Information technology investment approaches in Namibia: six case studies

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Abstract. The impact of IT has not been studied intensively in Namibia despite technological progress made by organisations in Namibia since independence. The existing definition of information technology (IT) in Namibia is also not adequate to include all IT expenditure. No return-on-IT-investment calculations are made although all managers participating in the case studies showed concern at the increasing IT expenses. The purpose of this study was, therefore, to determine what organisations use as a basis for decisions on IT investment. Case studies were conducted with six organisations in Namibia to determine how they define and manage their IT investments. Conclusions are that organisations need to re-classify their definition of IT to include aspects like communication systems, maintenance, etc. Also a responsible person should be appointed to take charge of managing the IT investments of the organisation and these investments should be tracked and justified.

1. Introduction

Throughout history, progress in technological behaviour had profound social significance – regardless of whether it was based on mere intuition, trial-and-error or a scientific approach. Schoderbeck et al. [7] cited Machiavelli who noted that

There is nothing more difficult to plan, more doubtful of a success, nor more dangerous to manage than the creation of a new system. For the initiator has the enmity of all who would profit by the preservation of the old system and merely lukewarm defenders in those who would gain by the new one.

Researchers now realise that information systems (IS) are the centre of a new business reality during the 1990s. The impact of the IT revolution is a phenomenon that is affecting every aspect of developing country societies. This revolution increasingly affects anything from the way organisations conduct business to the organisation of education. The problem is that the use of IT is not fully understood nor studied enough in developing countries in order to yield meaningful insights.

2. Previous attempts to quantify Information Technology investment

The evaluation of Information Technology (IT) investments has gained considerable interest among academics, consultants and practitioners [2–4]. It is also clear that the current approach to IT investment has got to change [1]. IT is taking too long to develop, costing too much and is generally not perceived to be delivering the benefits for the organisation which were intended [1,3].

The widespread interest in IT investment might be due to the large IT budgets for organisations and the strategic impact of IT on organisational performance. At the other end of the spectrum is the fast
moving organisational environment which many organisations face and this is why the goal posts for IT investment keep on changing. All IT investment decisions, according to Powell [6], are problematic. The IT community seems to shy away from evaluation of its investments. This lack of formal evaluation of IT projects might be due, not to a deficiency in the tools available to the evaluator, but to other factors. Powell argues that most IT researchers are of one opinion – that the costs and benefits associated with computer systems are difficult to quantify. Powell also claims that suitable techniques exist but are not applied.

According to Powell, quantitative techniques endeavour to categorise the costs associated with a system. These costs may relate to the functions of the system, to those involved in the system or to the life cycle of the system. Subjective methodologies, on the other hand, were often propounded as team building. The notion was to get the computer system out of the data processing domain and into that of the manager or user, thereby giving the user a sense of participation, ownership and commitment.

Powell [6] argues that the rapid pace of change in IT poses serious starting problems for any large IT investment. Any long-term, fixed project is almost obsolete before it has started and is certainly passé by the time it is fully installed. This does not, however, negate the need to evaluate projects. It is clear, according to Powell, that the justification of IT is difficult, yet techniques are available which give broad indications of success and failure. These standard techniques do not appear to be widely used, even though they have been employed in other fields and are recognised as useful. If IT is to emerge as a beneficial corporate tool, the decision to invest needs to be examined as rigorously as with any other large investment [6]. However, the important thing in business is not to make good forecasts but to make them come true.

Cragg and King [2] claim that the impact of computerisation has been significant on smaller firms since the advent of the microcomputer. However, they note, very little is known about the evolution of computing in small firms, even though more and more firms have installed computers or, if they already had them, have continued to upgrade. Smaller firms could experience different types of IT growth according to Cragg and King. Their case study analysis drew heavily on Nolan’s variables, especially with the advent of end-user computing. The types of growth they identified are: Growth in IT hardware, Growth in IT software, Growth in IT applications, Diffusion of IT, Growth in end-user development, Growth in users, and Growth in IS managerial practices.

They also identified different factors that encourage IT growth. Some of these factors are: Relative advantage, Competitive pressure, Consultant support, and Managerial enthusiasm. Some factors that discourage IT growth are: IS education factors, Managerial time, Economic factors, and Technical factors. Cragg and King argue that the considerable variation in IT growth among firms could be due to a number of influences, including both motivating and inhibiting factors. The strongest motivating factor was the owners’ enthusiasm towards computing. Many of the factors that encouraged IT growth were similar to the typical motivators for small firms to acquire their first computer. They warn, however, that some firms that exhibited considerable IT growth, experienced inhibitors to further IT growth. They concluded that while many firms had experienced growth in the number and type of IT applications, there has been little change with respect to the management of IT in small firms.

Cost-Benefit analysis (CBA) and return on investment (ROI) are the most commonly mentioned appraisal techniques for deciding upon IT investments [5,8]. Less than fifty percent of the respondents in the study of Lubbe et al. [5] mentioned formal techniques such as payback, ROI, internal rate of return (IRR), or net present value (NPV). Common problems experienced by responding managers, with the methods mentioned, were that they were unable to take account of the full range of potential bene-
fits, especially intangible benefits. This is because no methodology exists that can be used to effectively measure these intangible benefits.

Some respondents in the study of Ward et al. [8] mentioned that wrong IT investment projects were approved as a result of the mis-accounting of potential benefits. IT investment projects often have benefits that are intangible in nature. However, 25 percent of the samples used by Ward et al. believed that their current project justification process fails to identify intangible benefits in their IT investment project process. More than 70% of the managers believed that their current IT investment project’s justification fails to identify all benefits. This could imply that not only are benefits claimed that are unlikely to be realised in practice, but also that the process itself places greater emphasis on getting approval than on delivering any proposed benefits. An indication by the respondents were that the purpose of carrying out pilot studies is not always clear, and in the majority of cases the primary purpose does not appear to obtain an understanding of potential benefits that could be realised from any IT investment project.

More than 60% of the respondents in the Ward et al. [8] survey indicated that specific responsibilities for realising organisational benefits were not allocated to managers. They (Ward et al.) argued that the realisation of business benefits usually require changes to business processes or practices in order to achieve maximum effect. The central concept of the survey was that IT benefits are derived through business change and it can therefore be concluded that it is possible that with no business change, benefits are unlikely to be realised in practice.

The majority of managers believed that it is not possible to anticipate all benefits at the project approval stage. The implication is that there are often more benefits to be gained after implementation, but that current practices mitigate against exploring these potential further benefits. Ward et al. [8] argued that there appears to be a potential paradox between the current confidence that IT is delivering benefits to the organisation and the view that there is significant scope for improvement in how benefits are being realised. They noted that this may be explained by the nature of the benefits that respondents perceived were actually delivered, and a view that much greater potential exists to deliver other types of benefits; or that only a proportion of the benefits were actually delivered and that more could be delivered with a more effective process.

The effectiveness of IT investment has gained considerable interest among researchers [2,4,8] and practitioners. This interest is due to the large investments that organisations have made in IT, the increasingly strategic nature of the impact of IT on organisational performance; the realisation or not of both efficiency and effectiveness benefits, and no apparent consensus for the definition of IT success. Despite this interest there seems to be little agreement on how to evaluate the effectiveness of IT investment.

3. Research methodology

It was decided to conduct applied research because the approach could lead to possible solutions of problems experienced by some organisations in Namibia. A positivist approach was used because it allows the researcher the possibility to measure the properties of IT investment in Namibia through objective methods, rather than being inferred subjectively through sensation or intuition. It is important that the researcher should be independent of what is being observed but at the same time, the problem should be reduced to the simplest possible elements to help with generalisation. It was not possible to use data triangulation because of the size of the sample and the time and cost limitations imposed on the study. It is however, suggested that such a follow-up study be done and the results compared with the present results.
Case studies have been traditionally used as a research tool (Remenyi, 1996). Case studies also help the researcher to make controlled observations and controlled deductions and allow for replicability and generalisability (Yin, 1994). It was, therefore, decided to conduct case studies to help understand how organisations define and manage their IT investments in Namibia. The sample consisted of six organisations representing large, highly profitable organisations and the educational sector of Namibia. A lengthy semi-structured interview was conducted with senior representatives in the IS department of each organisation. Every attempt was made to keep the identity of the organisations and sensitive information confidential. The interview addressed issues such as:

- Information on the company.
- What does the organisation regard as part of their information technology?
- What are the IT resources?
- How do they manage and track IT investment?
- From where does the impetus for buying IT start?
- What factors influence IT investment decisions?

4. A synopsis of the case studies

Details of the case studies are given below. Section 5 discusses the analysis of the cases. However, prior to analysis it was possible to rank the case studies subjectively in terms of those which were most effective in their efforts to formulate and implement IT investment and IT benefit policies. The purpose of this ranking exercise is simply to give a first impression of the effectiveness of these organisations. It is clear from the evidence below that Insurance (2) is the most effective in this respect. They had a very clear vision of their objectives and strategies and their formulation and implementation procedures were conducted in a relatively systematic manner designed to support the generic strategy of the company.

The manufacturer of Consumer products was second for the same reasons as for Insurance (2), although on a smaller scale. The Transport organisation was third because they had an overall focused strategy to their position in the organisation. However, they did not have a clear view of all the issues which required their attention. The Banking organisation is fourth. They have conceptualised much of the framework they will require for the formulation and implementation of a formal IT investment policy, but have just begun to work in this area and the investment policy they consider strategic is not the result of formulation and implementation policies, but rather consequential to their operational efforts. The Insurance (1) and Education organisations trail last. Their use of PCs seems purely for specific purposes, for it seems that they do not have any strategy in place, consultants seem to make their decisions to invest in IT and they do not know how to manage their IT investment.

4.1. Organisation 1: Education

Organisation 1 is the only organisation in Namibia in the field of tertiary education. It consists of a University, a technical college and a Technikon.\footnote{A Technikon is at the same academic level as a community college or Polytechnic and is the African version of the mentioned institutions.} The main processes of the organisation are to supply quality lectures to their students, handle financial and other student matters, supply library services to their clients, complete the administrative duties concerned with an educational institution, and maintain equipment. The interviewee was the Director of the Computer Bureau. The IT resources included a mini
computer and several personal IBM compatible machines. These are for administrative purposes and for academic use. According to him, the policy of the organisation is to regard only hardware and software (excluding maintenance and consumables) as part of their IT. During the past couple of years the budget for investment into IT was drastically cut. This necessitated a policy of "Do we really need it?" and resulted in their IT equipment becoming obsolete and in need of replacement. All relevant purchases of IT equipment were the result of a replanning of departmental budgets. He mentioned that this could have a negative effect on the efficient running of the organisation. The administration student records and financial systems use the systems exclusively. It is however beyond the scope of this study to attempt to describe the number of IT applications.

IT is tracked in a combination of centralised (all administrative PCs) and decentralised way (all academic PCs) but no attempt is being made to include relatively small expenditures like consumables or maintenance. IT equipment is not captured during the tracking of IT investments if it was bought utilising savings from departmental budgets. No return on investment (ROI) is calculated although departments are assessed on an output versus input basis (outputs are interpreted as preparation for lectures while input could be office space, equipment, number of persons in the department, etc.).

The main reason for placing an IT investment is because of a general upgrade of IT or because of staff that need a personal computer. The Head of department approves or rejects applications. The drive to invest in IT equipment originates from departments who identify a need, obtain top management's permission and proceed to buy the equipment. Political considerations play a significant role during these IT investment decisions. The management of the IT is on a partly centralised and partly decentralised basis (shared by the IT department and the relevant academic department that placed the IT investment). There is no link between the buying of IT equipment and the strategy of the organisation.

The organisation noted that a need exists to consult users on what their needs are and by addressing this they hope to reduce IT investment mistakes made in the past. They acknowledge that IT investments can yield benefits, however they are not measuring any benefits. They also do not know how to train staff to optimally use PCs and receive benefit from IT investments. They also not that the effect of culture affects any possible benefits they could have received.

4.2. Organisation 2: Transport

Organisation 2 is a large organisation in the transport division. It was solely responsible for transport in SWA (now Namibia) before the 1990s. The transport industry has become competitive and they need accurate and timely information, giving their organisation a competitive edge. The organisation is the biggest employer in Namibia. The railways had a monopoly in the previous dispensation and they would like other organisations to share in the opportunities that now exist in the industry. The interviewee is the manager who controls the Information Technology division. He noted that the process of investing resources in IT is the responsibility of individual divisions. According to the respondent, IT is defined as including all hardware and software. However, the capacity of IT is planned in order to allow maximum advantage of their IT investment.

They have been using computers since the early 1980s. They are happy with the way IT is presently assembled but are preparing for the future and would like to keep an eye on the market to ensure that they increase their market share. They think that their communication is good and they are sure that there will be chaos if they had no access to IT. They are using only personal computers and these are all connected on a Novell network.

They have noted the influence of IT, on their organization, as information from the PCs is available earlier as a result of the speed of the PCs. The organisation emphasised that this monitoring is done
in a visual way and depends on the gut feeling of the manager in charge of the section. They are not too sure how to measure the benefits they are receiving from their computers, especially on service and operational level. They do not include hidden costs as they feel that these costs should not be taken into consideration. They also feel that there is no risk when they invest in IT for their organisation. Threshold investments (investments that are crucial to business and are a once off investment) are handled as any normal IT investment.

The respondent believes that the investment in IT could be maximised but stated that no real attempt is being made to do so. No return calculations are made on the IT investment and there is decentralised tracking of their IT investment. He noted that political issues play a part in decisions to invest in IT. The impetus to invest in IT comes from a central point within each department. If the need for IT is recognised, the relevant departmental manager notifies the IT manager who will discuss all issues with the department (e.g., How will the IT investment be used? How many hours per week will it be utilised?). There is no link between the organisational strategy and the investment in IT, although they feel that this should be aligned.

This case study has attempted to provide a brief insight into the transport business in Namibia. It has also tried to address the use of IT in the organization and has noted how the organisation needs to address the requirements of the organisation to change due to the implementation of IT applications if they want to maintain their market share.

4.3. Organisation 3: Banking

Organisation 3 is a commercial bank in Namibia and the ABSA group in South Africa has a small share in this bank. The banking group is not as large as its South African counterparts but it is run efficiently. The organisation has a high standing in the market place in Windhoek, achieved through a strategy whereby they enjoy the support of their clients. The respondent is a manager responsible for the IT section of the bank. The organisation includes hardware and software in its overall view of IT. The organisation does no productive planning of their IT investments. The bank keeps track of the IT investments on all levels using a combined centralised and decentralised basis (centralised – the IT section has the IT investments on its books; decentralised – the departments control the IT investment on behalf of the IT department). This is because no simple measurement of control is considered adequate in terms of accuracy. They are presently using the system of Boland Bank (another banking group in South Africa) as they felt that their present system is too small to warrant their own computer network.

The organisation believes that it differentiates itself from other banks in aspects such as quality, range of services, techniques and good people. Quality of work is of importance to their clients as it would ensure that they receive an accurate statement. In the areas of techniques, they are concerned with remaining a leader in the field by applying latest technology in Windhoek although they will not attempt to be leading-edge practitioner.

The organisation’s decision to invest in IT is taken at corporate level following inputs from the bottom. However, each department or section in the bank controls its own IT, provided it falls within the scope of the system they have out sourced. The respondent claims that political considerations play a big part in the decision to invest in IT. They are not taking any hidden costs into consideration when they consider any IT investment. According to him, a definite link exists between IT investment and the strategy of the organisation. Competitors also influence their eventual decision to invest in IT.
4.4. Organisation 4: Insurance

The insurance industry in Namibia is competitive and to be part of this industry means that all information and control should be tight. This organisation is a local business, handling all sorts of insurance for a large number of clients. They are not a leader in Namibia and they have a lot to learn. They do not employ a lot of people although they have offices throughout Namibia. The respondent is the manager of the financial department who also controls the IT section. They are not using IT as extensively as they could. This study will not attempt to describe all the applications they are using.

The insurance organisation’s current strategy is defined by their attempts to cope with the main drivers which propel the insurance industry. These drivers have been particularly strong during the last couple of years since other organisations have entered the market. Although there are several important drivers affecting the insurance industry, by far the most important for the organisation is the arrival and steady development of competition. Their decisions will not affect the competition as much but they need to keep track of the decisions their competitors make.

In addition to head count, expenses and assets, there is another resource available to divisions which relate to the support that a particular function can expect to receive from IT investments in order to help the organisation to achieve its objectives. In this context IT is being used to directly support the overall organisational strategy. It needs to view itself as a partner of the organisation to support it and achieve the stated objectives of the organisation. IT is a function expense-wise.

IT forms part of the financial function and their definition of IT includes hardware and software only. These run on a local area network with a Pentium II file server. They use IT for accounting purposes and other administrative chores. No productive allocation of personal computer time or any tracking of the IT is being done. The organisation does not conduct return on investment calculations because they consider it as too complicated. All the organisation’s information technology is managed from a centralised department. The respondent also noted that political considerations play a part in their decision to invest in IT and that is why their top management takes all decisions regarding the placement of IT investments. There is a link between the strategy the organisation employs and decisions to invest in IT.

They would like to increase the efficiency of their organisation but do not know how to approach this with the help of IT. They would like to know how to do the best IT evaluation and benefit calculation to help them improve their business processes. The study confirmed that IT has not addressed all the drivers which are responsible for making a firm look to its IT for competitive advantage.

4.5. Organisation 5: Insurance (2)

The organisation is a large multi-national insurance organisation with three major branches, i.e., individual insurance, group insurance and investments. The definition of IT includes all hardware and software but does not include consumables. Each department budgets for consumables. Decentralisation of the organisation helped with the decision to decentralise their IT. Political considerations play a small part in their eventual decision to buy IT as they feel they are one of the leaders in the field when it comes to the application development of IT. The drive to buy IT is usually taken by top management after motivation by the people lower down the hierarchy. This investment decision is partly based on what their opposition is doing and how the organisation defines their future strategy.

Their computer system is of strategic importance to the organisation for several reasons. The system affects the working methods of the organisation directly in such a way as to produce substantial produc-
tivity enhancements, as well as direct improvements in the effectiveness with which the organisation can control their products.

All the employees have a good working knowledge of IT and there is a positive attitude toward its use in the organisation. The management team approves all IT investments and benefits are measured in the form of productivity. They have a standard strategy of cost leadership, and to this end it has used IT very successfully. They might occasionally conduct post-implementation evaluations as productivity enhancements in their organisation.

4.6. Organisation 6: Manufacturer of consumer products

Organisation 6 is a large manufacturing organisation in the consumer products industry. The respondent is the manager of the Information Systems Department. According to him, the definition of IT includes all personal computer hardware and software as well as all consumables that are used for the personal computers. Productive capacity is planned in advance as management wants to use IT equipment to its fullest capacity. All IT is managed in a centralised way.

The decision to invest in IT is taken by the managers. Political considerations play no part in any IT investment decisions but there is a link between the decision to invest in IT and the strategy of the organisation. They are one of the largest manufacturers in Namibia. Organization 6 traditionally has held themselves aloof, being a market maker and standard setter rather than a market responder. However, the last couple of years have seen changes in the industry with a dramatic shift in the fundamental economics of manufacture and marketing. For a couple of years, Organization 6 has identified how they could make extensive use of IT to support its business strategy. They relate to how the IT department supports other departments and implement IT in order to gain competitive advantage. Also how they can develop policies of their own to survive in their industry. At the present stage they do not measure any benefits and are facing risks if their IT investments do not work out. They need to set the policies for any IT investment and how to measure IT benefits.

5. Discussion of the results

5.1. Factors that affected the decision to invest in IT

A variety of factors influence the decision to invest in IT. These factors could be summarised as follows:

5.1.1. The definition and tracking of Information Technology

The majority of organisations defined information technology in a narrow way to include only hardware and software. During the case study interviews it seemed that they are hesitant to include other costs because it might put more responsibility on their department. The trend is thus to keep the definition of information technology as narrow as possible and thereby keep their managers happy and, at the same time, they are not putting too much responsibility on their own shoulders. Costs, such as IT consumables, are regarded as being part of the departments that use the information technology and do not seem to be well controlled.
5.1.2. Management of the Information Technology investment

Most of the organisations track information technology expenses with varying degrees of success. Tracking is done by comparing the information technology expense with budgeted IT amounts for the specific year. The organizations also try and stick to the original budgeted amount. Another problem could be that information technology investments by departments (or organisations) are not captured by the overall picture of the organisation. No return on investment calculations on the information technology investments are done as people tend to think it is too difficult. The total information technology investment in hardware also appears as an entry in the assets register. Some organisations did not keep track of software expenses at all (no asset or software register).

5.1.3. Political and other influences

Political considerations are an important factor in most organisations – political in the sense that “my department” should also have computers or “I” must have a computer. The politics have a significant impact on the acquisition of information technology. These considerations sometimes surpass the technical and economic considerations and are becoming important. In most cases the decision for investment was taken by managers and the decision was not necessarily taken because the organisation would like to have more information technology available. Some of the organisations had a link between information technology and the overall business strategy.

6. Implications of these factors

The implications from these findings are:

i. Define and track information technology. As information technology expenditure increases, the need for a definition of information technology becomes a critical issue. This must be broadened to include all the IT expenditure.

ii. The calculation of the return on IT investment can be complex as no real cash flow is available and the problem of intangible costs extends this problem.

7. Recommendations (management guidelines)

Organisations in a developing country like Namibia should realise that they have to manage their information technology investments by:

(a) Defining and tracking information technology investments

Redefine the information technology definition to include all expenditure (e.g., hardware, software, people, consumables, training and maintenance). There must be an accurate recording of this expenditure and this could be measured over time against a convenient base such as revenue or staff employed. This ratio can be used to compare departments against each other and the organisation over time.

(b) Return on information technology investment

The justification that organizations need to provide for information technology investment poses a problem. Returns on investments (ROI) calculations sometimes do not apply to certain information technology investments because it is difficult to determine income for IT investment. Managers should, however, recognise that return on investment calculations are not always relevant for all IT investments.
Managers should also remember that some IT investment could be essential for the survival of the organisation (threshold investments). Lastly, managers should keep in mind that the total IT investment needs to be calculated if they want to see the effect of the IT investment on the organisation.

(c) Concentrating on organisational issues

Issues that must be paid attention to include top managers’ commitment to IT, previous experience with IT, user satisfaction with the systems, and the political environment of the organisation.

8. Conclusion

It was found that IT definitions are not wide enough. This could be because it was not IT people who assembled the definition or that there was no constructive plan to define IT. The feeling was that organisations in Namibia have no idea of the total amount of resources invested in IT. Another point that should be mentioned is that the IT investment is not managed satisfactorily and that nobody wanted to take responsibility for managing this investment. Workshops should be organised and people should be educated to take responsibility to manage their IT investment.

References