



The Role of IT Architecture in Strategic Alliance: A Case

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ABSTRACT

Business opportunities may necessitate strategic alliances, but many businesses find difficulty in managing the treacherous process of alliance formation. The development of IT architecture for the new situation and its use in the negotiation process could potentially be rewarding for all the parties involved. This paper uses a case study to describe the way in which a strategic alliance between a telecommunications organization (TEL) and other retail electricity organizations was structured so that TEL could improve its market position. An IT architecture for the new market situation was developed, which helped in understanding the future informational requirements and dependence of partners on each other.

INTRODUCTION

For an organization, to exploit the benefits of information technology a core competency is the design of an appropriate IT architecture (Feeny and Willcocks, 1998). Conceiving and implementing the required architecture, however, has not been an easy task to many CIOs. New information systems are required specially when the organization changes its business strategy and operating procedures, which could be the result of a BPR or strategic alliance. What would be the exact form and components of the overall information system to achieve the business goals? How and to what extent the existing IT/IS infrastructure requiring alteration or modification to satisfy the required system? These are some of the questions need to be looked seriously while designing the IT architecture by a CIO.

IT architecture is a particular form that information technologies take in an organization to achieve business goals (Hay and Munoz, 1997). IT design activities set that form. It seems there are three strands of design activities (related to IT/IS architecture) to take care of business needs: (1) strengthening the existing architecture in accordance with internal process changes, (2) redesigning IT architecture when major shifts takes place due to BPR or strategic alliances, and (3) designing IT architecture afresh for a completely new business. Good methodological supports are available in two of the above-mentioned situations, namely, in assisting the process of strengthening the existing architecture and in designing a new IT architecture (Laudon and Laudon, 2000). Unfortunately, redesigning IT architecture for situations of BPR or strategic alliances is quite challenging and situational, rather than procedural (Nissen, 1998). Apart from showing the broad picture of the organization's informational arrangements, an IT architecture planning adds in the strategic considerations, particularly in the negotiation phase of the alliances.

The case of a telecommunication company is presented here to highlight the major considerations in IT architecture planning which has resulted from strategic alliances with new business partners. The telecommunication company identified a new market opportunity as a result of changed market conditions. The company is in the traditional business of telecommunications and information services, but identified a new market opportunity in retail electricity distribution business that became apparent as a result of market deregulation in electricity industry. The company's own strength in IT areas, strong market position and opportunities in forming alliances with other business partners in electricity industry were the main considerations for this strategic move.

The formation of a strategic alliance was considered an enabler to support this transformation, but there were many pre-strategic alliance considerations that needed to be addressed in order to support such a business transformation. This paper highlights the information requirements together with the architecture of information system requirements. The architecture of the information system is consid-

ered very important to the company's management team, as this would guide in negotiations through the alliance formation stages. The key elements of the proposed structure for settlement system for the electricity business and how the system interacts with the existing telecommunications business system are identified and discussed.

The steps suggested here are equally applicable to other business situations - and as such provide specific guidelines to practitioners who face similar situations. The paper presents a brief account of IT architecture planning in the following section. The steps followed in carrying out this research are highlighted next. A description of the telecommunication company's operations and the business environment of electricity industry follow this. Three sections are devoted to present the logical steps for the process of information technology architecture development.

IT ARCHITECTURE AND STRATEGIC ALLIANCES

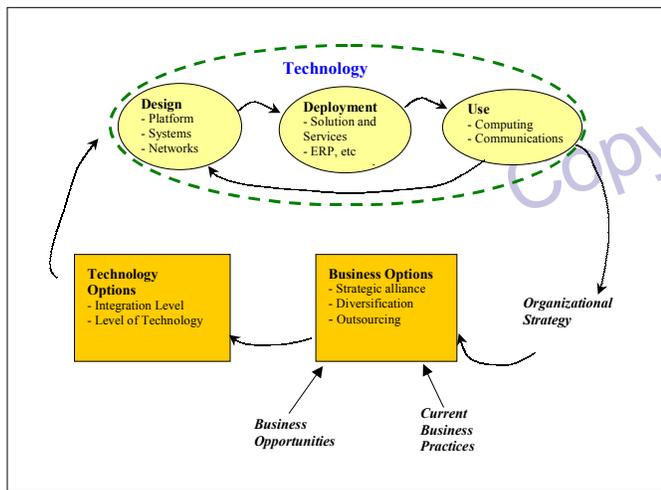
IT architecture is a high-level structure of a company's information systems. It is "the vision of an ultimate reality created in reaction to a defined strategy and known constraints" (Hay and Munoz, 1997). A strategic consideration, such as new alliances, would require visioning of a different IT architecture. Applegate, McFarlan and McKenney (1999) view IT architecture as an overall picture of the range of technical options as well as business options. "Just as the blueprint of a building's architecture indicates not only the structure's design but how everything - from plumbing and heating systems to the flow of traffic within the building - fits and works together, the blueprint of a firm's IT architecture defines the technical computing, information management and communications platform" (p. 209).

Figure 1 brings out the dynamic nature of IT architecture development process. The technology part, shown by dotted oval, is concerned with design, deployment and its use. This part is the core of IT architecture and a huge proportion of IT professionals' time is devoted to these activities. Considerations of business options, which feed to various technology options, are higher level activities in IT architecture development process. Business options, such as strategic alliances, outsourcing, diversification, etc., are influenced by major internal as well as external factors, for example, current business practices, business opportunities, and organizational strategy. There is a direct link between technology and organizational strategy. The technology (with its operational and technical settings) exerts a strong influence on to organization's future strategic direction. Thus, one can observe (as shown in Figure 1 through connecting lines) a close link between technical and other business factors, and like ever changing business the IT architecture is a dynamically evolving phenomena.

Traditionally, IT practitioners viewed IT architecture consisting of four components - data, function, hardware and connectivity

(Gifford, 1992). However, from managerial perspective the IT architecture should focus on how to achieve lasting competitiveness. According to Feeney and Willcocks (1998), three enduring challenges that companies face today in achieving competitive advantages are focusing IS efforts to support business strategies, devising effective strategies for the delivery of low-cost and high-quality IS services, and choosing the right technical platform on which to mount IS services.

Figure 1: Forces affecting overall IT architecture



Strategic alliances are a mutual agreement between two or more independent firms to serve a common strategic (business) objective (Bronder and Pritzel, 1992). A strategic alliance exists when the value chain between at least two organisations (with compatible goals) are combined for the purpose of sustaining and / or achieving significant competitive advantage (Bronder and Pritzel, 1992). An alliance can exist between any number of organisations. For example, telecommunication organisations could form an alliance for international joint ventures, or an alliance can be established between a banking organisation and IT supplier. The notion of developing a strategic alliance suggests an organization's performance can be significantly improved through joint, mutually dependent action (Holt *et al.*, 2000). For a strategic alliance to be successful business partners must follow a structured approach to developing their alliances, which may include strategic planning, communication, efficient and effective decision making, performance evaluation, relationship structure, and education and training.

Strategists have often suggested that organizations should consider entering into similar, or somewhat related markets sectors to broaden their product/service portfolios (Markides and Williamson, 1997; Henderson and Clark, 1990). Both the dimensions of market (customer and product as per Ansoff (1986)) in a related market can easily be identified and strategies formulated for deployment. The main advantage of adopting such a strategy is that an organization can easily use its competencies and strategic assets in generating a strategic competitive advantage (Markides and Williamson, 1997). Determining the design and the requirements of a new IS is a relatively simple task. In contrast, diversification into a significantly different market for an IT/IS organization is a very challenging task, which needs considerable evaluation.

ROLES OF IT ARCHITECTURE

IT architecture can serve three purposes while an organization is negotiating various terms and conditions of strategic alliance with partners:

1. Define the new environment for the organization and its partners.
2. Project the complexity and complementarities in the alliance.

3. Provide details of technical strengths and limitations for the new situation.

Define (from IT perspective) the new environment for the organization and its partners. This refers to the situation for which a new IT architectural planning has become necessary. Strategic alliances, dictated by business needs, invariably pose a new environment for the organization and its partners. One must understand this new environment comprehensively before the tasks of IT architecture development start.

Understand and project the complexity and complementarities in the alliance. Here one describes the rationale, procedure and content of the envisioned information systems. Schematic presentation of informational links between partners is of great help in appreciating the actual size and complexity of the information systems once implemented.

Provide details of technical strengths and limitations for the new situation. This refers to the usefulness of the IT architecture as planned - why this IT architecture? Like architectural or engineering drawing, IT architecture provides clues to the components of the information systems and their relationships. A manager, however, reads more from these relationships. He/she analyzes the architecture, identifies the areas of potential conflict, and makes necessary plan for future actions. For strategic alliance situation, a manager may identify potential information related problem areas and that could add in the future negotiations with partners.

The authors describe below the usefulness of a preliminary IT architecture developed by a telecommunications organization (TEL) while exploring the possibility of a strategic alliance with retail electricity organizations. The focus here is on to pre-strategic alliance activities, namely designing of an information systems architecture, which would be used as stepping board for future strategic alliance negotiations. Intention here is not to present the technical details of a fully developed IT system at TEL, but to provide an account of activities carried out in the pre-alliance stage.

THE NEW ENVIRONMENT (WHICH SITUATION?)

Before we proceed to design the new IT architecture it is necessary to comprehend the environment in which the telecommunication organization (TEL) operates. TEL provides services to its customers through its own telecom network and would like to improve its customer base by forming a strategic alliance with retail electricity distribution organizations. As large telecommunication organizations exhibit structural inertia, generating a competitive advantage in a new market poses an enormous challenge (Henderson and Clark, 1990). Noteworthy, an organization must make a distinction between a new product and the means to achieve that new product. The recent merger between American On-line and Warner Publishing clearly demonstrates that it is not too difficult for an IT organization to offer new products in an existing market. Considering this point, strategic alliances and partnership could be a way out for an IT organization to enter into a completely new product market. From a systems development perspective, alliances may result in the development of interfaces to the existing ISs or alternatively a new integrated IS.

As per the deregulation rules a retail distributor must make financial settlement with other suppliers of the electricity industry supply chain. This needs to cover the cost of electricity from the wholesale electricity market, tariffs for distribution of the same by the transmission and distribution service providers, and meter data from Meter Providers and Meter Data Agents. The processes and systems therein must be able to interface with retail energy distributors accounting and billing, service activation and service assurance processes and systems. Figure 2 shows the major revenue transactions between TEL and other parties in the supply chain.

To conduct business as a market participant TEL must purchase wholesale electricity and services for the physical delivery and metering to customer. There are two clear options available to TEL to purchase electricity:

Figure 2: Electricity retailing revenue flows

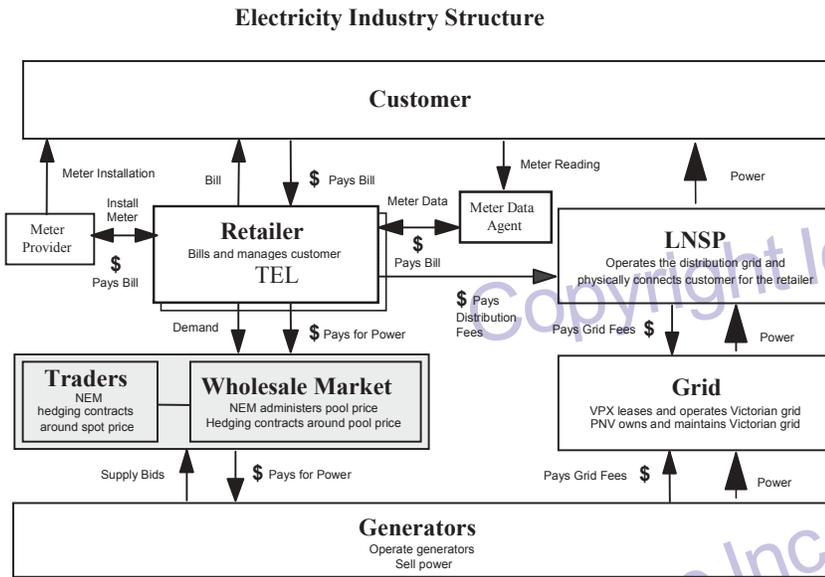
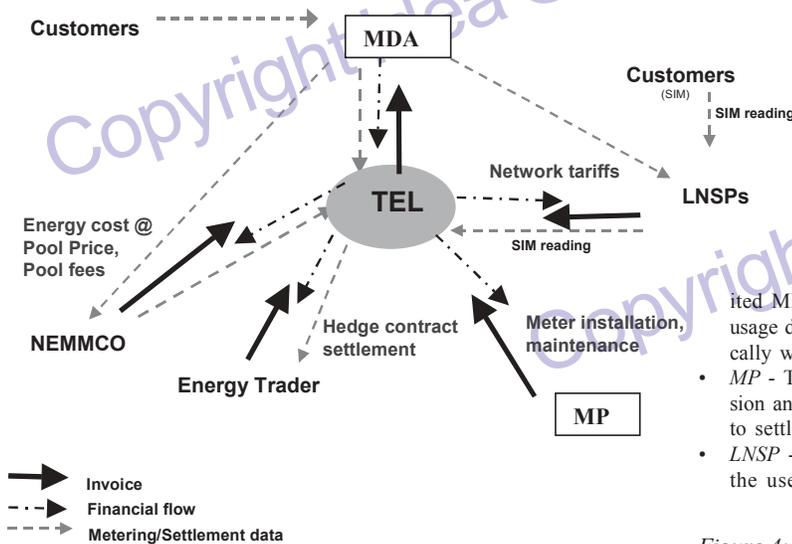


Figure 3: Relationships between TEL and third parties



TEL follows a standard procedure called PDOM (Product Development Operational Model) for any IT product development and this procedure was also applied in IT architecture design. PDOM is very similar to standard SDLC (Systems Development Life Cycle) (Kendall and Kendall, 1995).

Figure 3 below shows the relationship between TEL and third parties that it must reconcile.

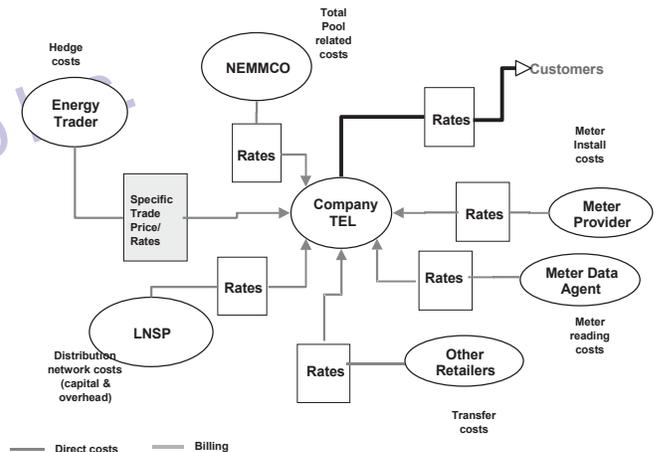
Reconciliation with these third parties is critical to ensure that charges are for correct customers, correct dates (i.e. customer's start and end dates), correct rates, services received, correct usage and correct loss factors. Reconciliation is also necessary to ensure that payments are settled for the correct dollar amount, and are on time. The third parties with whom TEL will be required to settle with are NEMMCO, LNSPs, Metering Data Agents, Meter Providers, Energy Traders, and Other Retailers.

Figure 4 below shows further details of the third party relationships as per market rules. This diagram shows the rates levied on the left relate to the cost or supply of energy, whereas the rates on the right relate to costs associated with connecting a customer.

TEL will be required to conduct ongoing financial settlements with a number of third parties in the conduct of electricity retailing. The third party organizations include (NECA, 1998):

- *Electricity sourcing* - TEL will contract energy traders to purchase electricity in the national electricity market. TEL will be required to settle periodically with these organisations for services rendered;
- *NEMMCO* - TEL will be required to settle periodically with NEMMCO for wholesale electricity purchases. NEMMCO will provide billing reconciliation data;
- *MDA* - TEL will contract with NEMMCO accredited MDAs for the collection and provision of customer electricity usage data for billing purposes. TEL will be required to settle periodically with MDAs for services rendered;
- *MP* - TEL as an RP, will have a relationship with MPs in the provision and maintenance of meter installations and TEL will be required to settle periodically for services rendered;
- *LNSP* - TEL will enter into service agreements with each LNSP for the use of their distribution network and for the connection and

Figure 4: Market overview



- by *direct participation* and trading in the national electricity market (NEM). This means that TEL would perform all electricity trader functions, act to bid and settle wholesale purchases in the national electricity market from its own resources and carry all market and prudential risks and responsibilities;
- by *engaging an existing specialist energy trader*. This means that TEL form a close and long-term relationship with one (or more) existing trader(s) who would operate all market trader functions and processes on TEL's behalf. This would be an outsourced supply arrangement.

COMPLEXITY IN IT ARCHITECTURE DEVELOPMENT (WHAT IS THE CONTENT?)

The management of TEL must realize the complexity and limitations of IT infrastructure before they venture into the new business.

supply of electricity. TEL will be required to settle periodically with LNSPs in terms of distribution fees for network use.

- *NEMMCO and State Regulators* - TEL will pay fees to NEMMCO and state regulators for operating licences and other regulatory charges;
- *Generators* - TEL may contract with generators (outside of the spot market) for long term energy requirements; and
- *TEL Partner sales commissions* - TEL could potentially enter into sales partnerships and pay appropriate commissions.

It can be seen from Figures 3 and 4 that a complex relation exists between TEL and its partners in electricity market place. TEL now needs to investigate further into these relationships.

DETAILS OF IT ARCHITECTURE FUNCTIONALITY

To forge a meaningful alliance TEL would be required to make a number of major business decisions, which would influence the overall IT architecture. These decisions would form the core of the IT system:

- The company will require a customer signed application form before the Retail Transfer process can commence.
- TEL will not enter into and conduct a customer transfer under the BETS process.
- The company will negotiate contracts with a LNSP, which will ensure that LNSPs will connect customers to their network at a customer nominated date and time or within a reasonable time. Noteworthy each LNSP will perform service location work for the electricity connection.
- TEL will appoint only registered Metering Data Agents (MDAs) to read meters at agreed customer start date and times.
- A Meter Provider will install and remove electricity meters only with company's written instructions.
- Meter Data Agents are to provide all customer electricity usage to the Retailer for billing purposes, typically daily overnight for smart meters. MDAs will employ manual meter readers to read SIMs at a minimum interval of monthly regardless of the billing cycle.
- TEL will settle with MDAs, LNSPs, MPs, energy traders and the Pool for electricity energy cost of goods sold.
- TEL must provide energy forecasts to energy traders so they can determine the amount of energy to hedge.

If these alliances are to eventuate the existing processes and systems (Custpro/Echidna) will be used to generate reports to partner sales and commissions. TEL would be required to provide a lot of technical support to potential strategic partners. Partners in electricity retail business in general do not have well developed information systems, which could be a limitation to full-scale system integration. Electricity retailers currently have manual settlement systems and are either developing their own systems or investigating the ABB Forstar (1997) suite of applications.

The IT system architecture as presented above demonstrated how TEL could interact with other partners and the nature of settlements. The IT architecture as discussed here not only presents the overview of future challenges, but also provides CIOs the nature of IT activities they would be faced with once the alliance becomes a reality.

DISCUSSIONS AND FURTHER WORK

An important lesson, which can be learnt from this work, is that IT architecture can contribute greatly to negotiations in strategic alliance process. In the process of strategic alliance, IT architecture plays an important role. In addition to projecting the overview of information systems in the organization, the IS architecture helps in the alliance negotiation through highlighting the major weaknesses and incompatibilities with information systems of various parties. As demonstrated in this paper, a telecommunication company formed strategic alliances with companies in electricity distribution market, which enabled the telecommunication organization to enter into elec-

tricity retail business. The settlement process presented here is a major component of business initiative carried out by TEL. The plan outlines the business requirements for the construction of such a system and defines benchmarks for evaluation of third party settlement systems.

In the intense environment where businesses compete, new methods of evolution from independence to interdependence continue to unfold, with the underlying precedence being the development of alliances or partnerships for competitive advantage. In doing so, many organizations are re-thinking their traditional business models and strategically planning for those that provides an edge over the competition. In response, strategic alliances are one of many business models that are available to management, where organizations are best positioned to improve their performance.

Though the case study pertains to a telecommunication company, the concepts can be applied to any business which contemplating to diversifying its operation. The development of IT architecture, with focus to which, what and why, would lead to practical improvement.

REFERENCES

- ABB Forstar (1997), 'ABB Forstar Systems and Services', May 1997, Surrey, England.
- Ansoff, I.H. (1986) 'Corporate Strategy', Sidwick and Jackson, London.
- Applegate, L. M., McFarlan, F.W., and McKenney, J.L (1999) Corporate Information Systems Management: Text and Cases, Irwin McGraw-Hill.
- Bronder, C. and Pritzl, R. (1992) Developing strategic alliances: A successful framework for co-operation. *European Management Journal*, 10(4), pp. 412-420.
- Feeny, D and Willcocks, L. (1998) Core IS capabilities for exploiting information technology. *Sloan Management Review*, Spring 1998.
- Gifford, R. (1992) Implementing the IS architecture. *Information Systems Management*, 9(4).
- Hay, G and Munoz, R. (1997) Establishing an IT architecture strategy. *Information Systems Management*, 14(3), p67.
- Henderson, R and Clark, K (1990) 'Architectural innovation: the reconfiguration of existing product technologies and the failure of established firms', *Administrative Science Quarterly*, 35, pp.9-30.
- Kendall, K.E and Kendall, J.E. (1995). 'Systems Analysis and Design' 3rd Edition, Prentice-Hall International, New Jersey.
- Laudon, K and Laudon, J. (2000) *Management Information Systems*, sixth edition, Prentice Hall, Upper Saddle River, New Jersey.
- Markides, C.C and Williamson, P.J. (1997) 'Related Diversification, Core Competencies and Corporate Performance'. In: Cambell, A and Sommer Luchs, K., (Eds.) *Core Competency-Based Strategy*, pp. 96-122. International Thomson Business Press, London.
- Nissen, M. (1998) Redesigning reengineering through measurement-driven inference. *MIS Quarterly*, 22(4).

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