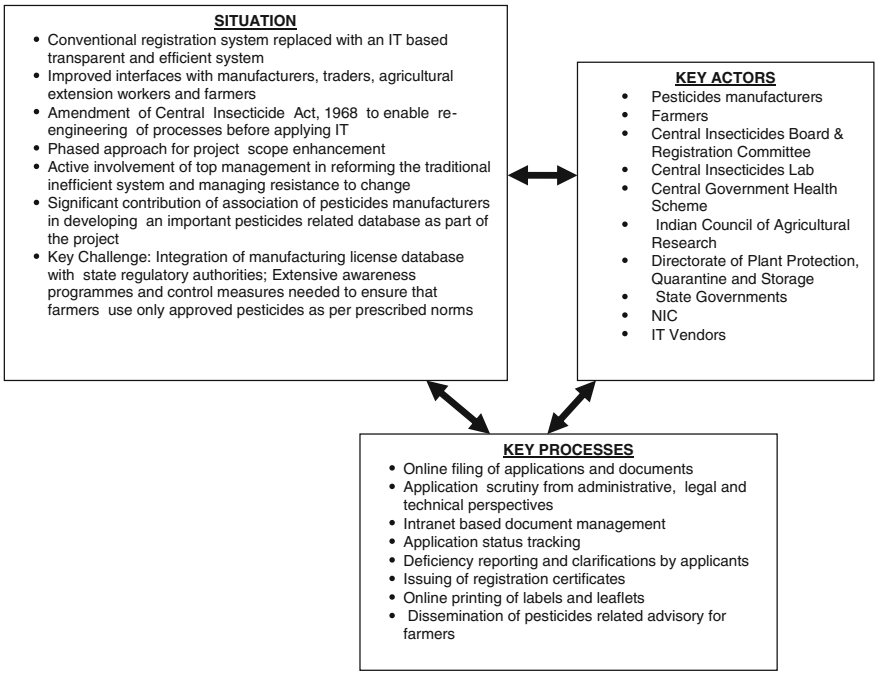

Fig. 8.2 Situation-actor-process interplay in CROP project

legal act which itself is a complex task. Progressive application of IT linked with gradual refinement of established procedures based on inputs from operational staff and beneficiaries has emerged as an effective approach for implementing e-governance. The pesticides industry association, which is part of the registration committee, keeps apprising government about the difficulties being faced by manufacturers/traders. This has triggered refinement of procedures. The progress of refinement has, however, been slow due to change in leadership during implementation and the processes being governed by a legal act. It has emerged that administrative heads having IT knowledge and IT experts having domain knowledge can both play a catalytic role in planning and implementation of e-governance projects.

The sample observed values in respect of respondents related to initial version of CROP project are discussed here as per the contexts of planners, implementers and beneficiaries. The survey of planners (Appendix B (a)) has revealed that societal sectors and their needs, objectives, activities and agencies involved have been adequately addressed during planning (large extent). The coverage of constraints, alterables and performance measures has been of small to medium extent. Defining of timelines for services is observed to be of medium extent. As learnt from S-A-P analysis, the project scope could not be expanded to cover all categories of pesticides for a considerably long time. Clarity about future services and monitoring of performance based on this could have expedited scope expansion. Emphasis has not been given on conducting SWOT like analysis (small extent). Involvement of stakeholders during planning and strategy formulation is observed to be of large and medium extents, respectively, as per the planners. There was adequate clarity (large extent) about benefits accruing to different stakeholders. However, measures for assessing the same are stated to be of medium extent. Roles and responsibilities of actors have been redefined to a large extent and processes re-engineered to a large extent. The survey reveals that involvement of operational staff and stakeholders in deciding about project mission was of small to medium extent. The involvement of seniors on this aspect is observed to be of very large extent. This may be due to the dominant role played by senior leadership in this project. The mechanisms for feedback from beneficiaries and other actors are observed to be of medium to large extent. It is observed that the planners are aware about the changing needs of beneficiaries to a large extent and they take actions for improving the service to a large extent. The planners are also able to maintain contact with beneficiaries and implementing units to a large extent. Flexibility in processes of preparation of project plan, capacity building, content development, content delivery and management of change is observed to be ranging from small to medium extent.

The survey of implementers (Appendix B (b)) reflects that field units have limited resources (small extent) for project implementation and performance-based incentives are of small extent. Implementers feel that their involvement in planning was to a medium extent and coherence among planners and implementers is observed to be of medium extent. Ability of implementers to maintain contact with beneficiaries and reporting of feedback by them to seniors are found to be of

medium extents. These observed values are indicative of the scope for improvement in project ownership by implementers.

The survey of beneficiaries (manufactures/traders) (Appendix B (c)) reflects that they are able to access and make use of the service features to a large extent. They provide feedback to project authorities to a medium extent and according to them, the authorities take action on their feedback to a medium extent.

As reflected by the respective observed averages, the three categories of actors differ in their perception about the performance of CROP project in terms of efficiency, transparency, interactivity and decision support. Among planners and implementers differences are with respect to interactivity and decision support aspects with the former expressing better performance on these aspects. The beneficiaries differ with implementers in their views about efficiency and transparency aspects of performance and have assigned lower values. Among planners and beneficiaries, the differences are visible on all the four aspects of performance. The benefits in terms of efficiency, transparency, interactivity and decision support are perceived to be of medium extent by the beneficiaries, whereas these benefits are perceived to be of large extent by the planners. Interestingly, planners do not perceive these benefits as of very large extent. This is apparently due to the fact that planners were cognizant of the actions underway in terms of system enhancement for bridging the gaps in the project. Comparing overall performance averages in numerical terms with respect to the three actor segments, it is observed that:

$$\text{Performance(Planners)} > \text{Performance(Implementers)} > \text{Performance(Beneficiaries)}$$

Interpretation of Validated Framework

Interpretation of validated frameworks (Chap. 4, Fig. 4.3; Chap. 5, Fig. 5.4; Chap. 6, Fig. 6.4) is now attempted for further improving the performance of CROP system from the perspective of three actor types. As in the previous cases, the interpretations are based on project-specific observed values of performance variables and influencing significant variables, micro-level validated relationships (Appendix C) and S-A-P analysis of the project. The interpretive matrices, in the form of L-A-P synthesis, are presented in Appendix D (l–n).

8.4 Case Study 6: Integrated Fertilizers Management Information System

Fertilizers have played an important role in the success of India's green revolution and consequent self-reliance in food-grain production. The Government of India has, therefore, been consistently pursuing policies conducive to increased availability and consumption of fertilizers in the country. The use of chemical fertilizers have gained further importance in view of the Indian National Food Security Act 2013 which aims to provide subsidized food grains to approximately two thirds of

India's 1.2 billion people. The scope for expanding land area under cultivation being limited, further increase in agriculture production in India can be achieved only by increasing crop productivity through balanced use of fertilizers and by bringing more of the existing cultivable land under the use of fertilizers. Chemical fertilizers, therefore, continue to play a pivotal role in the efforts for sustaining agricultural growth in India. The working group on fertilizer industry for the twelfth plan period of 2012–2017 had projected that the requirements of fertilizers in nutrient terms would reach about 34 million tonnes in the final year of the plan period. Government's thrust, therefore, is on increasing the consumption of fertilizers by making them available timely, adequately, at affordable price and in good quality throughout the country. Government is also promoting Integrated Nutrient Management (INM) by encouraging soil test-based judicious and balanced use of chemical fertilizers, bio-fertilizers and locally available organic manures to maintain soil health and its productivity for improving agricultural growth.

8.4.1 Brief Description of the Project

In order to improve internal efficiency and strengthening of linkages with various stakeholders, the Department of Fertilizers (DoF) has consistently been trying to set up an Integrated Fertilizers Management Information System (IFMIS) with the technical support of the National Informatics Centre (NIC) . The aspired system aims at supporting the national objective of ensuring timely and adequate supply of good quality fertilizers to farmers at affordable price. Broadly, it includes modules to facilitate monitoring of fertilizer production and distribution, import handling and payments, equated freight fixation and concessions/subsidy payments to fertilizer companies. These modules are under different stages of implementation. In particular, the system is extensively being used by the fertilizer companies to report plant-wise, product-wise fortnightly production data, fortnightly fertilizers dispatch and sales data, and monthly state level plan of movement of fertilizers to the DoF. The department has been trying to bring transparency in the sale of fertilizers and release of subsidy. In this pursuit, the scope of the system was first enhanced to enable monitoring of fertilizers movement at district level through a new website http://urvark.co.in. This was followed by a mobile-based application which is being implemented in a phased manner to further extend the monitoring of the fertilizers availability and sales transactions at the retail outlets of the companies (http://mfms.gov.in). The subsidy payment system developed under IFMIS to facilitate timely processing of subsidy or concession claims and related payments to the fertilizer companies is also being made more transparent accordingly (DoF 2003, pp, 47–48; DoF 2004, pp. 47–48; DoF 2005, pp. 53–54; NIC 2005, pp. 19–23; DoF 2006, pp. 57–60; DoF 2007, pp. 67–69; DoF 2014, pp. 87–90).

The DoF has been aiming for an Integrated Fertilizers Management Information System (IFMIS) since the year 1993. Once fully operational, such a system is expected to facilitate keeping a constant vigil on the demand, supply and availability position of fertilizers to minimize the demand-supply gap in different parts of the country besides timely processing of claims of manufacturers, handling agents, etc. It is, however, observed that although various functional requirements of the DoF have been largely incorporated in the operational ICT based system, even today there are noticeable gaps with respect to achieving an integrated MIS on fertilizers. The subsequent section attempts to study the evolution of this system over a period of time and explore the intricacies involved. An understanding about the factors responsible for gaps in the past efforts of the DoF is expected to sensitize practitioner to craft effective strategies for streamlining the fresh efforts being made to implement the system on a much larger scale.

8.4.1.1 Fertilizers Information Linkages of the DoF

There are 56 large-sized fertilizer plants in the country manufacturing a wide range of nitrogenous, phosphatic and complex fertilizers. The country has achieved near self-sufficiency for meeting the present domestic requirements of nitrogenous and phosphatic fertilizers. However, the raw materials and intermediates for the same are largely imported. The requirement of potash is also met through imports for lack of reserves in the country. At the central government level, the DAC makes fertilizers demand assessment through half-yearly zonal input conferences in consultation with the state governments and fertilizer industry. Thereafter, the DoF makes an assessment of the likely production in consultation with manufacturers and arranges for meeting the deficit through import. The DoF ensures adequate availability of fertilizers through issuance of Essential Commodities Act (ECA) supply plan and movement control order for indigenous and imported urea, respectively. The availability of decontrolled fertilizers, viz. Phosphatic (P) and Potassic (K) is left to market forces. The reasonableness of fertilizers prices is maintained through payment of the subsidy to manufacturers of urea and concessions on sales of P and K fertilizers by the DoF. Financial support is also extended to State Trading Enterprises (STEs) and handling agents for imported urea. The DoF constantly monitors the production/import and movement of urea (the only controlled fertilizer) and keeps the apex authorities [Prime Minister's Office (PMO), Cabinet Secretariat (CS), NITI Aayog, Ministry of Finance, Cabinet Committee on Economic Affairs (CCEA), Fertilizers Association of India (FAI)] informed about the status. The coordination by the DoF is limited to making fertilizers available at state level only as per their demands. Intra-state movement of fertilizers falls under the purview of respective state governments. The information linkages of the DoF with various agencies are presented in Fig. 8.3.

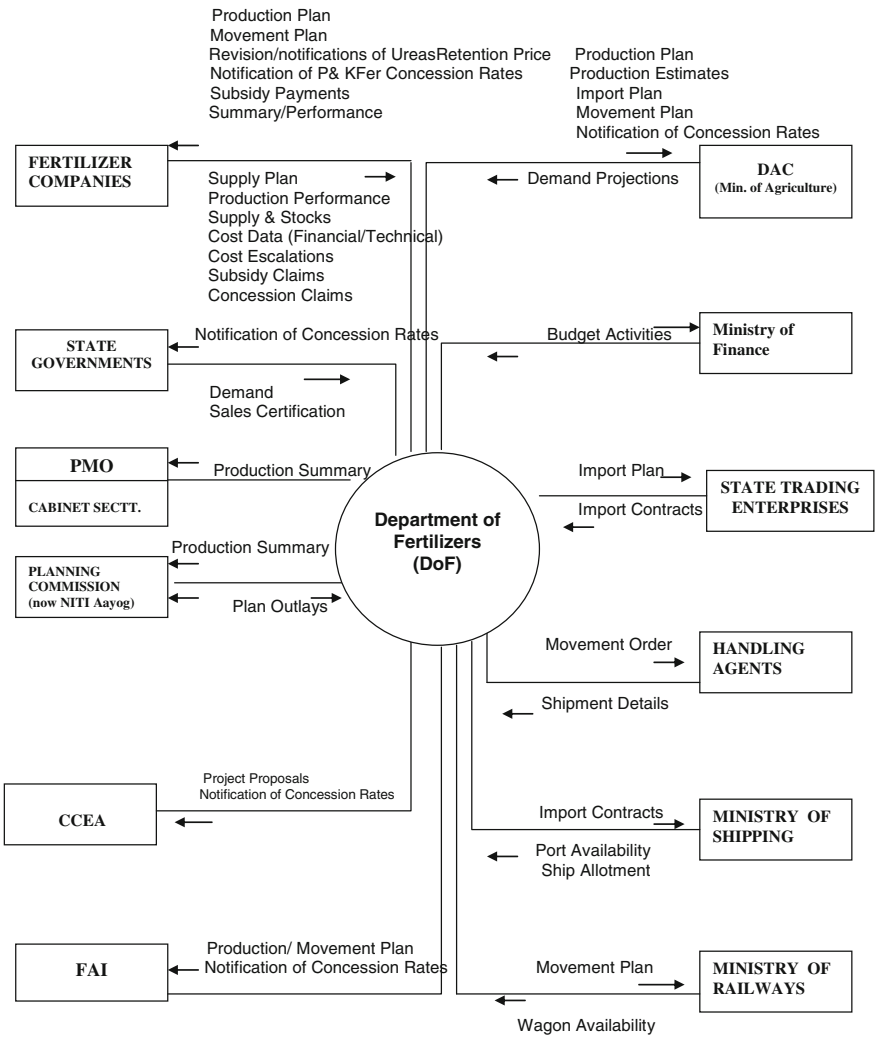

Fig. 8.3 Information linkages of department of fertilizers (*Source* Information Technology Plan for the Fertilizer Sector, December 1998)

8.4.2 S-A-P Analysis

An analysis of changes in situation and interplay of actors and processes with regard to computerization programme of the DoF is summarized below. The detailed S-A-P analysis has been conducted for the computerization efforts made by the DoF in the period prior to the year 2009 when the base research study concluded. The analysis has helped in evolving a synthesized strategic framework (Chap. 3, Fig. 3.3) for improving performance. A few of the recommendations

made as part of this analysis are observed to have been taken up for implementation in the subsequent years by the DoF.

8.4.2.1 Situation Analysis

The progress of computerization in the DoF is analysed below in chronological sequence till the conclusion of the main study. Key developments in the subsequent period has been launching of mFMS which is summarized in Box 8.1.

Adhoc Approach: 1986–1995

The Fertilizer Informatics Unit was set up by the NIC in the year 1986 to provide informatics support to the fertilizer sector. The unit extended support to the Fertilizers Division of the DAC and the DoF. There was no separate allocation of budget by the DoF or the DAC for the development of IT-based solutions in the fertilizer sector. The phase may be characterized as follows:

- Routine day-to-day IT support provided by the NIC-DoF Division as in the case of other government offices.
- Fertilizers installed capacity, production, consumption, retention price and subsidy payment details maintained in spreadsheets and FoxPlus-based systems; centralized computing environment.
- Ad hoc approach for adopting IT.
- Disconnected DoF and the DAC offices.
- Low ICT penetration in different divisions of the DoF and DAC.

Attempts for an Integrated Fertilizer Management Information System: 1995–1999

The DoF approved NIC's proposal for evolving an Integrated Fertilizer Management Information System (IFMIS) during March 1995. The project, scheduled to be completed in 2 years at a cost of INR 17 million, was based on a study conducted by the DoF through Tata Consultancy Services in the year 1993. An analysis of the IFMIS proposal and the inputs obtained through interaction with the team members reveal that there was considerable delay in the implementation of the project. The actual periods during which major components planned under the IFMIS were delivered can be categorized as 1995–97 (Establishment of ICT infrastructure) and 1998–99 (Application Development). A summary of planned deliverables, actual realization and the reasons for gaps are summarized in Appendix F (a and b).

IT Plan for the Fertilizer Sector: 1998–2002

The NIC submitted an IT Plan for fertilizer sector for the period 1998–2002 during December, 1998 (DoF-NIC 1998). The first year of the plan overlapped with the IFMIS project period which was extended to enable completion of application development component. The plan laid emphasis on further strengthening of the ICT infrastructure and enhancing skills of officers and staff of the DoF for making use of the facilities provided. Other than routine office automation applications, no

domain-specific application was proposed in the plan. The total plan outlay was projected as INR 19.8 million. Appendix F (c) summarizes the planned and realized deliverables and the reasons for gaps. The hardware procurement and deployment as also training components were taken over from NIC by the IT Division created in the Department during 1999.

IT Plan for the Fertilizer Sector: 2002–2007

With the advancement of technology, it was desirable to develop web-based applications to facilitate online entry of data expected from fertilizer companies and other stakeholders. The IT Plan for 2002–2007 accordingly projected web enablement of the key applications developed under the IFMIS and making effective use of the 100 mbps LAN established in the DoF (DoF-NIC 2002). Accordingly, the project was also termed as Fertilizer Management Online (DoF 2006, pp. 57–60). At the execution stage, the application development component was entrusted to the NIC, whereas the enhancement of computing environment and training components continued to be handled by the IT Division of the DoF as in the case of previous plan. Appendix F (d) summarizes the planned and realized deliverables and the reasons for gaps.

Apart from the reasons summarized in Appendix F (d), it has also emerged from the discussion with the officials involved in the implementation of the systems that the progress is also hampered by factors like lack of regular review and monitoring, shifts in priorities with changes in leadership, non-fixing of responsibilities of different divisions with respect to IT systems and dependence on multiple sources for updating the database.

The situation analysis, as brought out in this section, reveals that although the need for evolving an integrated MIS for fertilizers was realized by the government way back in 1993, there are gaps in the intended deliverables. Even though substantial efforts have been put in establishing state-of-the-art ICT infrastructure and migrating the applications to new technology environment from time to time, much remains to be done before the intended benefits start accruing as per expectations of the farmers at the grassroots.

8.4.2.2 Actor–Process Linkages

A large e-governance application such as an integrated MIS for fertilizers, comprise several actor–process interfaces whose seamless implementation is important for the success of the project. Key processes in fertilizer management and the associated actors have been identified and presented in the matrix form in Table 8.4.

The above matrix gives an indication about the involvement of various internal and external actors in the execution of various processes. This aspect needs to be appropriately addressed while prioritizing the applications to be taken up for

Table 8.4 Processes and actors interplay in IFMIS

S. No.	Process	Actors involved
1	Assessment of season-wise demand	State Agriculture Departments, Central Department of Agriculture and Cooperation
2	Assessment of availability of fertilizers and feedstock	DoF, Fertilizer Companies, Department of Energy, Department of Coal, Ministry of Petroleum and Natural Gas, Feedstock suppliers, State Governments
3	Preparation of production plan	DoF, Manufacturers
4	Preparation of import plan based on assessment of demand–supply gap	DoF
5	Fertilizer import	Import and Ocean Freight Sections of DoF, Canalizing Agencies, Department of Shipping, Foreign Suppliers, Vessel Owners, Brokers in case of Foreign Flag Vessel
6	Preparation of movement plan	Department of Fertilizers, Manufacturers
7	Fertilizer Distribution and Administration of Fertilizers Movement Control Order, 1960	DoF, State Governments, Ministry of Railways, Department of Road Transport and Highways, Handling Agents, Grassroots organizations like cooperatives and retail outlets of companies
8	Management of subsidy for fertilizers	DoF, Fertilizer Industry Coordination Committee (FICC), DAC, State Governments, Manufacturers, Handling Agents, Importers, Canalizing agents, Vessel Owners
9	Planning for fertilizer production based on likely growth of agriculture, globalization issues	DoF, DAC
10	Formulation of fertilizers policy	DoF, Experts from industry, academia and related organizations, viz. DAC, Indian Council of Agriculture Research, Department of Chemicals and Petrochemicals, Fertilizer Association of India
11	Regular progress reporting to regulatory/monitoring organizations	Prime Minister Office, Cabinet Secretariat, Planning Commission, Department of Expenditure, Department of Economic Affairs, Department of Public Enterprises, Ministry of Statistics and Programme Implementation

development in a large computerization programme. A process becomes inflexible if it is linked with several interdependent actors. Such processes need to be dealt with carefully to make them adaptable to the IT environment.

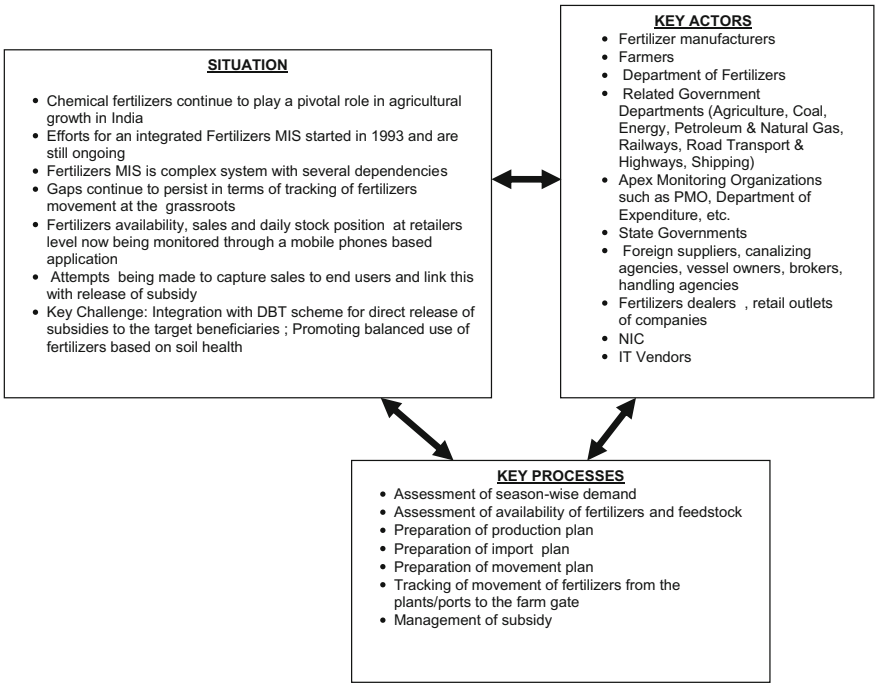

Fig. 8.4 Situation-actor-process interplay in fertilizers MIS Project

A detailed analysis of Situation-Actors-Process interplay can help in minimizing design-reality gaps and better utilization of resources while implementing e-governance. It is expected that in a given situation, the following approach will help in reducing deadlock like conditions at the implementation stage:

i. Develop actor–process interplay matrices.
ii. Rank actors in terms of number of processes they are involved with.
iii. Rank processes in terms of number of actors involved in handling a process.
iv. Prioritize application development and deployment in terms of manageable interplay of processes and actors. For example, a process having linkages with only internal actors is expected to be easier to handle than the one having linkages with external actors.
v. Identify actor–process interfaces which need to be refined and initiate the change process.
vi. Enhance the system capabilities incrementally based on priorities set in step iv.

The above approach will also help in identifying such actor–process interfaces which need to be refined before attempting their automation.

The Situation-Actor-Process interplay in the context of the system is presented in Fig. 8.4.

8.4.2.3 Summary of Key Developments in the Post Study Period

The existing Fertilizer Monitoring System (FMS—www.urvarak.co.in) that tracks availability at the district level is being extended, through the mobile Fertilizer Monitoring System (mFMS—www.mFMS.nic.in) to the last mile (i.e. retailer) to track the movement and availability. In Phase-I of the project which was launched in November 2012, the retailers have started acknowledging the receipt of sales made to them by either company or wholesaler. Phase II, being implemented in 12 districts initially, aims at capturing sales made to actual beneficiaries and directly transferring subsidy. The background of mFMS project and its present status is presented in Box 8.1.

Box 8.1
Mobile Fertilizer Monitoring System (mFMS)

Genesis
In June 2011, a Task Force constituted by Finance Ministry proposed to leverage 'Aadhar' unique identity numbers for direct payment of fertilizer subsidy into the bank accounts of about 120 million farmers using IT enabled technology solution. The mFSM initiative was launched on 1st November, 2012 to achieve this ambitious goal. In a subsequent meeting taken by the Principle Secretary to the Prime Minister, it was decided to put on hold the direct payment of subsidy to the farmers. This decision was made keeping in view the complexities involved in direct transfer of benefits in the context of fertilizers due to problems related to targeting, determining entitlements and preparing beneficiary databases. Therefore, in the initial phase, the Department of Fertilizers is trying to bring transparency in release of subsidy to the manufacturers by monitoring the availability and sales of fertilizers at the retailer level through mFMS.

Objectives
mFMS has been launched to eventually achieve the following objectives:

- To create information visibility for tracking the end-to-end movement of fertilizers from the plants/ports to the farm gate, including transactions in the supply chain.
- To make available fertilizers demand, production, movement and consumption databases for helping the stakeholders in making informed collective decisions for ensuring timely delivery of the fertilizers.
- To deliver electronic, non-repudiable, credible, timely and auditable subsidy payment to the relevant stakeholders without prolonged delays.

Technology
mFMS technology solution, developed using open source technology stack, includes a centralized system with web, mobile, point of sale device and IVRS access channels besides multilingual call centre.

Implementation Status
A mobile application has been developed and deployed nationwide to make real time updates in mFMS. Wholesalers and retailers are using mFMS for acknowledging receipt of fertilizers, reporting onward fertilizers sales and reporting daily stock position. The mFMS is rolled out through all the registered fertilizers manufacturers (116), wholesalers (16,577) and retailers (1,57,274) across the country.

In the next phase, it is being attempted to capture retailer's sale to the end user (farmer) by establishing linkages with AADHAR number of beneficiaries and land records. The proposed system, named as iFMS, aims at transferring subsidy directly to bank accounts of farmers. However, a major challenge in its implementation is identification of beneficiaries as in many states the land records are not updated Therefore, it is being attempted to implement the system in a phased manner starting with 12 districts (NIC 2014; http://pib.nic.in/newsite/PrintRelease.aspx?relid=123432, last accessed on 20.5.16).

8.4.3 Observations from Opinion Surveys and L-A-P Synthesis

It is learnt from S-A-P analysis that management of fertilizers is a complex exercise involving multiple stakeholders. Automation of workflows with these stakeholders is a challenging task. Even though several applications have been evolved under IFMIS project, the envisaged integrated system is yet to be realized as per aspirations. The sample observed values in respect of respondents belonging to IFMIS project are now discussed as per the contexts of planners, implementers and beneficiaries. The survey of planners (Appendix B (a)) revealed that though there was adequate clarity about objectives, activities and agencies involved (large to very large extent), lesser emphasis was given on identifying constraints, alterables or defining performance metrics (medium extent). The observed values reflect for further action to be taken in terms of re-engineering of processes and changes in roles and responsibilities of the actors involved. Clarity about benefits accruing to stakeholders is found to be of medium extent whereas measures to assess these benefits are observed to be of small extent. Involvement of stakeholders during planning, strategy formulation and implementation is found to be inadequate (near small extent). In particular, involvement of stakeholders during planning was

largely limited to only internal actors and IT experts. Other stakeholders like fertilizer companies, central and state departments of agriculture, farmers, etc., were involved from negligible to medium extent. The flexibility in the processes of preparation of project plan (small extent), capacity building (close to small extent), content development (medium extent), content delivery (small extent) and management of change (small extent) are observed to be inadequate. The ICT-based systems proposed in the successive IT plans of the DoF were found to be highly ambitious keeping in view their dependence on active participation of various actors who are beyond the control of DoF. As such, one of the reasons for the resultant gaps in planned and realized deliverables appears to be relying solely on IT executives for IT planning and investment decisions.

The survey of implementers (Appendix B (b)) revealed that operational staff and external stakeholders were involved from negligible to small extents while deciding the project mission. This explains the observed small extent of commitment from the actors involved as revealed by the survey of implementers. In practice only those divisions have actively supported computerization whose outcomes are closely monitored by apex authorities. Coherence among planners and implementers is found to be of small extent. Resources allotted for implementation are found to be inadequate (near small extent) with negligible extent of rewarding instruments for better performance. Implementers are able to use computing facilities to a large extent. Their ability to use applications is found to be of medium extent and ability to remain in contact with beneficiaries (fertilizer companies) in the context of the project is found to be of small extent. The observed values reflect lack of provisions for regular skill up-gradation of implementing staff (small extent), lack of encouragement to implementers to point out shortcomings (small extent) and deficiencies in terms of actions taken by seniors (small extent) on the inputs provided by the operational staff.

Beneficiaries' access to service and their ability to use it are observed to be of large extent from the survey of beneficiaries, i.e. fertilizer companies (Appendix B (c)) As per them, they provide feedback on the project to a medium extent which is being acted upon to a medium extent (both values towards small extent range).

The performance as perceived by planners is found to be of large extent whereas both implementers and beneficiaries have perceived the performance to be of medium extent. Similar pattern is observed in their response to overall satisfaction with the project. This is a reflection on insufficient benefits accruing to implementers and beneficiaries. In numerical terms it is observed that:

$$\text{Performance(Planners)} > \text{Performance(Beneficiaries)} > \text{Performance(Implementers)}.$$

Interpretation of Validated Framework

The empirically validated frameworks (Chap. 4, Fig. 4.3; Chap. 5, Fig. 5.4; Chap. 6, Fig. 6.4) are now interpreted in terms of project specific observed values of performance variables and influencing significant variables, micro-level validated

relationships (Appendix C), and understanding developed through S-A-P analysis of the project. The interpretive matrices presenting L-A-P synthesis are shown in Appendix D (o–q),

8.5 Concluding Remarks

A Government enterprise generally has to deal with a large number of internal and external actors who interact as per traditionally defined rules and procedures. With defined mandates, these organizations prefer to operate in silos and collaborate only when confronted with crisis like situations requiring their collective efforts. The analysis of Grapenet and CROP projects has revealed that e-governance can be effectively implemented by proactively collaborating with stakeholders and refining the actor-process interfaces in an iterative fashion. Learning from previous iterations should pave the way for next iteration. The analysis of IFMIS project has thrown light on resultant uncontrollable design-reality gaps if automation of an enterprise is attempted at one go. It has emerged that an analysis of actor-process linkages at the conceptualization stage will help the organizations in formulating realistic e-governance plans and minimization of the design-reality gaps at the implementation stage. Such an analysis also helps in identifying those actor–process linkages which need to be refined before applying IT. The gap analysis of the three projects has led to interpretations for improving the performance. The elemental level interpretations which have emerged from the SAP-LAP analysis performed in the previous and this chapter have been used for developing a synthesized framework (Chap. 3, Fig. 3.3) for improving the performance of e-governance projects in the study context.

Though all the six projects analysed here are based on collaboration among organizations/internal divisions, it is found that in most cases the synergetic relationships among the involved entities is seemingly presumed to be existing by default. In the absence of an effective collaborative framework, such projects seem to be drifting along with the support of assured departmental budgetary support. Such projects may not be able to sustain of their own once their budgetary support is removed. The challenge of sustainability can be overcome by building project based relationships with related organizations. The next chapter analyses the context of Agricultural Marketing Information System from the perspective of working out a cross-organizational collaborative framework for effective e-governance.

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Chapter 9
Effective E-Governance Through Strategic Alliances—An Illustration

9.1 Introduction

It is important to build partnerships with various agencies for establishing a sound market information service in the country. A systematic approach is required for building synergetic partnerships around AGMARKNET. The context is analysed using SAP–LAP framework.

The survey of 36 senior government officers across different projects reflected that it is nearly to a small extent that re-engineering of processes is attempted before automation and that the roles and responsibilities are redefined to a medium extent. Further, the valid responses of these senior officers and implementers reflected they provide feedback for improvement of other agriculture-related projects to a small extent and action on their inputs too is taken to a small extent by other project authorities (Chap. 5, Sect. 5.9; Appendix B (a) and (b)). It is, therefore, apparent that even though technology can facilitate a 'single stop shop' in the form of a front-end interface like www.indiaportal.gov.in (one of the mission mode projects), the purpose of Digital India programme may be defeated if the underlying processes are left untouched and departments are allowed to function in silos. The real challenge, therefore, lies in identifying redundant activities carried out by different departments, re-allocating them according to their respective inherent strengths and then integrating the processes within and across various departments using ICT for an effective single window-based service. Most of these organizations function independently and are non-profit making in nature. Non-equity-based strategic alliances mode of collaboration, as being widely practiced in the corporate sector, seems to be a logical way of bringing synergy among related government departments for efficient and effective e-governance.

In this section, an attempt is made to apply the relevant insights gained through the AGMARKNET pilot study and literature review to examine the proposition of implementing e-governance through strategic alliances among government departments. The illustrative context is taken as establishing a sound Agricultural

P.K. Suri and Sushil, *Strategic Planning and Implementation of E-Governance*,
Flexible Systems Management, DOI 10.1007/978-981-10-2176-3_9

Marketing Information System (AMIS) in India through collaboration among four different central government organizations, viz. the Directorate of Marketing and Inspection (DMI), the Directorate of Economics and Statistics (DES), the Department of Consumer Affairs (DCA) and the National Horticulture Board (NHB), which have independent systems of collection and dissemination of market information on agricultural produce.

9.2 Central Organizations and Their Agricultural Marketing-Related Information Systems

The significance of a sound agricultural system has been explained earlier. Various government committees have been emphasizing since long for a system for regular collection and dissemination of marketing information for the use of different stakeholders. Based on their recommendations, many organizations of centre and state governments have developed their own systems over the years as per specific requirements. Wholesale and retail prices of agricultural commodities are important for both producers and consumers. At the centre government level, there are four different agricultural market information systems being maintained by the DMI, DES, DCA and NHB. There is ample scope for collaboration among the four organizations for developing a unified system for the use of various stakeholders. For exploring the practical relevance of a collaborative arrangement among related organizations in the context of e-governance, the market information systems of the four organizations have been studied and discussed here.

9.2.1 Agricultural Market Information System of DMI

The Directorate of Marketing and Inspection—an attached office of the Department of Agriculture and Co-operation (DAC)—is primarily responsible for strengthening of the Indian agricultural marketing system. For this, it maintains a close liaison between the central and state governments through a network of its offices spread all over the country. The Directorate is trying to address the need for establishing a sound Agricultural Marketing Information System (AMIS) in the country through its AGMARKNET project. Even though the project has expanded to several markets and a unique ICT-based network of markets is evolved in the country, there are several issues which need to be resolved before the project gets transformed into a matured e-governance service and sustains of its own as discussed in Chap. 7.

9.2.2 Market Information System of DES

The Directorate of Economics and Statistics (DES)—an attached office of the DAC—is the custodian of data bank of the DAC. The organization is responsible for collection, compilation, validation and dissemination of agricultural statistics required by the Ministry of Agriculture and Farmers Welfare for the purpose of planning and decision support (DAC 2014, pp. 10–16). In the context of agricultural marketing, DES maintains basic data bank for formulating price policy for agricultural commodities. This includes collection and compilation of farm harvests prices, wholesale and retail prices, international prices and market arrivals of important agricultural commodities. The price data is collected through various agencies such as State Agricultural Statistical Agencies (SASA), State Agricultural Marketing Boards/Directorates, State Food and Civil Supplies Departments and 12 Market Intelligence Units (MI Units) of DES. Most of these centres are providing market information purely on voluntary basis due to which there are irregularities in data reporting by some of the centres. The reliability of information being provided is also not assured due to shortage of skilled staff for data collection and its monitoring. It is generally not possible for the staff to undertake field visits due to lack of required resources. At the central level, the Directorate has on its strength a large number of data entry operators and several officers with expertise in economics and statistics. However, with limited number of field offices, the Directorate depends on state level agencies for collection of data due to which enforcement of standards across different states becomes impractical. The wholesale prices collected by the DES from domestic centres are provided to the Office of Economic Adviser, Department of Industrial Policy and Promotion, Ministry of Commerce Industry for construction of weekly wholesale price index numbers. Market information is also provided to Food Corporation of India, Ministry of Commerce, Ministry of Food, Civil Supplies and Public Distribution. The aggregated reports, published through the web site (http://eands.dacnet.nic.in), are targeted to serve planning, policy making and research. DES also brings out a monthly journal 'Agriculture Situation in India' based on market information received from various sources. The information being disseminated by DES is not targeted at farmers, who need to access only the basic market information in a user-friendly manner.

9.2.3 Market Information System of NHB

The National Horticulture Board (NHB)—an organization under DAC—is primarily responsible for conceptualizing and implementing schemes and projects for improving production and marketing of fruits, vegetables and flowers. The Board is a lean organization with most officers having expertise in horticulture or agriculture. One of the plan schemes of NHB is to strengthen market information service on horticulture crops. Under the scheme, 33 market information centres of the Board

collect prices and arrivals information in respect of seasonal fruits, vegetables and flowers of commercial importance from selected wholesale markets and communicate to the Central Coordinating Cell (CCC) located at their Headquarters. The daily national market bulletin compiled by the Board is provided to the Horticulture Commissioner (DAC), State Marketing Boards/Directorates of Agriculture/Horticulture, State Agro Industries Corporations, Food Processing Centres, National/regional newspapers, All India Radio Stations, Doordarshan Kendras, concerned wholesale markets and private organizations (NHB 2006, pp. 1–6; NHB 2014, p. 11). The information is also disseminated through the web site of the Board, i.e. www.nhb.gov.in, to serve traders as well as producers for taking marketing-related decisions.

9.2.4 Market Information System of DCA

This Department under the Ministry of Consumer Affairs, Food and Public Distribution is primarily responsible for protection and welfare of consumers. One of its important responsibilities is to monitor the prices and availability of essential commodities in the country. The Department functions in close coordination with Food and Civil Supplies Departments of all state governments and the Ministry of Agriculture for assessing demand–supply gaps and formulating proposals relating to export and import of essential commodities and market intervention. Agricultural Market Information System in the Department is implemented through a Price Monitoring Cell (PMC) (http://consumeraffairs.nic.in/forms/contentpage.aspx?lid=610, last accessed on 21.6.2015). The PMC collects daily retail prices and weekly wholesale prices for 22 essential commodities with the help of the respective State Food and Civil Supplies Departments. The information received online or through fax/e-mail/telephone/postal mail is centrally computerized by the PMC (http://consumeraffairs.nic.in/forms/contentpage.aspx?lid=610, last accessed on 5.6.2016). The Department brings out daily and weekly price bulletins in respect of these commodities, which are published on the web site (http://fcainfoweb.nic.in/PMSver2/Reports/Report_Menu_web.aspx, last accessed on 21.6.2015). The High Powered Price Monitoring Board reviews the availability and price situation every month for initiating appropriate measures. The Committee of Secretaries also meets periodically to take appropriate measures on containing the prices of essential commodities. The market information about these commodities is to be compulsorily submitted to the apex authorities. As such, DCA rigorously monitors activities involved in timely generation of prices and arrivals. The cell also maintains international market information about the essential commodities. The end users of market information compiled by the DCA primarily include concerned centre and state level organization, who require it for commodity-related decision support and planning. Availability of essential commodities being critical from the perspective of consumers, the bulletins generated by DCA are closely reviewed by the Cabinet Secretariat and Prime Minister's Office.

9.3 Case Analysis Based on SAP–LAP Framework

The case is analysed using SAP–LAP framework. The situation representing the management context of four systems, key actors who are dealing with the situation and main processes that are responding to the situation, are analysed, synthesized and presented in Tables 9.1, 9.2 and 9.3, respectively. This follows a discussion on proposed actions based on learning and expected improvement in performance from the suggested actions.

Table 9.1 A situation-based comparison of market information systems

System attributes	DMI	DES	NHB	DCA
Scheme type	Plan	Non plan	Plan	Non plan
Start year	2000	During 2nd Five Year Plan Period: 1956–61	1985	Weekly prices since 1989; Daily prices since 1998
Core mandate of department	Strengthening agricultural marketing system	Maintaining Agricultural Databases for planning and decision support	Horticulture Development	Safeguarding consumer's interest
Key purpose of collecting market information	Empowering farming community with market information	Policy planning and decision support Providing inputs for generating weekly wholesale price indices by the Department of Industrial Policy and Promotion Ministry of Commerce and Industry	Market Information Service on horticultural produce for different users	Controlling the prices and availability of essential commodities
Markets covered	3250 wholesale markets for daily information; further expansion in progress; flexibility to accommodate retail markets and other sources	~150 markets for daily wholesale prices; 530 markets for weekly wholesale markets; daily retail prices from ~90 centres; weekly retail prices from 215 centres	36 wholesale markets for daily prices; retail prices from major outlets in metropolitans. The coverage is being expanded	75 centres for retail and wholesale prices

(continued)

Table 9.1 (continued)

System attributes	DMI	DES	NHB	DCA
Commodities covered	All agricultural commodities including fruits and vegetables; flexibility to include processed items also	All agricultural commodities including fruits and vegetables and important processed items	Seasonal fruits, vegetables and flowers of commercial importance	Commodities covered under "Essential Commodities Act"
Expected frequency of data reporting from field	Daily	Daily Weekly	Daily	Daily Weekly

Adapted from (Suri and Sushil 2006)

Table 9.2 Key actors associated with market information systems

	Key actors			
Data sources/users	DMI	DES	NHB	DCA
Ministry	Ministry of agriculture and farmers welfare	Ministry of agriculture and farmers Welfare	Ministry of agriculture and farmers welfare	Ministry of consumer affairs, food and public distribution
Major source of data	Wholesale markets	Wholesale and retail markets	Wholesale markets; Major organizations engaged in retail selling of fruits and vegetables in metropolitan cities	Wholesale and retail markets
Data reporting agency	Wholesale markets	Wholesale markets, SASA, state food and civil supplies departments	Field staff of NHB	State food and civil supplies departments
Data collation and analysis support	IT based automated system. A small statistical cell for analysing data	Data entry operators; A numb er of specialists in economics and statistics	A small technical cell	Few specialists in economics and statistics with supporting staff
Users of information	Farmers, traders, processors, planners and decision makers, researchers, etc.	Planner, decision makers, researchers, etc.	Farmers traders, planners and decision makers, researchers, etc.	Cabinet Secretariat, PMO, Concerned Ministries

Table 9.3 Key processes in market information systems

	Key actors			
Key processes	DMI	DES	NHB	DCA
Reporting method	Online	Online/Fax/Phone/e-mail	Online/Fax/Phone/e-mail	Online/Fax/Phone/e-mail
Compilation	Automated	Semi-Automated	Automated	Semi-Automated
Analysis	IT based	IT based	IT based	IT based
Dissemination	Web based	Web based	Web based	Web based
Monitoring	IT based; project monitoring committees at field and central level	Through telephone; no formal monitoring committees at field level	Through telephone; no formal monitoring committees at field level	Data reporting is strictly supervised

9.3.1 Learning Issues

Key learning issues that have emerged from the above analysis of the four organizations are as follows:

9.3.1.1 Redundant Efforts and Lack of Synergy

- The concerned organizations are collecting and disseminating agricultural produce-related information under different programmes. As such, the rigorous processes of data collection, compilation, reporting, validation, analysis and dissemination are repeated at state level as well as in each by each of the four organizations at the central level.
- All the four systems are operating in isolated modes. Hardly, any attempt has been made to evolve an integrated system based on capabilities of different departments.
- Market information being collected by each organization is discovered at the level of wholesale and retail markets. In the case of AGMARKNET system, the information is directly reported by the market official. In each of the other three cases, the information is collected from markets by different officials for reporting to their respective organizations.

9.3.1.2 Inherent Gaps in Each System

- The issues such as irregular reporting, delay in reporting, non-uniformity in commodity grades and standards are of concern in each system and require coordinated efforts among central and state level organizations. With the exception of NHB, the reporting agencies are also not under direct control of central departments. With limited resources, the systems are continuing with inherent gaps as shown in Table 9.4.

9.3.1.3 Farmer Centricity

- The systems of DES and DCA are mainly serving the purpose of providing inputs for planning and decision support. The DMI and NHB systems are expected to fulfil the market information needs of farming community and a diverse set of other stakeholders including government officials. The DMI is particularly striving for establishing the required access linkages for making the market information reach the grassroots.

Table 9.4 Inherent gaps in the four market information systems

Feature	DMI	DES	NHB	DCA
Alignment of system objective with strengthening of agricultural marketing system in the country	✓	✗	✗	✗
Wide network of field offices	✓	✗	✓	✗
Large pool of Economists and Statisticians	✗	✓	✗	✗
Mandatory submission of analytical reports to other Ministries	✗	✓	✗	✓
Thrust on information diffusion to grassroots	✓	✗	✗	✗
Direct reporting by markets through IT based system	✓	✗	✗	✗
Uniformity of variety names, standards and grades of agricultural produce across different markets	✗	✗	✗	✗
Supervisory checks before data transmission to Central Government	✗	✗	✗	✓
Non-response in data reporting by certain markets/centres	✓	✓	✗	✗
Irregularity in data reporting by certain markets/centres	✓	✓	✗	✗
Inconsistency in data reporting by certain markets/centres	✓	✓	✓	✓
Daily Web-based dissemination	✓	✓	✓	✓
Efforts for Dissemination in local languages	✓	✗	✗	✗
Flexibility for widening market network	✓	✗	✗	✗
Flexibility to include more commodities and varieties	✓	✗	✗	✗

Legend ✓ Exists; ✗ Does not Exist

- Out of the four systems discussed here, the AGMARKNET system covers the largest number of commodities and markets. Under the project, 3250 wholesale markets have been networked in a phased manner and sensitized to share data for dissemination purpose. The project is likely to grow further as it has been identified as one of the services in the Agriculture Mission Mode project by the Ministry of Agriculture and Farmers Welfare.

9.3.1.4 Need for Sharable Repositories

- The market information systems being maintained separately by different organizations need to be integrated by building a common database. The difficulties being faced presently in comprehending information from different sources can be easily tackled by building a common database of market information. The expectations from DES, NHB and DCA systems can be easily met if all the four organizations work together for the strengthening of largest of these systems, i.e. AGMARKNET.
- Keeping in view the fast changes in commodity trade flows at the global level, access to a reliable agricultural marketing information system gains significance for farmers, government as well as business community. The committee of State

Ministers to promote reforms in agricultural marketing has also emphasized on regular reporting of quality data by various markets covered under AGMARKNET and further expansion of the network by including Municipality/Panchayat and Private markets (DAC, 2013, p. 29). The IT capabilities developed in various markets spread across India need to be effectively leveraged for AGMARKNET to become a competitive advantage for the country in terms of an authentic market information system.

9.4 Developing Market Information Service by Forming an Inter-organizational Strategic Alliance

The four organizations, viz. DMI, DES, DCA and NHB, should form a strategic alliance and bring out a unified market information service for effectively serving the interest of various stakeholders. The alliance should focus on

- Removing redundancies from processes and developing integrated processes spread across departments.
- Rationalizing organizational structures based on capabilities of different departments.
- Safeguarding strategic autonomies of the involved organizations.
- Creating shared value for the partners and the beneficiaries.
- Harmonizing market information systems of different states.
- Integrating the unified Market Information Service with the common trading platform launched for agricultural commodities.

9.4.1 Role of DMI, DES, NHB and DCA in the Proposed Alliance

In view of the above discussion, an attempt is made here to highlight new roles of alliance partners in the context of Agricultural Marketing Information System as follows:

9.4.1.1 Directorate of Marketing and Inspection (DMI)

Amongst the four organizations discussed here, only the DMI has agriculture marketing-related formal linkages with the SMBs. DMI has been able to use this relationship to coordinate with the autonomous market committees for establishing a unique network for reporting and disseminating daily market information based on the strength of ICT. In view of its official relationship with SMBs, DMI is the

most appropriate candidate for interacting with the state level organizations related to agricultural marketing. Accordingly, in the proposed alliance framework their role with respect to the AMIS should be

- Expanding the network by covering Municipality/Panchayat and private markets with the support of SMBs.
- Arranging for regular up-gradation of IT skills of market personnel and officials of partner organizations with respect to use of various features of AGMARKNET portal.
- Spreading awareness about the market information service among the farming community with the help of SMBs.
- Identifying and encouraging grass root level organizations such as co-operatives for extending the service to the villages.
- Integrating with several other organizations listed in Tables 7.1 and 7.2 of Chap. 7 for content enrichment and expansion.

9.4.1.2 Directorate of Economics and Statistics (DES)

The Directorate of Economics and Statistics is the nodal central agency responsible for agricultural economics and statistics. Its core strength is its ability to conduct economic and statistical analysis of agricultural data and make interpretations there from. Accordingly, its role in the proposed alliance should involve the following:

- Devising standards for data collection and enforcing compliance at the stage of data reporting by actively involving their 12 Marketing Intelligence Units and other statistical agencies in the states.
- Analysing emerging trends in spot and future prices in national and global scenario and bringing out Market Intelligence reports for decision support to government and production and marketing-related advisories for specific commodities for the use of farmers.
- Developing an early warning system for fluctuations in commodity prices caused by demand–supply gaps and identifying other related factors to trigger market intervention by government.

9.4.1.3 National Horticulture Board (NHB) and Department of Consumer Affairs (DCA)

The two organizations have developed a system characterized by mandatory reporting by their field units. Through their field units, these organizations can play a key role in the alliance by keeping a vigil on the quality of data being reported by the markets. Their routine requirements related to market information can be met by the comprehensive repository built with joint efforts of the four organizations.

Figure 9.1 presents the conceptual framework of proposed alliance.

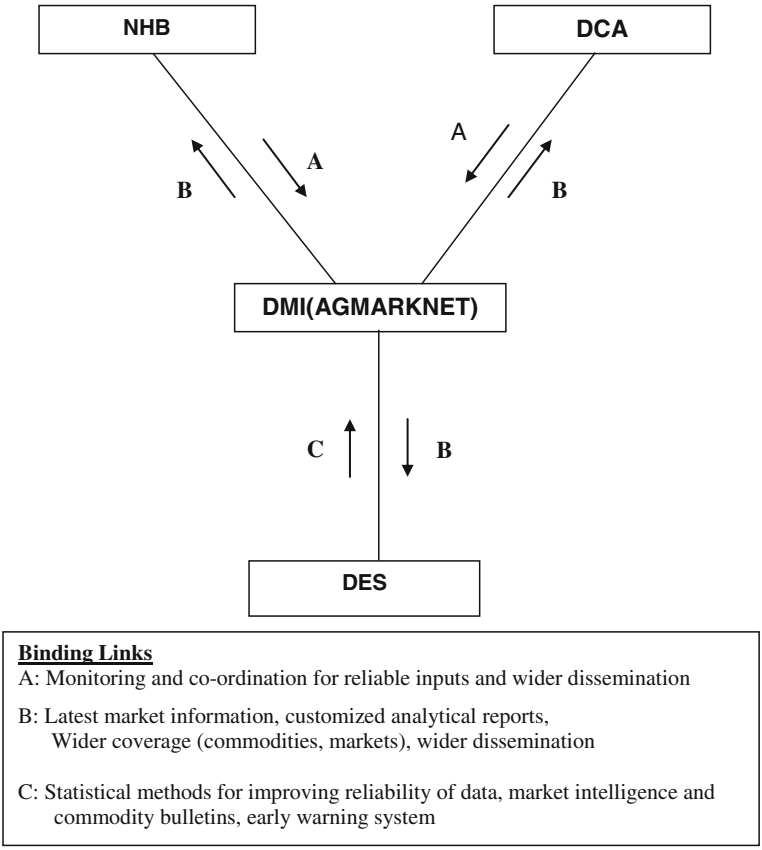

Fig. 9.1 Proposed alliance framework for agricultural marketing information system adapted from Suri and Sushil (2006)

9.4.1.4 Expected Value Creation Through Inter-organizational Alliance

The proposed alliance is expected to create value for individual organizations as well as for the society at large in terms of

- A robust agricultural marketing information system built upon unique strengths of independent departments.
- Well-defined roles of involved organizations making them accountable for respective responsibilities.
- Elimination of repetitive processes at different levels in the partnering organizations leading to improved productivity through redeployment of spare resources.

- Better control of quality of data reported and effective monitoring of data reporting agencies.
- Improved decision support system for government and reliable advisory system for the farming community.
- Improved commodity trade flows leading to better remuneration for the farmers produce and other actors in the supply chain.
- Sustainability of AGMARKNET.

9.4.1.5 Likely Conflicts in Alliance Formation

As is the case with any collaborative arrangement, even though the proposed alliance is expected to benefit all the involved partners, there may be areas of concern which may disturb the relationship built through the alliance. Some of such likely concerns may be

- Apprehensions related to manpower loss due to realignment of structure and process.
- Apprehensions of partnering organizations related to control over the common repository.
- Concerns related to division of powers and accountability.
- Reluctance of staff to assume roles as per redefined responsibilities.
- Issues relate to governance of alliance.

9.4.1.6 A Few Guidelines for Overcoming the Challenges

The aforesaid expected challenges in forming the alliance can be overcome by taking a few simple measures such as follows:

- Market information database to be declared as a shared national repository for the use of all related organizations at centre and state government levels, and public at large.
- Clear distribution of work; each organization to have a specific role as per its core competence.
- Shared ownership of the database.
- Alliance to be managed by an empowered committee with equal representation from each organization.
- Preserving strategic autonomies and departmental reporting structures.
- Clearly stated and commonly acceptable alliance mission, vision, strategic objectives and performance measures.
- Regular addressing of concerns raised by partnering organizations.
- Regular assessment of value accruing to all the stakeholders.

9.5 Concluding Remarks

In the corporate word, collaborations among different companies are commonly practiced for mutual benefit. However, effective partnerships are rarely observed among government organizations especially in the context of e-governance. It has, thus, been attempted to apply the learning from literature review and project execution experience to bring out a strategic alliance-based illustrative framework in the context of agricultural marketing for possible application in government context. The concept of strategic alliances discussed here is relevant for building synergetic relationships across all related departments across different tiers of government. The next chapter brings out strategic recommendations for effective e-governance based on several planning and implementation aspects discussed so far.

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Chapter 10
Effective E-Governance: The Way Forward

10.1 Introduction

An e-governance project is expected to comprehensively deal with the challenges related to change management, procedural reforms including amendment of related legal acts, process reengineering, interoperability, digital divide, cross-organizational content development and management, compliance to standards, use of emerging technologies, value accruing to stakeholders, performance measures, project sustainability, etc. In Indian context, these aspects have been well addressed by various studies commissioned by the government which have come out recommendations for effective e-governance. Some of the key documents which can be referred in this regard include *India as Knowledge Superpower—Strategy for transformation* (Planning Commission 2001), *Reference Compendium for IT Managers and CIOs on E-Governance* of the Department of Administrative Reforms and Public Grievances (DARPG 2003), *Second Administrative Reforms Commission's report on e-governance* (ARC 2008) and *India e-readiness reports* of the National Council of Applied Economics Research (DIT 2003, 2004, 2005, 2006, 2008, 2011). At international level, organizations like United Nations and World Bank have been bringing out survey reports and documents reflecting the progress of e-governance in different countries and showcasing best practices and innovative use of technology benefitting the citizens.

A review of such reports on the subject reveals that the likely hurdles and recommended practices for effective e-governance were well identified even when e-governance was at nascent stage in India. A recent government publication on policy initiatives under Digital India Programme reflects upon the renewed thrust being given on effective implementation of various ongoing MMPs of the erstwhile NeGP which have now been subsumed in e-kranti. The principles which define the framework for e-kranti and its broad implementation approach are brought out in Box 10.1

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Flexible Systems Management, DOI 10.1007/978-981-10-2176-3_10

Box 10.1
Principles of e-Kranti (Source: www.digitalindia.gov.in)
The key principles of e-Kranti are as follows:

i. **Transformation and not Translation**—All project proposals in e-Kranti must involve substantial transformation in the quality, quantity and manner of delivery of services and significant enhancement in productivity and competitiveness.
ii. **Integrated Services and not Individual Services**—A common middleware and integration of the back-end processes and processing systems is required to facilitate integrated service delivery to citizens.
iii. **Government Process Reengineering (GPR)** to be mandatory in every Mission Mode Project (MMP)—To mandate GPR as the essential first step in all new MMPs without which a project may not be sanctioned. The degree of GPR should be assessed and enhanced for the existing MMPs.
iv. **ICT Infrastructure on Demand**—Government departments should be provided with ICT infrastructure, such as connectivity, cloud and mobile platform on demand. In this regard, National Information Infrastructure (NII), which is at an advanced stage of project formulation, would be fast tracked by DeitY.
v. **Cloud by Default**—The flexibility, agility and cost effectiveness offered by cloud technologies would be fully leveraged while designing and hosting applications. Government Cloud shall be the default Cloud for Government Departments. All sensitive information of Government Departments shall be stored in a Government Cloud only. Any Government Department may use a private Cloud only after obtaining permission from Department of Electronics and Information Technology which shall do so after assessing the security and privacy aspects of the proposed Cloud.
vi. **Mobile First**—All applications are designed/redesigned to enable delivery of services through mobile.
vii. **Fast Tracking Approvals**—To establish a fast-track approval mechanism for MMPs, once the Detailed Project Report (DPR) of a project is approved by the Competent Authority, empowered committees may be constituted with delegated powers to take all subsequent decisions.
viii. **Mandating Standards and Protocols**—Use of e-Governance standards and protocols as notified by DeitY be mandated in all e-governance projects.
ix. **Language Localization**—It is imperative that all information and services in e-Governance projects are available in Indian languages as well.

x. **National GIS (Geo-Spatial Information System)**—NGIS to be leveraged as a platform and as a service in e-Governance projects.
xi. **Security and Electronic Data Preservation**—All online applications and e-services to adhere to prescribed security measures including cyber security. The National Cyber Security Policy 2013 notified by DeitY must be followed.

Approach and Methodology for Implementing e-Kranti

The following approach and methodology should be adopted for e-Kranti:

i. Ministries/Departments/States would fully leverage the Common and Support ICT Infrastructure (e.g. GI Cloud, National/State Data Centres, Mobile Seva, State Wide Area Networks, Common Services Centres and Electronic Service Delivery Gateways). DeitY would also evolve/lay down standards and policy guidelines, provide technical and handholding support, undertake capacity building, R&D, etc.
ii. The existing/ongoing MMPs would also be suitably revamped to align them with the principles of e-Kranti. Scope enhancement, Process Reengineering, use of integrated and interoperable systems and deployment of emerging technologies like Cloud and mobile would be undertaken to enhance the delivery of government services to citizens.
iii. States would be given flexibility to identify, for inclusion, additional state-specific projects, which are relevant for their socio-economic needs.
iv. e-Governance would be promoted through a centralized initiative to the extent necessary, to ensure citizen service orientation, interoperability of various e-Governance applications and optimal utilization of ICT infrastructure/resources, while adopting a decentralized implementation model.
v. Successes would be identified and their replication promoted proactively with required customization wherever needed.
vi. Public–private partnerships would be preferred wherever feasible to implement e-Governance projects with adequate management and strategic control.
vii. Adoption of AADHAAR-based ID would be promoted to facilitate identification and delivery of benefits.

Despite the past guidelines available for practitioners or the ones presented in the form of principles defining framework for e-kranti in Box 10.1, projects in India continue to face challenges particularly when it is attempted to roll out successfully completed pilots. In many instances, launching of projects is based on political expediency and not a thoroughly conducted feasibility study. There is hardly any project which can be said to have achieved mature stage of e-governance in India. It is, therefore, unlikely to expect Digital India Programme to bring the aspired

transformation in India which the erstwhile NeGP could not. The need of the hour is to bring out corrective measures for improving performance of projects based on their in-depth analysis from the perspective of key stakeholders. Unfortunately, the practitioners continue to highlight only the achievements made under e-governance initiatives ignoring the need for measuring performance of projects from different viewpoints and sharing the same for better planning and implementation of future projects. As a result, insights based on cross-case analysis of projects from the perspectives of key stakeholders are generally lacking in literature.

In this book, e-governance performance is analysed from the perspectives of three key stakeholders, viz. planners, implementers and beneficiaries spread across select projects in the study context. Further, significant strategic variables which are likely to influence project performance have also been identified. These strategic variables have been interpreted in projects and based on a synthesis of qualitative and quantitative analysis, a strategic framework has been brought out for improving performance of e-governance projects (Chap. 3, Fig. 3.1). This framework, based on cross-case analysis of projects, has been kept into view while bringing out strategic recommendations in this chapter.

10.2 Strategic Recommendations

The recommendations for improving performance from the perspectives of planners, implementers and beneficiaries are presented as follows:

10.2.1 Systems Approach to Plan for E-Governance Project

E-governance projects involve a diverse set of internal and external actors having different viewpoints, expectations and capabilities. The resultant complexities need to be methodically analysed by following a systematic approach while planning for large projects to avoid deadlock like situations during implementation. Program Planning Methodology, proposed by Hill and Warfield (1972), is one such guiding tool which can be used by the departments for formulating a comprehensive plan. As per this approach, emphasis need to be given on adequately addressing the affected societal sectors, assessment of their needs, clearly defined objectives, objective measures, expected constraints during execution, identification of alterables, activities, activity measures and agencies involved. Further, interlinkages among these elements need to be identified for the purpose of defining a realistic scope, prioritizing services and suggesting achievable milestones for the services.

10.2.2 Strengthening Bottom-up Planning Through Emergent Strategy and Village Level Socio-economic Databases

The planning infrastructure at state, district and panchayat levels in India is weak due to which the national planning system continues to be predominantly top driven. E-governance projects which have implications at grassroots, therefore, suffer from a gross mismatch between centrally driven plans and the ground realities. The unsuitability of the conventional top-down planning approach for e-governance projects is reflected in several of the projects losing their path midway and hardly any one reaching the maturity stage in terms of vertical and horizontal integration. Even though the Union Budget 2016 reflects government's intent to develop governance capabilities of Panchayati Raj Institutions, its realization may take considerable time in a large country like India. The evolving nature of e-governance projects ask for replacing the traditional one-time strategic planning approach with the emergent strategy approach (Mintzberg 1994) for the plan to remain relevant and aligned with the changing ground realities. For this, the operational level employees need to be actively involvement in the planning process.

Furthermore, planning needs to be supported by village level socio-economic databases which are generally lacking in under developed and developing countries. A nation-wide effort towards building such databases at district levels in India was made under the District Informatics Network (DISCNIC) programme conceptualized by the National Informatics Centre (NIC) way back in 1986. The programme, which was subsequently discontinued by NIC due to changes in organizational priorities, needs to be revived and its scope expanded to cover village level databases for strengthening government planning and decision support systems.

10.2.3 Designing Flexible Planning Processes

The project plans have to be flexible enough for responding to changing needs of stakeholders and advancements in technology during the course of project implementation. Project plans should thus be subjected to intermediate reviews and procedures involved in modifying an approved project plan need to be simplified. Analyses of existing processes encompassing preparation of project plan, capacity building, content development, content delivery and management of change reflect that these processes are highly inflexible in the present setup. It is, therefore, needed to introduce change mechanisms in the planning processes such as these in order to make them adaptable to changing situations and generate better value for the end users.

10.2.4 Rejuvenating IT Units of Government Departments

Strategic planning for e-governance projects should necessarily be backed by a thorough analysis of internal and external environment. This requires constant vigil on the changing environment through structured deliberations with a diverse set of stakeholders and analysing the emerging trends. In the present setup, the IT divisions created to take e-governance initiatives with the support of existing staff in the government departments, generally lack the required professional competencies to conduct such strategic analysis. These divisions, which usually are not equipped with the required expertise to formulate or critically evaluate e-governance project proposals, do not seem to be capable of managing the complex issues related to implementation of the much ambitious Digital India Programme. It is experienced that for bridging the capability gap, the departments generally resort to hiring services of IT companies without conducting an in-depth research about their larger interests. At times, this approach can lead to conflict of interest in government decision-making process. This serious limitation can be easily overcome by restructuring the IT wing of government, viz. the National Informatics Centre and integrating its sector-specific application divisions with the respective departments on the lines of other cadre services. Professionals with required techno-managerial skills can also be recruited from both academia and industry to further augment the required competencies in various departments.

10.2.5 Accelerating Organizational Learning and Responsiveness

Most e-governance projects are found to be lacking effective control mechanisms as government organizations are not designed to handle massive feedback from the end users. For accelerating organizational learning and responsiveness, it is required to have sound in-house mechanisms for regularly obtaining feedback from internal actors, related external organizations, related projects and beneficiaries and analysing the same for keeping pace with the changing expectations of various stakeholders. The feedback-based learning should also form the basis for bringing agility in the organizations through incremental changes in the associated processes, roles and responsibilities. The up-scaling of projects should necessarily be based on learning from pilot implementations.

10.2.6 Practicing Contact Leadership

Planners need to extensively use innovative means including social media for constantly maintaining contact with implementers and beneficiaries to remain updated with the ground realities. They need to frequently visit field offices and personally

interact with beneficiaries to directly understand the implementation-related issues. Their better perception about changing user needs is expected to sensitize them to take measures for meeting emerging requirements and reducing design–reality gaps.

10.2.7 Monitoring Strategic Effectiveness Based on Governance Reforms

The traditional government system of monitoring performance in terms of physical and financial progress of e-governance projects may not necessarily reflect upon the intended improvement in the governance system. Merely keeping the focus on operational aspects, as is being generally practiced through service level agreements undertaken for outsourced project activities, does not reflect on the progress of a project in terms value accruing to intended beneficiaries. The performance review system of an e-governance project should, therefore, stress upon monitoring of strategic effectiveness of a project from the perspective of bringing reforms in the governance system (e.g. expected accruing of value in terms of efficiency, transparency, interactivity and decision support). The measures for assessing value accruing to stakeholders should be explicitly defined in the project plan in verifiable terms. The project performance should be regularly reviewed against these measures to maintain a synergetic relationship with the stakeholders. Ideally, the performance levels experienced by the beneficiaries should match with the performance levels perceived by the implementers and planners and should also be of high order.

10.2.8 Improving Service Levels Through Learning Loops

Planning for implementation of an e-governance project should be based on iterative enhancements in service levels enabled through learning loops. Service levels should be prioritized by conducting a thorough analysis of associated actor–process interfaces. The dependencies of an intended service on various internal and external actors should be resolved before taking up its automation to avoid deadlock like situations in a project. The approach requires constant dialogue among planners, implementers and beneficiaries throughout the project life cycle.

10.2.9 Forming Strategic Alliances for Effective E-Governance

The federal system of government as being practiced in India adds to the complexities associated with e-governance projects. To avoid redundant efforts and wastage of

scare resources, e-governance projects need to be jointly owned by all the related organizations at the centre and state government levels. This can be achieved by forming strategic alliances among the involved organizations while planning for a project. The structure of such an alliance should be based on capabilities of the respective organizations for generating better value for the target beneficiaries and the partners involved. The databases built through joint efforts should be recognized as national assets and its sharable contents be made accessible to the end users.

Furthermore, government resources alone are not adequate enough to connect with the large rural base in countries like India. The scope of strategic alliances should, therefore, be expanded by partnering with trustworthy companies, NGOs, Self Help Groups, Co-operatives, etc.

10.2.10 Ensuring Strategic Coherence Among Planners and Implementers

Committed involvement of implementers is essential for the success of any e-governance project. Planners and implementers have, therefore, to function as a cohesive unit towards the same strategic direction. Strategic coherence among planners and implementers can be achieved by infusing a shared vision and mission among the officials working at different layers of the involved organizations. For this, operational level officials need to be involved in the planning of e-governance projects. They need to be encouraged to document and escalate shortcomings experienced during implementation. Implementers need to be empowered to deviate from approved procedures for meeting emerging requirements and provided with adequate resources for effective implementation of strategy.

10.2.11 Bridging Planners–Beneficiaries Gaps

Implementers work closer to beneficiaries as compared to planners. They need to play a critical role by remaining in touch with beneficiaries, understanding changing user needs, providing regular feedback about ground realities and pursuing with planners for taking corrective measure. This is expected to trigger timely interventions by planners as per emergent service delivery-related issues at grassroots thereby bridging the generally prevailing perception gaps among planners and beneficiaries.

10.2.12 Shared Ownership of E-Governance Services

Implementers can play a key role in localization of e-governance service offerings. For ensuring their shared ownership of the services offered, the implementers need

to be adequately sensitized about their changed role as service providers. They need to be equipped with knowledge of IT tools and analytical skills for developing better insights about project progress in terms of adoption of e-governance services by the target beneficiaries.

10.2.13 Incentivizing Implementers for Local Initiatives

Implementers need to be incentivized and empowered to involve other stakeholders during execution to extend the concept of shared ownership beyond the organizational limits. Better understanding of the stakeholders' expectations and operational constraints shall prompt implementers to take local initiatives for project strengthening through an innovative mix of conventional methods and IT-based solutions.

10.2.14 Ensuring Adoption of E-Governance Services

A number of e-governance services continue to remain underutilized due to beneficiaries' continued preference for the conventional systems. For e-governance services to be effective, beneficiaries need to be attracted to the novel methods of service delivery. This can be achieved by facilitating their smooth access to services through a mix of conventional means and digital technology-driven alternate delivery channels. The design of service interfaces should be based on usability attributes such as learnability of target users, their speed of operations, recoverability from user errors and localization of contents besides improving their trust on services by ensuring reliable and secured transactions, maintaining privacy, etc.

10.2.15 Enabling Implementers and Beneficiaries for Participatory Governance and Demand-Driven Services

E-governance service interfaces get stabilized with increased user participation. To ensure that the services are demand driven, the capability building programmes need to focus on improving implementers' and beneficiaries' ability to make use of the service features. For customized service offerings and participatory governance, beneficiaries need to be sensitized and enabled to regularly provide feedback for improving services as per their needs. On government's part, beneficiaries need to be mandatorily informed about the action taken on feedback to build their confidence on e-governance systems. Skills and receptiveness of government officials and beneficiaries pose a major challenge in the transformation expected from e-governance.

Keeping in view the low literacy levels, supporting infrastructure on the lines of common service centres has to be established at village level and large-scale capability building programmes organized for bringing the citizens at grassroots to the mainstream. A focused thrust on establishing beneficiaries level feedback loops by various departments is also expected to facilitate effective utilization of web-based grievance redressal systems being implemented at centre and state government levels. Further, the capability building programmes of different projects need to be constantly fine-tuned based on their regular assessment through independent surveys.

10.2.16 Strengthening the National Informatics Centre

It is pertinent to underline here that National Informatics Centre has been the harbinger of IT in the government sector in India. Since its establishment in 1976, this prestigious national organization has been striving hard to network India, despite several constraints. Over the years, NIC has closely worked with various government organizations at centre, state and district levels on various projects and developed a rich knowledge base in different sectors by experiencing both successes and failures. Therefore, it is important to reiterate here that the potential of this pioneering national enterprise needs to fully exploited by effectively leveraging its ICT infrastructure and knowledge base for the success of 'Digital India Programme'.

10.3 Concluding Remarks

In this chapter, recommendations for improving project performance have been brought out from the viewpoints of planners, implementers and beneficiaries which are the key stakeholders in a typical e-governance project. The recommendations are based on an in-depth strategic analysis of projects identified for the study. It is expected that these recommendations based on cross-case analysis of projects in India shall be useful for effective implementation of the ongoing projects and better planning and implementation of future projects not only in India but also in other developing countries, keeping in view the experience gained by India.

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Appendix A

A.1 Evaluation Summary of A Few Popular E-Governance Projects in India

(a) Project Profiles

Project	Purpose/core service	Geographical coverage	Benefits/performance features
AKSHYA	Networked Multi-purpose Community Information Centres to provide ICT access for promoting e-literacy	All districts of Kerala	Comprehensive contents relevant to locals Faster discharge of government service
BHOOMI	Computerization of land records for facilitating online delivery of land titles to farmers	177 sub-district offices in Karnataka	Hassle-free accessibility and faster delivery of authenticated land titles to farmers; faster processing of their farm credit applications by banks Application status monitoring facility for farmers; Better monitoring and control of land encroachments; Planning and decision support to administrators and financial institutions; decision support to courts
CARD	Property registration	214 sub-registrar offices across the state of Andhra Pradesh	Speedy, transparent, easily accessible and reliable land registration services to citizens Public pressure on government to improve services in other areas in similar fashion
e-Procurement exchange	Reforming the tendering process to improve procurement process in government departments using IT tools	Government departments in Andhra Pradesh	Transparency in procurement process. Speedier, simplified and less-subjective bid evaluation process 20 % reduction in procurement transactions

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Flexible Systems Management, DOI 10.1007/978-981-10-2176-3

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Project	Purpose/core service	Geographical coverage	Benefits/performance features
			Elimination of conventional paper bid method of procurement Improvement in monitoring and reviewing of public procurement across departments Improved decision-making. Standardization of procurement process across departments Elimination of contractor cartels Single source for suppliers to keep track of tenders called by various departments Increase in number of bids implying greater involvement of supplier community
e-Seva	Integrated multi-departmental government services such as utility bills, birth/death/caste certificates, permits/licenses, vehicle registration, etc.	46 centres with 400 service counters spread over the cities of Hyderabad, Secundrabad and Ranga Reddy district (Andhra Pradesh)	Single-window service Less paper office Faster service delivery Saving of cost and time Transparency in government operations
FRIENDS	To provide a one-stop centre to citizens for payment of various taxes and utility bills to different government departments	All the 14 districts of Kerala State	Single-window service for taxes and utility bills payment Time and cost savings for citizens Transparency in government functioning Improved interactions with government Enhanced revenues to government
GYANDOOT	Agriculture produce auction centres rates, Land records, online application registration for income/cast/domicile/complaints, etc. certificates, village auction sites, general information about rural development schemes	Villages of Dhar District of Madhya Pradesh	Saving of cost and time in filing complaints or submitting applications to District Headquarters Faster processing of requests Access to market prices leading to better decision-making by farmers while selling their produce
KAVERI	Property registration; registration of firms, societies and marriages	Sub-registrar offices across the state of Karnataka	Comprehensive, reliable, transparent, efficient and friendly property registration service Less paper office Reduction in transaction costs. Effective monitoring and decision support

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Project	Purpose/core service	Geographical coverage	Benefits/performance features
Lokvani	Transparent, accountable and responsive administration for grievance handling, land records maintenance and services like birth, death, income and domicile certificates	Sitapur, Uttar Pradesh	Transparency and efficiency in functioning of district collectorate (faster disposal of applications) Interactive interface for citizens Citizens can monitor the progress of their grievance Facilitates monitoring of performance of various departments by the District Magistrate
Nagarpalika	General administration, certification/licensing, taxation, accounts, solid waste management, complaint redressal for services like water supply and street lighting	Initially implemented in Vejalpur Municipality in Gujarat; subsequently replicated in 116 municipalities of the state	Simplified tax collection system (Revenue shot up to Rs 3 crore from an average Rs 85 lakh in the preceding 3 years Direct issuing of shop licenses without depending on middlemen Faster delivery of services Reliable service Cost saving in terms of reduced requirement of manpower, lesser use of paper-based transactions. Effective control of solid waste management transportation Effective monitoring of citizens' complaints

Source (DIT 2003, pp. 32–57, 2004, pp. 30–64, 2005, pp. 37–75; Bhatnagar 2004, pp. 95–136; ARC 2008)
Note Also see Chaps. 1, 2, 4, 5, 6, 7 and 8 for important e-governnace projects in India

(b) Challenges and Success Factors

Project	Challenges overcome	Success factors	Sustainability requirements/ evaluation remarks
AKSHYA	Building entrepreneurial capacity to run commercially viable IT centres in rural areas	Involvement of Panchayats in project implementation Service accessibility to households within 2 Kms Ensuring availability of basic infrastructure (power, telephone) while identifying locations of service centres Thrust on developing competence of actual users to enable use of IT by them Development of contents of local relevance in local language	Major hurdle in sustainability of AKSHYA centres has been the conflict between achievement of twin goals of social development and financial viability. Before scaling up, the sustainability issue needs to be adequately addressed

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Project	Challenges overcome	Success factors	Sustainability requirements/ evaluation remarks
		Financial support by State Government to private partners	
BHOOMI	Poor up-keep of land records at field level Lack of uniformity in maintenance of land records (data heterogeneity) across the state Resistance of field level functionaries for fear of loosing authority	Redefining of roles and responsibilities of existing manpower Change in procedures Intensive training at various levels to develop required skills and bring about attitudinal changes Involvement of political leaders Involvement of field units as well as senior officers in application design, development and improvement Roll out in a phased manner based on learning from pilots System permits multiple copies of land record, application status tracking through touch screens and can accommodate change in land ownership Discarding of manual system as soon as the computerized system became operational	Database to be made exhaustive by including land records prior to the present cut-off year of 1999 Strict supervision required at field level to check errant behaviour of operators Over-dependence on proprietary software to be dealt with Access to service need to be provided at village level to cut down travel cost of villagers. Provision need to be made for web based feedback system
CARD	Data entry in respect of basic property valuation and encumbrance certificate data for last 15 years Development of a complex application and making it operational at 212 locations Low level of IT operational skills of employees	Assessment of deficiencies in existing system A clear cut plan to target a service having large citizen interface and generating high revenue BPR in the form of amendment of national registration act 1908 so as to permit registration using electronic devices Effective change management (Leaving elimination of middlemen to market forces without confronting them directly; using surplus staff for other activities instead of resorting to downsizing) Upgradation of skills of employees on an ongoing basis Grooming of a core team as technical resource persons. The team members were free	Transactional efficiency achieved but intermediaries could not be eliminated A transaction-based fee structure has been introduced to support the project

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Project	Challenges overcome	Success factors	Sustainability requirements/ evaluation remarks
		to contact Head of Department to resolve implementation issues A series of sensitization workshops across the districts Extensive field visits by Head of Department and his participation in sensitization workshops Involvement of field units as well as senior officers in business process re-engineering, application design and development Application based on local language Campaigns to educate public about the benefits	
e-Procurement exchange	Ensuring inter-departmental co-ordination for streamlining different procurement procedures across departments Slow adoption of the system in the initial stage Identifying a sustainable business model	Recognition of internal strengths and weaknesses; Taking advantage of the IT Act 2000 (which provided legal recognition to electronic records) to reap the benefits of IT for providing good governance Involvement of stakeholders in the study of existing system and designing of proposed system Effective change management for re-engineering processes and evolving a uniform procurement procedure across departments Redefining of roles and responsibilities Ensuring benefits to stakeholders and secured transaction Phased implementation across departments as per mutually agreed timelines Helpdesk to record and address issues and concerns of stakeholders Training workshops for stakeholders Commitment of involved actors	The initiative sustains without government budgetary support

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Project	Challenges overcome	Success factors	Sustainability requirements/ evaluation remarks
e-Seva	Initial resistance from vested groups-government officials and middlemen	Political and bureaucratic support Public demand Phased rollout based on learning Re-engineering of processes across departments Inter-departmental co-ordination	Sustainable PPP model in urban setting Technological and financial sustainability in rural settings yet to be tested Skills of government officials to be enhanced to reduce dependence on private operator
FRIENDS	Departmental silos operating under different rules and procedures Resistance of departments for fear of loosing authority Building a team of service-oriented officer	Study of operating environment of various government departments by the Administrative Reforms Committee Thorough assessment of needs Realistic initial scope Citizens treated as customers Training of service officers with thrust on service orientation and operational skills upgradation Motivated manpower with better service conditions Involvement of top leadership	Maintaining continuity of employees' enthusiasm for quality service Backend computerization and web enabling Wider coverage and service range Self-support
GYANDOOT	Serving people in tribal area who have poor access to government functionaries Bringing together departments at backend to collectively address citizens' concerns	Assessment of problems faced by villagers and their needs Involvement of District Collector (project champion) Realistic initial scope Feedback mechanism through kiosk operators Regular progress reviews of different serving departments by the then District Collector Motivation of kiosk operator through regular contact/training, incentives and appreciation	Project driven by effective leadership Power and connectivity issues at grassroots Backend computerization and web enabling
KAVERI	Not mentioned	Assessment of previous attempts of computerization, study of successful model of the Maharashtra and improving upon it before replication Process re-engineering Involvement of staff Well-defined roles of pubic and private partners Ensuring usage of service even by computer illiterate persons	Service delivery is improved in terms of time but corruption involved in property registration continues

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Project	Challenges overcome	Success factors	Sustainability requirements/ evaluation remarks
Lokvani	Resistance to change by government officials Negligible computer literacy in the district Poor power supply and Internet connectivity	Locally designed software which was developed incrementally as per people's requirement Contents in local language Easy access to government service through Lokvani centres Sense of ownership by kiosk operators Intensive engagement of citizens Feedback system	More kiosk based services required for ensuring sustainability of the project running in PPP mode
Nagarpalika	Non co-operative and indifferent attitude of municipal staff	Assessment of prevailing deficiencies in the manual system and recognizing the opportunities offered by ICT to overcome these Contents in local language Easy accessibility to service Improving IT competence of existing employees Exemplary teamwork	The project has been evaluated as sustainable

Source (DIT 2003, pp. 32–57, 2004, DIT, 2005, pp. 37–75, pp. 30–64; Bhatnagar, 2004, pp. 95–136; ARC 2008)
Note Also see Chaps. 1, 2, 4, 5, 6, 7 and 8 for important e-governnace projects in India

Appendix B

B.1 Questionnaires and Mean Values

(a) Q1—Questionnaire for Planners

S. No.	Aspect	N	Mean value
P1	*Extent to which the following aspects are covered in the plan scheme/project plan*		
P1.1	Affected societal sectors	36	0.708
P1.2	Needs assessment of affected societal sectors	36	0.632
P1.3	Constraints/Bottlenecks involved	36	0.535
P1.4	Identification of alterables (e.g. alternate solutions)	36	0.403
P1.5	Objectives	36	0.799
P1.6	Objective measures (Metrics/yardsticks for measuring objectives)	36	0.528
P1.7	Activities involved	36	0.757
P1.8	Activity measures (Metrics/yardsticks for measuring activities)	36	0.528
P1.9	Agencies involved	36	0.750
P2[a]	Extent to which key stakeholders were involved at the planning stage of the project	36	0.522
P3	Extent to which IT project/scheme EFC/SFC memo is service oriented i.e. it defines timelines for progressively introducing more services for beneficiaries	36	0.569
P4	Extent to which IT project/scheme EFC/SFC memo is modifiable once it is approved by apex bodies	36	0.424
P5	In your opinion to what extent clarity about IT projects develop as the project progresses	36	0.778
P6	Extent to which your organization's planning framework is flexible enough to meet the emerging requirements/expectations (which are other than approved plan components)	36	0.549
SF1	Extent to which SWOT like analysis is conducted before finalizing the project strategy	35	0.421
SF2[a]	Extent to which key stakeholders were involved for formulating strategy before taking up implementation	36	0.544
SF3.1	Extent to which project mission/vision/goals are decided by Senior officers at Hqrs	36	0.854

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S. No.	Aspect	N	Mean value
SF3.2	Extent to which operational level staff/field offices are involved in defining project mission/vision/goals	36	0.368
SF3.3	Extent to which other stakeholders not belonging to your organization are involved in defining project mission/vision/goals	36	0.313
SF4	Extent to which there is clarity in the project plan about benefits accruing to different stakeholders mentioned in SF2	36	0.632
SF4.1	Extent to which measures for assessing these benefits are reflected in project objectives	36	0.451
SF5	Extent to which existing processes are re-engineered before taking up computerization	36	0.424
SF6	Extent to which role and responsibilities have been re-defined for better execution of project	36	0.514
SF7	Extent to which expected changes in user needs are projected over time	36	0.500
SF8	*Extent to which provision is made for regular interaction with following for obtaining feedback*		
SF8.1	Internal actors (Hqrs and field offices/operational level staff)	36	0.660
SF8.2	External actors belonging to other related organizations	36	0.410
SF8.3	Beneficiaries	36	0.417
1.	Extent to which you are aware of *project* mission/purpose	36	0.882
2.	Extent to which you are aware of *project* vision/roadmap	36	0.875
3.1	Extent to which you have access to computers	36	0.910
3.2	Extent to which you have access to Internet	36	0.917
3.3	*Extent to which you are using computers for*		
3.3.1	e-mail	36	0.924
3.3.2	Internet browsing	36	0.896
3.3.3	Word processing	35	0.857
3.3.4	Data analysis	36	0.597
3.3.5	Improving your efficiency/productivity	36	0.806
3.3.6	Interacting with government	36	0.750
3.3.7	Interacting with industry	36	0.563
4.	*Extent to which*		
4.1	You are familiar with various features/contents of the *(project) website*	36	0.917
4.2	You are able to use various features of this site	36	0.868
4.3	You have smooth/uninterrupted access to the above site	36	0.910
5.	*Extent to which the site (site/project name)*		
5.1	Helps in getting faster access to (−)	36	0.813
5.2	Has simplified the procedure to access (−)	36	0.708
5.3	Has helped me by reducing dependence on printed material/correspondence (−)	36	0.688
5.4	Has helped in reducing communication cost (−)	36	0.715
5.5	Provides (−) information which is reliable	36	0.722
5.6	Meets (−) information requirements	36	0.715
5.7	Helps in getting easy access to (−)	36	0.785

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S. No.	Aspect	N	Mean value
5.8	Has helped in ensuring fairness (−)	36	0.715
5.9	*Helps in interacting with following on* (−)		
5.9.1	Internal actors(Hqrs and field offices/operational level staff)	35	0.679
5.9.2	External actors belonging to other related organizations	36	0.549
5.9.3	Beneficiaries 11	36	0.611
5.10	Helps in (−) planning and decision-making	36	0.653
5.11	Helps in monitoring and control (−)	36	0.611
5.12	The project has facilitated your normally assigned work (i.e. your basic activities)	36	0.639
5.13	Extent to which the project can be considered successful	36	0.729
5.14	Extent to which expectations/needs of users(beneficiaries) from this project are changing	36	0.785
5.15	*Extent to which you receive feedback from the following for improving (project name)*		
5.15.1	Internal actors (Hqrs and field offices/operational level staff)	36	0.611
5.15.2	External actors belonging to other related organizations	36	0.396
5.15.3	Beneficiaries	36	0.444
5.16	Extent to which Hqrs is able to act on such feedback for improving the service	36	0.576
5.17	Extent to which you provide feedback to related e-governance initiatives of other Centre/State Govt. departments	36	0.382
5.18	Extent to which other Dept's act on your feedback	36	0.319
6.1	Extent to which you are able to be in direct touch with field/operational level officers	36	0.660
6.1.2	Extent to which you are able to be in direct touch with beneficiaries	36	0.528
6.2[b]	Awareness about other agriculture-related projects	36	0.635
6.2.1	Awareness about National e-governance Plan	36	0.576
6.2.2	Awareness about IT vision of Ministry of Agriculture	36	0.618

[a]Respondents were asked about involvement of stakeholders as per project context. Project-wise list of key stakeholders along with mean values are shown in Appendix B(e)
(−)Project-specific qualifiers shown in Appendix B(d)
[b]In each case, respondents were asked about their awareness level about each of the other five projects identified for the study. For example, respondents pertaining to AGMARKNET project were asked about their awareness level about KCC, DACNET, Grapenet, CROP and IFMIS projects

Flexibility of Processes
(Please assign a score towards the options applicable to this project)
Ex.: In F1, if project plan preparation is a one-time process-assign score 1; if it is dynamic process i.e. the plan is changeable-assign score 5; If it is towards a dynamic process but not strictly a dynamic process-assign score 4; if it is more towards a one-time activity-assign score 2; If it is in between the two extremes-assign score 3.

	Process	Option	1	2	3	4	5	Option
F1.	Preparation of project plan/EFC/SFC memo	One-time process in a plan period						Dynamic process (Changeable)
F2.	Capacity building	One-time activity						Provision for continuous learning
F3.	Content development	Department's own perception						Based on regular feedback of stakeholders mentioned in SF1
F4.	Content delivery	Confined to project-specific database (without collaborating with other related projects)						Based on inter-organizational collaboration at centre/state level (integrated databases within and across related organizations)
F5.	Management of change	Application of IT without undertaking any restructuring/process re-engineering						Restructuring of existing organizational framework/re-engineering of processes to support e-governance

Aspect		N	S	M	L	VL
Preparation of project plan/EFC/SFC memo						
F1.1	Extent to which it is easy to change an approved plan (EFC/SFC memo) in the present planning framework					
F1.2	To what extent the present planning framework is able to cater to emerging requirements which were not conceived while planning(at the time of preparation of project plan/EFC/SFC memo)					
Capacity building						
F2.1	To what extent employees are given incentives/encouraged for upgrading their IT skills					
F2.2	To what extent employees are in position to make best use of ICT infrastructure					
Content development						
F3.1	To what extent the present set-up is equipped to develop customizing contents based on regular feedback from customers (citizens)					
F3.2	To what extent the present website/service is able to deliver information as per specific demands/needs of different users					
Content delivery						
F4.1	To what extent the established government system facilitate integration of databases across related departments at centre/state government level					
F4.2	To what extent the present Government system is able to provide domain specific unified service to citizens independent of departments at centre/state government level					

(continued)

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Aspect		N	S	M	L	VL
Management of change						
F5.1	To what extent the existing Government system at centre/state government level is suitable to support e-governance					
F5.2	To what extent the present Government system ensures reaching of e-governance benefits to the grassroots					

N Nil, *S* To a small extent, *M* To a medium extent, *L* To a large extent, *VL* To a very large extent

Observed Mean Values

Process	Extent of			
	Options	Change mechanisms	Adaptability to situation	Flexibility
Preparation of project plan/EFC/SFC memo	0.285	0.292	0.410	0.329
Content development	0.778	0.375	0.542	0.565
Content delivery	0.493	0.549	0.563	0.535
Management of change	0.465	0.396	0.368	0.410
Content development	0.431	0.472	0.465	0.456
Mean	0.490	0.417	0.470	0.459

(b) Q2—Questionnaire for Implementers

S. No.	Aspect	N	Mean value
1.	Extent to which you are aware of *project* mission/purpose	107	0.724
2.	Extent to which you are aware of *project* vision/roadmap	107	0.612
3.1	Extent to which you have access to computers	107	0.696
3.2	Extent to which you have access to Internet	107	0.666
3.3	*Extent to which you are using computers for*		
3.3.1	e-mail	107	0.661
3.3.2	Internet browsing	106	0.644
3.3.3	Word processing	106	0.620
3.3.4	Data analysis	106	0.488
3.3.5	Improving your efficiency/productivity	100	0.610
3.3.6	Interacting with government	107	0.516
3.3.7	Interacting with industry	102	0.397
4.	*Extent to which*		
4.1	You are familiar with various features/contents of the *(project) website*	107	0.694
4.2	You are able to use various features of this site	107	0.636
4.3	You have smooth/uninterrupted access to the above site	107	0.645
5.	*Extent to which the site (site/project name)*		
5.1	Helps in getting faster access to (−)	106	0.667

(continued)

(continued)

S. No.	Aspect	N	Mean value
5.2	Has simplified the procedure to access (−)	105	0.610
5.3	Has helped me by reducing dependence on printed material/correspondence(−)	107	0.607
5.4	Has helped in reducing communication cost (−)	106	0.639
5.5	Provides (−) information which is reliable	104	0.644
5.6	Meets (−) information requirements	107	0.633
5.7	Helps in getting easy access to (−)	107	0.659
5.8	Has helped in ensuring fairness (−)	107	0.610
5.9	*Helps in interacting with following on* (−)		
5.9.1	Internal actors(Hqrs and field offices/operational level staff)	105	0.476
5.9.2	External actors belonging to other related organizations	105	0.464
5.9.3	Beneficiaries	105	0.476
5.10	Helps in (−) planning and decision-making	105	0.548
5.11	Helps in monitoring and control (−)	105	0.564
5.12	The project has facilitated your normally assigned work (i.e. your basic activities)	104	0.464
5.13	Extent to which the project can be considered successful	106	0.611
5.14	Extent to which expectations/needs of users (beneficiaries) from this project are changing	107	0.558
5.15	Extent to which you provide feedback for improving this service	107	0.491
5.15.1	Extent to which Hqrs act on your feedback for improving the service	107	0.472
5.16	Extent to which you provide feedback to related e-governance initiatives of other Centre/State Govt. departments	104	0.344
5.17	Extent to which other Dept's act on your feedback	104	0.281
6[a].	Extent to which key stakeholders were involved at the implementation stage of the project	107	0.543
7.	*Extent to which*		
7.1	You were involved at the planning stage of this project	107	0.346
7.2	There is clarity of directions from Hqrs	107	0.509
7.3	Progress of project is reviewed by seniors	107	0.558
7.4	Field offices are encouraged to point out shortcomings in the plan/strategy	106	0.439
7.5	Powers are delegated at implementation level to meet emerging requirements at ground level	106	0.408
7.6	Field offices have the flexibility to deviate from approved scheme framework to meet emerging requirements	105	0.264
7.7	Manpower allocated to your office is adequate to organize implementation as per your ideas/thinking	106	0.311
7.8	Budget allocated to your office is adequate to organize implementation as per your ideas/thinking	102	0.417
7.9	Project action plan defines timelines for progressively introducing more services (for beneficiaries/users)	95	0.416
7.10	Targets set are met to your satisfaction within the allocated time and budget	104	0.476
7.11	Officials at Hqrs are putting extra efforts towards this project	106	0.524

(continued)

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S. No.	Aspect	N	Mean value
7.12	Officials at field level are putting extra efforts towards this project	104	0.510
7.13	Vendors related to hardware and software are providing satisfactory support	105	0.462
7.14	There is provision for skill upgradation of field office employees as per needs	107	0.442
7.15	Your better performance is appreciated by upper management in terms of rewards/other benefits	106	0.295
7.16	You are able to maintain direct touch with beneficiaries	107	0.402
8[b].	Awareness about other agriculture-related projects	103	0.394
8.1	Awareness about National e-governance Plan	96	0.367
8.2	Awareness about IT vision of Ministry of Agriculture	99	0.386

(−)Project-specific qualifiers shown in Appendix B(d)

[a]Respondents were asked about involvement of stakeholders as per project context. Project-wise list of key stakeholders along with mean values are shown in Appendix B(e)

[b]In each case, respondents were asked about their awareness level about each of the other five projects identified for the study. For example, respondents pertaining to AGMARKNET project were asked about their awareness level about KCC, DACNET, Grapenet, CROP and IFMIS projects

(c) Q3—Questionnaire for Beneficiaries

	Aspect	N	Mean value
1.	Extent to which you have access to computers	139	0.570
2.	Extent to which you have access to Internet	138	0.551
3.	*Extent to which*		
3.1	You are familiar with various features/contents of the *(project) website*	139	0.565
3.2	You are able to use various features of this site	138	0.551
3.3	You have smooth/un-interrupted access to the above site	139	0.498
	Extent to which the service (site/project name)		
3.4	Helps in getting faster access to (−)	139	0.495
3.5	Has simplified the procedure to access (−)	139	0.513
3.6	Has helped me by reducing dependence on printed material/correspondence(−)	139	0.495
3.7	Has helped in reducing communication cost (−)	139	0.527
3.8	Provides (−) information which is reliable	139	0.568
3.9	Meets (−) information requirements	139	0.574
3.10	Helps in getting easy access to (−)	138	0.585
3.11	Has helped in ensuring fairness (−)	139	0.518
3.12	Helps in interacting with government (Centre/State) on (−):	136	0.439
3.13	Helps in (−) planning and decision-making	139	0.450
3.14	Helps in monitoring and control (−)	138	0.466
3.15	Extent to which you are satisfied/service is beneficial to you	127	0.614
3.16	Extent to which you provide feedback on project to the government	139	0.379

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	Aspect	N	Mean value
3.17	Extent to which government acts on your feedback for improving the service	139	0.322
4[a].	Awareness about other agriculture related websites	138	0.224
4.1	Awareness about National e-governance Plan	137	0.215
4.2	Awareness about IT vision of Ministry of Agriculture	136	0.221

(−)Project-specific qualifiers shown in Appendix B(d)

[a]In each case, respondents were asked about their awareness level about each of the other five projects identified for the study. For example, respondents pertaining to AGMARKNET project were asked about their awareness level about KCC, DACNET, Grapenet, CROP and IFMIS projects

(d) Project-specific qualifiers for performance

S. No.	AGMARKNET	KCC
1.	*country-wide market information*	*agricultural related information*
2.	*market information*	*to get answers to agriculture related queries*
3.	*for seeking agricultural marketing related information from government agencies*	*for seeking agriculture related information from government agencies*
4.	*for accessing market information*	*for accessing agriculture related information*
5.	*commodity arrivals and prices*	*Agriculture*
6.	*agriculture marketing related*	*agriculture related requirements of information seekers*
7.	*market-wise information*	*agriculture related information*
8.	*by providing unbiased/unmanipulated market information*	*by removing bottlenecks in seeking of agriculture related advice from government*
9.	*agricultural marketing related matters*	*agriculture related matters*
10.	*agricultural marketing related*	*agricultural related planning and decision-making at the level of citizens/government*
11.	*over market situation (arrivals and prices)*	*different developmental schemes in agriculture*
	DACNET	GRAPENET
1.	*information exchange with Hqrs/other DAC offices/divisions*	*country-wide grading activities*
2.	*execution of routine tasks*	*for issue of CAG/Phytosanitary Certificate*
3.	*has helped in reducing paper work*	*for issue of CAG/Phytosanitary Certificate*
4.	*seeking information*	*for implementing grapes certification programme*
5.	*on agriculture*	*grapes consignments inspected by approved labs/issue of CAG*
6.	*agriculture related*	*requirements for issue of CAG/issue of Phytosanitary Certificate*
7.	*agriculture-related information pertaining to other divisions*	*approved labs reports/CAG*

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S. No.	AGMARKNET	KCC
8.	*office circulars/notifications/opportunities/new initiatives*	*by providing transparency and cutting down delay*
9.	*agriculture-related matters*	*grapes certification related matter*
10.	*related to work assigned to you*	*QC related*
11.	*agriculture schemes and taking corrective measures*	*over issue of CAG/Phytosanitary certificate*
	CROP	IFMIS
1.	*registration application*	*preparation of monthly movement plan/faster processing of financial claims related to subsidy, freights, etc.*
2.	*has helped in simplifying procedures*	*industry–government co-ordination*
3.	*has helped in reducing paper work*	*reducing paper work*
4.	*pesticides-related information*	*reducing communication cost*
5.	*pesticides related*	*fertilizers-related matters*
6.	*pesticides related*	*fertilizers-related information requirements*
7.	*application status/pesticides norms information*	*monthly movement plan*
8.	*in handling of applications by the government*	*in co-ordination between industry and government*
9.	*pesticides-related matters*	*fertilizers-related matter*
10.	*pesticides related*	*fertilizers related*
11.	*of pesticides availability*	*fertilizers production and distribution*

Note The performance questions are appropriated and qualified, wherever required, using above phrases specific to the context of respective projects. In the respective questionnaires, care has been taken by forming the sentences properly

(e) Involvement of Stakeholders in Planning, Strategy formulation and Strategy Implementation

Stakeholders	Involvement in		
	Planning	Strategy formulation	Strategy implementation
AGMARKNET			
Markets	0.375	0.542	0.671
State Marketing Boards/Directorates	0.458	0.583	0.779
DMI Hqrs Divisional Heads	0.875	0.792	0.721
Other related DAC Divisions/Govt. Deptts.	0.625	0.500	0.500
DMI field offices	0.583	0.708	0.603
ICT experts	0.792	0.875	0.654
Other Stakeholders (Commodity Directorates, Commodity Boards, Exporters, Traders, Processors, Banks, Research Insts., Extension Workers, Farmers representatives etc.)	0.292	0.458	0.379

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Stakeholders	Involvement in		
	Planning	Strategy formulation	Strategy implementation
KCC			
DAC Hqrs Divisional Heads	0.708	0.625	0.545
DAC Hqrs operational level employees	0.625	0.500	0.500
DAC Directorates	0.667	0.583	0.727
Service providers e.g., Call Centre Operators	0.333	0.375	0.705
ICT experts	0.583	0.625	0.523
Extension workers	0.250	0.292	0.364
State Agricultural Departments	0.458	0.417	0.455
ICAR	0.292	0.250	0.341
Agricultural Universities	0.500	0.458	0.545
Krishi Vigyan Kendrass	0.250	0.200	0.341
Other stakeholders (Commodity directorates, Commodity boards, Exporters, Traders, Processors, Banks, Farmers representatives …)	0.375	0.292	0.523
DACNET			
DAC Hqrs Divisional Heads	0.469	0.844	0.530
DAC Hqrs operational level employees	0.344	0.375	0.462
DAC Directorates	0.531	0.656	0.545
DAC field offices	0.375	0.406	0.561
ICT experts	0.844	0.781	0.523
Other related Govt. Departments	0.156	0.156	0.281
GRAPENET			
PSC authorities (Hqrs level)	0.600	0.650	0.694
PSC authorities (field level)	0.500	0.500	0.583
State Horticulture Depts.	0.600	0.600	0.611
DMI Hqrs	0.550	0.550	0.583
National Research Centre on Grapes, Pune	0.850	0.900	0.778
APEDA (Hqrs)	0.450	0.500	0.611
APEDA (Field offices)	0.400	0.550	0.625
DMI field offices	0.900	0.900	0.750
ICT experts	0.850	0.850	0.556
Exporters	0.650	0.700	0.611
Approved laboratories	0.700	0.750	0.722
Other Stakeholders (Farmers representatives, etc.)	0.550	0.563	0.472
CROP			
Registration Committee	0.917	0.792	0.694
Pesticides Manufacturers Association	0.750	0.708	0.575
Operational level employees	0.792	0.667	0.625
ICT experts	0.917	0.833	0.600

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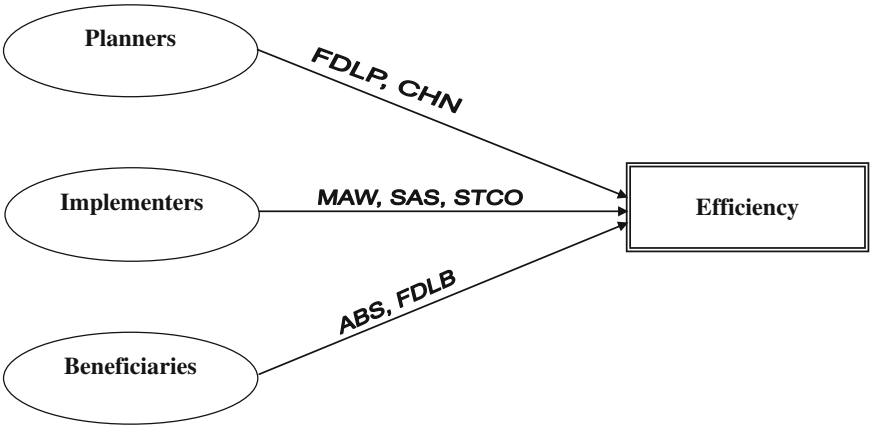
Stakeholders	Involvement in		
	Planning	Strategy formulation	Strategy implementation
Ministry of Petrochemicals	0.250	0.250	0.200
State Agricultural Departments	0.208	0.167	0.450
Other related DAC divisions/Govt. Deptts	0.417	0.292	0.450
IFMIS			
Fertilizers Companies	0.550	0.350	0.528
Ministry of Agriculture	0.250	0.250	0.417
Different Divisional Heads of DoF	0.900	0.900	0.528
Fertilizers Association of India	0.550	0.350	0.361
Operational level employees	0.850	0.700	0.500
ICT experts	0.800	0.800	0.611
State Agriculture Departments	0.000	0.000	0.361
Concerned central Ministries like Railways, Shipping etc.	0.050	0.050	0.333
Apex Ministries which monitor fertilizers availability	0.050	0.050	0.389
State Trading Enterprises	0.200	0.150	0.250

Appendix C

C.1 Micro Level Validated Relationships

(a) Efficiency as Dependent Variable



FDLP Planners' level feedback loop, *CHN* Changing user needs, *MAW* Mission awareness, *SAS* Smooth access to service, *STCO* Strategic coherence among planners and implementers, *ABS* Ability to use project service, *FDLB* Beneficiaries level feedback loop

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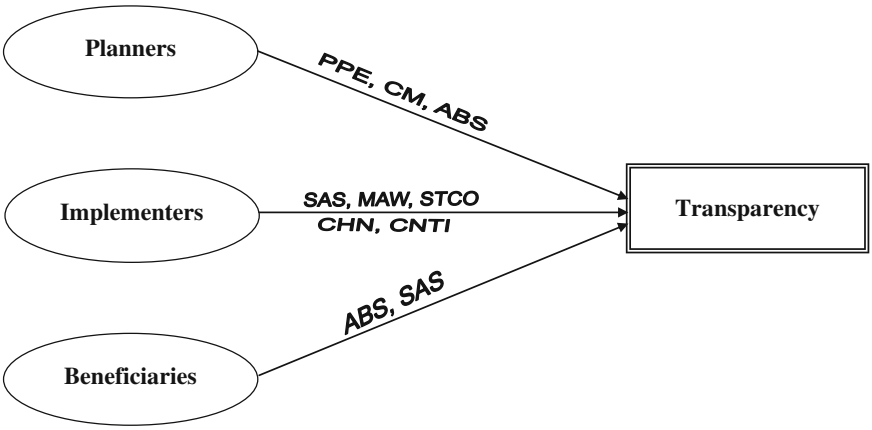
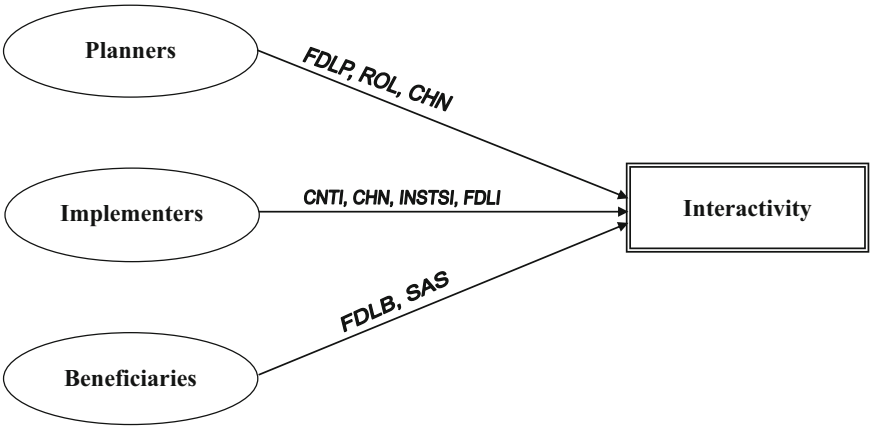
(b) Transparency as Dpendent Variable



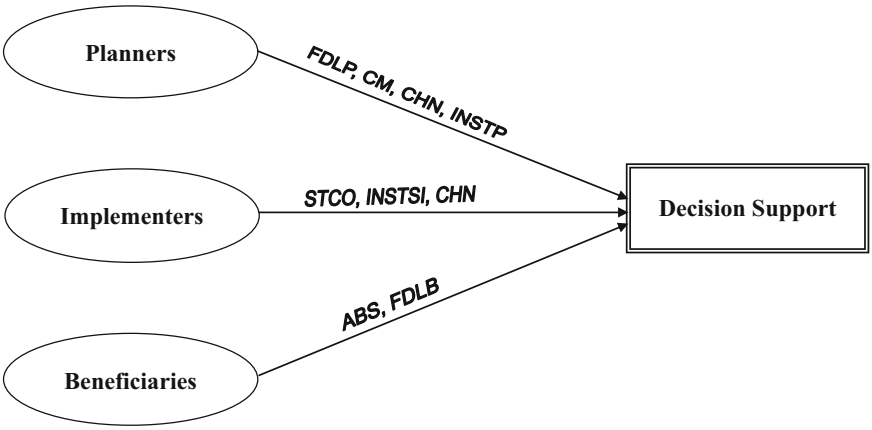
PPE Coverage of program planning elements, *CM* Change mechanisms, *ABS* Ability to use project service, *SAS* Smooth access to service, *MAW* Mission awareness, *STCO* Strategic coherence among planner and implementers, *CHN* Changing user needs, *CNTI* Implementers' ability to maintain contact with beneficiaries

(c) Interactivity as Dependent Variable



FDLP Planners' level feedback loop, *ROL* Re-defining of roles and responsibilities, *CHN* Changing user needs, *CNTI* Implementers' ability to maintain contact with beneficiaries, *INSTSI* Involvement of stakeholders in strategy implementation, *FDLI* Implementers' level feedback loop, *FDLB* Beneficiaries' level feedback loop, *SAS* Smooth access to service

(d) Decision Support as Dependent Variable



FDLP Planners' level feedback loop, *CM* Change mechanisms, *CHN* Changing user needs, *INSTP* Involvement of stakeholders in planning, *STCO* Strategic coherence among planners and implementers, *INSTSI* Involvement of stakeholders in strategy implementation, *ABS* Ability to use project service, *FDLB* Beneficiaries' level feedback loop

Appendix D

D.1 L-A-P Synthesis of Projects

(a) L-A-P Synthesis (AGMARKNET) based on S-A-P Analysis and Survey of Planners

Performance of E-Governance: 0.710 (L) Efficiency: 0.750 (L), Transparency: 0.729 (L), Interactivity: 0.639 (L), Decision Support: 0.625 (L)			
Significant variable/ level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Extent of planning: 0.508 (M)			
PPE (Coverage of program planning elements) 0.625 (L)	Large performance level of e-governance due to adequate coverage (large to very large extent) of program planning elements in terms of affected societal sectors and their needs, objectives, activities and agencies involved in the project plan Issues like irregular and inconsistent reporting of data, non reporting by several markets, subjective selection of markets, implementation delays at new markets, localization, etc. still remain unresolved	Emphasis on remaining elements, viz. expected constraints, alterables and measures for objectives and activities is expected to lead to project expansion based on ground realities. This is supposed to improve overall performance through improved transparency in terms of reliability and comprehensiveness of market information	Ensuring project ownership by implementing agencies Systematic project expansion Avoiding deadlock like situations during implementation *(through effective program planning)*
Comprehensiveness of strategy formulation: 0.535 (M)			
FDPROV (Provision for obtaining feedback) 0.611 (L)	Large level of provision for feedback is due to adequate provision for feedback from internal actors	Feedback mechanisms from beneficiaries and other external actors need to be improved. This is expected to improve performance in terms of efficiency (sensitization of planners for improving service), transparency (reliability and	Better accruing of value to farming community, planners and decision-makers in government and other stakeholders Attraction to AGMARKNET service by exhibiting intent for participatory approach

(continued)

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(continued)

Performance of E-Governance: 0.710 (L) Efficiency: 0.750 (L), Transparency: 0.729 (L), Interactivity: 0.639 (L), Decision Support: 0.625 (L)			
Significant variable/ level	Learning	Actions/impact on performance	Interpretation (expected benefits)
		comprehensiveness of contents), more interactions with users and improved utility of service for decision support	*(through feedback mechanisms)*
Changing situation: 0.836 (VL)			
FDLP (Planners' level feedback loop) 0.597 (M)	Large level of perceived performance is explained by close to large extent observed value of planners' level feedback loop The feedback loop is predominantly internal and pertains to operational aspects. Quality and coverage of market information remains a concern	Feedback loop need to be improved based on additional inputs from actual users and capability to act upon. This is expected to improve performance through improved efficiency (planners will be sensitized to work out alternate delivery channels), improved interactions (with users) and improved decision support	Customized content offerings Improved user access interfaces based on feedback of beneficiaries Participation of citizens in governance Plugging of perception gaps among planners, implementers and beneficiaries Improved planning and strategy making based on field inputs *(through feedback loop)*
CHN (Changing user needs) 0.750 (L)	Planners' large level of perception about changing needs is contributing to large level of perceived performance Feedback from farmers being negligible, large level of perception about changing needs is apparently due to resourceful users (banks, consultants, agri-business firms, etc.) who are approaching senior officers (planners) for customized contents as per their specific needs	Information about farmers' changing needs need to be provided to planners. This is expected to make them take actions for improving performance in terms of efficiency (exploring alternate dissemination channels and simplifying backend processes), improved interactions with users and better decision support tool for planners	Customized content offerings Sensitization of planners leading to improved planning and decision-making *(through awareness about changing needs)*
Competence level of actors: 0.769 (L)			
CNTP (Ability to maintain contact with implementers and beneficiaries) 0.604 (L)	Planners' large level of ability to maintain contact with implementers and beneficiaries is contributing to large level of perceived performance The overall large value of ability to maintain contact is apparently with respect to the internal actors. The corresponding observed	Planners' ability to maintain contact with actual beneficiaries need to be improved. Their better insights about ground realities may trigger actions such as alliances with other organizations for content enrichment and wider	Better insights of planners about ground realities Improved planning and strategy making based on field inputs *(through maintaining contact with implementers and beneficiaries)*

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Performance of E-Governance: 0.710 (L) Efficiency: 0.750 (L), Transparency: 0.729 (L), Interactivity: 0.639 (L), Decision Support: 0.625 (L)			
Significant variable/ level	Learning	Actions/impact on performance	Interpretation (expected benefits)
	value with respect to beneficiaries is much lesser	accessibility for improving performance	
Flexibility of processes: 0.450 (M)			
CM (Change mechanisms in processes) 0.400 (M)	Change mechanisms in terms of data sharing by independent markets for the national service is contributing to large level of perceived performance	Project plans need to be modifiable, employees need to be given incentives for enhancing their skills. Improvement in change mechanisms is expected to improve performance in terms of improved transparency and improved decision support by involving other partners in implementing the project	Flexible government processes adaptable to changing situations Versatility through change mechanisms in processes Building public–private partnerships for project implementation Avoiding deadlock like situations during e-governance project life-cycles *(by introducing change mechanisms in conventional processes)*

(b) L-A-P Synthesis (AGMARKNET) based on S-A-P Analysis and Survey of Implementers

Performance of E-Governance: 0.651 (L), Efficiency: 0.684 (L), Transparency: 0.671 (L), Interactivity: 0.495 (M), Decision Support: 0.618 (L)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Effectiveness of strategy implementation: 0.479 (M)			
STCO (Strategic coherence among planners and implementers) 0.526 (M)	The medium level observed value of strategic coherence among planners and implementers is attributing to large level of performance Observed values reflect insufficient clarity in communication of strategy to field units and markets, inadequate progress review, unrealistic targets due to increasing number of markets, inadequate involvement of markets, Marketing Boards and DMI field units for improving strategy, lack of commitment of field units and vendors, etc.	Coherence among planners and implementers need to be improved. This is expected to improve performance through the committed involvement of implementers for taking measures to improve quality and consistent reporting by regularly interacting with markets, building local partnerships for wider dissemination and localizing contents, preparing analytical reports on market situation for decision support, improvement in efficiency, promoting usage among related local departments	Sharing of project ownership between planners and implementers Project sustainability by building value based linkages with local departments *(through strategic coherence)*

(continued)

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Performance of E-Governance: 0.651 (L), Efficiency: 0.684 (L), Transparency: 0.671 (L), Interactivity: 0.495 (M), Decision Support: 0.618 (L)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
INSTSI (Involvement of stakeholders in implementation) 0.621 (L)	The large extent involvement of sponsoring and implementing agencies (limited to headquarters levels of central and state governments) during implementation is causing large level of performance. The involvement is more about resolving operational issues at markets. Other related DAC divisions and farmers related organizations involved to lesser extent	Stakeholders need to be involved in strategy implementation in terms of content enrichment and wider dissemination. This is expected to enhance performance through improved interactions with users and improved usage of market information service for decision support	Addressing of stakeholders' concerns Sharing of ownership by stakeholders Project sustainability *(through involvement of stakeholders in implementation)*
Changing situation: 0.653 (L)			
SAS (Smooth access to service) 0.693 (L)	Smooth access to the service has helped in better progress monitoring in terms of markets reporting data. This is contributing to large extent of perceived performance	Implementers need to be sensitized about their role in improving the dissemination service Smooth access to service by implementers should translate into better performance in terms of improvement in efficiency (faster and simplified access to market situation, reduced paper use and communication costs in office work) and transparency aspects of service (better quality and coverage of information)	Sharing of ownership by implementers *(by ensuring smooth access to service)*
MAW (Mission awareness) 0.800 (VL)	As per observed data, field officers were involved at the planning stage to a small extent and their involvement in defining core purpose of the project was to a medium extent Though awareness among implementers about project mission/purpose is high, it is not contributing to achieve similar level of project performance in terms of shared mission	Field units need to be sensitized about their role in integrating farmers with the project and supporting headquarters in content development and expanding dissemination service at local level Shared mission is expected to improve project performance on transparency and efficiency aspects	Committed organizational efforts *(through shared mission)*

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Performance of E-Governance: 0.651 (L), Efficiency: 0.684 (L), Transparency: 0.671 (L), Interactivity: 0.495 (M), Decision Support: 0.618 (L)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
CHN (Changing user needs) 0.564 (M)	Implementers' medium level perception about changing needs is indicative of less interaction with the farming community and other users of the service	Implementers' awareness about changing needs has to be improved. This is expected to improve performance by triggering actions to improve transparency (data quality and coverage, service access, fairness), interactions (participation of beneficiaries and inputs to seniors) and decision support (access to actual needs based information) aspects	Customized service offerings as per changing needs *(through awareness about changing needs)*
FDLI (Implementers' level feedback loop) 0.518 (M)	Feedback of implementers on project service is dominated with their own perceptions as their ability to maintain contact with beneficiaries is observed to be near small extent. Medium level of feedback loop at their level is contributing to large level of perceived performance	Implementers' level feedback loop needs to be improved based on inputs from beneficiaries. This is expected to improve project performance through improved interactions with target users and bridging the gap between beneficiaries and planners	Feedback mechanism through implementers Customized service offerings *(through feedback loop)*
Competence level of actors: 0.576 (M)			
ABS (Ability to use project service) 0.711 (L)	Implementer's ability to use the service is helping them for monitoring purpose only (submitting routine scheme progress reports to headquarters). Their upgraded skills need to reflect in marketing/promotion of the scheme at the local level	Implementers need to be trained with emphasis on service features. Active involvement of knowledgeable implementers is expected to improve performance in all respects, i.e. of efficiency, transparency, interactivity and decision support	Project ownership by implementers *(by ensuring ability to use service)*
CNTI (Ability to maintain contact with beneficiaries) 0.414 (M)	Implementers' medium level ability to maintain contact with beneficiaries is contributing to large level of perceived performance	Implementers need to remain in touch with beneficiaries. This is expected to improve performance in terms of transparency (portal contents based on farmers' needs) and interactivity (knowledgeable farmers will start interacting with government on portal service)	Bridging the gap between planners and beneficiaries *(through maintaining contact with beneficiaries)*

(c) L-A-P Synthesis (AGMARKNET) based on S-A-P Analysis and Survey of Beneficiaries

Performance of E-Governance: 0.405 (M), Efficiency: 0.373 (S), Transparency: 0.478 (M), Interactivity: 0.267 (S), Decision Support: 0.383 (S)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Changing situation: 0.222 (S)			
SAS (Smooth access to service) 0.331 (S)	The key intended beneficiaries, viz. farmers do not have smooth access to the contents of web based market information service which is explaining their much lower perception about performance as compared to planners and implementers	Farmers' accessibility to service needs to be improved. This is expected to contribute to performance through improvement in transparency (easy access to government information) and improved interactions with respect to quality, coverage and fairness of service	Participation of grassroots level actors in governance Attraction to use service Narrowing of digital divide *(by ensuring smooth access to service)*
FDLB (Beneficiaries' level feedback loop) 0.113 (N)	Inadequate beneficiary level feedback loop is attributing to medium level (towards small extent range) of project performance	Beneficiaries need to be trained to provide feedback and project officials need to act on inputs. This is expected to enhance performance through improvement in efficiency in terms of actions by government (alternate channels for service delivery, relevant and understandable contents, marketing related advisories for farmers, etc.) for enabling timely and simplified access to market information in a cost effective manner, improved interactions with government on service related aspects and improved decision-making	Improved user access interfaces based on feedback of beneficiaries Customized content offerings Participation of grassroots level actors in governance Attraction to use service *(through feedback loop)*
Competence level of actors: 0.427 (M)			
ABS (Ability to use project service) 0.427 (M)	Medium level ability to use service is explaining medium level (towards small extent range) of performance	Improvement in farmers' ability to use service is expected to improve performance in terms of improvement in efficiency through faster access to specific contents, lesser dependence on print media, reduced communication costs, improved interactions and improved usability of service for decision support	Empowerment of beneficiaries Realization of mission/purpose *(by ensuring ability to use service)*

(d) L-A-P Synthesis (KCC) based on S-A-P Analysis and Survey of Planners

Performance of E-Governance: 0.662 (L), Efficiency: 0.708 (L), Transparency: 0.708 (L), Interactivity: 0.528 (M), Decision Support: 0.542 (M)			
Significant variable/ level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Extent of planning: 0.488 (M)			
PPE (Coverage of program planning elements) 0.620 (L)	Adequate coverage of Program Planning Elements in the project plan in terms of affected societal sectors, objectives, activities and agencies involved (large to very large extents) explains large level of perceived performance level Key objective of a sound ICT based agricultural extension system for farmers yet to be in place and seems difficult to be achieved with present approach	Remaining elements, viz. assessment of needs, expected constraints, alterables and measures for objectives and activities need to be emphasized upon. The resultant plan is likely to be realistic in terms of a limited scope, utilization of existing ICT infrastructure and agricultural databases, a cautious approach to outsourcing core functions and measurable targets. This is expected to improve performance by ensuring reliable, comprehensive, accessible and fair agricultural extension service	Realistic project scope with achievable targets Corrective measures during implementation through performance metrics Avoiding deadlock like situations during implementation Incremental project expansion based on learning *(through effective program planning)*
Comprehensiveness of strategy formulation: 0.445 (M)			
FDPROV (Provision for obtaining feedback) 0.458 (M)	Medium extent of provision for feedback explains large level of perceived performance Medium level of provision for feedback is due to medium extents of feedback mechanisms from internal and other external actors. Provision for feedback from beneficiaries is found to be of small extent	Feedback mechanisms need to be strengthened to ensure inputs from farmers and other actors Performance is expected to improve in terms of efficiency (sensitization of planners for improving service), transparency (reliability and comprehensiveness of contents), more interactions with users and improved utility of service for decision support	Efficiency gains through improved internal workflows and external linkages leading to better accruing of value to stakeholders Attraction to KCC initiative by providing better service through participatory approach *(through feedback mechanisms)*
Changing situation: 0.717 (L)			
FDLP (Planners' level feedback loop) 0.500 (M)	Medium level of feedback loop explains large level of perceived performance Internal actors and farmers are providing feedback to a medium extent. Feedback from related organizations is towards small extent. Seniors are	Planners need to be enabled to take actions on feedback. Their capability to do so is expected to transform KCC into a need based service. Improvement in feedback loop is expected to improve overall performance in terms of	Integrating central service delivery projects with changing needs Introducing mechanisms in government organizations for acting on bulk feedback Alert system leading to sensitization of planners

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Performance of E-Governance: 0.662 (L), Efficiency: 0.708 (L), Transparency: 0.708 (L), Interactivity: 0.528 (M), Decision Support: 0.542 (M)			
Significant variable/ level	Learning	Actions/impact on performance	Interpretation (expected benefits)
	able to act on feedback to a medium extent	simplified procedures to access agriculture related information, improved interactivity between farmers and organizations, and utilization of the KCC service for monitoring progress/taking corrective measures on ongoing agriculture development schemes	about ground realities and timely interventions *(through feedback loop)*
CHN (Changing user needs) 0.583 (M)	Medium level perception about changing needs is explaining large level of perceived performance The observed value reflects on lesser interaction between planners and farmers. Planners' focus is on improving operational aspects of the delivery system (increasing number of call centres, improving accessibility through phone lines, etc.) instead of vigorously taking up the challenge of evolving a system based on effective inter-organizational collaboration	Planners need to shift focus to creating inter-organizational linkages for developing contents and making them reach the grassroots Improvement in planners' perception levels about changing needs is expected to improve performance in terms of efficiency, interactivity and decision support	Expansion of projects based on periodic assessment of benefits accruing to stakeholders Linking investment in e-governance projects with beneficiaries' satisfaction *(through awareness about changing needs)*
Competence level of actors: 0.731 (L)			
CNTP (Ability to maintain contact with implementers and beneficiaries) 0.563 (M)	Medium extent of ability to maintain contact with actors in field and beneficiaries is explaining large level of perceived performance The ability to maintain contact with implementing units is found to be of large extent. The corresponding observed value with respect to beneficiaries is of lesser extent	Planners' ability to maintain contact with actual beneficiaries need to be improved. This will sensitize planners to initiate actions for improving service delivery which in turn is expected to contribute to improved performance	Better insights of planners about ground realities Improved planning and strategy making based on field inputs *(through maintaining contact with implementers and beneficiaries)*

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Performance of E-Governance: 0.662 (L), Efficiency: 0.708 (L), Transparency: 0.708 (L), Interactivity: 0.528 (M), Decision Support: 0.542 (M)			
Significant variable/ level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Flexibility of processes: 0.472 (M)			
CM (Change Mechanisms in processes) 0.417 (M)	Change mechanisms (medium extent) in terms of a new structure (L1, L2, L3 actors) created for the project and a novel mechanism to reach farmers are contributing to planners' large level of perceived performance	Change mechanisms need to be introduced in form of changeable project plan to meet emerging requirement, incentives to employees for skill improvement and evolving value sharing based linkages with agriculture related organizations and extension agencies. Performance is expected to improve in terms of improved transparency and improved decision support	Flexible government processes adaptable to changing situations Versatility through change mechanisms in processes *(by introducing change mechanisms in conventional processes)*

(e) L-A-P Synthesis (KCC) based on S-A-P Analysis and Survey of Implementers

Performance of E-Governance: 0.526 (M), Efficiency: 0.563 (M), Transparency: 0.597 (M), Interactivity: 0.424 (M), Decision Support: 0.364 (S)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Effectiveness of strategy implementation: 0.377 (S)			
STCO (Strategic coherence among planners and implementers) 0.424 (M)	The medium extent of observed value of strategic coherence among planners and implementers is explaining medium level of performance as perceived by implementers Observed values reflect medium extent of clarity in directions, near small extent of progress reviews by seniors, lack of encouragement to point out shortcomings, lack of service-oriented timelines, inadequate provisions for need based skill upgradation, etc.	Coherence among planners and operational level staff need to be improved. This is expected to trigger effective contribution from field units leading to improved performance in terms of transparency (comprehensive and reliable contents), efficiency (faster and simpler methods for delivering agricultural information) and decision support (utilization of service in supervising ongoing schemes)	Sharing of project ownership between planners and operational level staff Encouraging innovations through motivation and empowerment of operational level staff *(through strategic coherence among planners and implementers)*

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Performance of E-Governance: 0.526 (M), Efficiency: 0.563 (M), Transparency: 0.597 (M), Interactivity: 0.424 (M), Decision Support: 0.364 (S)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
INSTSI (Involvement of stakeholders in Implementation) 0.506 (M)	The medium level involvement of stakeholders during implementation is causing medium level of performance. Implementation being carried out primarily through DAC directorates and call centre operator. The directorates are not under direct control of IT or extension divisions as they report to other divisions. KCC related tasks are additional responsibilities for them	Adequate involvement of other related stakeholders during implementation need to be ensured. This is expected to improve performance through enhanced interactions with stakeholders and improved usage of service for decision support	Addressing of stakeholders' concerns Sharing of ownership by stakeholders Project sustainability *(through involvement of stakeholders in implementation)*
Changing situation: 0.614 (L)			
SAS (Smooth access to service) 0.614 (L)	The large level of service accessibility by implementers is explaining medium level of perceived performance The query–response database developed under the project can serve as a useful reference resource for implementers in their work related to agricultural development	Implementers need to be encouraged to use service and take possible corrective measures at local level/provide feedback to headquarters for improvement. With these actions, smooth access to information service by implementers is expected to translate into better performance in terms of improved efficiency (faster access to information on schemes, reduced paper use and communication costs while interacting with beneficiaries and headquarters) and transparency (reliable and comprehensive contents for dissemination)	Use of beneficiaries' database for improving performance of developmental schemes Binding of implementers with project *(by ensuring smooth access to service)*
MAW (Mission awareness) 0.818 (VL)	Implementing units were inadequately represented while formulating project mission (small extent) Very large level of mission awareness has not translated into shared project mission among implementers which is explaining relatively much lower level of performance	Implementers need to be empowered and sensitized about utility of the KCC service for farming community as well as in their routine work of co-ordinating agriculture development schemes. Shared mission is expected to improve project performance in terms of transparency and efficiency	Committed organizational efforts *(through shared mission)*

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Performance of E-Governance: 0.526 (M), Efficiency: 0.563 (M), Transparency: 0.597 (M), Interactivity: 0.424 (M), Decision Support: 0.364 (S)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
CHN (changing user needs) 0.409 (M)	Implementers' medium level perception about changing needs explains medium level of performance It is indicative of less interaction with the farmers and less usage of the beneficiaries' database developed at call centres	Implementers need to be abreast about changing needs Performance is expected to enhance through actions at their level to improve transparency (customized content), interactions (with farmers, L1 and L2 actors and inputs to seniors) and decision support aspects	Need based service delivery *(through awareness about changing needs)*
FDLI (Implementers' level feedback loop) 0.523 (M)	Medium level Implementers' level feedback loop explains medium level of performance Headquarters are not able to adequately act (close to small extent) on inputs by implementers	Implementers' level feedback loop needs to be improved. This is expected to improve project performance through improved interactions with beneficiaries and bridging the gap between beneficiaries and planners	Feedback mechanism through implementers Customized service offerings *(through feedback loop)*
Competence level of actors: 0.611 (L)			
ABS (Ability to use project service) 0.773 (L)	Implementer's ability to use the service is helping them for routine functions only (e.g. submitting project progress reports to Hqrs.). Their ability to use service need to reflect in marketing/promotion of the project at the local level	Implementers (who already possess domain knowledge) need to be actively involved in execution. This is expected to improve performance in all respects, i.e. efficiency, transparency, interactivity and decision support	Project ownership by implementers Marketing through implementers *(by ensuring ability to use service)*
CNTI (Ability to maintain contact with beneficiaries) 0.409 (M)	Implementers' medium level ability to maintain contact with beneficiaries is contributing to medium level of performance	Implementers' ability to remain in touch with beneficiaries need to be improved. This may improve performance in terms of transparency (content refinement based on better insights into quality of service delivery) and interactivity (more interaction with call centres due to improved awareness among farmers)	Bridging the gap between planners and beneficiaries Better assessment of service delivery *(through maintaining contact with beneficiaries)*

(f) L-A-P Synthesis (KCC) based on S-A-P Analysis and Survey of Beneficiaries

Performance of E-Governance: 0.482 (M), Efficiency: 0.503 (M), Transparency: 0.523 (M), Interactivity: 0.385 (S), Decision Support: 0.403 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Changing situation: 0.355 (S)			
SAS (Smooth access to service) 0.388 (S)	Medium level of perceived performance by farmers is explained by small extent of service accessibility	Farmers' accessibility to service needs to be improved. This is expected to improve performance in terms of hassle-free access to desired information about crops or livestock (transparency) and improved interactions for seeking related advice (interactivity) Specific measure could be to build location based strategic alliances between KCC and agencies at grassroots	Participation in governance Binding of beneficiaries to service Resolving the last mile issue Narrowing of digital divide *(by ensuring smooth access to service)*
FDLB (Beneficiaries' level feedback loop) 0.321 (S)	Small extent of beneficiary level feedback loop is explaining medium level of project performance (observed values reflect that beneficiaries are providing feedback to small extent and headquarters are able to act on such feedback to a small extent)	Feedback from farmers and action on inputs need to be improved. This is expected to enhance performance through improvement in efficiency and interactivity in terms of actions by government such as alternate access points, simplification of procedures to seek expert advice, etc.	Improved user access interfaces based on feedback of beneficiaries. Orientation of service as per stakeholders' requirements Participation in governance Binding of beneficiaries to service *(through feedback loop)*
Competence level of actors: 0.482 (M)			
ABS (Ability to use project service) 0.482 (M)	Beneficiaries' medium level ability to use service explains medium level of perceived performance	Capability of farmers to use the service features need to be improved. This is expected to improve performance in terms of efficiency, transparency and decision support aspects	Service driven by beneficiaries' requirements *(by ensuring ability to use service)*

(g) L-A-P Synthesis (DACNET) based on S-A-P Analysis and Survey of Planners

Performance of E-Governance: 0.526 (M), Efficiency: 0.523 (M), Transparency: 0.602 (L), Interactivity: 0.438 (M), Decision Support: 0.422 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Extent of planning: 0.424 (M)			
PPE (Coverage of program planning elements) 0.556 (M)	Medium extent of coverage of program planning elements is explaining medium level of performance Medium performance level due to medium extent coverage of needs, constraints, alterables, objective measures and activity measures during planning Key objective of a comprehensive common internal repository accessible by various divisions remains to be achieved despite deployment of sophisticated collaborative tools. Computing facilities mostly being used in isolated modes	Need assessment, expected constraints, alterables and measures for objectives and activities are to be emphasized upon. This is expected to ensure regular enrichment of websites developed by respective DAC divisions under DACNET project Performance is expected to be improved in terms of a comprehensive, reliable and easily accessible central repository (transparency)	Project ownership by various functional divisions Realistic e-governance project plan for minimizing gaps between planned and actual deliverables Progressive enrichment of Intranet service through performance metrics Avoiding deadlock like situations during implementation *(through effective program planning)*
Comprehensiveness of strategy formulation: 0.303 (S)			
FDPROV (Provision for obtaining feedback) 0.260 (S)	Small extent of feedback mechanisms explains medium extent of performance Observed values reflect that provisions for feedback from internal and external actors is of medium and small extents respectively	Adequate mechanisms need to be established for obtaining feedback from different actor types Performance is expected to improve in terms of efficiency (sensitization of planners for improving service), transparency (reliability and comprehensiveness of contents), more interactions with users and improved utility of service for decision support	Better accruing of value to employees at different levels Attracting officials to participate for implementing Intranet *(through feedback mechanisms)*

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Performance of E-Governance: 0.526 (M), Efficiency: 0.523 (M), Transparency: 0.602 (L), Interactivity: 0.438 (M), Decision Support: 0.422 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Changing situation: 0.708 (L)			
FDLP (Planners' level feedback loop) 0.292 (S)	Small extent of feedback loop explains medium extent of performance Co-ordinated efforts and push from seniors to promote Intranet as a collaborative platform for inter-divisional information exchange is found to be missing	Feedback loop need to be improved through regular inputs from different divisions and actions thereon. This is expected to improve performance in terms of efficiency, interactivity and decision support	Capability building and sensitization of employees Participatory approach for improved governance system Mechanisms for feedback and taking actions thereon *(through feedback loop)*
CHN (Changing user needs) 0.813 (VL)	Planners are aware of the ineffective usage of the collaborative tools deployed to fulfill the growing requirement of knowledge sharing in the department	IT set-up need to be empowered in terms of additional manpower with IT and domain knowledge and delegation of powers to co-ordinate working of other divisions for enriching the intranet. This can help in transforming their perceptions about changing needs into actions for improving project performance in terms of efficiency, interactivity and decision support	Strengthening and empowerment of planners for effective adoption of IT in an organization Linking IT investment with performance gains *(through awareness about changing needs)*
Competence level of actors: 0.670 (L)			
CNTP (Ability to maintain contact with implementers and beneficiaries) 0.344 (S)	Small extent of ability to maintain contact with actors in field is explaining medium level of perceived performance	Planners' ability to maintain contact with actual users need to be improved. This is expected to keep them apprised about actual requirements and performance gaps. Sensitized planners are expected to initiate actions for promoting use of the collaborative platform which will contribute in improving performance	Better insights of planners about ground realities Improved planning and strategy making based on field inputs *(through maintaining contact with implementers and beneficiaries)*

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Performance of E-Governance: 0.526 (M), Efficiency: 0.523 (M), Transparency: 0.602 (L), Interactivity: 0.438 (M), Decision Support: 0.422 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Flexibility of processes: 0.354 (S)			
CM (Change mechanisms in processes) 0.300 (S)	Small extent of change mechanisms in processes is explaining medium extent of performance Change mechanisms in terms of instant access to information about agricultural schemes, personal details of employees, etc. are contributing to planners' medium level of perceived performance	Change mechanisms need to be introduced in the form of modifiable IT project plan to cater to emerging requirements of divisions, incentives for skill improvement of employees, Intranet contents based on feedback of different divisions, integration of divisional level databases, etc. This is expected to improve the overall performance in terms of effective utilization of technology infrastructure to facilitate transparency and decision support	Flexible government processes adaptable to IT-induced changing situations IT-induced versatility in processes *(through change mechanisms in processes)*

(h) L-A-P Synthesis (DACNET) based on S-A-P Analysis and Survey of Implementers

Performance of E-Governance: 0.603 (L), Efficiency: 0.646 (L), Transparency: 0.618 (L), Interactivity: 0.443 (M), Decision Support: 0.568 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Effectiveness of strategy implementation: 0.398 (S)			
STCO (Strategic coherence among planners and implementers) 0.468 (M)	The medium level observed value of strategic coherence among planners and implementers is explaining perceived performance which is close to medium extent range The insufficient communication in terms of project related directions to operational level staff and regular progress review; implementers not being	Coherence among planners and operational level staff need to be improved by ensuring adequate involvement of planners during implementation and appreciating views of implementers. This is expected to improve performance (in terms of transparency, efficiency and decision support) through committed involvement of both planners and	Sharing of project ownership between planners and operational level staff Encouraging innovative IT usage through motivation and empowerment of operational level staff *(through strategic coherence)*

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Performance of E-Governance: 0.603 (L), Efficiency: 0.646 (L), Transparency: 0.618 (L), Interactivity: 0.443 (M), Decision Support: 0.568 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
	encouraged to point out shortcomings (small extent), lack of timelines for more services, etc.	implementers in utilizing INTRADAC application for inter-divisional collaboration	
INSTSI (Involvement of stakeholders in implementation) 0.486 (M)	The medium extent involvement of all the key stakeholders during implementation is causing performance which is close to medium extent range. Other related government departments involved to small extent only	Involvement of functional divisions, field offices, ICT experts and other departments (having experience of using collaborative tools) in implementation of project strategy need to be ensured. This is expected to enhance performance in terms of improved interactivity and decision support through the collaborative platform (One measure could be to form a core expert team and depute them across the organization to lead the project)	Sharing of ownership by stakeholders Project serving the intended purpose *(through involvement of stakeholders in implementation)*
Changing situation: 0.560 (M)			
SAS (Smooth access to service) 0.606 (L)	The service accessibility level towards lower limit of large extent range is explaining similar level of perceived performance ICT infrastructure has helped the individual functional divisions in routine office work. However, the intended inter-divisional content sharing/workflows through Intranet not realizing despite its smooth accessibility to employees	Implementers need to be encouraged to use collaboration application tool. This is expected to improve performance in terms of efficiency and transparency	Involvement of implementers for achieving project mission *(by ensuring smooth access to service)*
MAW (Mission awareness) 0.644 (L)	It is to a small extent that functional level employees were involved while deciding about project mission and vision. Employees are found to be using IT tools for routine office work	Extensive focused training on INTRADAC application and sensitization workshops for employees need to be organized. This is expected to improve performance through	Committed organizational efforts *(through shared mission)*

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Performance of E-Governance: 0.603 (L), Efficiency: 0.646 (L), Transparency: 0.618 (L), Interactivity: 0.443 (M), Decision Support: 0.568 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
	but not for enriching the sharable contents Large level of awareness has not translated into shared project mission among employees for enriching the contents, which is explaining performance level which is towards lower limit of large extent range	shared mission in terms of improved transparency and efficiency	
CHN (Changing user needs) 0.553 (M)	Implementers' medium level perception about changing needs is indicative of under-utilization of the collaborative IT platform	Employees need to be sensitized about IT usage. This is expected to improve performance by triggering actions by employees to enrich divisional websites for improving transparency (sharing contents for common usage), interactions (with other divisions through Intranet and decision support in office work	Effective utilization of collaborative ICT tools by employees Customization of service as per changing needs *(through awareness about changing needs)*
FDLI (Implementers' level feedback loop) 0.417 (M)	Medium level of employees' level feedback loop is responsible for observed level of perceived performance which is towards lower limit of large extent range	Implementers' level feedback loop needs to be improved. This is expected to improve project performance through improved interactions (information exchange) with other divisions	Feedback mechanism through employees Need based knowledge sharing service *(through feedback loop)*
Competence level of implementers: 0.501 (M)			
ABS (Ability to use project service) 0.595 (M)	Implementers' medium level ability to use service is contributing to the perceived level of performance. Implementers seem to be using the computing facilities in isolated modes and not for enriching Intranet and websites for sharing contents across the department	Ability of implementers needs to be improved in terms of developing and sharing contents through INTRADAC. This is expected to improve performance in all respects, i.e. efficiency, transparency, interactivity and decision-making (one measure to improve usability is to develop	Project ownership by implementers Contribution of implementers to intended purpose of the project *(by ensuring ability to use service)*

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Performance of E-Governance: 0.603 (L), Efficiency: 0.646 (L), Transparency: 0.618 (L), Interactivity: 0.443 (M), Decision Support: 0.568 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
		interfaces of already developed applications such as weekly weather watch, crop prospects, personnel management and building dynamic queries for retrieving contents)	
CNTI (Ability to maintain contact with beneficia-ries) 0.341 (S)	Implementers' small level of ability to maintain contact with beneficiaries (users belonging to other divisions) is preventing higher performance	Implementers' ability to remain in touch with other users need to be improved. This is expected to improve performance in terms of transparency (content refinement) and interactivity among divisions	Bridging the gap between planners and beneficiaries Better assessment of service delivery *(through maintaining contact with users)*

(i) L-A-P Synthesis (Grapenet) based on S-A-P Analysis and Survey of Planners

Performance of E-Governance: 0.920 (VL), Efficiency: 0.925 (VL), Transparency: 0.938 (VL), Interactivity: 0.867 (VL), Decision Support: 0.900 (VL)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Extent of planning: 0.775 (L)			
PPE (Coverage of Program planning elements) 0.811 (VL)	Very large performance level due to comprehensive coverage of Program Planning Elements in the project conceptualization. All the elements have been adequately addressed except for alterables Aspects such as inadequate manpower with DMI to cope with increased workload, inadequate backend infrastructure and bandwidth were not anticipated	Planners need to anticipate IT-induced changes. Adequate deliberations on alterables could have helped in tackling initial bottlenecks during implementation leading to better preparedness with ICT infrastructure and faster project execution	Avoiding deadlock like situations during implementation *(through effective program planning)*

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Performance of E-Governance: 0.920 (VL), Efficiency: 0.925 (VL), Transparency: 0.938 (VL), Interactivity: 0.867 (VL), Decision Support: 0.900 (VL)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Comprehensiveness of strategy formulation: 0.713 (L)			
FDPROV (Provision for obtaining feedback) 0.783 (L)	Large extent of provision for feedback from different actor groups is contributing to very large extent of perceived performance Emphasis has been on frequent interactions with exporters, laboratories and involved government departments	The existing practice of regular interactions for getting feedback should continue for sustaining very large extent of performance APEDA may now explore integration with common service centres scheme of Department of Electronics and Information Technology to further extend their reach to farmers for obtaining direct feedback	Better accruing of value to exporters, farmers, other stakeholders, and government organizations Attraction to e-governance initiative through participatory approach *(through feedback mechanisms)*
Changing situation: 0.932 (VL)			
FDLP (Planners' level feedback loop) 0.808 (VL)	APEDA is able to act on feedbacks to very large extent. Very large level of feedback loop explains the highest level of perceived performance among all projects	Feedback loop can be further improved by encouraging more feedback from state government, exporters and farmer co-operatives Improvement in feedback loop will improve performance in terms of further simplification of quality control processes, speedy implementation of corrective measures in the Residues Monitoring Plan, redressal of farmers'/exporters' grievances	Strategy making as a continuous exercise based on regular inputs from stakeholders Becoming a learning organization Participatory governance *(through feedback loop)*

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Performance of E-Governance: 0.920 (VL), Efficiency: 0.925 (VL), Transparency: 0.938 (VL), Interactivity: 0.867 (VL), Decision Support: 0.900 (VL)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
CHN (Changing user needs) 0.900 (VL)	APEDA organizes seasonal interactive sessions with stakeholders to assimilate their changing needs. Very large level of understanding about changing needs explains very large level of performance	The existing practice should continue for sustaining the performance level	Regular assessment and convergence of stakeholders' needs *(through awareness about changing needs)*
Competence level of actors: 0.792 (L)			
CNTP (Ability to Maintain contact with implementers and beneficia-ries) 0.700 (L)	Large extents of ability to maintain contact with both implementing actors and beneficiaries is explaining very large level of perceived performance	The existing practice of workshops with stakeholders should continue. Organization of farmers level workshops need to be further encouraged	Better insights of planners about ground realities Improved planning and strategy making based on field inputs *(through maintaining contact with implementers and beneficiaries)*
Flexibility of processes: 0.730 (L)			
CM (Change Mechanisms in processes) 0..720 (L)	Change mechanisms in terms of changeable project scheme as per emerging requirements and feedback based regular enrichment of website contents explain the very large extent of perceived performance	Change mechanisms in service delivery need to be introduced by integrating with agencies at grassroots (such as common service centres). This is expected to improve performance in terms of transparency (easy access to service) and actions based on wider inputs from farming community (decision support)	Flexible government processes adaptable to changing situations Versatility through change mechanisms in processes Single-window service through change mechanisms *(by introducing change mechanisms in conventional processes)*

(j) L-A-P Synthesis (Grapenet) based on S-A-P Analysis and Survey of Implementers

Performance of E-Governance: 0.725 (L), Efficiency: 0.715 (L), Transparency: 0.778 (L), Interactivity: 0.556 (M), Decision Support: 0.722 (L)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Effectiveness of strategy implementation: 0.495 (M)			
STCO (Strategic coherence among planners and implementers) 0.543 (M)	The medium level observed value of strategic coherence among planners and implementers is explaining large level of performance as perceived by implementers Grapenet has induced streamlining of procedures in the involved government agencies. The resistance of these agencies of these agencies appear to be reflected in lesser observed value of their coherence with planners	Coherence among planners and operational level staff need to be improved through sensitization and capability building programmes. This is expected to improve performance through the committed involvement of implementing units	Sharing of project ownership between planners and operational level staff Encouraging innovations through motivation and empowerment of operational level staff *(through strategic coherence among Planners and Implementers)*
INSTSI (Involvement of stakeholders in implementation) 0.641 (L)	The large level of stakeholders' involvement in strategy implementation explains large level of perceived performance	Further increase in involvement of stakeholders in implementing project strategy is likely to enhance performance through improved interactions among them as well as with APEDA and improved usage of Grapenet for decision support	Addressing of stakeholders' concerns Sharing of ownership by stakeholders Project sustainability *(through involvement of stakeholders in implementation)*
Changing situation: 0.681 (L)			
SAS (Smooth access to service) 0.667 (L)	The large level of service accessibility is explaining large level of perceived performance A few of the district level implementers faced difficulties in accessing Internet due to connectivity and power related issues. With the delegation of work to	The system being web based, performance is expected to be improved further by providing alternate access mechanisms from remote locations	Binding of implementers with project Adequate ICT facilities for implementers. *(by ensuring smooth access to service)*

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Performance of E-Governance: 0.725 (L), Efficiency: 0.715 (L), Transparency: 0.778 (L), Interactivity: 0.556 (M), Decision Support: 0.722 (L)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
	remote pack-houses, accessibility may become an issue		
MAW (Mission awareness) 0.861 (VL)	Very large level of awareness about project mission is not translating into same level of performance Implementers may not be involved with the project wholeheartedly due to dilution of their powers	High awareness level need to be transformed into shared mission through sensitization programmes for implementers. This is expected to improve performance through actions initiated by implementers locally for simplifying procedures and ensuring fair dealing with grape exporters	Inter-organizational effort for e-governance *(through shared mission)*
CHN (Changing user needs) 0.611 (L)	Implementers' large level perception about changing needs explains large level of performance	Implementers' awareness about changing needs is to be improved further. This is expected to improve performance by triggering actions to improve transparency (customized content), interactions (forming a channel between exporters/farmers and APEDA) and decision support aspects	Customized offerings as per changing needs *(through awareness about changing needs)*
FDLI (Implementers' level feedback loop) 0.542 (M)	Medium extent of Implementers' level feedback loop explains large level of performance APEDA has relied on its own knowledge on export-related issues to drive the project through implementing units Presently, feedback from implementers is limited to interaction	Implementers need to interact more with exporters and farmers through locally organized workshops and field visits. Improvement in implementers' level feedback loop is expected to improve performance through improved interactions with beneficiaries and	Feedback mechanism through implementers Customized service offerings *(through feedback loop)*

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Performance of E-Governance: 0.725 (L), Efficiency: 0.715 (L), Transparency: 0.778 (L), Interactivity: 0.556 (M), Decision Support: 0.722 (L)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
	during workshops organized by APEDA	bridging the gap between beneficiaries and planners	
Competence level of actors: 0.610 (L)			
ABS (Ability to use project service) 0.694 (L)	Implementer's ability to use the service to a large extent is contributing to large extent of perceived performance APEDA has now permitted labs and pack-houses to use features which were hitherto accessible to government officers only	Ability of using service features by external actors need to be ensured through capability development programmes for them. This is expected to improve performance level in all respects, i.e. efficiency, transparency, interactivity and support	Project ownership by implementers Capable implementers *(by ensuring ability to use service)*
CNTI (Ability to maintain contact with beneficiaries) 0.556 (M)	Implementers' medium level ability to maintain contact with beneficiaries is explaining large level of performance	Implementers' ability to remain in touch with exporters and farmers need to be improved through local workshops. This is expected to improve performance in terms of transparency (content refinement based on better insights into quality of service delivery) and interactivity (through increased interactions with labs, State Governments, APEDA headquarters to address exporters' concerns about the service)	Bridging the gap between planners and beneficiaries Better assessment of service delivery *(through ability to maintain contact with beneficiaries)*

(k) L-A-P Synthesis (Grapenet) based on S-A-P Analysis and Survey of Beneficiaries

Performance of E-Governance: 0.682 (L), Efficiency: 0.682 (L), Transparency: 0.734 (L), Interactivity: 0.620 (L), Decision Support: 0.609 (L)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Changing situation: 0.587 (M)			
SAS (Smooth access to service) 0.683 (L)	Large level of performance level perceived by exporters is explained by their large level of accessibility to service	Service need to be made accessible through alternate channels. This is expected to improve performance in terms of contents as per demand (transparency) and improved interactions	Participation in governance Binding of beneficiaries to service Narrowing of digital divide *(through smooth access to service)*
FDLB (Beneficiaries' level feedback loop) 0.511 (M)	APEDA has relied on workshops with select exporters to obtain feedback on web based service in the initial years Even with medium extent of observed beneficiary level feedback loop, the perceived performance is of large extent	Beneficiaries' level feedback loop needs to be improved. This is supposed to improve performance through improvement in efficiency (simplification of farmer–exporter government linkages), improved interactions with government and improved decision support in export-related issues	Improved user access interfaces based on feedback from beneficiaries Service orientation as per stakeholders' requirements Participation in governance Binding of beneficiaries to service *(through feedback loop)*
Competence level of actors: 0.690 (L)			
ABS (Ability to use project service) 0.690 (L)	Beneficiaries' ability to use service to a large extent explains the large level of perceived performance	Capability of beneficiaries to use the service features need to be further improved. This is expected to improve performance through reduced communication costs, lesser correspondence with government, improved perception about fairness of service and better planning and decision support in grape exports	Service driven by beneficiaries requirements *(by ensuring ability to use service)*

(l) L-A-P Synthesis (CROP) based on S-A-P Analysis and Survey of Planners

Performance of E-Governance: 0.748 (L), Efficiency: 0.792 (L), Transparency: 0.740 (L), Interactivity: 0.681 (L), Decision Support: 0.708 (L)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Extent of planning: 0.595 (M)			
PPE (Coverage of program planning elements) 0.597 (M)	Large performance level due to close to large extent coverage of Program Planning Elements Alterables, objective and activity measures and constraints addressed from small to medium extent	Adequate deliberations on alterables, constraints, etc. required for better preparedness for faster project execution. Improvement in PPE coverage is expected to enhance performance through improved transparency (information on licenses issued by states and actual manufacturing, adequate availability of pesticides across states)	Better project preparedness Addressing stakeholders' interests Avoiding implementation delays *(through effective program planning)*
Comprehensiveness of strategy formulation: 0.586 (M)			
FDPROV (Provision for obtaining feedback) 0.569 (M)	Medium (near large) extent of feedback mechanisms is contributing to large level of performance Near large level of provision for feedback is due to provision for feedback from internal actors	Feedback mechanisms in respect of beneficiaries and other external actors need to be improved This is expected to improve performance in terms of efficiency (sensitization of planners for improving service), transparency (reliability and comprehensiveness of contents, e.g. information from field about spurious pesticides), more interactions with users and improved utility of service for decision support	Better accruing of value to beneficiaries and government organizations Attraction to e-governance initiative through participatory approach *(through feedback mechanisms)*

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Performance of E-Governance: 0.748 (L), Efficiency: 0.792 (L), Transparency: 0.740 (L), Interactivity: 0.681 (L), Decision Support: 0.708 (L)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Changing situation: 0.851 (VL)			
FDLP (Planners' level feedback loop) 0.632 (L)	CIB and RC ensure prompt actions on feedback and has even amended insecticides act. Large extent of planners' level feedback loop explains the large extent of perceived performance	Feedback loop can be further improved by encouraging feedback from external actors such as state agriculture departments and related divisions of DAC Improvement on this aspect is expected to improve performance in terms of efficiency (reduced correspondence with respect to quality of pesticides, streamlining of allotment of manufacturing licenses by states), better interactivity and decision support (filling demand–supply gaps, monitoring registration certificate-manufacturing licenses gaps)	Effective e-governance through amendment of traditional acts Emergent strategy approach for system improvement based on regular inputs from stakeholders Becoming a learning organization Synergetic relationships between centre and state governments Participatory governance *(through feedback loop)*
CHN (Changing user needs) 0.833 (VL)	Very large level of understanding about changing needs explains large level of performance CIB and RC have pesticides manufacturing association on its board. Besides this, regular interactions are held with industry	Streamlining of registration procedures for all categories of pesticides is expected to improve planners' perception about performance in terms of efficiency, interactivity and decision support	Constant improvement in service delivery through regular assessment and convergence of stakeholders' needs *(through awareness about changing needs)*

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Performance of E-Governance: 0.748 (L), Efficiency: 0.792 (L), Transparency: 0.740 (L), Interactivity: 0.681 (L), Decision Support: 0.708 (L)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Competence level of actors: 0.854 (VL)			
CNTP (Ability to maintain contact with implementers and beneficiaries) 0.729 (L)	Large extent of ability to maintain contact with operational staff actors and beneficiaries is explaining large level of perceived performance Seniors are adequately aware about service improvement related issues	Planners should adequately involve implementers and beneficiaries in the integrated pesticides registration service being developed. This is expected to further improve performance	Better insights of planners about ground realities Improved planning and strategy making based on interactions with beneficiaries and operational staff *(through maintaining contact with implementers and beneficiaries)*
Flexibility of processes: 0.439 (M)			
CM (Change mechanism in processes) 0.317 (S)	Pesticides registration processes are difficult to change as the same are governed by a legal act Change mechanisms in terms of streamlining of registration process through amendment of the act, which led to improved functioning of CIB and RC, explains the large extent of perceived performance	Change mechanisms in processes need to be improved to facilitate integration of pesticides manufacturing license databases across states and service delivery through collaboration with agencies at grassroots This is expected to improve performance in terms of transparency (comprehensiveness of information related to pesticides quality, requirement and availability of pesticides, easy access to information by farmers) and actions based on access to state-wise status and inputs from farmers (decision support)	Amendment of rigid procedures, acts, rules as per changing environment Enhancement of government efficiency *(by introducing change mechanisms in conventional processes)*

(m) L-A-P Synthesis (CROP) based on S-A-P Analysis and Survey of Implementers

Performance of E-Governance: 0.590 (M), Efficiency: 0.625 (L), Transparency: 0.625 (L), Interactivity: 0.517 (M), Decision Support: 0.488 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Effectiveness of strategy implementation: 0.396 (S)			
STCO (Strategic coherence among planners and implementers) 0.468 (M)	The medium level observed value of coherence among planners and implementers is explaining medium level of performance as perceived by implementers Refinement of registration process was driven by Secretary (CIB) to address the grievances of industry and reported cases of malpractices Forced dilution of powers of the implementing officers on one hand and simplified working procedures on the other is explaining the medium level of coherence score	Coherence among planners and operational level staff need to be improved. This is expected to improve performance through committed involvement of implementers in achieving transparent and efficient registration process for all pesticides, better co-ordination with states for ensuring quality pesticides for farmers besides adopting IT for improving individual productivity (improved efficiency, transparency and decision support)	Sharing of project ownership between planners and implementing officers Encouraging innovations through motivation and incentives to operational level officers *(through strategic coherence among Planners and Implementers)*
INSTSI (Involvement of stakeholders in implementation) 0.510 (M)	Medium level of involvement of stakeholders explains medium level of performance CIB, RC, industry, operational staff and IT experts are involved to a large extent during strategy implementation. Other stakeholders involved to lesser extent	Other important stakeholders, e.g. state governments and other DAC divisions need to be actively involved. This is likely to enhance performance through improved interactions with stakeholders and improved application usage for decision support in pesticides related matters	Addressing of stakeholders' concerns Sharing of ownership by stakeholders Project sustainability *(through involvement of stakeholders in Implementation)*
Changing situation: 0.650 (L)			
SAS (Smooth access to service) 0.700 (L)	The large level of accessibility to service by implementers is explaining medium level of performance	Implementers need to be encouraged to suggest corrective measures for improvement Smooth access to information service by implementers should translate into better performance in terms of improved efficiency and transparency	Binding of implementers with project Performance metrics linking accessibility by implementers to improvement in service delivery
MAW (Mission awareness) 0.700 (L)	Large level of awareness about project mission is not translating into similar level of performance Implementers may not be involved with the project	Implementers need to be sensitized about the governance issues for transforming their attitudes. High awareness level need to be transformed into	Employees' involvement through shared mission *(through shared mission)*

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Performance of E-Governance: 0.590 (M), Efficiency: 0.625 (L), Transparency: 0.625 (L), Interactivity: 0.517 (M), Decision Support: 0.488 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
	wholeheartedly due to dilution of their powers	shared mission. This is supposed to improve performance through actions initiated at implementers' level for simplifying procedures and ensuring fairness in registration process	
CHN (changing user needs) 0.775 (L)	Implementers' large level perception about changing needs is explaining medium level of performance	Implementers need to be sensitized about the governance issues for transforming their attitudes. Better appreciation of changing needs is likely to trigger actions at their level for improving service performance in terms of interactivity and decision support for them. The medium performance level hints at lack of such initiatives by implementers	Addressing changing needs by augmenting internal capabilities *(through awareness about changing needs)*
FDLI (Implementers' level feedback loop) 0.525 (M)	Medium level implementers' feedback loop is explaining medium level of performance	Implementers' level feedback loop needs to be improved. This is expected to improve project performance through increased inputs to seniors based on operational level interaction with applicants	Feedback mechanism through implementers Service improvement through implementers *(through feedback loop)*
Competence level of actors: 0.570 (M)			
ABS (Ability to use project service) 0.713 (L)	Implementer's ability to use the service to a large extent is contributing to medium extent of perceived performance Though implementers have realized the benefits of initial level process re-engineering, they apparently seem to be reluctant for further refinement for fear of loosing control on the registration process	Active involvement of implementers needs to be ensured. Involvement of knowledgeable implementers is likely to facilitate further process re-engineering which will improve overall performance in all respects, i.e. efficiency, transparency, interactivity and decision support	Project ownership by implementers
CNTI (Ability to maintain contact with beneficiaries) 0.525 (M)	Implementers' medium level ability to maintain contact with beneficiaries is contributing to medium level of performance	Implementers' ability to remain in touch with beneficiaries need to be improved. This is expected to improve performance in	Bridging the gap between planners and beneficiaries

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Performance of E-Governance: 0.590 (M), Efficiency: 0.625 (L), Transparency: 0.625 (L), Interactivity: 0.517 (M), Decision Support: 0.488 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
		terms of transparency (opening of latent processes to aspiring registrants, content refinement based on better insights into quality of service delivery) and interactivity (increased use by manufactures and government officials with the introduction of more services)	Sensitizing implementers for process refinement *(through maintaining contact with implementers and beneficiaries)*

(n) L-A-P Synthesis (CROP) based on S-A-P Analysis and Survey of Beneficiaries

Performance of E-Governance: 0.526 (M), Efficiency: 0.485 (M), Transparency: 0.585 (M), Interactivity: 0.512 (M), Decision Support: 0.500 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Changing situation: 0.613 (L)			
SAS (Smooth access to service) 0.691 (L)	Liaison officers of pesticide manufacturers mostly operate from cities which explain their smooth access to service They have been raising concerns through their association to streamline registration procedures The computerization of Mee too category was highly appreciated by industry. The survey reflects their increased expectations from the service	Improvement in service accessibility may not cause any further improvement in performance Performance is expected to improve with the implementation of an integrated system covering all categories of pesticides	Forcing improved service delivery by government
FDLB (Beneficiaries' level feedback loop) 0.536 (M)	Medium extent of beneficiaries' level feedback loop explains medium level of perceived performance Government is not able to take prompt actions on beneficiaries' feedback in a reasonable time frame due to resource constraints as well as legal implications. CIB and RC is pursuing for further amendment of the Act which is a complex process	Beneficiaries' level feedback loop need to be improved in terms of actions by government This is expected to enhance performance through improvement in efficiency in terms of further simplification of registration process, improved interactions with government and improved decision support in pesticide related issues	Participation of beneficiaries in governance Mechanisms for fast action on beneficiaries' feedback *(through feedback loop)*

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Performance of E-Governance: 0.526 (M), Efficiency: 0.485 (M), Transparency: 0.585 (M), Interactivity: 0.512 (M), Decision Support: 0.500 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Competence level of actors: 0.738 (L)			
ABS (Ability to use project service) 0.738 (L)	Beneficiaries are highly literate with technical knowledge and use the CIBRC website extensively Beneficiaries' ability to use service to a large extent is not translating into higher performance due to delays in action on their inputs for improving performance	Expeditious implementation of the system with enhanced functionalities is expected to improve performance	Service as per stakeholders' requirements

(o) L-A-P Synthesis (IFMIS) based on S-A-P Analysis and Survey of Planners

Performance of E-Governance: 0.761 (L), Efficiency: 0.800 (VL), Transparency: 0.775 (L), Interactivity: 0.617 (L), Decision Support: 0.725 (L)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Extent of planning: 0.493 (M)			
PPE (Coverage of program planning elements) 0.600 (L)	Large performance level due to adequate coverage of Program Planning Elements in the project plan in terms of objectives, activities and agencies involved Key objective of keeping a vigil on demand–supply gaps at various levels yet to be fully achieved due to disparate internal systems evolved under the project	Remaining PPE elements, viz. affected societal sectors and their needs, expected constraints, alterables and measures for objectives and activities need to be adequately addressed This is expected to improve overall performance in terms of coverage and updated-ness of fertilizers related information (eg. consumption, requirement and availability of raw material) and fairness in co-ordination between fertilizers industry and government (e.g. timely and fair settlement of subsidy claims)	Avoiding deadlock like situations during implementation Project ownership by stakeholders Realistic e-governance plan for minimizing gaps between planned and actual deliverables Control on implementation delays through performance metrics *(through effective program planning)*

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Performance of E-Governance: 0.761 (L), Efficiency: 0.800 (VL), Transparency: 0.775 (L), Interactivity: 0.617 (L), Decision Support: 0.725 (L)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Comprehensiveness of strategy formulation: 0.332 (S)			
FDPROV (Provision for obtaining feedback) 0.400 (M)	Medium extent of feedback mechanisms is explaining large extent of performance Feedback mechanisms are primarily with respect to internal actors. Provision for feedback from beneficiaries and other external actors is found to be of lesser extent	Feedback mechanisms need to be improved to get inputs from beneficiaries and other actors. This is expected to enhance performance in terms of efficiency (sensitization of planners for improving service), transparency (reliability and comprehensiveness of contents), more interactions with users and improved utility of system for decision support	Efficiency gains through improved internal workflows and external linkages leading to better accruing of value from investment made on IT Attraction to e-governance initiative by adopting participatory approach *(through feedback mechanisms)*
Changing situation: 0.783 (L)			
FDLP (Planners' level feedback loop) 0.467 (M)	The feedback loop is predominantly internal and pertains to operational aspects with respect to independent application systems within the department. Feedback from beneficiaries is of medium extent, feedback from other related organizations is of negligible extent	Feedback loop need to be improved by addressing needs of industry and related departments such as DAC and state/district governments This is likely to improve the performance through improved efficiency (planners will be sensitized to activate unused applications and enrich web interfaces), improved interactions (with stakeholders) and improved decision support (on fertilizers production and distribution)	Customized interfaces for exchanging information with external stakeholders Active participation of industry in governance Plugging of perception gaps among planners, implementers and beneficiaries Improved planning and strategy making based on regular external inputs *(through feedback loop)*
CHN (Changing user needs) 0.850 (VL)	Planners seem to be keen to keep investing on latest IT tools based on their knowledge about IT usage by fertilizer companies and similar expectations of industry from DoF. Their perception about	It is required to improve planners' understanding about changing needs based on actual workflow related inputs from industry and related organizations This will make them take actions leading to	Assessment of projected requirements through strategic audit of IT plans Linking investment in IT with performance gains

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Performance of E-Governance: 0.761 (L), Efficiency: 0.800 (VL), Transparency: 0.775 (L), Interactivity: 0.617 (L), Decision Support: 0.725 (L)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
	performance seems to be influenced by justification of investments made over time in terms of ICT infrastructure and application systems	improved performance in terms of efficiency (simplifying processes related to co-ordination with industry), improved interactions with users and better decision support tool for planners	
Competence level of actors 0.790 (L)			
CNTP (Ability to maintain contact with implementers and beneficiaries) 0.750 (L)	Large extent of ability to maintain contact with operational staff and fertilizer companies is explaining large level of perceived performance	It is required to build IT capability of planners. This will sensitize them to improve internal working as well strengthen ICT interfaces with companies. Performance is expected to improve through effective use of the applications developed under the project	Sensitization of planners about IT-enabled interfaces Improved planning and strategy making for e-governance projects
Flexibility of processes: 0.373 (S)			
CM (Change mechanisms in processes) 0.440 (M)	Medium extent of change mechanisms in terms of ICT enabled fertilizers production inputs from companies and digital interface for disseminating information are contributing to planners' large level of perceived performance	Change mechanisms in processes need to be introduced in the form of changeable project plan for meeting emerging requirements, incentives for skill improvement, and establishing district/block level linkages for monitoring fertilizers demand and availability This is likely to improve performance in terms of improved transparency and improved decision support	Flexible government processes adaptable to changing situations Versatility through change mechanisms in processes *(by introducing change mechanisms in conventional processes)*

(p) L-A-P Synthesis (IFMIS) based on S-A-P Analysis and Survey of Implementers

Performance of E-Governance: 0.418 (M), Efficiency: 0.352 (S), Transparency: 0.475 (M), Interactivity: 0.407 (M), Decision Support: 0.444 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Effectiveness of strategy implementation: 0.381 (S)			
STCO (Strategic coherence among planners and implementers) 0.394 (S)	The small (close to medium) level of strategic coherence among planners and implementers is explaining medium level of performance Observed values reflect ineffective communication of project related directions to operational level staff, lesser encouragement to implementers to point out shortcomings, inadequate progress reviews, etc.	Coherence among planners and operational level staff need to be improved through empowerment of the latter. This is likely to enhance performance through implementers' committed involvement in improving application systems developed for better linkages with fertilizer companies, improving efficiency, inter-division co-ordination besides adopting IT for improving individual productivity	Sharing of project ownership between planners and operational level staff Encouraging innovations through motivation and empowerment of operational level staff *(through strategic coherence among planners and implementers)*
INSTSI (Involvement of stakeholders in implementation) 0.429 (M)	The medium level involvement of stakeholders during implementation is causing medium level of performance Active involvement of fertilizer companies Inadequate involvement of other stakeholders	All key stakeholders need to be adequately involved during implementation. This is likely to enhance performance through improved interactions with users and improved usage of applications for decision support	Addressing of stakeholders' concerns Sharing of ownership by stakeholders Project sustainability *(through involvement of stakeholders in implementation)*
Changing situation: 0.483 (M)			
SAS (Smooth access to service) 0.556 (M)	The medium level of service accessibility is explaining medium level of performance as perceived by implementers Planners' persistence with manual preparation of fertilizers supply plan (one of the core functions of DoF) and lack of integrated system views for different divisions is explaining medium level of accessibility to service	Implementers need to be encouraged to use application systems developed under IFMIS This is expected to enhance performance by improving efficiency (faster preparation of fertilizers supply plan, import plan, reduced paper use and communication costs in office work) and transparency (timely publication of supply plan, timely settlement of claims)	Binding of implementers with project *(by ensuring smooth access to service)*

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Performance of E-Governance: 0.418 (M), Efficiency: 0.352 (S), Transparency: 0.475 (M), Interactivity: 0.407 (M), Decision Support: 0.444 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
MAW (Mission awareness) 0.500 (M)	As per observed data, it is only to a small extent that implementers were involved while deciding about project mission and vision. Medium level of awareness has not translated into shared project mission among implementers which is explaining medium level of performance	Implementers need to be sensitized about use of various web based applications to get inputs from fertilizer companies on aspects such as details of raw material used in production, requirement of raw material, supply of fertilizers to districts, etc. Shared mission is expected to improve project performance in terms of transparency and efficiency	Committed organizational effort through shared mission *(through shared mission)*
CHN (Changing user needs) 0.444 (M)	Implementers' medium level perception about changing needs explains medium level of performance The observed value is indicative of their lesser interaction with the fertilizers companies and other stakeholders with respect to the IT based service	Implementers' understanding about changing needs need to be improved. This is expected to enhance performance through actions at their level to improve transparency (customized content), interactions (with stakeholders and inputs to seniors) and decision support aspects	Customized web interfaces as per changing needs *(through awareness about changing needs)*
FDLI (Implementers' level feedback loop) 0.417 (M)	Feedback of implementers on project service is dominated by their own perception. Medium level of feedback loop at their level explains medium level of performance	Improvement in implementers' level feedback loop needs to be improved. This is expected to improve project performance through improved interactions with beneficiaries and bridging the gap between beneficiaries and planners	Feedback mechanism through implementers. Customized service offerings *(through feedback loop)*
Competence level of actors: 0.480 (M)			
ABS (Ability to use project service) 0.528 (M)	Implementers' medium level ability to use service is contributing to medium level of performance Implementers are using the applications for routine work (e.g. downloading fertilizer	Implementers' skills on service features need to be upgraded. They should regularly use applications Active involvement of knowledgeable implementers will improve performance in	Project ownership by implementers Effective utilization of service through implementers *(By ensuring ability to use service)*

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Performance of E-Governance: 0.418 (M), Efficiency: 0.352 (S), Transparency: 0.475 (M), Interactivity: 0.407 (M), Decision Support: 0.444 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
	production statistics for preparing monthly movement plan, processing subsidy/concession related bills). Several of the application modules remain unutilized	all respects, i.e. efficiency, transparency, interactivity and decision support	
CNTI (Ability to maintain contact with beneficiaries) 0.278 (S)	Implementers are able to maintain contact with beneficiaries to a small extent which is explaining medium level of performance	Implementers need to regularly interact with beneficiaries and activate unutilized applications. This is expected to improve performance in terms of transparency (content refinement based on requirements of industry and department, better insights into quality of service delivery) and interactivity (utilization of dormant service modules)	Bridging the gap between planners and beneficiaries Refinement of service delivery *(through maintaining contact with beneficiaries)*

(q) L-A-P Synthesis (IFMIS) based on S-A-P Analysis and Survey of Beneficiaries

Performance of E-Governance: 0.552 (M), Efficiency: 0.563 (M), Transparency: 0.567 (M), Interactivity: 0.567 (M), Decision Support: 0.492 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
Changing situation: 0.558 (M)			
SAS (Smooth access to service) 0.683 (L)	Medium level of performance level perceived by fertilizer companies despite having smooth access to service (large extent) reflects inadequate fulfilment of their requirements by the service	Application interfaces need to be prioritized based on progressive streamlining of actor–process linkages This is expected to translate smooth access to service into improved performance in terms of customized contents (transparency) and improved interaction in terms of reduced dependence on manual interfaces with DoF	Participation in governance Binding of beneficiaries to service
FDLB Beneficiaries' level feedback loop)0.433 (M)	Medium extent of beneficiary level feedback loop is explaining medium level of project performance	Beneficiaries' level feedback loop needs to be improved. This is expected to improve performance through improvement in efficiency	Improved user access interfaces based on feedback of beneficiaries

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Performance of E-Governance: 0.552 (M), Efficiency: 0.563 (M), Transparency: 0.567 (M), Interactivity: 0.567 (M), Decision Support: 0.492 (M)			
Significant variable/level	Learning	Actions/impact on performance	Interpretation (expected benefits)
		(timely publishing of supply plan, and simplified access to fertilizers policy related matters), improved interactions with government (on raw material requirements and fertilizers distribution related aspects) and improved decision support (in fertilizer production related matters)	Orientation of service as per stakeholders' requirements Participation in governance Binding of beneficiaries to service *(through feedback loop)*
Competence level of actors: 0.625 (L)			
ABS (Ability to use project service) 0.625 (L)	Beneficiaries' ability to use service is not translating into improvement in performance Fertilizer companies seem to be using service under compulsion as it is linked to settlement of their bills	It is required to implement application features which streamline beneficiaries' interfaces with DoF, e.g. automation of transactions related to raw material requirements, settlement of subsidy/concession related claims, etc. This is expected to translate beneficiaries' ability to use service into improved overall performance in terms of efficiency, transparency and decision support aspects	Service driven by beneficiaries' requirements

Appendix E

E.1 Evolution of Grapenet

(a) Iterative Enhancements in Grapenet Scope

Year	Enhancements in system scope	Gaps (which triggered next level of system enhancements)
2004 end	Online facility for APEDA accredited laboratories to apply for financial subsidy for testing samples of grapes	Independent system not having any linkage with the local system of registering farms/plots at the SHDs. Different coding methods followed at state level for registering farms/plots Manual issuing of registration certificates at state level Requirement of manual intervention for establishing authenticity of registered farms/plots Difficulties in establishing traceability of samples due to non standard sample identification codes used by laboratories; no provisions to filter out duplicate subsidy claims
2005	Centralized registration of farms/plots introduced for the use of states to establish a uniform system of farms/plots registration. The system also enforced unique sample identification codes. These features aimed at facilitating APEDA to cross-check for duplicity cases while releasing subsidy to labs and ensuring traceability of grape samples. States could now uniformly generate registration certificates in pre-printed forms The labs module was enriched to capture details of sample collection (by lab person at plot level) and sample receipt (at labs level), generate test reports for	Backend infrastructure constraints (insufficient network bandwidth and server capacity) at APEDA due to which only the registration module could be implemented as it required minimum data entry from the district level offices of SHDs. Labs module could not be implemented as it involved web based bulk data entry from individual labs (test reports in respect of about 90 pesticides and 1500 samples per lab in every season). Sample traceabilty could, therefore, not be achieved Issuing of certificate of agmark grading (CAG) and phytosanitary certificates used to be handled independently by

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Flexible Systems Management, DOI 10.1007/978-981-10-2176-3

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Year	Enhancements in system scope	Gaps (which triggered next level of system enhancements)
	farmer/exporter and generate accurate subsidy reports	Directorate of Marketing and Inspection (DMI) and Phyto Sanitary Certification (PSC) authorities respectively. This was being done manually without any linkage with the application system. Exporters had to physically submit (i) test report to DMI for the issuing of CAG and (ii) test report and CAG to PSC authority for the PSC certificate DMI was finding it difficult to cope with consignment inspections work at pack-houses. Manpower pooled from other locations in the first season faced language/location identification problem. These constraints forced DMI to conduct random inspections only The transactions between labs and National Referral Laboratory (NRL) with respect to failed samples were manual. Issuing of alert or other related instructions/advisories by NRL to the stakeholders was also manual
2006	Before start of 2006 season, APEDA installed a dedicated server and acquired extra bandwidth (dedicated 2 mbps leased line) The automated workflow was improved by including modules for DMI, PSC and the NRL. It now facilitated consignment creation by labs on behalf of exporters, forwarding of inspection reports by labs to the DMI for the issuing of CAG certificates. The respective PSC authorities could now access inspection report and CAG certificate online and issue the PSC certificate NRL module enabled flow of auto-generated e-mails between NRL and labs with respect to failed samples and anomalies found in test reports of labs. NRL could now also broadcast internal alerts to various stakeholders in case of failed samples. It could also revoke alerts Traceability up to farm/plot level achieved in 2006	Exporters had to physically pass the required information to labs for creating consignments and initiate the inspection process. They had to still physically approach DMI and PSCs to apply for respective certificates. Further, they could not track status of their applications without visiting these offices

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Year	Enhancements in system scope	Gaps (which triggered next level of system enhancements)
2007	Exporter interface created to enable them to create consignments, apply online for certificates and track their application status Improved mechanism for traceability Labs Module enriched to facilitate issuing of CAG and PSCs Registration number linked with village census code. Village wise reports could be created Refinement in various system interfaces	It was desirable to have pallet/punnet level traceability
2008	Exporters have been advised to get registered with identification system of GS1 (an organization dealing with design and implementation of global standards) to achieve traceability through bar coding	

Note Also see Chap. 8 for a summary of key developments in the post study period

Appendix F

F.1 IFMIS: Planned Deliverables and Actual Realization

(a) Deliverables under IFMIS—Stage I (1995–1997)

S. No.	Deliverables		
	Planned	Realized	Reasons for gaps
1.	*Domain specific application systems*		
	i. Fertilizer planning system ii. Budget system iii. Fertilizer import management System iv. Fertilizer distribution system v. Fertilizer handling and payment system for imports vi. Fertilizer project monitoring system vii. Performance monitoring and evaluation system	Could not be taken up	Manpower constraints in IT unit during the period; The project progress was affected due to absence of key team members who possessed domain knowledge Project activities could not be taken up in parallel as scheduled. Focus remained on development of ICT infrastructure
2.	*ICT infrastructure*		
	Computer centre established in the offices located in different buildings Unix based server with terminals extended to sections through serial cables in each of these offices Internet connectivity established through VSAT/RF Link/Dial-up modem based on communication traffic Server access through dumb terminals/PCs for senior officers only	Infrastructure set-up as planned but there was schedule slippage	Procedural delays in placement and execution of orders for hardware procurement Non-readiness of sites
3.	*Training*		
	IT skills to make use of computing facilities Application usage	Series of in-house training programmes organized Could not be taken up	Limited participation by DoF divisions Delay in application development

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Flexible Systems Management, DOI 10.1007/978-981-10-2176-3

(b) Deliverables under IFMIS—Stage II (1998–1999)

S. No.	Deliverables		
	Planned	Realized	Reasons for gaps
1.	*Domain specific application systems*		
	As in Table 2	All applications except Budget System developed and handed over by NIC for operationalization; Fertilizer Project Monitoring System could not be implemented Integrated system could not be evolved	At the implementation stage, DoF did not feel the need for separate systems for Budget monitoring (other than the generic package of NIC) and detailed monitoring of fertilizers projects; Applications iii and v were not continued due to changed government policy which discouraged import of urea Lack of active participation and coherence among organizations involved
2.	*ICT infrastructure*		
	Strengthening of NICNET LAN at all the DoF offices PCs and Internet access for key officers and staff	Implemented Implemented	Procedural delays in placement and execution of orders for hardware procurement
3.	*Training*		
	IT skills to make use of computing facilities Application Usage	Basic skills upgraded Partially implemented	Difficulties faced in smooth conduction of training due to inadequate nominations

(c) IT Plan for Fertilizer Sector: 1998–2002

S. No.	Deliverables		
	Planned	Realized	Reasons for gaps
1.	*Domain specific application systems*		
	No application system planned for development during the period. Thrust was on implementation of systems developed under IFMIS project	A new requirement emerged for developing Concession Schemes Information System. Requirement study was undertaken during Oct-Dec 2000. The system was implemented at Concession Wing and Fertilizer accounts wing during 2001	Concession scheme for de-controlled fertilizers transferred to DoF by DAC on 1st October 2000. The system was required to be implemented on priority to settle large number of claims regularly to be settled by DoF

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S. No.	Deliverables		
	Planned	Realized	Reasons for gaps
2.	*ICT infrastructure*		
	PCs and Internet access for Assistants and Clerks	Implemented by DoF as proposed in the IT plan	–
3.	*Training*		
	IT skills to make use of computing facilities, office automation, etc.	Different levels of officers could not be trained as per plan	Reluctance to nominate officials for regular training due to other office exigencies

(d) IT Plan for Fertilizer Sector: 2002–2007

S. No.	Deliverables		
	Planned	Realized	Reasons for gaps
1.	*Domain specific application systems*		
	Fertilizer Production Information System	Implemented with curtailed functionalities	DoF's persistence with continuation of established paper-based reporting system also
	Fertilizer Distribution and Movement Information System	-do-	
	Integrated Pricing Information System	Three independent systems (Concession scheme, equated freights, subsidy payment)	Fear of loosing control over decisions/knowledge
	Handling and Payment System for Fertilizer Imports	Implementation awaited	
	Fertilizer Imports Management System	Implementation awaited	Manual systems preferred due to low import volumes, data under control of different divisions
	Model based Systems Capacity Build-up Plan Production Plan Port Nomination Plan Movement Plan	Could not be taken up so far	Lack of active participation of various stakeholders
2.	*ICT infrastructure*		
	Hardware and software items for enhancing the computing environment	Implemented by DoF as proposed in IT plan	–
3.	*Training*		
	Application usage and office productivity tools	Partially implemented	Reluctance of DoF in nominating officers/staff for training; delay in implementation of the applications envisaged in the IT plan

Note Also see Chap. 8 for a summary of key developments in the post study period

Appendix G

G.1 Interpretation of Linkages to Performance

Planners

Program Planning Elements (PPE)

AGMARKNET	KCC	DACNET	Grapenet	CROP	IFMIS
Avoiding deadlock like situations during implementation	Avoiding deadlock like situations during implementation	Avoiding deadlock like situations during implementation	Avoiding deadlock like situations during implementation	Better project preparedness	Avoiding deadlock like situations during implementation
Ensuring project ownership by implementing agencies		Project ownership by various functional divisions			Project ownership by stakeholders
				Addressing stakeholders' interests	
Systematic project expansion	Incremental project expansion based on learning	Progressive enrichment of Intranet service through performance metrics			
	Corrective measures during implementation through performance metrics			Avoiding implementation delays	Control on implementation delays through performance metrics
	Realistic project scope with achievable targets	Realistic e-governance project plan for minimizing gaps between planned and actual deliverables			Realistic e-governance plan for minimizing gaps between planned and actual deliverables

P.K. Suri and Sushil, *Strategic Planning and Implementation of E-Governance*,
Flexible Systems Management, DOI 10.1007/978-981-10-2176-3

Provisions for Obtaining Feedback (FDPROV)

AGMARKNET	KCC	DACNET	Grapenet	CROP	IFMIS
Better accruing of value to farming community, planners and decision-makers in government and other stakeholders	Efficiency gains through improved internal workflows and external linkages leading to better accruing of value to stakeholders	Better accruing of value to employees at different levels	Better accruing of value to exporters, farmers, other stakeholders, and government organizations	Better accruing of value to beneficiaries and government organizations	Efficiency gains through improved internal workflows and external linkages leading to better accruing of value from investment made on IT
Attraction to AGMARKNET service by exhibiting intent for participatory approach	Attraction to KCC initiative by providing better service through participatory approach	Attracting officials to participate for implementing Intranet	Attraction to e-governance initiative through participatory approach	Attraction to e-governance initiative through participatory approach	Attraction to e-governance initiative by adopting participatory approach

Planners' level Feedback Loop (FDLP)

AGMARKNET	KCC	DACNET	Grapenet	CROP	IFMIS
Participation of citizens in governance		Participatory approach for improved governance system	Participatory governance	Participatory governance	Active participation of industry in governance
Improved planning and strategy making based on field inputs			Strategy making as a continuous exercise based on regular inputs from stakeholders	Emergent strategy approach for system improvement based on regular inputs from stakeholders	Improved planning and strategy making based on regular external inputs
Customized content offerings	Integrating central service delivery projects with changing needs				Customized interfaces for exchanging information with external stakeholders

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AGMARKNET	KCC	DACNET	Grapenet	CROP	IFMIS
Plugging of perception gaps among planners, implementers and beneficiaries	Alert system leading to sensitization of planners about ground realities and timely interventions				Plugging of perception gaps among planners, implementers and beneficiaries
Improved user access interfaces based on feedback of beneficiaries	Introducing mechanisms in government organizations for acting on bulk feedback	Mechanisms for feedback and taking actions thereon			
			Becoming a learning organization	Becoming a learning organization	
				Effective e-governance through amendment of traditional acts	
				Synergetic relationships between centre and state governments	
		Capability building and sensitization of employees			

Changing User Needs (CHN)

AGMARKNET	KCC	DACNET	Grapenet	CROP	IFMIS
	Expansion of projects based on periodic assessment of benefits accruing to stakeholders		Regular assessment and convergence of stakeholders' needs	Constant improvement in service delivery through regular assessment and convergence of stakeholders' needs	Assessment of projected requirements through strategic audit of IT plans

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AGMARKNET	KCC	DACNET	Grapenet	CROP	IFMIS
	Linking investment in e-governance projects with beneficiaries' satisfaction	Linking IT investment with performance gains			Linking investment in IT with performance gains
Customized content offerings					
Sensitization of planners leading to improved planning and decision-making					
		Strengthening and empowerment of planners for effective adoption of IT in an organization			

Ability to Maintain Contact with Implementers and Beneficiaries (CNTP)

AGMARKNET	KCC	DACNET	Grapenet	CROP	IFMIS
Better insights of planners about ground realities	Better insights of planners about ground realities	Better insights of planners about ground realities	Better insights of planners about ground realities	Better insights of planners about ground realities	Sensitization of planners about IT-enabled interfaces
Improved planning and strategy making based on field inputs	Improved planning and strategy making based on field inputs	Improved planning and strategy making based on field inputs	Improved planning and strategy making based on field inputs	Improved planning and strategy making based on interactions with beneficiaries and operational staff	Improved planning and strategy making for e-governance projects

Change Mechanisms (CM)

AGMARKNET	KCC	DACNET	Grapenet	CROP	IFMIS
Flexible government processes adaptable to changing situations	Flexible government processes adaptable to changing situations	Flexible government processes adaptable to IT-induced changing situations	Flexible government processes adaptable to changing situations		Flexible government processes adaptable to changing situations
Versatility through change mechanisms in processes	Versatility through change mechanisms in processes	IT-induced versatility in processes	Versatility through change mechanisms in processes		Versatility through change mechanisms in processes
Building public–private partnerships for project implementation					
Avoiding deadlock like situations during e-governance project life-cycles					
			Single-window service through change mechanisms		
				Amendment of rigid procedures, acts, rules as per changing environment	
				Enhancement of government efficiency	

Implementers

Strategic Coherence among Planners and Implementers (STCO)

AGMARKNET	KCC	DACNET	Grapenet	CROP	IFMIS
Sharing of project ownership between planners and implementers	Sharing of project ownership between planners and operational level staff	Sharing of project ownership between planners and operational level staff	Sharing of project ownership between planners and operational level staff	Sharing of project ownership between planners and implementing officers	Sharing of project ownership between planners and operational level staff
Project sustainability by building value based linkages with local departments					
	Encouraging innovations through motivation and empowerment of operational level staff	Encouraging innovative IT usage through motivation and empowerment of operational level staff	Encouraging innovations through motivation and empowerment of operational level staff	Encouraging innovations through motivation and incentives to operational level officers	Encouraging innovations through motivation and empowerment of operational level staff

Involvement of Stakeholders in Strategy Implementation (INSTSI)

AGMARKNET	KCC	DACNET	Grapenet	CROP	IFMIS
Sharing of ownership by stakeholders	Sharing of ownership by stakeholders	Sharing of ownership by stakeholders	Sharing of ownership by stakeholders	Sharing of ownership by stakeholders	Sharing of ownership by stakeholders
Addressing of stakeholders' concerns	Addressing of stakeholders' concerns		Addressing of stakeholders' concerns	Addressing of stakeholders' concerns	Addressing of stakeholders' concerns
Project sustainability	Project sustainability		Project sustainability	Project sustainability	Project sustainability
		Project serving the intended purpose			

Smooth Access to Service (SAS)

AGMARKNET	KCC	DACNET	Grapenet	CROP	IFMIS
Sharing of ownership by implementers	Binding of implementers with project	Involvement of implementers for achieving project mission	Binding of implementers with project	Binding of implementers with project	Binding of implementers with project

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AGMARKNET	KCC	DACNET	Grapenet	CROP	IFMIS
			Adequate ICT facilities for implementers	Performance metrics linking accessibility by implementers to improvement in service delivery	
	Use of beneficiaries database for improving performance of developmental schemes				

Awareness About Mission (MAW)

AGMARKNET	KCC	DACNET	Grapenet	CROP	IFMIS
Committed organizational efforts	Committed organizational efforts	Committed organizational efforts	Inter-organizational effort for e-governance	Employees' involvement through shared mission	Committed organizational effort through shared mission

Changing User Needs (CHN)

AGMARKNET	KCC	DACNET	Grapenet	CROP	IFMIS
Customized service offerings as per changing needs	Need based service delivery	Customization of Intranet service as per changing needs	Customized offerings as per changing needs	Addressing changing needs by augmenting internal capabilities	Customized web interfaces as per changing needs
		Effective utilization of collaborative ICT tools by employees			

Implementers' Level Feedback Loop (FDLI)

AGMARKNET	KCC	DACNET	Grapenet	CROP	IFMIS
Feedback mechanism through implementers.	Feedback mechanism through implementers	Feedback mechanism through employees	Feedback mechanism through implementers	Feedback mechanism through implementers	Feedback mechanism through implementers
Customized service offerings.	Customized service offerings	Need based knowledge sharing service	Customized service offerings	Service improvement through implementers	Customized service offerings

Ability to Use Service (ABS)

AGMARKNET	KCC	DACNET	Grapenet	CROP	IFMIS
Project ownership by implementers	Project ownership by implementers	Project ownership by implementers	Project ownership by implementers	Project ownership by implementers	Project ownership by implementers
			Capable implementers		
	Marketing through implementers				
		Contribution of implementers to intended purpose of the project			Effective utilization of service through implementers

Ability to Maintain Contact with Beneficiaries (CNTI)

AGMARKNET	KCC	DACNET	Grapenet	CROP	IFMIS
Bridging the gap between planners and beneficiaries	Bridging the gap between planners and beneficiaries	Bridging the gap between planners and beneficiaries	Bridging the gap between planners and beneficiaries	Bridging the gap between planners and beneficiaries	Bridging the gap between planners and beneficiaries
	Better assessment of service delivery	Better assessment of service delivery	Better assessment of service delivery	Sensitizing implementers for process refinement	Refinement of service delivery

Beneficiaries

Smooth Access to Service (SAS)

AGMARKNET	KCC	DACNET[a]	Grapenet	CROP	IFMIS
Participation of grass root level actors in governance	Participation in governance	–	Participation in governance	Forcing improved service delivery by government	Participation in governance
Attraction to use service	Binding of beneficiaries to service	–	Binding of beneficiaries to service		Binding of beneficiaries to service
Narrowing of digital divide	Narrowing of digital divide	–	Narrowing of digital divide		
	Resolving the last mile issue	–			

[a]DACNET being an Intranet project, elemental level interpretations derived for the 'implementers' category as they are the key beneficiaries

Feedback Loop (FDLB)

AGMARKNET	KCC	DACNET[a]	Grapenet	CROP	IFMIS
Participation of grassroots level actors in governance	Participation in governance	–	Participation in governance	Participation of beneficiaries in governance	Participation in governance
Improved user access interfaces based on feedback of beneficiaries	Improved user access interfaces based on feedback of beneficiaries	–	Improved user access interfaces based on feedback of beneficiaries		Improved user access interfaces based on feedback of beneficiaries
Customized content offerings	Orientation of service as per stakeholders' requirements	–	Service orientation as per stakeholders' requirements		Orientation of service as per stakeholders' requirements
Attraction to use service	Binding of beneficiaries to service	–	Binding of beneficiaries to service		Binding of beneficiaries to service
		–		Mechanisms for fast action on beneficiaries' feedback	

[a]DACNET being an Intranet project, elemental level interpretations derived for the 'implementers' category as they are the key beneficiaries

Ability to Use Service (ABS)

AGMARKNET	KCC	DACNET[a]	Grapenet	CROP	IFMIS
Empowerment of beneficiaries	Service driven by beneficiaries' requirements	–	Service driven by beneficiaries requirements	Service as per stakeholders' requirements	Service driven by beneficiaries requirements
Realization of mission/purpose		–			

[a]DACNET being an Intranet project, elemental level interpretations derived for the 'implementers' category as they are the key beneficiaries

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