6 Getting Value from IT Investments: Experiences from Two Organisations

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1 Introduction

In the last few years expenditure on information technology by organisations in developing countries such as India has risen substantially. During 1998–99 Indian organisations collectively spend US$5 billion on hardware, software, training and maintenance (projected from the annual expenditure of 1997–98 in Dataquest, 1998). This represents nearly 1.5 per cent of India’s GDP. The annual rate of growth in this expenditure is 30–40 per cent. This means that India will soon catch up with its neighbours in East Asia, where IT expenditure is around 2 per cent. Organisations are spending more on IT because of the rapid rate of obsolescence of hardware, increasing geographic scope of IT applications within large organisations, and pressures to improve competitiveness in economies which are liberalising at a fast pace. Even as IT expenditures rise, research studies show that the economic impact of IT on organisations in North America and Europe has at best been ambivalent. Even though IT has changed the way different types of work (clerical, engineering, manufacturing and managerial) gets done, in terms of concrete benefits measured as return on investment, few organisations believe these returns to be significant (Scott Morton, 1991, p. 331). It has been reported that much of the £10 billion invested by UK companies on IT each year is giving no real payback (Jason, 1991).

The poor return is blamed on improper choice of applications and poor implementation. The Comptroller General of the USA has observed: ‘Despite spending more than $200 billion on information management and systems in the last 12 years, the government has too little evidence of meaningful returns’ (GAO, 1994, p. 48). A large number of failures of large IT projects have also been reported (Beyon-Davis, 1995; Salabert et al., 1995) For example, a US$65m IT project for the Internal Revenue service of Thailand has been
abandoned recently. This project was supported by the World Bank and the task was undertaken by IBM which had subcontracted the initial software development work. After three years, a World Bank review found that the hardware had been put in place but little software other than word processing had been developed. In the later stages IBM took over the software development tasks from the subcontractors, but the project still did not make satisfactory progress. It had to be finally abandoned. Such stories should put some caution in the minds of managers who make decision regarding investments in IT projects.

Publication of research highlighting the poor correlation between IT spending and corporate results in the North American and European contexts (Strassman, 1997, p. 426) has indeed raised concern amongst managers about the value being derived from investments in IT. However, in developing countries like India this concern is not as widespread as it ought to be (Harris, 1998). To understand the prevailing attitudes of top management regarding IT investments and resulting benefits, 40 general managers and chief executives were asked to respond to a 25-item survey.

2 Attitudes Towards IT: Results of a Survey

The respondents participated in a one-week general management programme at the Indian Institute of Management, Ahmedabad. They came from five countries in Asia and Africa and represented a cross-section of manufacturing and service industries. Thirty responses were reviewed.

It was found that only one-third believed that IT investments were producing adequate benefits. The remaining two-thirds believed that IT was providing substantial benefits even though they were unable to identify specific areas where such benefits were derived. Forty per cent of respondents felt that the concern regarding the benefit that accrued from the IT applications are adequate versus inadequate.

In terms of specific benefits, more than two-thirds indicated that IT had enabled organisations to reduce costs. However, an equal number agreed that IT had not enabled organisations to expand their market. Nearly 55 per cent felt that some competitive advantage has been gained. Interestingly the number of people who agreed with the assertion that IT applications are inadequately aligned with business strategy was more than those who disagreed. Forty per cent agreed that IT expenditure was not focused on appropriate applications. The greatest impact of IT was seen to be on supervisors and front line managers
followed by senior managers and clerical workers. Impact on engineers, designers, blue collar workers and field workers was seen to be less significant.

Interestingly, about one-third of respondents felt that the IT function was well managed and an equal number felt the contrary. On the issue of whether organisations are satisfied with the quality of their IT manpower there was some ambivalence. A large percentage (63 per cent) felt that leadership of IT function was not effective. Nearly two-thirds strongly agreed with the statements that the organisation was competitively affected through poor execution of IT projects. Nearly half the respondents felt that organisations are slow in adopting new technologies and most disagreed with the statement that organisations tend to jump into new technologies too early.

In terms of the IT planning process, there was an overwhelming agreement with the need to develop an IT strategy and to evaluate and audit an IT investment made in the past. This did seem contradictory to their assessment that benefits from IT applications have been clearly identified by most organisations and have indeed been quantified by most organisations.

A significant proportion felt that knowledge and awareness about IT among the top management is quite inadequate. This was a small sample but the responses indicate a certain amount of discomfort amongst top management on issues relating to investments, management of IT function and benefits from IT. On the other hand the sample displayed a lack of awareness about the mistakes that researchers have pointed out as being common (Remenyi, 1996) and were possibly being committed by the organisations that were surveyed.

In another survey of seven companies implementing enterprise-wide solutions in the city of Ahmedabad, it was found that the process of implementation was much slower than anticipated. All the seven companies which have invested Rs 40 to 200m in ERP implementation are dissatisfied with the benefits.

3 Unravelling the Magic Formula Through Case Studies

Researchers attempting to fathom the question of what makes IT investments tick have taken one of two approaches. Some have analysed case studies of failed IT implementation in specific organisations and have drawn lessons from such failures. For example, the story of IT use in Bank of America (both failures and successes) identified how strategy and structure can be aligned by means of technological innovations and lessons were drawn on the role of
leadership (Hitt et al., 1996). In some Indian banks inadequate re-engineering of cheque cashing procedure during computerisation has lead to very marginal benefit in customer service (Bhatnagar, 1997). Others (Remenyi, 1996) have studied several failure stories to come up with a list of common mistakes. Amongst the 10 common information systems mistakes identified by Remenyi, interestingly only two mistakes refer to the process of making application choice: developing native applications and lack of alignment of IT with business strategy. Five factors point to an inadequate process of system design development and implementation. Some of these are: inadequate funding, an improper assessment of in-house IT skills, and not listening carefully to the users. Remenyi also recognises that evaluation of information systems investment is being neglected and often organisations jump onto the technology band wagon too early. Both seem to represent a failure of the planning process. Frank Land has provided guidelines which can be used to manage the process of change through the implementation of IT applications (Land, 1990). In another case study, the villain of the piece in a failure story seems to be inept handling of change management by the chief executives who strongly supported a large IT investments but failed to intervene appropriately during the implementation process (Business World, 1996).

We believe that avoidance of failure in implementing cannot be equated to successful impact. Moving away from a post mortem of failures, in this paper an attempt has been made to look at two organisations which have been successful in deriving large measurable benefits from IT. In discussing value from IT investments it has been recognised that there may be different measures of value such as productivity, consumer surplus and business profitability (Hitt et al., 1996). It has been argued that business profits may not always result from increased productivity or increased consumer value. The case studies that we cite have had impact on all the three indicators. The paper describes the IT applications briefly and draws lessons in terms of factors that can contribute to success. Some authors (Cash et al., 1992, p. 702) have discussed innovative IT applications but the context has been set in countries with high IT penetration. For example, Ramani discusses a Singapore bank and identifies the management of IT project as being crucial to its success (Ramani, 1994). The key to successful project management was the identification of deliverables of the project. Most of the bank's IT projects were designed to be completed in nine months, during which time equal effort was spent on planning (design and development) implementation.

We present brief case studies of two Indian organisations which seem to have been successful in getting value from their IT investments – a fact that is
recognised by the IT community in India. One of these organisations was a contender for the national award for the best IT application in 1997, instituted by the Computer Society of India. We attempt to identify some positive lessons from these case studies. First of these organisations is a large consumer product company with interest in soaps and detergents, personal products, foods and beverages and frozen products. Their annual turn over is Rs 40 billion. The second organisation is a medium-sized courier company.

4 Strengthening the Supply Chain in a Large Consumer Products Company

The consumer products company has used IT to manage its supply chain. The supply chain consists of 20 factories, 70 vendors to whom manufacturing is outsourced, 52 warehouses and more than 3,000 resellers. These resellers supply to 600,000 retailers who in turn sell to the final consumer. The customers for the supply chain are the resellers, who are independent private enterprises often stocking other products. The company has implemented an Enterprise Resource Planning (ERP) package covering production and warehousing centres at all the locations. The company is also encouraging 10 per cent of the resellers, who account for nearly 70 per cent of sales, to install PCs and software to manage their stocks. Such resellers are able to dial in to the company's database for purposes of placing orders and making enquiries. The implementation took three years to roll out completely. It involved an expenditure of Rs 400m covering communication infrastructure, hardware upgrades, cost of ERP software and cost of implementation.

The company claims that the service level to the customer (reseller) has been enhanced and that the inventory in the pipeline has been reduced by Rs 1 billion. In physical terms the inventory of their major product line has been reduced from a level of 19,000 to 11,000 tons.

Some of the factors that seem to have contributed to the successful use of IT in this company and the lessons that can be drawn are discussed below.

The choice of the application was made after careful thought. The management of supply chain is one of the critical success factors for the company. The company operates in a highly competitive environment, with several multi-national companies in the marketplace. Many of these competitors had begun to improve services to the reseller significantly. Management of supply chain needs to ensure high availability of stocks with resellers and retailers without requiring them to invest large sums in holding
inventories. An out-of-stock retailer not only means loss of sales but also a switch by the customer to a competitor’s brand.

Increasing sales for this company was also a function of increasing its reach to cover more areas and retailers. However, if such an extension of reach meant larger volumes of inventory in the pipeline then there would be an adverse impact on costs. Therefore, the supply chain had to be managed in a manner such that reseller demand could be met in time while keeping the cost of inventories in the pipeline at an acceptable level.

**Lesson 1: successful IT application is needed to support critical success factors of an organisation.**

There was a clarity of purpose in building the ERP application to manage the supply chain identified as a CSF. The focus was on improving service to resellers (customer) and reduction of pipeline inventories.

When the company was discussing service level to the resellers with its marketing people, prior to the IT implementation, they were unable to make an accurate assessment. A common understanding of what was meant by ‘service level’ had to be evolved and seen from the perspective of the reseller. Most sales persons believed that the resellers were being served well. A typical comment was that there were no complaints and no problems recorded in the weekly reports of the sales person. However, there was no quantitative measure to judge the service level. On the other hand interviews with resellers suggested that many sales people made arbitrary decisions regarding the quantities to be supplied against an order as well as the timing of these supplies. One of the reasons for implementing an IT application to manage the supply chain was that the company could get a more accurate picture of the service level. Then came the question of deciding on a measure of the service level. Service level had to measure the degree to which an order request was fulfilled.

The company came up with two indicators. The first was a measure of case-fill which determined for an entire order consisting of several line items, the number of cases ordered in the aggregate vs. number of cases supplied. A second and more stringent indicator of service level attempted to capture product-by-product success in meeting an order. Thus if a product was supplied within plus/minus one day of the requested delivery date and the quantity supplied was within plus/minus 10 per cent then the order execution was considered successful. The indicator measures the number of items for which the order execution thus defined was successful.
To begin with, this indicator was a mere 35 per cent. However, over time the system was fine-tuned by changing the location of many decisions, formalising rules for dispatch from warehouses and using IT for quick transfer of information. All this has enabled a substantial improvement in the above indicator which now stands at 55 per cent. The company hopes to take this indicator to 70 per cent.

Often targets for benefits can be worked out by constructing models to define a desirable level of benefits. For example, it was pointed out earlier that pipeline inventory for the means product line has been reduced to 11,000 tons. A simulation of the supply chain systems indicated that it may be possible to further reduce pipeline inventory to a level of 8,200 tons. The organisation can therefore continuously fine-tune systems to achieve this target.

Lesson 2: specific IT benefits and indicators which will measure these benefits need to be defined prior to application development. These indicators must be continuously monitored after implementing the application so that necessary actions can be taken to achieve these benefits.

It is interesting to note that the ERP implementation was not a simple integration of existing computer application and automation of manual procedures. There was a distinct paradigm shift in the way the supply chain was being managed. The following changes were made:

1) centralised to decentralised planning: earlier the dispatches from all factories and depots to resellers were planned centrally. Now this task has been decentralised to the level of depots except for slow moving items for which centralised planning is retained;

2) manual to automated planning: earlier the sales people had a great deal of flexibility also in deciding what would be supplied against each order. This was used to push slow moving brands (deliberately supplying more than the ordered quantities) and ration the quantities of brands with a strong pull. This flexibility allowed them to take care of qualitative consideration such as importance of a reseller. In the current system this flexibility has been taken away. There is automated planning;

3) weekly to daily planning: with fast movement of information from reseller to the factory through an integrated system, the replenishment cycle has
now been made a daily cycle rather than a weekly one. This of course requires a total rework in terms of trucking arrangements.

Many of the above changes mean that this company now has a greater operational dependence on IT as compared to the earlier system. This requires a high reliability of the IT infrastructure, particularly the communication system. The company has recognised this aspect and ensured that the reliability is maintained, even though many of the supply points are quite remote, by using a variety of communication technologies. The choice of technology was determined by the overriding need for high reliability.

**Lesson 3: clerical, business and management processes must be reviewed and changed. IT applications can enable such changes.**

There are other benefits which can accrue to this company. It is now possible for the company to monitor daily sales of thousands of products that are sold in different places. Of course these sales would represent movements from resellers rather than movement from retailers. However, since the replenishment is on a daily cycle, the reseller’s sale may represent a reasonably accurate picture of the final sale. However, for harnessing benefits from such desegregated and current data would require an attitude change in managers in terms of using information for decision-making. Often reviews of sales promotion schemes implemented in remote areas were carried out as a hindsight, months after the event had taken place. Even if the company learnt that a promotion scheme was not successful, nothing could be done. Now the currency of information can enable managers to take timely action. If sales do not pick up in a region where a promotion scheme is operational, reasons can be analysed in terms of stock availability and availability of promotional material and timely corrections can be made.

Finally, it must be said that this application would not have resulted in any benefits if it was not implemented successfully. The company operates a very lean IT unit which works as an internal consultancy team. Activities involving software development are outsourced. The IT staff act primarily as project managers, coordinating the work of other agencies to whom work has been outsourced. This strategy has enabled them to draw upon appropriate skills from the market and implement systems in reasonable time frames. The company has wisely not cut corners and spent adequate resources in building a reliable telecom infrastructure, and upgradation of hardware to support the ERP package. If there is an area where they could have done more it is in
training. The key functionaries in the IT department have an interdisciplinary background. The head of the IT department is a management graduate with 25 years of industry experience. All the above factors seem to have contributed to the successful implementation of the project.

5 Creating Operational Efficiency in a Medium-sized Service Company

In the second example we discuss the case of a courier company. The sales of this company are Rs 3 billion and it employs 3,000 people. It is the leading domestic courier operating in partnership with an international courier company. Over the last five years the company has built a tracking system for letters and packages received at 300 offices from clients spread in 250 cities across India. Such packages are delivered in India or internationally in partnership with the foreign associate. These packages pass from a branch office to a local hub to other hubs and to the final destination branch office. The company began computerising its operations about a decade back through an off line tracking system built at four large hubs. Local area networks were installed at these hubs and software was developed in Clipper and Foxpro to do reconciliation of packages. Data on packages handled was received from branch offices through floppies. The application was extended gradually in its geographic scope, communication infrastructure and functionality. Initial computerisation was handled by the Chief of Operations who was a management graduate with significant IT exposure and experience.

Four years back the reconciliation system was replaced by a new tracking system built on an Oracle database server. Now each branch office is responsible for the capture of key data on every package, such as sender, receiver, contents, value and package identifier on its computers. At all the intermediate locations, the packages are scanned to record the bar code identifier. The database is maintained centrally. Nearly 100 branches and hubs are connected together in a wide area network using VAST and leased lines. Other smaller branch offices are able to dial up the nearest node and transfer files at frequent intervals. The central databases are built around a large Oracle database engine and the front ends run on Foxboro.

The company has been able to derive from the system the benefits shown in Table 6.1. The current on-time delivery is measured at 99.6 per cent, as against 99.1 per cent two years ago. Although the company has grown three fold in its volume, the number of personnel has hardly grown over the last
Table 6.1  Benefits from IT applications

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Specific benefits</th>
<th>Examples</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Operational decision support systems through early access to electronic data</td>
<td>Route planning for pick-up, delivery, booking transport capacity</td>
</tr>
<tr>
<td>2</td>
<td>Ability to spot and recover from errors of mishandling</td>
<td>Shortage/excess through reconciliation, missed pick-up</td>
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<tr>
<td>3</td>
<td>Cut delay through paperless transactions</td>
<td>Advance custom clearance through electronic manifests</td>
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<tr>
<td>4</td>
<td>Improved customer service</td>
<td>Monitor the delivery performance, response to esquire from customer site</td>
</tr>
<tr>
<td>5</td>
<td>Improved customer satisfaction</td>
<td>Timely proof of delivery received on electronic term from distributors</td>
</tr>
<tr>
<td>6</td>
<td>Closer monitoring of performance</td>
<td>Service levels; revenues by sales agents, customers, areas</td>
</tr>
<tr>
<td>7</td>
<td>Reduce data entry load</td>
<td>Customer preparing document, esquire</td>
</tr>
<tr>
<td>8</td>
<td>Improved collection of receivables</td>
<td>Timely and accurate billing</td>
</tr>
<tr>
<td>9</td>
<td>New products/services</td>
<td>Electronic fund transfers, service extended from letters to packages</td>
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three years. The tracking application has allowed the company to cope with growth. The total investment in this application is Rs 60m.

As in the earlier company, in this company the Head of IT is completely conversant with the courier business and the business strategy of the company. The company has been able to identify several opportunities for building operational DSS after the basic tracking system was in place. These operational DSS have lead to major gains in customer service and in cutting down operational costs.

Lesson 4: benefits from an automated business process can be multiplied several fold by identifying opportunities to build decision support systems using operational data.

Besides the specific advantages mentioned in the table above, the company has been able to derive significant competitive advantage. The company, along with another national company which has also invested heavily in IT has been able to change the basis of competition in the courier industry. In the early days of courier industry in India the basis of competition for national operators serving medium- and large-sized corporations was price. Today the
basis of competition has changed to service. In fact the price charged by the
two national courier companies is three to four times that of other local
companies providing the same service. This is largely due to the tracking
system and the resulting improvement in customer service that has been
achieved. The investments in tracking systems have also become a barrier to
entry for new entrants. Any other courier company which wishes to operate
on a national scale in competition with the two main players would need to
invest large sums in IT to build a complex tracking system.

The company has developed most of the applications in-house with a
team of 10 IT professionals. The application system has grown in scope in
stages. The technology used has never been state-of-the-art, but has been
appropriate for the purpose. Initially some of the data transfer was taking
place by physical movement of floppies. Subsequently as telecom infra-
structure improved, the data was moved over dial up connections or wide
area networks. Even today the front end continues to be in Foxpro, whereas
many other organisations have moved to other sophisticated technologies such
as client server. The company was quick to adopt the scanning and bar coding
technology as it recognised the importance of the role that is played by scanning
in the tracking system.

Lesson 5: need for careful analysis prior for introducing new technologies.
The company has not been enamoured of new technologies and yet has
absorbed a few of these much ahead of the competition.

6 Conclusions

Some of the lessons that have been drawn from the two case studies have
been identified by other researchers as well. These relate to the close alignment
of IT applications with business strategy and critical success factors and a
need to review and re-engineer clerical and business processes. However, the
importance of other lessons like the need for defining specific benefits and
indicators for their measurements before implementing IT applications is not
well recognised. Similarly, the need to change managerial thinking in terms
of information use for planning and decision-making is also not recognised.
To bring such a change requires extensive training during implementation.
However, this training is not skill- or package-oriented but identifies
opportunities for performing analysis as well as building decision support
systems for enhancing operational efficiency. Such an information culture
has to be driven by the top management through practices in their own sphere of work. The case study also highlights that sophistication in technology is not an essential condition for success.

Top management and user involvement can help in avoidance of failure but in the final analysis the role of the CIO seems to be critical in ensuring success. This is particularly so today when rapid technological change enables a large choice in terms of what applications can be taken up and how these can be implemented. The two case studies exemplify the impact of a proactive CIO who can take responsibility for change management as advocated by Markus (1996).

References


Harris, R. (1998), 'Information Technology – A New Cargo Cult', Information Technology in Developing Countries, 8, 1, pp. 7–9.


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