Adoption of e-Government Services: A Case Study on e-Filing System of Income Tax Department of India

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1 Introduction

The aim of e-Government is to provide better services for citizens by taking use of Information Communication Technology and to evaluate the success of an e-Service, its adoption is a standard criterion. Governments worldwide are developing multiple capabilities to deliver services to the global Citizens. With the intelligent use of ICT and especially the Internet, Indian governments have the unique opportunity to take advantage of the indisputable advantages that these technologies can offer, in order to achieve better and more functional government. ICT have a valuable potential to help Indian central and state governments deliver good governance to their constituents.

Acceptance is termed as agreeing to receive something new or the act of receiving it whereas adoption is an act of taking something new or different on as your own and process of beginning to use that. Technology adoption can be an appropriate and effective usage of technology. Technology adoption is important because it is the vehicle that allows most people to participate in a rapidly changing world where technology has become central to our lives. Factors responsible for and influencing adoption of e-Services could be different for developing countries than developed countries, as the priorities and ecosystem for execution is entirely different. Strategy and approach for diffusion of e-Services to maximum of the citizens with minimum resources in developing countries like India would also be different than the practise in developed countries. However, the governments for the developing countries can retrofit and build on the learnings of the countries who have already succeeded in e-Government implementations.

This paper consists of seven sections. First section provides the background, definitions and context of different terms used in this paper. Second section covers the

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findings from the literature reviewed for this study with focus on the e-Government adoption relationship with established IS adoption models with focus on studies in the taxation domain worldwide. Third section tells about the research gaps, objective and scope of this study based on the literature reviewed. Fourth section gives information about the research methodology used and the scope of the information gathered in this study. Fifth section covered the details of the case study of the e-Filing system of the Income Tax Department of India. Sixth section provides the findings and recommendations including limitation of this research paper the future research based on the findings of this case study. The last section contains the list to the research and studies referenced in this paper.

2   Literature Review

e-Government research touches many other research domains, such as Information Systems (IS), Public Administration, Management and Political Science. In literature review, it is observed that in every e-Government study or research some of the literature cited is definitely from Information Systems or e-Business concepts modified in some way to fit into a public administration perspective. Literature and ideas representation in e-Government research from economics and sociology is not much, despite the fact that these domains have contributed significantly to informatics and governance research [18].

2.1   e-Government to e-Services

In literature many different definitions of e-Government are available [25]. The definitions by different agencies/organizations/sources may differ among them, however, there is a commonality across these definitions as "an electronic Government contains, using of information and communication technology, especially the Internet, to improve the delivery of government services to its citizens, businesses, and other government agencies". E-Government enables the citizens/users to interact with and/or receive services from the central government, state or local governments on 24×7 bases. E-governance is generally considered as a wider concept than e-government. E-governance [25] is the use of ICT by government for improving information and service delivery to citizen and encouraging them to participate in the decision-making process in making government more accountable, transparent and effective. E-governance is generally considered as a wider concept than e-government, since it can bring about a change in the way citizens relate to governments and to each other. E-Service is an umbrella term for services being provided on the web like application hosted by services providers on web or e-commerce transactions services for handling online orders. There are different definitions of e-Services in literature. However, most reflects three components [26], service

Table 1 Overview of the prominent models of adoption of information systems

Model	Study	Key constructs
Technology acceptance model (TAM)	Davis [8]	Perceived usefulness (PU), perceived ease of use (PEU), attitude towards use (A), behavioral intention of use (BI) and actual use (usage)
TAM2	Venkatesh and Davis [36]	Extension of TAM, by including cognitive instrumental processes and social influence processes and excluding attitude towards use (A)
Theory of reasoned action (TRA)	Fishbein and Ajzen [14]	Behavioral beliefs, attitude towards behavior, normative beliefs, subjective norm, behavioral intention and actual behavior
Theory of planned behavior (TPB)	Ajzen [1]	Extension of TRA, by including a relationship of control beliefs, perceived behavioral control and behavioral intention
Unified theory of acceptance and use of technology (UTAUT)	Venkatesh et al. [37]	Performance expectancy (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC)
Diffusion of innovations (DOI) theory	Rogers [28]	Relative advantage, compatibility, complexity, 'triability' and 'observability'

provider—government agency, service receiver—citizens and businesses and the channel of service delivery—Internet. The e-Filing system [12] is not about simply making it possible to transmit information electronically. It is about a change in the basic infrastructure used by citizens and the government to deal with one another. The electronic filing (e-Filing) is the electronic submission of information that is required by law using the designated e-Filing system.

2.2 Adoption of ICT

There are a number of proven theories and models relating to Adoption of IS available in literature, which are still in some form being referred for research/studies in IS domain. The prominent models (Table 1) of adoption of IS are as follows:

- Technology Acceptance Model [36]—TAM is one of the most frequently employed models for research into new information technology acceptance. It suggests that when users are presented with a new technology, two beliefs, the

perceived usability and utility and the perceived ease of application, determine attitudes to adopt new technologies.

- The Theory of Reasoned Action [14]—TRA says, "Behavior is determined by the Behavior Intension to emit the behavior. Attitudinal factor and normative factor determine the Behavior Intension."
- The Theory of Planned Behavior [1]—TPB says, "Human behavior is guided by beliefs about the likely consequences (Behavioral beliefs), beliefs about the normative expectations of other people (Normative beliefs) and beliefs about the presence of the factors that may impact the performance of the behavior (Control beliefs)."
- The Diffusion of Innovations (DOI) theory [28]—explain how an innovation diffuses through a society, it has five components as, relative advantage, compatibility, complexity, "triability" and "observability".
- The Unified Theory of Acceptance and Use of Technology [37]—UTAUT is an integration of predictability capabilities from different existing models of technology acceptance. It says, "Performance expectancy, effort expectancy, and social influence predict behavioral intention towards the acceptance of information technology."

In the existing body of knowledge [3] it was observed that theories and models generally cited are the theory in the research area of acceptance and adoption of technology. Most of these theories focus at a time on any of the individual theory as TAM, TRA, TPB, or UTAUT. The variables of success in IS in adoption are System Quality, Information Quality, Use, User Satisfaction, Individual Impact, and Organizational Impact [10] and inclusion of Service Quality as an additional aspect of IS success [11] assigning different weights to System Quality, Information Quality, and Service Quality depending on the context and scope of the project. Perceived ease of use was an important determinant factor of perceived usefulness [35]. Experience and voluntariness are the controlling factors of subjective norm [36] and external variables affect perceived usefulness. However, UTAUT, which touches impact of intervention, has four key constructs (i.e., performance expectancy, effort expectancy, social influence, and facilitating conditions) that influence behavioral intention to use a technology and/or technology use [37]. Most of the studies on technology adoption used modified versions of the TAM [33] rather than original model and the results were influenced by other variables that were introduced when using any of the modified versions of the TAM models. Interventions impact both determinants of technology adoption, perceived ease of use and perceived usefulness [34].

2.3   e-Government and Adoption

The successful implementation of e-Governments not only depends on the strong support and commitment from the governments, but also depends on whether the citizens would like to accept and adopt the e-Government services [2]. ICT invest-

ments are helpful [22] in improving the performance and productivity (throughput). The acceptance and adoption by user and ensuring the optimum use of ICT systems is a challenge in any organizations. In an e-Government initiative, [27] we need to understand and represent the relationships among different stakeholder of the initiative. The development and integration of a strong back-office to support is an essential factor in achieving the best of the frontend portal of an e-Government initiative. A weak or no backend support leads to failure of any e-Government initiative [15, 21, 32]. While planning an e-Government initiative, we must have a change management package as built-in [16]. When the roadmap/blueprint is being drawn for any e-Government initiative in any organization, there are no readymade and common or "one size fits all" e-Governance solutions available [17]. Every country, at each level of government within that country, has a distinctive combination of conditions, priorities and resources. The role of intermediaries [39] particularly for developing countries is vital for success of e-Government initiatives, as they implement their own infrastructure to bridge the digital divide and technology gap. There are also significant differences while measuring the "use of e-Government services" when accessed through intermediaries or there is a direct online access, by the citizens. It is empirically validated [38] in the perspective of UTAUT that performance expectancy, effort expectancy, and social influence have a significant positive influence on behavioral intention to use information kiosks and intermediaries. These kiosks operators and intermediaries are partners of the Government to support e-Services. We should not consider the e-Government a one-step process or a single project [19], instead, we should conceptualize it as evolutionary and progressive, which involves multiple stages or phases of execution. We find that clear vision and goal definition, with excellent leadership is essential for adoption of e-Government initiative. The measures to evaluate the success [29] of an e-Government project are the adoption of that e-Service.

The challenges and problems associated with the implementation and adoption of ICT systems have led scholars and practitioners to seek to understand and manage the processes and phenomena related to the field [22]. It was found that trust, financial security, and information quality are adoption barriers, whilst time and money are potential adoption benefits. For successful e-Government it requires the engagement of all stakeholders, and it is expected that development of strategies should align stakeholder interests, so that participation in e-Government for all stakeholder can be self-governing. It was found in a study [7] that most of the e-Government initiatives in developing countries abandoned very soon after implementation or major Goals were not attained. This is major problem, as developing countries have a limited number of resources at their disposal and cannot afford to waste large amount of money on such projects.

2.4   e-Governance in India

The National e-Governance Plan (NeGP) was launched by government of India on May 16, 2006 with focus on building the right governance and institutional mechanisms, setting up of the core infrastructure and framing policies along with the implementation of a large number of e-Governance projects called Mission Mode Projects at the levels of Union government, state governments as well as integrated service levels to develop a citizen-centric and business-centric environment for governance. The NeGP [9] list now comprises of 31 mission mode projects (MMPs). One of the important provisions of the NeGP is to encourage Public Private Partnership into various key projects. The focus of e-Government in India is to make all Government services accessible to the common citizen and use it as a tool to further economic development and good governance.

In Indian government sector, there is a strategic shift being observed [4], Instead of acquiring hardware and software, the governments in India (central and state) now have started buying ICT services. Most of these ICT procurements are as Managed Services projects under Public Private Partnership (PPP) model, which allows the governments to focus on critical value-adding business and activities (which only government can do as best way) and transferring the technology-related requirements to IT professionals (IT partner), most of the time a private organization, taking advantage of the matured Indian IT services industry. Successful implementation of PPP is not easy to implement in e-Governance sector in India. It requires [30], the adoption and intelligent use of key best practices and lessons learnt (from mistakes) from earlier PPP implementation experiences in e-Government and this is especially useful for developing countries, where there is already a scarcity of resources in terms of finances and technical skills.

2.5   e-Governance and Taxation

In order to reach taxpayers more effectively [31], the organization leveraged on its relationship with trade groups, bodies, NGOs and corporates to educate taxpayers on tax matters. Also, different type of incentives given to eFilers and providing easy internet access to taxpayers (kiosks and community clubs) helped in promoting e-Filing of tax returns. The automation of taxation department [23] led to improved efficiency by saving time and cost. Savings from automation is resulting from greater productivity of staff. The error and fraud detections significantly improve by automation. "E-Tax" is intended to radically improve tax administration efficiency [5] in both back-office tax record management and front-line tax consultation. The impact of e-Government requires mobilizing internal resources particularly the people to implement e-Government initiatives. Both compatibility (COMP) and PIIT strongly [24] influence BI. The direct significant effect of PEOU on BI supports a previous research finding that PEOU directly affects BI. Limitation of the study is the

participants. However, this study used a convenience sample of graduating engineering and management students, who in reality have never filed any Income Tax return (e-filed or manual). Based on the analysis [6] of the factors surrounding e-Government adoption issues and identifying which ones should take priority, the findings of previous studies advocating that government website managers must work towards increasing and improving citizen awareness and adoption and usage rates were confirmed.

3 Research Gap, Contribution, and Scope

There are research citations available on Information Systems field on the adoption and acceptance of technology. Most of these researches and studies are in generic e-Governance perspectives than the specific ones and considering cases from developed countries. There is hardly any study to focus on adoption of use of e-Services of Government from developing countries, specifically from India. The finding of this study will contribute to the knowledge body in this gap. It focuses on efficiency and effectiveness of e-Services system. The finding of this study will be helpful in providing the direction to the planners of these services in similar context.

The objective of this study is to explicate the best practices and lessons learnt in the context of the technology adoption models, with a specific focus on use of the electronic services in India. Specifically, how the adoption of e-Services can be promoted through different stages of adoption is of greater focus. By exploring a qualitative case study which provides a greater overview of the stages descriptively, we attempt to explore greater breadth of incidents instead of focusing exclusively on validation of the findings or existing models through empirical evidences.

Scope of this exploratory research was to conduct a focused study work guided by availability of resources and time on a citizen focused e-Government initiative. Government of India has done huge investment for implementation of ICT systems (e-Government projects), which are impacting the citizens of India. It is significant to study the e-Government systems with a point of view of efficiency, effectiveness and adoption of these systems by users. As scope, we covered the case study e-Services on citizen portals of Income Tax Department (e-Filing System). Income Tax Department has initiated one of the major e-Governance initiatives of India. Under this initiative, the department offers e-Services through web-based, single-window, 24×7 Managed Services models. E-Filing system of the department is flagship e-Services initiative for the citizens.

4 Research Methodology

Case Study based qualitative research methods have been used in this research. It was decided that we collect information from those stakeholders who are close to the

day-to-day activities of the systems. The chances are that we get information from important stakeholders while discussing the ICT systems, which the person (government official) may otherwise not be comfortable in sharing, especially through email or otherwise. The interview is also a fine method with which to identify incidents that are critical for (dis)satisfaction with the service.

Triangulation approach was adopted for information and findings, by using different data-sources and data types. We collected information from multiple sources (Interviews, System database, reports/documents available in public domains and project documents) with aim to corroborate the same finding. Multiple sources of evidences essentially provide multiple measures of the same phenomenon. We covered interviews with personal worked or working on key positions the project, to collect the data from both views, Service Provider and Sponsor (civil servants). When these stakeholders were interviewed, the focus was on their specific knowledge for the system. Interviews were semi-structured. We prepared a list of questions for each type of stakeholder interview but also on case-to-case bases deviated from the format to track interesting issues that come up during the conversation and shifted focus to other potentially relevant topics that were not previously included in the interview scheme. In second part, we did a focused discussion with different interest groups and intermediaries (Law firms, Chartered Accountants and Third party e-Filing utility providers) on their expectations and experience for the system. In parallel, we collected data from documents available in public domain and project documents (Functional Requirement and System Design documents) and from system databases extracted the relevant information of portal usage on different parameters, including portal data of stakeholders' grievance and feedback. Based on these as inputs, we did the analysis using critical factor analysis and human factor analysis. The outcome of this analysis becomes bases for findings and recommendations of this study.

5   Case Study: e-Filing System of Income Tax Department

The task force constituted by Government of India [13] on taxation recommended that tax departments should concentrate on its core functions with focus on assessment and enforcement duties, rather than logistics and support services. To achieve this, one the recommendation stressed on the use of information technology to provide better services to taxpayers and enhance tax efficiency. The approval was also given to the Scheme of e-filing of Income Tax Returns. This study covered in-depth analysis of the progress across all phases of implementation of e-Filing system of Income Tax department.

5.1 Initial Phase

As per the recommendations of the task force, in the budget speech in Feb 2006, Finance Minister announced e-Filing of Income Tax returns effective Assessment Year (AY) 2006–07. The time given to department was not enough to implement a comprehensive e-Filing system. So, similar to the concept/model generally being adopted by different Government departments in India for execution of ICT systems, Income Tax Department also followed the same approach of owning and managing the system under a multi-vendor execution model with department handling the management activities and specialist individual vendors for networks of the department (LANs and WANs), main hardware (Servers) had been supplied by a multinational hardware vendor and Application was developed by an Indian software services company and was being maintaining on annual basses by the same. Project Management and day-to-day system operations were being handled by technical staff of the department.

Department launched its website with URL as www.incometaxindiaefiling.gov.in for e-Filing of Income Tax Returns. The implementation of this system was full of challenges for all stakeholders, especially for the department. The taxpayers were not ready for this system and process. A feedback based study for done to find the reasons for reluctance of users to optimally use this system. The reasons were prioritized and actions were taken within the constraints of the system. No training or awareness was imparted to citizen to use the system. Usability (ease of use) of the system was considered as poor. Reliability and availability of system was also an issue. These are the important attributes for potential adopters to be motivated to connect to the system for usage [20]. However, actions to improve on these issues were taken by the department and within short time the system stabilized. The confidence of all stakeholders increased on this system. The total number of returns filed electronically increased from around 0.36 million in FY 2006–07 to around 5.7 million in FY 2009–10, which was more than the capacity for the implemented system. This was further expected to grow. The reason for this is considered as the usage of online systems increased tremendously due to widespread awareness of ICT and penetration of Internet, as well as the faster processing of electronically filed ITRs with respect to processing of paper returns (the returns filed in the jurisdictional offices of the department). This is because of inbuilt benefits of e-Filing and dedicated facility at CPC Bangalore for electronically filed IT Returns only in bulk mode. As an incentive, citizens who filed ITR electronically started receiving their tax refunds faster, hassle-free, including in most of the cases, directly into their bank accounts.

5.2 Transition Phase

Although every vendor was expert in its own area, however there are many other constraints/challenges in this type of execution model especially the coordination

and communication among different vendor partners. Many times very small problem or issue caught into blame game among them. The problem gets worsen if the organization internally is not competent to handle technology. Many system environment components (like servers, network equipment and storage) had been declared obsolete by respective Original Equipment Manufacturers and needed a large investment for the system. The department decided to scrap the existing e-Filing system all together and development of fresh new ICT system with new thoughts and with long term benefits in consideration including more freedom/flexibility in terms of technology progress and adoption, functional scope and focusing on the lessons learnt from execution of the previous system.

5.3   Transformational Phase

Department finally took a conscious call to go for the new afresh e-Filing system with an innovative concept of partnership with IT service provider (Managed Services model). The new e-Filing System has been made live on November 9, 2012 with many new facilities to taxpayers and extension of electronic filing of other statutory forms and reports (other than ITR forms) as prescribed in the Income Tax Rules. This portal is a single-window interface to different category of users like Individual taxpayers, Business, Corporate, Tax Professionals, Electronic Return Intermarries (ERIs), internal departmental users and External Agencies (Banks and other departments) for information through role bases scoured access control system. There is a dedicated Call Centre service for all stakeholders of this system. Provision is there for online feedback and grievance from users and subsequently after analysis, tracking to closure. A few functionalize have been added and some are modified, based on the analysis of the online feedback received through portal. With new system in place and realizing the potential of e-Filing, department wants that most of the taxpayers who file paper tax returns to be encouraged to shift to e-Filing of IT returns. This e-Filing has an interface with both the Central Processing Centre (CPC) which is a dedicated facility of the department for a jurisdiction free bulk processing for Income Tax Returns (ITRs) and with the Core ITD Application system for information flow for Assessing Officers and other department officials. There is service level agreement with all service providers to ensure the timely completion of end-to-end activities. The information of the different status of the ITRs at CPC flows back to e-Filing system for showing the same status information to the taxpayer. Due to these interfaces and flow of information across systems, PAN validation facility and view of Tax Credits (26AS statement) are available online on new e-Filing System. The intimation of the final result of ITR processing is also sent through email as well as through SMS to taxpayer. Figure 1 shows the process of e-Filing the Income Tax Return by taxpayer.

For the FY 2014–15, more than 34 million Tax Returns were files as e-Returns. More than 43 million are registered users of this system (Retrieved from: https:// incometaxindiaefiling.gov.in/). Department also experienced a sudden increase in
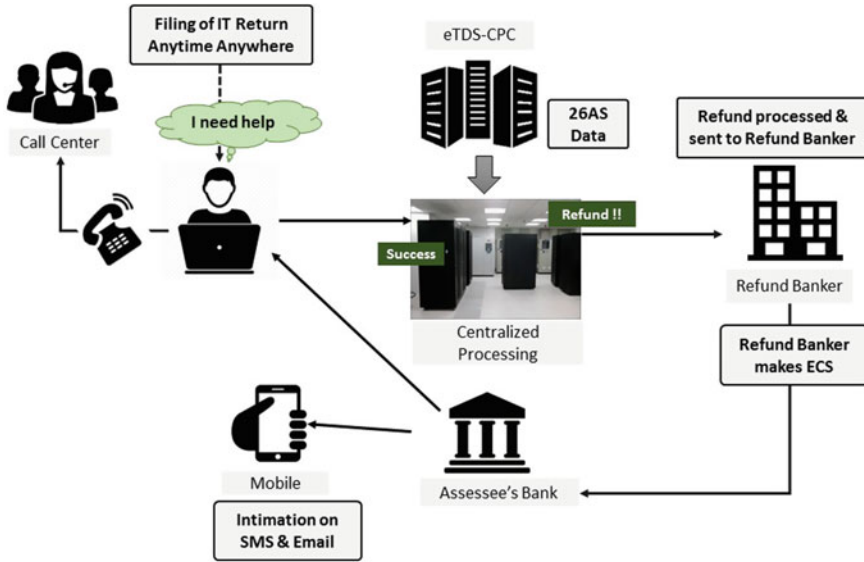
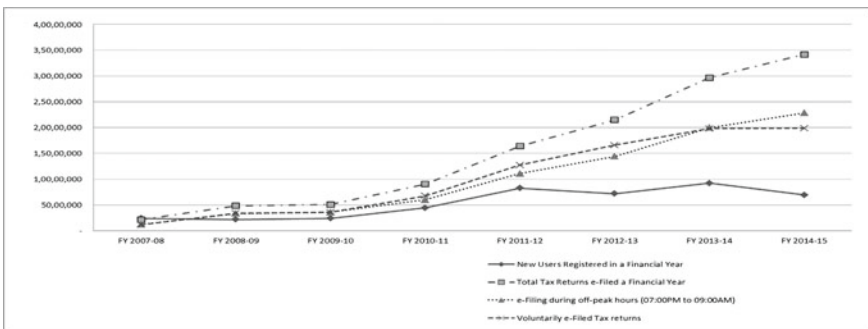**Fig. 1** Experience of taxpayers for e-Filing of tax return

Fig. 2 Growth of e-Filing of income tax returns (*Source* Departmental Reports)

volumes of voluntary filing of Income Tax Returns electronically. Figure 2 shows the summary of growth trends of different activities of e-Filing system of Income Tax Department. Attitudinal factors as usefulness of the system and image enhancements of the user become important for continued usage of the ICT system for users [20]. To ensure that the users take maximum benefit of this system, there has been a further push by the department to focus on awareness and education of taxpayers, steadily inclusion of more taxpayers' categories as compulsory e-Filing of Income Tax Returns, involvement of Intermediaries and Tax Return Preparers (TRPs) to encourage the e-Filing of ITRs and include more business services of the department to e-Services through this system.

Since beginning, the ITR-V process established by the department has a big issue for both, the taxpayer and the department. Effective AY 2009–10, the ITR-V is to be sent by post to Central Process Centre (CPC) of the department in Bangalore. Many times the return filer (e-Filed return) claims, that the ITR-V was sent well within due date (120 days of filing the return on System). The facts in the department tells different story, either ITR-V has not been received or has been received after the due date. Even after this new system, this issue has not been tackled. Now, with advance in the technology and implementation in the e-Filing with best available technology, department implemented certain innovative solutions like One Time Electronic Signatures and "Aadhaar" based authentication and in these cases, the taxpayer is not required to send of signed ITR-V to department (Bengaluru). This further helped in faster processing of tax returns and hence faster refunds reaching faster to the taxpayers' accounts.

After the success and acceptability of this System, coupled with growing expectations of the citizens it has become a single window of interaction with department for all external stakeholders, including the taxpayers who are filing their ITRs in paper format, are also being given many services through this System. Income Tax Department (ITD) has recently introduced a new initiative as "e-Sahyog", in line with the government's commitment under Digital India to work in an e-Environment and to e-Enable public services for the benefit of the citizens. This has been done with a view to reduce compliance cost, to increase transparency and to reduce the need for the taxpayer to physically appear before tax authorities. With focus now to increase the further spread of e-Services, the department has already started the development and will launch a facility to interact with e-Filing system through different mobile platforms.

6   Discussion and Conclusion

The e-Government projects always require a lot of investment of resources, so the failure of the e-Government projects means great amount of loss on the citizens' money. The e-Government adoption model can identify the main influencing factors affecting adoption, which can help the successful implementation of e-Government projects. The analysis of these models shows that the two constructs ease of use and usefulness under different names are part of each model. Observing the adoption progress of the e-Filing system of the department and focusing on awareness by the department, taxpayers were being encouraged for opting using the e-Filing process of Income Tax Returns every year. With addition of many other e-Services to the citizens though this System, this e-Filing System of the Income Tax Department is now an e-Interaction System of the department (one stop shop—Single window). For end-to-end activities, e-Filing of Tax Return till receiving the refund in the bank account, taxpayer is not required to visit the income tax office. Most of the exceptions are also being handled through System or through emails ("e-Sahyog"). In context of developing country, awareness, affordability and accessibility, are the core

factors which impact the adoption and acceptance of any e-Service or Digital Service, irrespective of the maturity stage or level. Important factors have clearly emerged during the study, which explain the significance of the roles of intermediaries, kiosks, back-office, other interfacing ICT systems (upstream ICT systems) and internal users of the organization for success of an e-Service. For organization like Income Tax Department of India, transparency could be a factor for adoption of e-Services by the taxpayers. However, each of these need to be further studied and can be other paths to further researches.

Although the initial adoption of usage of the system is important, the sustained use of the system by the same users is more important. The increase in efficiency, especially the response of the system to its users, led to further participation and hence to adoption of e-Service. There is clear evidence of the importance of citizens' participation for improving the performances of a policy-making process in adoption. For citizens, service maturity levels and trust in government are important factor for adoption of an e-Service. For e-Service, it is important to know the reasons why citizens are hesitant or resistant to use e-Services and evaluates different actions governments could take to increase e-Services usage. It requires the engagement of all stakeholders from an early stage of the project, and that a prerequisite to that engagement is a shared understanding of the interests, perspectives, value dimensions, and benefits sought from e-Government by the various stakeholders. Being citizen-centric systems, the reliability and availability has to be given priority in design this system. Social networking and other trends in the internet are also to be exploited for training and awareness of citizens. The criteria to judge the success of an e-Government project is the adoption. This is also on the same lines what is mentioned in UTAUT. The implementation of these e-Services should be in sustained manner with effectiveness (adoption) of each stage being measures before shifting to next stage of maturity of e-Services. However, plan of sustained release of e-Services should be different across identified countries based on the setup and conditions. For further spread of e-Services, provide the e-Services also through different mobile platforms. This study also confirmed that Managed Services model through Public Private Partnership (PPP) for e-Governance projects in India is successful. The corresponding author is a practitioner and in past more than one decade, he is closely associated with ICT implementation for Government of India. The observations from his experience up to an extent have also matches the findings of this study. Considering the penetration and diffusion of mobile technology in India, it is observed that these e-Services are being made available on mobile platforms (m-Services). Citizens prospective as a user of this System, preferably using quantitative technique would be further research step.

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