



## A model for investment justification in information technology projects

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### Abstract

To remain competitive and ever increasingly sophisticated in the marketplace, businesses must invest in Information Technology (IT) if they are to survive in the long-term. Advances in IT have enabled new competitors to enter existing markets more readily, which has stimulated and strengthened the paradigm of global competitiveness. At the same time, increasing economic pressures are forcing businesses to re-evaluate their IT operations. In response to the changing business environment and to remain competitive and improve organisational performance some businesses have strategically made considerable investments in IT, yet their benefits are difficult to quantify. With this in mind, this paper aims to study the justification for investment in IT projects, by examining tangible and intangible benefits such as competitive advantage and securing future business by facilitating appropriate management change. A model to determine whether or not to invest in IT for any given company is presented. The developed model is then applied to a case study to analyse the implications of implementing IT and its impact on organisations. © 2001 Elsevier Science Ltd. All rights reserved.

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### 1. Introduction

Most businesses use some form of Information Technology (IT) in their business operations. The increasing use of the Information Superhighway and E-Commerce to conduct business

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demonstrates that many firms are in fact becoming dependent on IT. However, investing in IT can be an extremely expensive and time-consuming exercise and its justification is difficult to quantify because of ineffective Information Management Systems (IS). For the purpose of clarification the authors feel that the differences between IT and IS should be identified, as this paper deals with only IT. Essentially, IT is a generic term for the convergence of computers, hardware, software, telecommunications, Internet, electronics and the resulting technologies. Whereas, IS is a wider concept, which refers to how information flows are designed in an organisation so as to meet an organisations information needs.

There has been a rising trend in IT expenditure over the last two decades (Benchmark Research, 1997), which corresponds to the mass of IT products now available in the market. Such new products pose in ever increasing problem to managers, as they constantly have to invest and justify their decisions to update software and hardware to keep abreast of their competitors. Together with the rising expenditure trends managers are faced with the problem of having to constantly:

- identify what their competitors are doing with IT;
- determine whether or not they can remain competitive with or without IT; and
- evaluate how the adoption of IT can improve their performance and/or competitiveness.

In stating a case for the justification of IT, managers must embrace various appraisal techniques such as IT budgeting, IT investment management, IT project planning, investment budgeting, payback period performance metrics and return on investment (ROI). However, the justification of IT is a complex issue due to many intangibles and non-financial benefits which are inherent in the implementation of IT (Irani, 1999; Irani, Ezingard, Grieve, & Race, 1999; Swamidass & Kotha, 1998). Farbey, Land, and Targett (1992, 1993, 1995) found that companies that used traditional approaches to justify the implementation of IT indicated a degree of uncertainty about how to measure the full impact of their investment. They state that there is no ‘best’ appraisal technique that addresses ‘all’ project considerations. Further, they argue that the reason for this is that strategic investments in IT are aggregates of complexity, and notably different from each other. Essentially, each investment displays its own characteristics, and offers a range of benefits and costs. Conversely, each appraisal technique that can be used also displays its own characteristics, and has its own set of limitations (Irani, Ezingard, & Grieve, 1997; Peppard & Ward, 1999; Hares & Royle, 1994). Therefore, the development of an ‘all embracing’ generic appraisal technique for justifying IT expenditure that takes account of the wide variety of IT related implications, may be considered too rigid and complex for use.

According to Parker and Benson (1989), most chief executive officers (CEOs) are not comfortable with the current tools and techniques used to justify their investments in IT, because they lack the preciseness of definition in the financial methods used. The apparent inability of traditional modes of financial analysis to justify certain investments has led to a growing number of managers and observers to call for a moratorium in their use. Based on a review of the literature and findings from a case study, this paper proposes a model that can be used to determine the effectiveness of implementing IT at the strategic, tactical, operational levels as well as to determine intangible and non-financial benefits.

## **2. Justification of investments in IT**

Well-managed IT investments that are carefully selected and focused on meeting business/mission needs can have a positive impact on an organisation's performance. Likewise, poor investments, those that are inadequately justified or whose costs, risks, and benefits are poorly managed, can hinder and even restrict an organisation's performance. According to Willcocks and Lester's (1991) survey of American, British, Australian and New Zealand companies in 1990, the quality with which investment decisions are made on IT projects can have a dramatic effect on an organisation. At the same time, increasing economic and competitive pressures can compel companies to cut costs and force them to scrutinise their IT operating and capital budgets more carefully, so as to allocate limited resources among competing projects in the best way possible (Carlyle, 1990). Thus, careful and correct IT investment (or project selection) decisions are an economic and competitive necessity.

Hochstrasser (1992) argues that the high rate of failure in IT projects is partly attributed to a lack of solid but easy to use management tools, for evaluating, prioritising, monitoring and controlling investments in IT. Voss (1986) claims that most technology focused investments fail due to organisational problems, and has identified economic justification as a significant contributing factor. In a similar fashion, Hochstrasser and Griffiths (1991) identified the overwhelming belief by many industries that they are faced with outdated and inappropriate procedures for investment appraisal, and that all responsible executives can do is cast them aside in a bold 'leap of strategic faith'.

Essentially, the purpose of IT investment is to improve operational efficiency of an organisation so as to reduce costs and improve profit levels. Thus, many traditional appraisal techniques are used to evaluate tangible benefits, which are based on direct project costs. Although this operational emphasis has milked the efficiency benefits of investing in IT, many managers are now appreciating the wider strategic implications of an IT infrastructure, and making investments to help transform their business processes. As a result, many qualitative benefits are being realised, and typically include improved customer support and greater product flexibility. However, these may be impossible to assess and quantify, with many companies even possibly having to accept short-term losses, in order to reap long-term benefits (Hochstrasser, 1992; Wilner, Kock, & Klammer, 1992; Belleflamme, 2001; Kulatilaka, 1984; Lefley & Sarkis, 1997; Meredith & Suresh, 1986).

Irani et al. (1999), Farbey et al. (1993), Ward, Taylor, and Bond (1996), and Maskell (1991) suggest that traditional appraisal techniques are often unable to capture many of the qualitative benefits that IT brings. These techniques also ignore the impact that the system may have in human and organisational terms. Companies may, therefore, be left questioning how to compare a strategic investment in IT, which delivers a wide range of intangibles, with other corporate investments whose benefits are more tangible. Simmonds (1983) suggests a shift in justification emphasis towards a strategy based review process, where focus is placed on progress being measured against its contribution towards the corporate strategy, and not how well it meets the criteria laid down by accounting rules and regulations. Therefore, this implies the strategic significance of the investment. Hence, companies should identify opportunities for making investments in projects pertinent to the objectives of their business, and that investment decisions should not be made on the sole basis of a monetary return alone.

There are few universally accepted guidelines for evaluating IT projects, with much research suggesting that many companies have no formal IT justification process, and lack adequate post-implementation audit techniques, against which project objectives can be measured (Kennedy & Mills, 1992; Kumar, 1990; Primrose & Leonard, 1987). This claim is further substantiated by Hochstrasser (1992) who reported in a survey, that only 16 per cent of companies sampled were using rigorous methods to evaluate their IT investments. Other studies such as that undertaken by Currie (1995) are less pessimistic.

Willcocks and Lester (1991) concluded that many industry sectors when looking to introduce IT still use the cost–benefit and competitive advantage as their primary evaluation criteria. While more experienced users such as central government, publishing and education sectors use a variety of methods to assess their projects. Willcocks and Lester (1991) found that the most established sectors such as the financial services and manufacturing industries, with the exception of IT, have not changed their evaluation criteria since they first introduced IT. This is because some organisations simply do not have the necessary techniques for alternative evaluation or they lack confidence in them and/or prefer to keep tried and tested formulae.

There are some techniques which are still widely used in justification investment in IT such as, ratio based techniques, etc. which are based on the traditional view of ROI. However, there are a growing number of academics and IT managers who believe, that ROI on its own simply does not work as an appraisal mechanism for information systems (Irani et al., 1999; Slagmulder & Bruggeman, 1992). Cost–benefit analysis is an appropriate technique to evaluate internal effectiveness of IT investments and could be used to identify organisations that mainly look towards internal benefits from IT (Willcocks & Lester, 1991). Less optimistically, criteria used to measure internal effectiveness such as capacity utilisation, employee productivity, scrap level, etc. may have the effect of restricting and biasing the evaluation process. Other less experienced sectors such as services, agriculture, mining and construction, perhaps encouraged by the IT industry, are beginning to use more adventurous criteria as a priority over the traditional techniques. In this sense they may well be able to leapfrog part of their learning curve on IT evaluation, while more experienced organisations, such as financial and manufacturing may find it difficult to shed their inherited legacy of techniques and criteria. However, it could simply be that the financial services and manufacturing industries are satisfied with their evaluation methods and therefore do not need to look elsewhere. Whilst the less experienced sectors have had to find new criteria because established evaluation methods may be adapted to their industries or specific needs.

According to Willcocks and Lester (1991) management and financial controller's attitudes have changed towards the IT investment criteria, in the sense that:

- IT is seen more as a support function rather than a strategic tool;
- executives are unsure about how IT may be effectively implemented; and
- most view IT from a technical rather than a business approach.

Based on the literature review on investment justification in IT projects, some significant general points emerge from reviewing the major research studies in this area:

- managers have found it difficult to justify the cost associated with purchase, development and use of IT in financial terms,

- the difficulties in measuring benefits and cost are thought to be a major constraint to IT investment,
- there should be methods other than financial criterion devised to investigate the IT investment justification,
- the current financial justification methods are inadequate to deal with IT investment issues,
- intangible benefits are valuable assets but cannot be quantified in monetary term.
- IT investment should be part of infrastructure investment of an organisation.

In order to study the implications of IT on organisational performance and for the justification of investments in IT projects a conceptual model is developed and presented in the next section of this paper.

### **3. A conceptual model for evaluation of IT projects**

Existing methods for justifying the investment in IT projects are considered to be inadequate based on reasons that include lack of strategic integration and ignoring the intangibles and non-financial performance measures. With this in mind, an attempt has been made to address the benefits and costs at all levels of organisations including various decisions making at different levels together with appropriate performance measurements. A conceptual model that places emphasis on evaluating the benefits of strategic, tactical, operational, financial and intangible investment appraisal techniques is presented in Fig. 1. This model offers a feasible, potentially cost effective method to determine if investment in IT is a viable proposition taking into consideration the points mentioned above.

#### *3.1. Strategic impact*

Inputs into corporate strategy need to be linked to the objectives of the business. The essential nature of this tie-up is twofold. Firstly, it provides the basis for establishing a clear strategic direction for the business, and demonstrates both the strategic awareness and strategic willingness, which are essential to corporate success. Secondly, it will define the boundaries and mark the parameters against which the various inputs can be measured and consistency established, thus providing the hallmarks of a coherent corporate plan. For each company, the objectives will be different in nature and emphasis will reflect the nature of the economy, markets, opportunity and preferences of those involved. The important issues here, however, are that they need to be well thought through, held logically together and should provide the necessary direction for the business. Typical measures concern profit in relation to sales and investment, together with targets for growth in absolute terms or with regard to market share. Businesses may also wish to include employee policies and environmental issues as part of their overall objectives.

#### *3.2. Tactical considerations*

On this branch of the conceptual model, resources are identified and as such there is a need to establish ‘tactical’ critical success factors (CSFs). These should be project specific, and are requirements, which must be fulfilled by isolating detailed tasks, processes and resources, to

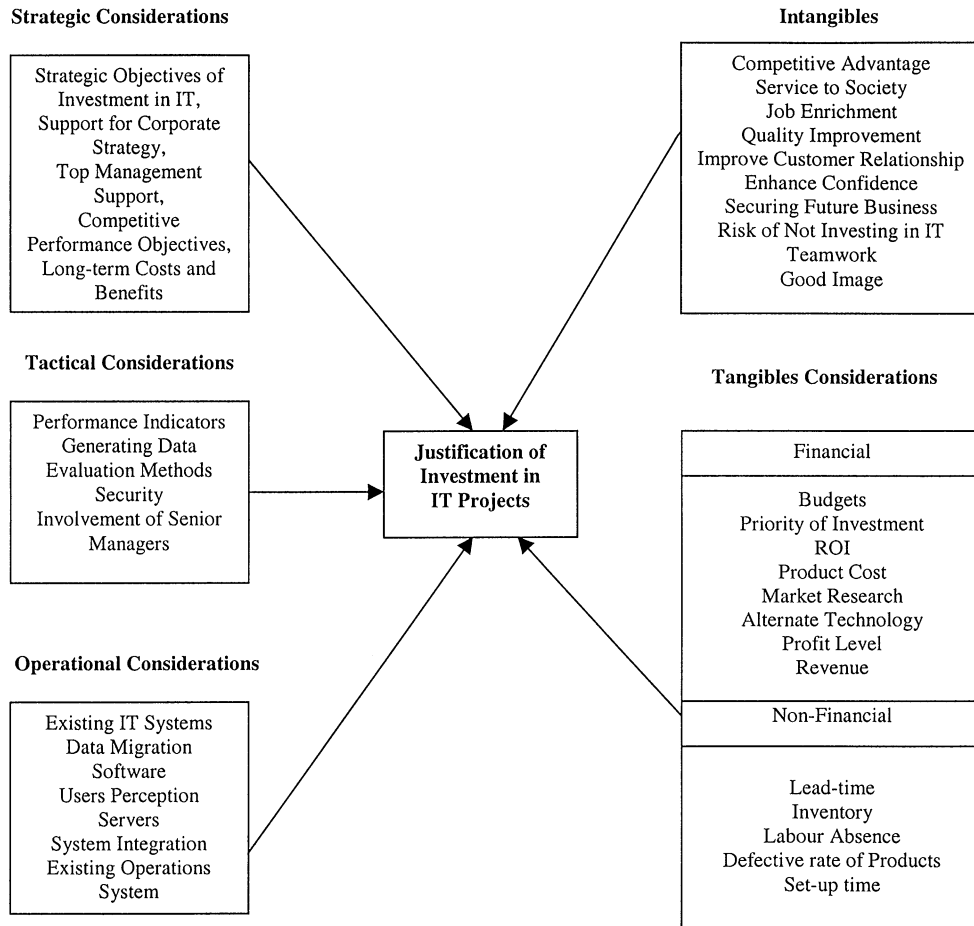


Fig. 1. A model for investment justification in IT projects.

ensure medium/short-term tactical success. If these CSFs are not achieved, they will become an obstacle to corporate progress, and may ultimately result in a loss of business, and failure in the achievement of project deliverables (Hochstrasser & Griffiths, 1991; Swamidass & Waller, 1991). It is essential that when tactical CSFs are identified, appropriate ‘hybrid’ performance measures are identified and described. Such measures might include the impact the project has on turnover, manufacturing lead times, new product development, and so on. Although the strategic perspective may not have non-financial indicators, the tactical dimension will have a combination of both tangible and intangible measures. Furthermore, it is essential to develop appropriate mechanisms for the quantification of the tangible measures.

### 3.3. Operational performance

The next immediate consideration is ‘operational’ evaluation. Here the identification of operational project specific critical success factors (CSFs) is done. These are requirements, which

must be achieved at an operational day-to-day level, to ensure project success. Again, when operational CSFs are identified appropriate micro performance measures must be detailed. These considerations could be classified as follows: IT and IS are being developed with the IT or IS department working closely with the business functions, the company emphasising on the importance of balance between involvement of user departments and technical IS or IT functions in the design of IS. In operational justification, the existing IT infrastructure operation has to be considered to resolve the integration problems. Data migration, upgrades, host servers, the need for a database, level of internal expertise, system administrator, need for training, department users affected, type of licence required are just some of the issues in this branch of the model.

### *3.4. Financial considerations and justification*

Another consideration is that of ‘financial’ evaluation. Naik and Chakravarty (1992) have identified issues associated with organisational financial positioning that should be raised. These include: Is the company in a position to make the required investment? What are the sources of finance for capital budgeting? Does the investment fit in with the company’s overall strategy? What is the overall outcome of the investment in IT/IS. This means increase in profit, ROI, etc.

Once finances are agreed, and in place, the objective is then to match the most appropriate financial appraisal technique to the characteristics of the project being implemented. Preliminary research (Hochstrasser, 1990; Farbey, Land, & Targett, 1995) suggests that this is possible, as it is claimed that project characteristics affect the way in which an investment decision is made, and therefore indicate which of the alternative appraisal techniques might be more suitable for a particular investment. This process is further assisted, as the individual project characteristics would have already been addressed during ‘strategic’ and ‘tactical’ justification.

The financial performance of the investment is then examined to see whether the suggested financial returns achievable meet the specific requirements of the organisation (payback period, hurdle rates, etc.). This process is essential, as applications of IT as high installation and start-up costs, and when combined with over optimistic forecasted savings and ambitious benefits, could ultimately result in the project being considered a failure. It is therefore necessary to include this issue, as a successful investment decision must yield a return in excess of the cost of capital invested (Kaplan, 1993).

### *3.5. Intangible benefits*

Rate of return on investment (ROI) methods are based on an ‘investment’ view of decision making. Managers are seen as having a certain amount of money under their control and they decide to ‘invest’ in the projects that will bring the largest return. This process sometimes has the sophistication of a ‘hurdle’ rate, which is the minimum rate of return from a project before it can be approved. However, some investment decisions do not fit in with this ‘investment’ view of the business world.

Owing to the dynamic factors inherent in IT investments, evaluation must be regarded as a continuous process which needs to be constantly reviewed. It cannot be tenable to justify a policy proclaiming a single one-off evaluation procedure. Without regular re-evaluation, additional potential benefits may be missed for the following reasons:

- the technology itself may develop to a stage where cheaper technical solutions become viable;
- users may outgrow the current system; and
- the demands of the market environment in which a company operates may change so that older systems no longer address current needs.

The lack of relevant and regular evaluation procedures may lead to the loss of control of IT investments. Without relevant evaluation procedures, the introduction of IT is based on an act of faith without repeating these procedures at regular intervals, benefits once achieved may no longer be realised. As such, the development of a comprehensive programme is not an overhead, but an investment in a valuable tool for supporting a company's strategic IT deployment.

#### **4. Research methodology**

A case study is a “methodology based on interviews, which are used to investigate technical aspects of a contemporary phenomenon with its real life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used” (Yin, 1984, p. 3). Thus, a case study approach may lead to a more informed basis for theory development. It can provide analytical rather than pure statistical generalisations. Thus, “theory” can be defined as a set concepts and generalisations. A theory can provide a perspective and a way of seeing an interpretation, which ultimately leads to understanding some phenomenon (Agar, 1986). Thus, a case study was used to gain an understanding as to how the developed model could be used to justify IT in the selected organisation.

Structured interviews were used as the primary source of data collection. The questions asked can be found in Appendix A and were divided into six different categories: Company's details, strategic, tactical, operational, tangible/intangible, and cost related benefits of IT employment. The questionnaire was used to interview the Knowledge Manager in the selected case company. The questionnaire has been designed to study the major dimensions of the model. These include strategic impacts, tactical considerations, operational considerations, tangibles and intangibles. The main objective of the case study was to study the application of the model in the real world.

#### **5. The case study—ICL**

ICL is a leading European IT company. Operating in over 80 countries, it supplies integrated system and services that improve the performance of its customers' business. In 1997 it generated revenues of 3.1 billion pounds. Fujitsu is the major shareholder and ICL is an autonomous part of the Fujitsu group of companies. ICL was formed in 1968 by the merger of leading British indigenous computer suppliers, and its corporate centre is in London. In 1984 ICL was acquired by STC PLC, which then became the second largest UK based industrial electronic group. In November 1990, Fujitsu Ltd. of Japan invested in ICL by taking 80 per cent of its share holdings.

Appropriate data were collected by interviews at ICL's headquarters in Slough, England. The interview was arranged and given by the Knowledge Manager (KM). The responsibility of KM is to provide information on all the projects, contracts, bids, R&D, successes and failures, lesson learned, etc. The KM provides this facility by creating an internal web page which contains this



information and makes it available for the selected individuals across the company, who have been given passwords to gain access to these pages. For this service, they were required to purchase suitable equipment, employ skilled staff and continuously update their legacy software and hardware. Naturally, this required financial justification. The purpose of case analysis, therefore, was to establish investment justification for such an operation and whether or not this information centre fits in with proposed model described above.

## 6. Analysis of data

In this section, the data collected through a structured questionnaire (see Appendix A) and the information acquired from the interview with respect to the developed model are analysed.

### 6.1. Strategic

Being an IT company, ICL is of the view that IT is vitally important and plays an essential role in the survival of any business in today's competitive market. On the question of justifying investment in IT, the KM's answers are very much in line with the framework offered earlier.

The effectiveness of IT investment can undoubtedly be maximised through better strategies. The elements within the infrastructure strategy should be regarded as an agreed standard set of integrated components required to offer ICL a viable IT platform.

This strategy, they found to be continuously changing to address the need for adaptability in an ever-changing world of technology. One of the important issues within the strategy relates to the question of the mobility of staff. The KM made the following comment:

For example, fixed PCs are not suitable for a sales person. ICL would like its people to be able to get into the network at any time, any where through a secure fire wall and get information without it falling over.

Within the department was no traditional cost justification calculation. The KM stated that:

It is a matter of writing a short report informing the director of amount needed to carry out a job, the reason for this is that if there is no chance of getting the money, the time spent preparing a formal report will not be wasted. The investment/expenditure is done as and when it is needed, so long as it is within the IT strategy. Their top management is in total support of investment in IT and encourage their customers to do the same.

In fact, one of the ways ICL do cost justifications is to estimate the cost of *not* doing it. However, the KM considered that this method of justification was not scientific and stated:

Just before 1980, ICL was responsible for implementation of a word processing system into the company, it was impossible to predict what effect the word processing would have, ICL had to go through a vigorous cost justification process and had to lose two people. The argument was that if we do this, then we do not need as many people. The misconception here was that by losing two people the company also lost the experience, loyalty, and also implanted the fear for future IT implementation into other staff. That was 20 years ago, today its absolutely

imbedded, everybody has IT at their disposal. Today there are 19 000 people in the company; when it was introducing the word processing, the organisation had 400 people with 5 processors.

The KM then added “So therefore the way of justifying an IT implementation is cost of not having it—the place will fall apart”. It transpired that KM in fact has been involved in many projects before, in none of which could the project manager quantify the information, it would start by using scientific methods; however, soon they would realise that this would not work in monetary terms. For any given IT projects then, they would try to estimate what is the cost of *not* doing it.

### 6.2. Intangibles

The expectations from the new investment had been to gain a competitive advantage. The aim was do something faster with improved quality and accuracy and by doing it better ICL hoped to be able to respond better than their competition. However, it was very difficult for ICL to estimate the cost for such projects.

Job enhancement is another advantage of investment in IT, keeping people knowledgeable and learning new techniques is all part of ICL’s competitive advantage. Also, investment in IT is of strategic importance to the company. Traditionally, companies such as ICL were measured on inventory and how much they had in stock. Today, the value of ICL is measured by how much their people know, that is, their *Intellectual Capital*, which of course is difficult to quantify.

ICL is involved in hundreds of different projects; however, individual employees do not know anything about these projects, and the individual project managers who work on these projects are exposed to the details and therefore are aware of all aspects. This resulted in very few people having vast experiences across the company. It was perceived that a very limited amount of knowledge is shared across the company and this has led to reinventing the wheel every time, as no solid library of documentation had been kept on previous projects carried out. The KM’s aim was to rectify this imbalance. It was envisaged that IT would help the company to capture this information and therefore enhance its value. Another very important aspect of IT relates to the use of management information tools. With these mechanisms data are readily available for commercial directors to make strategic decisions. This medium was not available to ICL but the company is working towards this goal. It has envisaged that these tools will enable the company to respond quickly to the customer’s needs and consequently their relationship will undoubtedly improve.

### 6.3. Cost related

ICL had a capital budgetary procedure for investment in IT. The procedure aimed to focus the project owner’s mind in the way they are aiming to use IT and how the performance of a project was to be monitored. Specific performance indicators were used by management to make a decision as to whether or not to fully fund the investment. If the indications were negative, even though the budget may well have been allocated to the project and by no means exhausted, management had the right to withdraw the funding. For IT expenditure, no ROI calculations

were carried out; however, risk assessment was considered to be important and there were risk management teams dedicated to undertake risk assessment. For example, ICL is involved with the London Underground Ticketing System whereby they are looking at developing a ticketing system that can use smart card, transactions as ICL will be paid on each transaction rather than by the project. This project was considered to be a high-risk venture.

Security for some IT projects, are a major consideration. We are about to embark on a new project, which is going to cost millions of pounds and will be going through with our group security personnel.

By implementing IT, the company is exploiting its existing market. By providing a web based information system, we are able to share information with our customers, quickly and effectively. When we sell a service to a customer, we tend to win a whole range of other services and IT helps us to do that because we can share information a lot easier.

The success of projects are not measured in monetary terms, the projects progress with such speed that it will be not cost effective to evaluate the success of the project. However, if the project is not progressing well, this is when the project costs will be taken into consideration.

#### *6.4. Tactical*

Customer perception was very important to ICL. It has happened in the past, when ICL has sent consultants to a customer site and found that company had far superior IT than ICL. The KM stated that:

It is therefore of vital importance that we use the right technology at the right time for the right customer. This is part of the strategy to have a good image which will increase the confidence of our customers in our capabilities.

Implementation of IT was welcomed by all members of ICL staff and in fact was felt to be long over due. Technology changes all the time and the company had to keep abreast of the latest developments. However, with changing technologies come uncertainties and the need for greater support. As a part of measuring the effectiveness of these steps taken, help desks were established. An evaluation process was carried out at several stages of purchasing new IT. Depending on the level and size of purchase, many different layers of management were involved in ensuring that the new purchases were in line with the company's strategy.

#### *6.5. Operational*

At one stage, the company went through a phase when the IT departments did not work with the business functions. However, they were aware of this situation and relationships were established to overcome this issue. There were checks carried out all the time to make sure that ICL's entire IT system was Y2K compliant. A dedicated committee had been assigned to this task to ensure that the systems currently in place were Y2K compliant. This was further developed to take a look externally at customers systems' Y2K compliancy.

The company no longer has a mainframe-distributed service. They used to have mainframes and a number of terminals but now they have servers, which facilitate a community of

applications. The operation has changed from one of a star system to a fully integrated (plant servers) one and some applications are shared.

Integration of ICL's system was an issue, which operationally was taken seriously. It happened all the time, as it was seen to be a vital ingredient in developing the internal network. This is more so recently when they have had to capture some information from their legacy systems into a new one. The systems are now being developed in modules. This is because the requirements of the business increases so can the IT systems which support it. Database is another area where it requires attention. Work is constantly carried out on integration of series of databases. Daily system administration is an operational issue, which is outsourced to another part of the company.

The main aim and objective of ICL is to improve the quality of service it provides to its customers. Traditionally, the company has sold a solution to a customer and maintained it. Today, the aim of the company is to provide a solution for customers' customer. For example, ICL is providing cash dispenser machines, for a variety of high street banks and it is paid on every transaction. The benefit to the customer is reduced cost and improved quality of service. There have been some projects that have not worked, and as such have cost the company a fortune. This failure of a project can be primarily contributed to bad communication between the customer and the account team, requirements not being understood, and risk analysis not being carried out properly.

ICL has taken a proactive role in IT. The company sees IT as an essential part of the infrastructure of the business rather than a mere tool. They provide a comprehensive range of services to help their customers exploit their IT investment. They facilitate their management to have a right medium to have access to the right information, which would lead to strategic decisions and win contracts. ICL has a comprehensive IT strategy which it has to comply with. Traditional methods such as RIO, payback period, etc. are not carried out for justifying IT investment but there are procedures, which include preparation of a report, which addresses the issue of the cost of not investing in IT. ICL illustrates/portrays a positive outward looking attitude toward IT development, which is a highly effective lever for commercial success.

## **7. Conclusions**

The findings from the case study have indicated that the current accountancy evaluation process, for investment justification in IT such as ROI is not sufficient to warrant an investment decision. There are many intangible benefits offered by IT, which are not of a quantifiable nature but essential to the endurance of a company. When implementing IT overall consideration must be given to the company's organisational strategy and full support and commitment of the company must be in place before commencing any projects. In particular, an organisations IT manager should have full knowledge of the company's strategy, commitment from management employees are also some of the important issues that need to be considered when contemplating an investment in IT. Tactical considerations are equally consequential in the success of an IT project, as there should be measures to monitor the success of the investment. These performance measures should be constantly monitored to ensure that the project is progressing in line with the aim and objectives of the project as well as the organisation's strategy.

**Appendix A. Interview Questions***Strategic*

Had primary/short-term objective	Y
Had secondary/long-term objective	Y
There is an IT strategy	Y
IT is seen as essential to business	Y
IT investment had top management support	Y
When are projects considered:	
• As and when proposed,	N
• Management asks for projects periodically,	N
• Management advises when necessary,	N
• When IT strategy dictates,	Y
• When customer need/dictate it	Y

*Intangible consideration*

Not investing in IT will lead the Company to suffer	Y
What expectation do you have from the new system?	
competitive advantage,	Y
cost benefit	Y
service to the public,	Y
quality of product,	N
job enhancement	Y
improve management information,	N
user requirement,	N
legal requirement,	N
strategic importance	N
By implementing the new IT has the quality of service/product improved?	Y
Is there a management information tool built into this IT system?	Y
Is the implementation of new IT will have any competitive advantage?	Y
Will the IT improve the customer relationship?	Y

*Tactical*

Has there been any invitation to tender?	Y
Has there been any risk analysis carried out?	Y
By implementing the new IT will the company consolidate the existing market and create new opportunities?	Y
Has IS development been led by the CEO? Chief Executive Officer?	Y
Can data available/generated by IT be used for later use? (therefore time/labour savings)	Y
Can the success of the project be measured by monetary value?	N

If relevant—How will customers perception change with the introduction of the new IT?

- Will increase the business Y
- It is cosmetic but good for the image Y
- It would not make a difference at all

What implication will new IT system have on staff in company project?

- Threatened N
- Welcome the move Y
- Longed and well over due Y
- Indifferent N
- Concerned that they will not be able to cope N

### *Operational*

Who completes/carries out the evaluation?

- IT department Y
- Users department N
- Separate committee Y
- Project office N
- Individuals N

Are you satisfied with IT evaluation process?

- Not satisfied
- Satisfied Y
- Could do better

Have IT and IS been developed with the IT or IS department working closely with the business functions? Y

Has your Company put any emphasis on the importance of balance between involvement of user departments and technical IS or IT functions in the design of information systems. Y

Are other departments going to be affected by it? Y

### *Cost related*

Is there sufficient budget set aside for this project? Y

For any capital expenditure, is there any ROI calculation carried out? Y

Is there a budget for security? Y

For a given IT investment, is there any evaluation methodology such as:

- Return on investment (ROI) Y
- SSADM N
- PRISM N

• Industry standards	Y
• Arthur Anderson SD method	N
• Cost benefit	N
• CCTA guidelines	N
• Price	N
• Common sense	Y
• Prompt	N
• Risk assessment	Y
• Finger in the air	N
• Other	

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