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TRANSFERABILITY OF INFORMATION TECHNOLOGY AND ORGANISATIONAL PRACTICES

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Abstract

In this paper we argue that organisations in developing countries should be cautious when they adopt systems development methods and try to introduce organisational change by means of implementing IT based information systems. Transfer of techniques, methods, models and organisational practices, may impede rather than facilitate the utilisation of the potential of IT in developing countries. Organisations in developing countries need to learn ways that can serve their own requirements. To that end, developing countries may gain much more by following the theoretical efforts that have been made in the West to understand the nature of IS and organisational change, rather than by transferring practices packaged in the form of methods or organisational change recipes.

1. INTRODUCTION

Information technologies have been developed in industrialised countries, to satisfy the socio-economic requirements of their context. Nevertheless, the developmental potential of IT is well recognised, and most developing countries are keen to exploit the potential benefits of productivity, organisational effectiveness and business competitiveness that new IT is associated with. Concern about the low diffusion of IT in many regions of the world, such as in Africa and parts of Asia and Latin America, leads many authors to emphasise the significance of establishing effective ways of technology transfer from industrialised countries. In order to accelerate the utilisation of IT in an effective way, to avoid waste of scarce hardware and software resources, and increase the chances for successful projects it is often suggested that developing countries should not only acquire machinery and technical know-how from industrialised countries, they should also try to transfer sound systems' development methods, and organisational practices.

In this paper we examine critically such suggestions and argue that current emphasis of IT transfer may retard rather than promote IT use in developing countries. We identify two main risks. First, trying to transfer techniques, methods, models and organisational practices, may impede rather than facilitate the utilisation of the potential

of IT in developing countries. Each systems development method implies a particular rationality for organising and carrying out complex tasks which may be incompatible with the rationality that prevails or is effective in an organisation of a developing country; business activities models and methods that proved useful in the West may not be effective in a different organisational environment. Second, we argue that by making efforts to learn the ways IT is used in industrialised countries, organisations in developing countries fail to discover ways that can serve their own requirements. We demonstrate such risks by presenting briefly a case of a company in South America which tried to follow the logic and the practice of IS planning as theory suggests with poor results.

The question, therefore, we consider valid to address is what aspects of IT and what part of the knowledge concerning its use that has been accumulated in industrialised countries are transferable. We suggest that while hardware, generic packaged software and the technical knowledge to operate them have to a large extent to be imported, caution should be exercised about transferring practices that have proved valid in a different context. Particular methods, and methodologies should also be adopted only if it is understood that they can be useful within an organisational culture. To that end, developing countries may find the ongoing debate about the nature of information systems and the systems development process particularly relevant.

In other words, we argue for the de coupling of the technical components of IT from the problem 'solutions' they support, and the dominant rationality of addressing information issues that the most widely recommended methodologies tend to convey.

2. THE NATURE OF IT TRANSFER

There is a vast literature on technology transfer, partly concerning the business of multinational corporations, and partly the socio-economic development of third world countries and, more recently Eastern European countries. Literature surveys such as those by Farok and Sagafi-nejad (1981) and Sagafi-nejad, (1991) suggest the existence of an abundance of empirical data and theoretical perspectives from many different disciplines. However, relatively little effort within this domain has been made to understand the process of IT transfer and its impact, despite wide recognition that IT is the most significant technology of the 1980's and 1990's (see for example (OECD, 1988) and (Freeman and Perez, 1988). Characteristically, a greater number of publications in the technology transfer literature concern the production of micro-electronics than the development of information systems for business purposes.

Perhaps the most systematic effort to examine the efforts of organisations in developing countries to transfer IT into their information systems is the research by Odedra in Africa, in the mid 1980's (Odedra, 1990). She identified five main channels of IT transfer: acquisition of IT, education and training, technical assistance, licensing, and direct foreign investment. Her studies suggest that despite efforts made, the results of the transfer are disappointing. Many projects fail, and a number of those which succeed to deliver a technical system do not have a significant positive impact on the performance of the organisation, while their equipment is often under-utilised.

The IS literature tends to support Odedra's findings. Many ambitious projects - in terms of technology and objectives - are announced and sometimes described in detail (see for example (Salih, 1981; Han & Render, 1989)), but implementation and post-implementation studies are rather rare, and reveal difficulties and discrepancies of the results achieved from the expected improvements of the organisation's performance (Madon, 1994). Typical problems quoted in such studies are inadequate supporting

environment in terms of maintenance and operation skills, and aspects of organisational culture which do not permit the utilisation of the technology based system in its initial specified way. Thus, recommendations often include the development of managerial skills and organisational capacity to support the IT transfer process.

In order to understand the nature and the significance of such problems it is useful to acknowledge that, in the case of IS applications (i.e. excluding the construction of automatic devices and scientific applications) IT transfer comprises the acquisition of hardware, software and telecommunications, the development of technical skills and an infrastructure for technical services, and the development of an organisational capacity to manage projects for the application of IT in the tasks of the organisation. Successful IT transfer is accompanied by the transfer of organisational structures routines and skills. This last element of the IT transfer process in the case of IS applications, organisational change, seems to be most problematic and has received relatively little attention.

The general technology transfer literature identifies efforts to transfer organisational structures and processes as the transfer of a distinct type of technology, referred to as organisational or 'soft' technology (Morgan, 1991; Westney, 1991). It is acknowledged that the transfer of such technologies is assuming growing significance, but the process of the transfer is not well understood and remains particularly problematic. It is understood that the transferred organisational technologies tend to be adapted to the local context, rather than being used in the same form as in the context where they were first developed. However, little research has been done to understand the factors which shape such adaptation and the organisational and social change that takes place. The transfer of organisational, often firm-specific technologies, which are of paramount importance to the service industries, was identified as a major area of further research in the field of technology transfer (Sagahi-nejad, 1991)

Westney (1991) makes a distinction of technology transfer according to the extent they involve the transfer of organisational technology:

1. purely physical technologies
2. physical technologies that are supported by certain organisational technologies
3. organisational technologies that are supported by certain physical technologies
4. purely organisational technologies.

Information systems projects belong either to the second or the third of these categories. We can distinguish between:

- a) projects which aim primarily at introducing new organisational structures or processes and they involve the development of IS systems as part of the effort to achieve this, and
- b) projects which aim at introducing IT in order to improve the information systems of the organisation, and by doing so they result in organisational changes.

For example, various programmes for institution-building in developing countries that are sponsored by international development agencies can be seen as efforts to transfer organisational technologies, and they usually involve IS projects such as the

development of databases to provide required information infrastructure. Similarly, the adoption of management practices, such as total quality management, or business planning by companies in developing countries is usually accompanied by the development of decision support systems to facilitate managers in the new roles required for the new organisational functions. In other cases, the transfer of organisational structures and practices that have proved to be effective in the context of industrialised countries is a requirement for the successful implementation or an implicit objective of IT projects.

In cases which involve the development or acquisition of IT in order to support the transferring of some desirable organisational structures or processes, there are expressed organisational change objectives which are systematically pursued. In addition to the prime organisational transfer aims of such projects, the implementation of the IT component implies further organisational requirements. First, the organisation needs to develop the capacity to manage the systems development process and the sustained use of the resulting IS resources. Second, the technologies implemented, as well as the adopted process for their development and use, often introduce their own dynamics for changes in the structure and practices of the organisation.

Information systems projects which do not have explicit goals of organisational change still convey pressures for organisational adjustment for the management of the systems development process and the resulting IS resources. In addition they may be catalysts for other organisational change, such as centralisation or decentralisation of decision making, or re-distribution of responsibilities to employees.

The significance of research in understanding organisational issues in different cultures and politico-economic contexts cannot be overemphasised. Little is known about the relevance of even fundamental concepts of western organisational theory, such as 'administrative rationality', or 'entrepreneurship' in other social contexts. To assume that they are universally applicable or necessary to be transferred in all organisations bears the risk of missing out local characteristics, perhaps equally or more valuable.

Nevertheless, there are two points which we can elaborate upon in this paper. The first is the transferability of methods of the systems development process. The second is whether IT is linked with organisational imperatives of structure and process.

3. THE TRANSFER OF IS DEVELOPMENT METHODS

During the nineteen seventies and nineteen eighties in the USA and Europe the application of IT in organisational activities has been studied extensively. The information systems development process was modelled as a life cycle and systematised in sets of methods, the most prevalent type of which is the family of 'structured methods'. In addition, various techniques and computerised tools were developed to support the effective application of methods. Such was the significance attributed to the systematisation of the IS development process, that the debate on the relevant merits and disadvantages of proposed methods - the 'methodologies' issues - dominated the research agenda of information systems for almost two decades (Avison and Fitzgerald, 1988; Olle *et al.*, 1991; Avgerou and Cornford, 1993).

Initially, systems development methods were concerned with the more technical parts of the systems development process, programming, design, and detailed analysis of data and functions to be handled by the technical system. Gradually, though, emphasis on methods shifted towards those tasks of the systems development process which

involve organisational interventions, such as deciding on IS requirement in business rather than technical terms, implementation of a new IS, management of the use and evolution of information systems to secure their effective and long life. More recently, research and training efforts concentrated on methods for aligning decisions for developing information systems with business plans, and methods for the management of IS resources (Earl, 1989).

In parallel with research and training for the diffusion of systematic IS development practices, there have been two other streams of effort worth-while mentioning at this point. The first is project management, dealing mainly with questions of efficient allocation of financial, staff, and time resources according to the needs of the IS development process (Berkeley *et al*, 1990). The second is evaluation, dealing with forecasting or assessing the benefits in relation to the risks an organisation phases with the development of a new IS (Symons, 1991; Farbey *et al*, 1993).

In the nineteen nineties, the debate on methods continues in much lower tones. Undoubtedly, a number of practices for systems development have become common among IS professionals, such as structured programming, or systems analysis techniques. Methodology based systems development practices have been adopted by a number of organisations, mainly public sector institutions, corporations, and large IS consultancy and software firms. IS planning, management and evaluation methods are applied much more eclectically.

All in all, the methods movement has spread some good practice and has produced some complex products which proved their validity in several demanding projects of particular organisational contexts, but its strength has been diminished with time. Several trends have contributed to this, including the increasing significance of more flexible technologies, such as microcomputers and networks, a shift from well defined and structured application areas, such as accounting transactions processing, towards more idiosyncratic information handling tasks - such as office work -, disillusionment with efforts to 'rationalise' processes which are more political than engineering in their nature.

Efforts to spread systems development methods have reached developing countries as well. Expatriate IS consultants and local IS practitioners trained in industrialised countries apply their preferred methods and often try to standardise its use by in house training, although there is no much evidence about widespread diffusion of systematic methodical practice.

Many feel that slow diffusion of IS methods is one of the factors responsible for poor IT utilisation in developing countries and recommend educational efforts and policies to that effect, while others argue about the significance of choosing the right methodology for particular project circumstances. Bell, for example, (1992) proposed the use of self-analysis and pre-analysis techniques to make explicit choice of systems analysis and design methods by considering the intellectual background of the analyst, methodological preferences, and the problem context (Bell, 1992)

Others are sceptical about the appropriateness of methods that have been developed for western organisations. There are concerns that formal procedures, such as making an IS strategy cannot be sustained in the culture of many organisations in developing countries, and that our understanding of cultural transformation dynamics is too limited to be able to make effective methodological recommendations (Madon, 1994).

Such concerns are not unknown in the field of IS in the industrialised countries. Perhaps, in the longer run, the main value of the methodologies debate is as a platform from which a better understanding about the nature of information systems and of the IS development process has emerged. There have been cautionary voices that excellence of organisational performance, and in particular successful systems development, is not a matter of methodical practice. It has been argued that effective management and systems development require creativity and are largely driven, often informally, by the interests an organisation's participants (Ciborra, 1991).

Moreover, systems development methods have been seen as adding to systems failures, rather than securing the development of successful systems. The reason for this is that the prevailing methods are too limited in scope, unable to cope with the social nature of the systems development process, and therefore jeopardising efforts of improving organisational performance by introducing IT.

A number of alternative perspectives of the systems development effort have been proposed (Lyytinen, 1987). Although they have not resulted in new widespread methodical practices, they have, nevertheless, influenced the way IS researchers and practitioners approach their tasks. For example, even though participation is rarely practised in the systematic way that the proponents of the socio-technical perspective suggested (Mumford and Weir, 1979; Land and Hirschheim, 1983; Land *et al*, 1980), most systems practitioners came to understand that ignoring the views and concerns of the participants of an organisation regarding the information system under change, may have detrimental effects on the success of their project.

In summary, the systems development process involves much more than the methodical execution of some technical tasks, it is an 'organisational technology' in Westney's terms (1991). Successful systems development is more a matter of judgement of what organisational changes are feasible and desirable and how they can be realised, than the adoption of some formal arrangements and the acquisition of formal skills. However, such judgement can benefit from knowledge of the theoretical efforts that have been made to understand the factors that affect the process of organisational change.

4. IT TRANSFER AND ORGANISATIONAL CHANGE

The impact of computers on the structure and processes of organisations has been the subject of a great deal of research. For example, in the days of the mainframe computers there was significant evidence that computerisation had a centralisation effect (Laudon, 1974). Even in cultures which valued decentralisation of power to local communities, such as Norway, the advent of first generation computers in their public administration had centralisation effects (Wiese Shartum, 1987). Another much discussed effect is the redundancy of large numbers of middle managers; computers have tended to flatten the administrative pyramid by eliminating the need for middle management layers.

However, centralisation trends ceased to be a technological imperative after smaller machines and more versatile software reached the market. Moreover, organisations facing ever fiercer competition sought more effective organisational structures and processes. IT has been understood as an 'enabling' technology, meaning that it can be used to contribute to the realisation of some desirable organisational form.

The most established ways of organising production and sales, such as bureaucracy and scientific management have been questioned and often severely criticised as

inadequate to cope with the demanding business and administration environment of the post-seventies era. Various new organisational forms have been suggested. Mintzberg (1979) neatly classified this variety in five 'ideal types': the simple structure (entrepreneurial form), machine bureaucracy, professional bureaucracy, divisional form, and adhocracy. More recent models are the 'matrix organisation' (Bartlett & Ghoshal, 1989), the 'networked organisation' (Powell, 1990), the 'learning organisation' (Drucker, 1988), and others. IT is considered to play a critical role in the realisation of all these models. While there seems to be widely accepted that organisations are changing, and the proponents of the new types of organisational model argue about their appropriateness to today's socio-economic conditions, empirical evidence suggests a much less clear picture about the prevailing new organisational forms. For example, based on longitudinal case studies in USA firms, Applegate (1994) concludes by suggesting 'the emergence of a new "information enabled" hybrid organisational model that marries features of the hierarchy, entrepreneurial form, matrix and adhocracy in unique ways".

Nevertheless, there is no shortage of hype, not only on what sort of changes organisations should aim to achieve by applying IT, but also on how to approach change. Business process re-engineering is the latest and currently most influential of the suggested approaches (Hammer, 1990). While many business firms and government institutions seek radical change by following the principles of business process re-engineering, many argue that the enthusiasm it has created is hardly justified (Jones, 1994).

In short, looking beyond the hype, the literature on organisational change and IT suggests that there is no specific organisational model that is tightly related with the IT available today. There is some generally accepted 'good advice', such as: don't use IT for automating jobs, and controlling employees, use it to 'informate', i.e. to empower employees by providing information that makes it possible for them to play a more substantial role in their organisations (Zuboff, 1988), although the extent to which such advice is put to practice and whether it leads to business success is not clear. While most writers on organisational change tend to focus on the new emerging forms enabled by IT, Kraft and Truex (1994) make the point that many of the companies of the USA discussed in the literature of organisational change only design and sell products; the production process tends to be sub-contracted to firms in developing countries which apply traditional bureaucratic and Tayloristic processes to achieve the degree of efficiency that allows them to be competitive, thus 'preserving the old system in the name of transforming it' (phrase from David Noble quoted in Kraft and Truex, 1994).

There is no organisational imperative that accompanies the application of IT. IT can support successfully as diverse organisational forms as huge corporations and clusters of small enterprises. Considering the possibilities presented by new IT, some analysts speculate the emergence of socio-economic conditions in which large multinationals will dominate (Castells, 1989), and others put forward theories about 'flexible specialisation' characterised by the prevalence of regional co-operatives of small business organisations (Piore & Sabel, 1984).

Nevertheless, training in western business schools and consultants tend to attempt to transfer particular organisational models as the way to exploit the potential of IT. Sometimes these are old 'rational' forms, such as bureaucratic control and efficient fragmentation of responsibilities. In other cases they may be the latest hype. Unless it happens that the suggested change makes sense to the organisation concerned, the effort is wasted. More importantly, the use of IT is frustrated, adding to the inferiority

syndrome about lack of ability to master new technology that prevails in many developing countries.

5. AN EXAMPLE OF UNSUCCESSFUL APPLICATION OF METHODS

In the early 1990's Petrolatino¹, a large state corporation in a Latin-American country, went through a major organisational reform. This reform involved loosening of government administration and the introduction of business management practices, splitting of the corporation into four almost autonomous companies, along the lines of products and services they produce, with independent business management. To achieve this transformation the government relied heavily on American consultants, who designed the overall structure of the corporation and the structure of each of the new companies that comprise it, and they specified the tasks each of them has to perform. Information and IT management were given a great deal of attention and were assigned to be part of the responsibilities of top management in each of the new independent companies.

Each of these four new companies inherited part of the IS resources of the old corporation, and had to make provisions to cover a large range of requirements. The case of Petrolatino Oil, one of the four new companies, is indicative of the difficulties of transferring methodical planning practices. The director of information and IS employed an IT manager who had a degree in business studies, technical expertise in new technologies acquired partly by training in the USA and partly through practice, and long time experience in managing systems development projects within Petrolatino.

The first job that the IT manager undertook was the formulation of an IS strategy and the setting of an IS management capable to support the realisation of the strategy. With full support from his boss, he talked to all other directors and many managers of the company, he applied methods of proven validity, such as critical success factors, and aligned plans for IT investment with the company's expressed business objectives. The strategy he proposed was based on the premise that in order to be competitive in the world oil market the company needed information systems at least as good as those of their competitors.

A major objective was the development of an integrated IS infrastructure which would be able to provide management with accurate and reliable information. To achieve that, a portfolio of applications for the production, distribution and management tasks were proposed, and an overall plan to integrate them was designed. The proposed plans were expensive, both in terms of hardware and software development, as they aimed at installing computer terminals at all production and distribution sites and offices and at equipping all workers with hand-held devices for accessing the data base.

The proposed strategy was accepted without anybody challenging the validity of its objectives or the urgency of the proposed applications portfolio, and it was approved by the director general. There was some concern about the cost and the way the strategy could be implemented. However, it was accepted that, although expensive, the proposed IS infrastructure was a crucial investment which the company ought to make, and at present it seemed that it could afford it. As for the implementation of such an ambitious strategy, the IT manager designed an IS management structure which shifted

¹For reasons of confidentiality we do not use the real name of the company.

ownership and control of the development of applications to user departments. At that time user departments had little IT resources, both in terms of computers and staff, but new appointments were made and each user department established its own IT unit. Also, it was intended to subcontract most of the development projects. The IT manager's department retained responsibility for the design of the integrated systems model, applications to provide data to top executives, methodological standards, technical support to all IT units, collaboration with sub-contractors.

Two years later the company had done little progress towards the realisation of the strategy and dissatisfaction with the poor IS infrastructure was rapidly growing in all parts of the company, from the director general office to the production sites. The director of information and IS was wondering what went wrong. He believed that the IT manager had done 'the right' thing. In fact, a revision of the strategy and the IS management structure by external consultants confirmed that the way they acted was what IS management textbooks suggest. The procedures that had been followed and the plans that were made were in accordance to the latest knowledge of 'good practice'. However, they did not seem to be effective in this company. A number of aspects caused concern.

The various departments were frustrated as they found it impossible to follow the 'integrated systems' design of the IT manager. As a result, those which had adequate skills went ahead with their own requirement specifications, ignoring the requirements for an integrated system that the IT manager and his team were trying to draw. They felt that the IT manager and his staff were constraining rather than supporting them. However, those departments which did not manage to acquire the necessary systems development skills could neither take initiatives to over pass the proposed specifications of the IT manager, nor to collaborate with him to work out their requirements, and they continued to lack even the most fundamental applications for their functions.

A clash of cultures was detectable. Many departments were more willing to entrust their systems development to their engineers - engineering skills were abundant and highly valued in the company - who were quick in acquiring software development competence, than to the IT manager who had adopted a 'business' language and was introducing a new ethos. Many managers were highly suspicious that the apparently 'democratic' IS management structure was a mockery, and that the IT manager's department had too much power.

Concerns emerged about the adequacy of the proposed systems to support top management. Apart from the question whether an integrated system capable to supply information for the needs of all management was feasible, the director of information and IS began to question the role of such a system in the company's management. Within the two years of life as an 'independent' company, it became apparent that a number of aspects of the company did not materialise in the way it was presented in the initial design. Top management continued to be partly politically driven - after all they were not completely independent, they were part of the larger corporation which had to comply to targets set by the ministry. Within such a management context, executives continued to rely on the old, partly bureaucratic and partly informal, information channels and planning mechanisms. They all agreed that they needed to establish new indicators of performance, new ways of business planning, and more efficient communication channels between production and distribution sites and top management, however they were reluctant to abolish existing mechanisms which, although *ad hoc*, they were familiar and well trusted.

Also, some departments were still struggling to establish effective business functions. For example, sales and marketing were largely new activities which the company had to organise in parallel with, rather than by replacing, the ways of reaching customers that were inherited by the old state company. Business objectives and practices were not so clear after all. No wonder the IS strategy, which was formed on the basis of stated business plans, was not very effective.

It became apparent that the way 'good practice' knowledge about IS planning and IS management was applied in the company was totally artificial, it failed to capture the complex situation faced by the company, and it led to non-realizable decisions. As a result the company followed frustrated efforts, which hindered the development of even the most fundamental information systems. It is interesting to note that initially no reservations about the proposed strategy was expressed. The managers of the company considered that both organisational design and the IS strategy are matters for the expert. Of course, many doubts were lurking and a great deal of activity at the first period of the company's transformation was informal and *ad hoc*. The IS expert's approach to apply the established 'best practice' failed to cope with the complexities of the real situation.

6. CONCLUSIONS

Within a changing global economy, developing countries face the need to acquire a powerful technology which originates and has been developed for the organisations of advanced industrialised countries. In addition to the difficulties they face to find the financial resources for importing the new technologies, a main problem is how to exploit a technology which, although it carries an enormous potential, if it is not appropriately applied it alienates rather than empowering a society.

Technology has reached a great variety of forms, allows for many different types of application and can be tailored to serve the requirements of very different contexts. There is great choice in hardware and software products which are highly flexible to serve as diverse objectives as centralisation or decentralisation, control or emancipation. However, there is much less flexibility in the way we think about its use and the practices we adopt to utilise it.

As a critical mass of computer hardware and software becomes available in developing countries efforts are made to systematise their utilisation and increase their payoff by transferring the business practices and systems development methods prevailing in western countries. While this may be feasible in a number of organisations, the effectiveness of such transfer should not be generalised. Organisations may have more to gain from experimenting with both, types of technologies and ways of applying them. To do so, even fundamental principles for the utilisation of technology, such as the principle that hardware and software are developed only after an analysis which determines the exact requirements of the organisation may have to be reconsidered. Indeed, this logic is not necessarily useful. A number of organisations in developing countries find it more 'natural' to acquire the equipment and adapt it to their practices, rather than specify their requirements in advance. In such cases technological flexibility is more important than rigour of specification and development method.

In this paper we have argued that organisations in developing countries should be cautious when they adopt systems development methods and try to introduce organisational change by means of implementing IT based information systems. Apart

from the techniques for the very technical tasks of systems development, such as design and programming, systems development methods constitute systematic attempts of organisational intervention. As such, their effectiveness vary within different socio-organisational contexts. Moreover, today's IT is not linked deterministically with any particular organisational structure or work procedures. While it is true that the greatest benefits from IT stem from the possibilities it opens for organisational change, developing countries should be aware that there are no recipes for successful organisations.

These are areas where developing countries need to foster indigenous research. To that end, theoretical efforts that have been made in the West to understand the nature of IS and organisational change, (Boland & Hirschheim, 1987; Galliers, 1992; Walsham, 1993) can provide useful insights to developing countries too.

To the extent that Odedra's conception of technology transfer as education is valid, the transfer of understanding of the nature of IS, organisational change, and IS development can be much more effective than the transfer of packaged organisational practices, such as SSADM, or Critical Success Factors. University curricula should develop the capacity of practitioners to organise systems development practices which can be effective in their organisations.

An obvious drawback of such an approach is that it does not offer a short cut to effective exploitation of the capacity of IT is provided. There is no evidence that such short-cuts are possible. To the contrary, there is a great deal of documented and anecdotal evidence that expatriate consultants fail to deliver the expected results. Without considerable indigenous experience, rationalisation efforts such as on what systems to be developed, how they should be managed and how they should be developed, are imposed from the outside, and may be inappropriate in the country's context.

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