Framework

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SAP-LAP Linkages – A Generic Interpretive Framework for Analyzing Managerial Contexts

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Abstract

The implementation of flexible systems management paradigm can be facilitated by SAP-LAP (Situation, Actor, Process, Learning, Action, Performance) framework and SAP-LAP models. The SAP-LAP models in vogue are atomic or naive models. In these models, the components of SAP-LAP are treated in isolation. This paper presents a generic framework to identify SAP-LAP linkages and develop models of managerial contexts taking into consideration various interrelationships along with their interpretation. The integrated framework is presented using self-interaction, cross-interaction and assessment matrices.

Keywords: assessment matrix, cross-interaction matrix, SAP-LAP linkages, SAP-LAP models, self-interaction matrix

Introduction

Flexible systems management is rooted into the concept of 'systemic flexibility' (Sushil 1997, 2000) which deals with synthesis of thesis and anti thesis. The application of this paradigm is facilitated by SAP-LAP framework (Sushil 2000a, 2001) and SAP-LAP models (Sushil 2000b, 2001a) SAP-LAP framework constitutes of basic entities in any managerial context. Basically, any managerial 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 interplay and synthesis of Situation–Actor–Process (SAP) leads to Learning-Action-Performance (LAP). The SAP analysis brings out key learning issues, which act as a base to take actions leading to performance.

Largely, SAP-LAP models that are developed are naive or atomic models treating the basic components of SAP-LAP framework independently without explicitly considering their interdependence or interrelationships. Examples of such naive models can be seen in many applications (Sushil 2000a, Husain and Sushil 1997, 2000, Husain et. al. 2002, Kak and Sushil 2002, Gupta 2003, Rawani and Gupta 2000).

Interaction of various elements or components can be represented by using concepts and tools of structural modeling, such as self-interaction and cross-interaction matrices (Harary et. al. 1965, Warfield 1973, 2003). These matrices are used as a base in developing Program Planning Linkages (Hill and Warfield 1972, Sage 1977, Saxena et. al. 1989, 1990, 2006) which is used as a guiding framework to develop SAP-LAP linkages, as proposed in this paper. However, the presentation in the proposed framework is enriched using interpretive matrices (Sushil 2005).

SAP-LAP Framework - An Overview

SAP-LAP is an integrative framework comprising of six basic components:

i. The 'situation' to be dealt with, which can be external or internal to the organization.

ii. The 'actor(s)' dealing with the situation, which can be 'internal' or 'external' with reference to the organization under study.

iii. The 'process(es)' dealing with the situation, which can again be 'internal' or 'external' to the organization.

iv. The key learning issues, in terms of the achievement of objectives or problem areas.

v. The 'action(s)' to be taken based on learning, affecting the performance areas or objectives.

vi. The 'performance' areas in terms of 'objectives' to be achieved or key result areas (KRAs).

An illustration of external and internal elements under situation, actor and process is shown in Table 1 in the context of a typical business organization. The list of elements is only illustrative in nature and by no means is comprehensive. The elements have to be identified in the context of a case situation under investigation. SAP-LAP is a generic framework which can be used in a variety of contexts, such as problem solving, change management,

Table 1: Examples of SAP Elements for a Typical Business Organization

Components		Elements
Situation (S)	External	- Competition - Market Growth - Attractiveness - Substitutes
	Internal	- Core Competence - Financial Health - Market Share - Technological Capabilities - Flexibility
Actor (A)	External	- Customers - Competitors - Suppliers - Partners - New Entrants - Government
	Internal	- Top Management - Business Unit Heads - Functional Heads - Process Owners - Employees
Process (P)	External	- Alliance Management - Supply Chain Management - Distribution - Technology Acquisition - Business Development - Outsourcing - Customer Interface
	Internal	- Product Development - Production - Core Competence Building - Strategic Planning - Performance Management - Technology Capability Building - Accounting and Costing

strategy formulation, supply chain management, marketing management, technology management, human resource management, and so on.

The first step in any problem context would be identification of SAP elements, both external and internal. Care should be taken to identify only key elements, or else further analysis would become too cumbersome to be adopted for any practical use. Similarly, key elements are to be identified for learning, action and performance, as is done in LAP synthesis in general.

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The analysis carried out in SAP framework helps in synthesizing the key learning issues in the case. Learning includes taking a fresh look of the processes operating in detail. When we are learning the key issues, we try to analyze the drawbacks of the process and the manner in which these can be overcome. The drawbacks are identified while keeping present as well as future scenarios in mind. Key learning issues can be of two types: (i) generic and (ii) specific. The generic issues are the ones which can be related to the lessons learnt from the previous cases and can be used as generalized statements for the similar cases in the future by proper synthesis. The specific learning issues are linked directly with the case under consideration and are either expressed in terms of the obstacles or in terms of the targets to be achieved. To solve these issues, special attention and focus is required, as these are specific to the case under consideration. This requires intelligence and keen observation.

Basic Matrix Structure

The simplest form to depict interrelationship of elements can be used in the form of a matrix, having two dimensions. The basic matrices in SAP-LAP linkages taken are self-interaction and cross-interaction matrices. A third type of matrix is added to facilitate the assessment of elements in different components which is termed as 'assessment matrix'.

Though there is one-to-one correspondence between matrices and structural models, the structural graphics is advantageous to read and interpret as compared to large matrices. However, the graphical structural model, in the context of cross-interaction of two different sets of elements becomes at times complicated to be read by the user. Since there is one-to-one correspondence between matrices and structural models, the graphical models can easily be portrayed by using the data in matrices. As the paper is the first attempt to include interrelationships of SAP-LAP elements, it is preferred to use matrices rather than graphical representations.

Self-interaction Matrices

The relationships among the elements of a particular component can be represented by a self-interaction matrix. For example, the interdependence of actors in a given context can be represented in the form of information support, team work and so on. A pair wise comparison is made and a binary relationship (1, 0) is represented in the matrix as shown in Figure 1 (a). An entry of '1' in a cell means that the two elements (in this case actors) have some interaction, and '0' means no interaction. Further, the nature of interaction is qualified in an 'interpretive self-interaction matrix' as

0	0	1	0	A1
0	1	1	A2	
1	0	A3		
1	A4			
A5				

1(a) Binary Matrix for Five Actors

—	—	Information Support	—	A1
—	Team Work	Team Work	A2	
Knowledge Sharing	—	A3		
Reporting	A4			
A5				

1(b) Interpretive Matrix for Five Actors

Figure 1: Sample Self-interaction Matrix for Five Actors

Table 2: Indicative Interpretive-Relationships for Self-interaction

Component	Interpretive Relationship
Situation	Multiplier effect, Adds to Uncertainty, Contributes, Influences
Actors	Information Support, Team work, Knowledge sharing, Reporting, Collaboration, Competition
Process	Physical flow, Information flow, People flow, Order flow, Money flow, Facilitation
Learning	Synergy, Conflict, Influence, Provide Support or Evidence
Action	Synergy, Conflict, Information exchange, Prerequisite or precedence relationship
Performance	Will help achieve, Will contradict

shown in Figure 1(b), so as to understand the inter-actions more meaningfully. Some possible types of interpretive relationships, for developing interpretive self-interaction matrices, for various components are illustrated in Table 2. The relationships between different pairs of elements can either be identified qualitatively based on experience and judgment, or it can be established empirically in the given setting by correlation analysis. These matrices can be partitioned for external and internal elements, as shown in the illustrative case in Appendix II (Exhibits 3 to 5).

Cross-interaction Matrices

The relationship/deployment among the elements of two different components, such as 'actors' and 'processes' or 'actors' and 'performance' can be represented by a cross-interaction matrix, as shown in Figure 2. Here again the interaction can be represented in a binary (1,0) mode (Figure 2(a)) or in a interpretive mode enumerating the interpretive relationship (Figure 2(b)). Some of the possible interpretive relationships for different pairs of components are given in Table 3. These matrices can be partitioned for external and internal elements, as shown in the illustrative case in Appendix II (Exhibits 6 to 8).

The relationships among the elements of a particular component can be represented by a self-interaction matrix.

Assessment Matrices

The assessment matrices provide the assessment of the state of elements in a component (Appendix I). These matrices have slightly different structure for each component. For example, the assessment matrix for the

Actor	P1	P2	P3	P4	P5
A1	1	0	0	1	0
A2	0	0	1	0	0
A3	0	1	1	0	0
A4	0	0	0	1	1
A5	0	0	1	1	1

Process

2(a) Binary Matrix

Actor	P1	P2	P3	P4	P5
A1	Owner Co-ordinator	-	-	Co-ordinator	-
A2	-	-	Owner	-	-
A3	-	Owner Co-ordinator	Gatekeeper	-	-
A4	-	-	-	Owner	Coordinator
A5	-	-	Coordinator Champion	Gatekeeper	Owner

Process

2(b) Interpretive Matrix showing Roles of Actors

Figure 2: Sample Cross-interaction Matrix for Five Actors and Five Processes

Table 3: Possible Interpretive Relationships for Different Pairs of Components

Pairs of Components			Interpretive Relationship
Situation	—	Actor	Climate (Situation influencing the actors), Constraints to act
Actor	—	Process	Roles
Process	—	Situation	Response (Process influencing the situation)
			Constraints lifted, alterables changed
Actor	—	Performance	Actor contributing to Performance Area/ Objective
Process	—	Performance	Process contributing to Performance Area/Objective
Action	—	Performance	Action influencing Performance
Performance	—	Learning	Performance giving feedback to Learning

situation gives the state of different situational elements in the form of a score as well as qualitative assessment. This matrix may take into consideration multiple situations. For example, in case of organizational transformation two situations can be assessed, i.e. pre-transformation situation and post-transformation situation. The assessment matrices for 'actor'/'process' give a comparative assessment of actors/ processes for the organization under consideration as well as its main competitors. The assessment can be in qualitative terms as well as in the form of a score based on a scale.

SAP-LAP Linkages

A comprehensive generic framework of SAP-LAP linkages in provided in Figure 3 in the form of assessment, self-

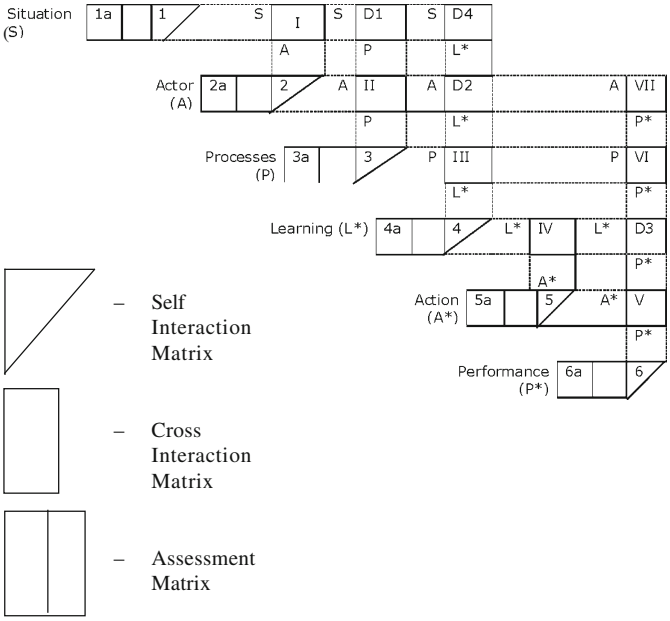

Figure 3: Matrices in SAP-LAP Linkages

interaction and cross-interaction matrices. In any context, depending upon the requirement and resources, a relevant sub-set of matrices may be chosen for analysis. The comprehensive framework consists of six assessment matrices numbered 1a to 6a; one for each component of SAP-LAP. Similarly, there are six self-interaction matrices numbered 1 to 6 for each component of SAP-LAP framework. There are, in all, 11 cross-interaction matrices proposed in the framework, out of which seven are basic cross-interaction matrices and four are derived cross-interaction matrices. Some cross-interaction matrices may be derived by multiplying two cross-interaction matrices. For example, the cross-interaction matrix Situation X Process (D1) can be derived by multiplying the matrices Situation X Actor (I) with Actor X Process (II).

The relationship/deployment among the elements of two different components, such as 'actors' and 'processes' or 'actors' and 'performance' can be represented by a cross-interaction matrix.

The basic cross-interaction matrices are:

I – Situation (S) X Actor (A)

II – Actor (A) X Process (P)

III – Process (P) X Learning (L*)

IV – Learning (L*) X Action (A*)

V – Action (A*) X Performance (P*)

VI – Process (P) X Performance (P*)

VII – Actor (A) X Performance (P*)

The derived cross-interaction matrices are:

D1 – [Situation (S) X Process (P)] = [Situation X Actor] X [Actor X Process]

D2 – [Actor (A) X Learning (L*)] = [Actor x Process] X [Process X Learning]

D3 – [Learning (L*) X Performance (P*)] = [Learning X Action] X [Action X Performance]

D4 – [Situation (S) X Learning (L*)] = [Situation X Process] X [Process X Learning]

Some of the matrices of SAP-LAP linkages can be traced in terms of standard analysis being carried out in various areas of management such as SWOT analysis is based on S x A matrix, whereas QFD matrix is a S X P matrix.

Steps for Implementation

The SAP-LAP linkages, proposed in this paper, can be implemented in the context of any case analysis. The following broad steps may be followed for its implementation:

i. Carry out SAP-LAP analysis of the case treating all components independently.

ii. Sharply define elements in SAP-LAP.

iii. Select relevant matrices out of the framework.

iv. Develop scales and assess the elements in the framework of assessment matrices.

v. Develop binary as well as interpretive self-interaction matrices.

vi. Develop binary as well as interpretive cross-interaction matrices and derived cross-interaction matrices.

vii. Interpret the relationships as depicted in matrices.

Illustration

The framework of SAP-LAP linkages is partially illustrated with the case of ABB India as reported in Sushil (2001) in the context of technology pioneering. The SAP-LAP analysis, as reported in this paper, is provided in Appendix II. All the Exhibits of further analysis for this illustrative case are also given in Appendix II. As per the steps of implementation, firstly the elements of SAP-LAP are sharply defined as given in Exhibit 1. For the sake of illustration, all the matrices of SAP are used and only one cross-interaction matrix of LAP, i.e. Action X Performance is selected.

Assessment Matrices

The three assessment matrices (Exhibit 2) for SAP are used to quantitatively assess the situation, actors and processes using a five point scale as given below. The assessment given in Exhibit 2 is only illustrative and not accurate as the purpose here is only to illustrate the application of the framework. For a better estimate in case of practical situations, a questionnaire can be developed and an empirical study can be carried out.

VL	L	M	H	VH
1	2	3	4	5

Self-interaction Matrices

The self-interaction matrices for 'situation', 'actor' and 'process' elements are given in Exhibits 3 to 5 respectively.

Cross-interaction Matrices

Two cross-interaction matrices, i.e. Situation X Actor (I) and Actor X Process (II) are developed and third one is derived, i.e. Situation X Process (D1) by multiplying binary matrices I and II and then its relationships are interpreted. The three cross-interaction matrices are shown in Exhibits 6 to 8. These matrices are also partitioned into external and internal elements. In the LAP part, only one cross-interaction matrix, i.e. Action x Performance, is illustrated as shown in Exhibit 9.

Discussion and Interpretation

As per the assessment matrix, 'stiff competition' and 'strong technology base' are the strong elements of external and internal situation respectively. The organization has edge in almost all actors and processes over its main competitor. The 'opening up of opportunities' is the key element of the situation influencing other elements as per self-interaction matrix. Similarly, 'ABB India's Management' is the most linked actor and 'Technology and business strategy alignment' is the most linked process. CEO of ABB (Parent company) and ABB India's management relate to most of the process and situation elements. The prospected action on 'core competence building agenda' will help in achieving all the performance objectives.

The assessment matrices provide the assessment of the state of elements in a component. The assessment can be in qualitative terms as well as in the form of a score based on a scale.

Critique

The proposed linkages in SAP-LAP models are a step forward in considering the relationships of various elements. However, there are some areas of concern that are supposed to be incorporated in future developments so as to evolve sounder relational models. A discussion on some of these areas is provided as follows.

- The proposed linkages are primitive in nature, as these depict undirected relationships and are not examined for model consistency as is possible in the context of Interpretive Structural Modeling (Warfield 1974, 2003).
- In view of the interpretive matrices, the size of the matrices is limited to a modest-sized class of problems, say up to a size of 10 × 10 elements. However, with the past experience with SAP-LAP models, in a variety of situations by many researchers, it can be seen that a large class of problems can be meaningfully modeled with the size limitations prescribed in the present form.
- The proposed framework is largely based on depicting the relationships in the form of matrices, whereas structural graphics are usually more convenient to read and interpret. It would be a challenge to depict the cross-interaction of two different sets of elements graphically for problems even of the size of 10 × 10 elements with the interpretation of linkages. Further, matrix structures may prove to be useful in developing computer based models of knowledge base contained in such interpretive linkages.
- Since the proposed linkages are based on qualitative interpretation of relationships, validation of models would be quite challenging and would largely be governed by face and content validity. It would require further empirical evidence to validate the constructs behind such relationships.

Conclusion

The proposed generic framework of SAP-LAP linkages can be applied in multiple ways to facilitate analysis of various managerial contexts. It is based on the three key entities, viz. situation, actor and process and takes the learning centered synthesis in terms of learning, action and performance. The proposed SAP-LAP linkages incorporate only those relationships which might be of use in a variety of situations. However, some new cross-interaction matrices can also be developed if required in a particular context. For example, Actor x Action matrix giving relationship of actors for various actions would be useful. This matrix is indirectly represented in the current framework in terms of assessment matrix for 'action' for fixation of responsibility with various actors, and thus, not proposed as a separate cross-interaction matrix.

The utility of the framework would be enhanced by way of application in various practical situations with adaptation and innovation. It is expected that a richer analysis would be possible to generate new insights into managerial contexts for effective problem solving, strategic planning and organizational analysis. Since the proposed framework already has interpretive relationships in various matrices, subsequently Interpretive Structural Models (Warfield 1974, 2003) can be developed to interpret the hierarchies of elements under SAP-LAP framework. In view of the 'actors', taken as an explicit component, the application can also be made with multiple perspectives of actors involved. The framework also incorporates, to a limited extent, the concerns of conflicts in interpretive matrices. The proposed framework can at best be treated as a stepping stone to incorporate interrelationships of SAP-LAP in managerial analysis and many avenues are likely to be opened up by future applica-tions, such as directionality and polarity of interactions, quantification of intensity of interactions, and so on.

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Appendix - I
Templates for Assessment Matrices for SAP-LAP

(a) Assessment Matrix Template for 'Situation'

Situation Elements	Assessment of State		
	Situation I	Situation II	Situation III
S1			
S2			
..			
..			
Sn			

(b) Assessment Matrix Template for 'Actor'

Actors	Assessment			
	Own Organization	Main Competitors		
		C1	C2	C3
A1				
A2				
..				
..				
..				
An				

(c) Assessment Matrix Template for 'Process'

Processes	Assessment			
	Own Organization	Main Competitors		
		C1	C2	C3
P1				
P2				
..				
..				
..				
Pn				

(d) Assessment Matrix Template for 'Learning'

	Learning Elements	Gap Analysis	Benchmark
L1*			
L2*			
..			
..			
Ln*			

(e) Assessment Matrix Template for 'Action'

Actions	Time Estimate	Resources Required	Responsibilities (Actors)
A1*			
A2*			
..			
..			
An*			

(f) Assessment Matrix Template for 'Performance'

Performance Elements (Objectives)	Target	Achievement	Remarks
P1*			
P2*			
..			
..			
Pn*			

Appendix - II
Illustrative Case of ABB India

SAP Analysis (Sushil 2001)

Context

Developing in-house R&D for technological pioneering, Electrical power generation and distribution technology leader in the making

Prevailing Situation

- ABB India has very stiff competition from BHEL, KEL, and other foreign multinationals.
- Independent Power Plants (IPPs) in India and development of a power generation base have opened up opportunities for ABB India.
- The company's financial health has improved, and hence its R&D budget is also likely to go up.
- The firm has a strong technology base and keeps the emphasis on technology in its future planning.

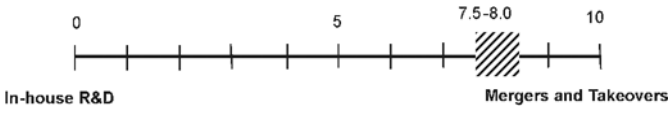
Main Actors

- CEO of ABB, as the motivating force behind ABB all over the world.
- ABB India's management as the local policy-makers.
- ABB India's employees as the heart and soul of the company.
- Government of India and various state governments in context of IPPs.

Process of Technology Pioneering

- Emphasis on technology in business strategy and corporate philosophy.

- ABB India managing technology through mergers and acquisitions. It has taken over companies, which were supplying key technology components. The firm is consolidating its technological position in the power industry and emerging as a technology leader in many new areas. If technology development is mapped on a continuum that ranges from in-house R&D to mergers and takeovers, then ABB India's position falls in the range of 7.5 to 8.0 on a 10-point scale, as shown in Figure 3.



Technology Development Continuum
Figure 3

- A deep backward integration has been chosen as a technology strategy.
- The local ABB (within a country) enjoys the support of ABB at the global level. It is in a position to offer the best technological solution to a customer, taking into account the strengths of various national level facilities spread over the globe.

LAP Synthesis

Learning Issues

Technology Policy

- Technology policy is missing. In its absence, the firm ends up as a mere manufacturing facility.
- Dependence on developed countries continues. Core competencies have not been identified.

Technology Development

- Backward integration of high-tech or key component manufacturing by way of takeovers can help in improving technological health of the firm.

Innovation Culture

- Takeovers of high-tech firms affect the innovation culture adversely, and those firms' technologists lose creativity.

Technology and Competitive Advantage

- The local firm draws benefit from the global image of the corporation and also can rely on corporate technological support when needed.

Technology Absorption

- The capability to cater to local customers' needs and innovate on existing technology requires technology absorption to a nearly complete level.

Suggested Actions

- Make Technology Management at par with other management functions to be accomplished more professionally by establishing a technology policy.
- Develop and deploy a core competence building agenda.
- Strengthen implementation of backward integration strategy by acquiring key component manufacturing firms.
- Develop in-house R&D for technology absorption so that further innovations can be made.

Expected Performance

- Development of sustainable competitive advantage through core competence building.
- Higher customer satisfaction by way of innovation to meet local needs.
- Dependence on imported technology will be reduced.

Exhibit 1: Elements of SAP-LAP in Case of ABB India

Components		Elements
Situation	External	S1–Stiff Competition S2–Opening up of Opportunities
	Internal	S3–Improved Financial Health S4–Strong Technology Base
Actor	Internal	A1–CEO of ABB (Parent Company) A2–ABB India's Management A3–ABB India's Employees
	External	A4–Government of India
Process	Internal	P1–Technology and Business Strategy Alignment
	External	P2–Mergers and Acquisitions P3–Backward Integration P4–Offering Technological Solution to Customer

Learning	L1* – Technology Policy L2* – Technology Development L3* – Innovation Culture L4* – Global Image L5* – Technology Absorption
Action	A1* – Technology Management as Core Function A2* – Core Competence Building Agenda A3* – Backward Integration Strategy A4* – Develop inhouse R&D
Performance	P1* – Sustainable Competitive Advantage P2* – Customer Satisfaction P3* – Dependence on Imported Technology

Exhibit 2: Assessment Matrices for ABB India

(a) Situation

Situation Elements	Assessment of State
S1 – Stiff Competition	4
S2 – Opening up of Opportunities	3.5
S3 – Improved Financial Health	3
S4 – Strong Technology Base	4

(b) Actor

Actors	Assessment	
	Own Organization	Main Competitor (BHEL)
A1	5	Not Relevant
A2	4	BHEL's Management – 3.5
A3	4	BHEL's Employees – 3.5
A4	4	4

(c) Process

Processes	Assessment	
	Own Organization	Main Competitor (BHEL)
P1 – Technology and Business Strategy Alignment	2	2
P2 – Mergers and Acquisitions	4	2.5
P3 – Backward Integration	3	3.5
P4 – Offering Technological Solution to Customer	4.5	4

Exhibit 3: Self-interaction Matrix for Situation (ABB India)

(a) Binary Matrix

Internal		*External*	
0	0	1	S1
1	0	S2	
1	S3		
S4			

(b) Interpretive Matrix

Internal		*External*	
—	—	Liberalization generated competition	S1
Able to Transfer Technology	—	S2	
Likely Increase in R&D Budget	S3		
S4			

Exhibit 4: Self-interaction Matrix for 'Actor' (ABB India)

(a) Binary Matrix

External	*Internal*		
0	0	1	A1
1	1	A2	
0	A3		
A4			

(b) Interpretive Matrix

External	*Internal*		
—	—	Vision & Strategy	A1
Policy & Clearances	Guidance & Support	A2	
—	A3		
A4			

Exhibit 5: Self-interaction Matrix for Process (ABB India)

(a) Binary Matrix

External			*Internal*
1	1	1	P1
1	0	P2	
0	P3		
P4			

(b) Interpretive Matrix

External			*Internal*
Help in developing technological solutions	Technology Strategy guides backward integration	Technology Strategy guides M&A	P1
Create competence for new technological solutions	—	P2	
—	P3		
P4			

Exhibit 6: Cross-interaction Matrix Situation X Actor (ABB India)

(a) Binary Matrix

Situation		Internal			External
		A1	A2	A3	A4
External	S1	1	1	0	0
	S2	1	1	0	1
Internal	S3	0	1	0	0
	S4	1	1	1	0

Actor

(b) Interpretive Matrix

		Internal			External
		A1	A2	A3	A4
Situation	S1	Vision and Global Strategy	Domestic Strategy	—	—
	S2	Provision of New Technology	Technology Transfer	—	Liberali-zation
External	S3	—	Better Financial Control	—	—
Internal	S4	Provision of New Technology	Technology Transfer	Technology Absorption	—

Actor

Exhibit 7: Cross-interaction Matrix Actor X Process (ABB India)

(a) Binary Matrix

		Internal		External	
		P1	P2	P3	P4
Actor	A1	1	1	0	0
Internal	A2	1	1	1	1
	A3	0	0	0	1
External	A4	0	1	0	0

Process

(b) Interpretive Matrix

		Internal		External	
		P1	P2	P3	P4
Actor	A1	Vision & Global Strategy	Provision of Resources for M & A	–	–
Internal	A2	Domestic Strategy	Post M&A Integration Integration	Areas for Backward Integration	Understanding Customers needs and developing solutions
	A3	-	-	-	Developing Technological Solution
External	A4	-	Regulation for M&A	-	-

Process

Exhibit 8: Derived Cross-interaction Matrix Situation X Process (ABB India)

(a) Binary Matrix (Derived)

		Internal		External	
		P1	P2	P3	P4
Situation	S1	1	1	1	1
External	S2	1	1	1	1
	S3	1	1	1	1
Internal	S4	1	1	1	1

Process

(b) Interpretive Matrix

		Internal		External	
		P1	P2	P3	P4
Situation	S1	Global & Domestic Strategy	Global & Domestic Strategy	Cost saving	Understanding customer needs
External	S2	Global & Domestic Strategy	Competence building	Areas for backward integration	Technology Transfer
	S3	Strategy for Financial Performance	Value creation by M&A	Cost saving	Investment for new technology
External	S4	Technology Strategy	Technology competence acquisition	Technology Develop-ment	Generating solutions

Process

Exhibit 9: Cross-interaction Matrix Action X Performance (ABB India)

(a) Binary Matrix

		P1*	P2*	P3*
	A1*	1	0	1
	A2*	1	1	1
Action	A3*	0	1	0
	A4*	1	0	1

Performance

(b) Interpretive Matrix

		P1*	P2*	P3*
	A1*	Better Techno-logical Solutions	–	Help in In-house Technology Development
	A2*	Better Solutions and Value Offering	More Value to Customers	Higher Technology Capabilities
Action	A3*	–	Reduced Cost	–
	A4*	Better Techno-logical Solution	–	In-house Technology Development

Performance