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DEVELOPING A METHODOLOGY TO EVALUATE THE IMPACT OF STAFF PERCEPTIONS ON THE STRATEGIC VALUE OF INFORMATION SYSTEMS IN A SMALL TO MEDIUM SIZED ENTERPRISE

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Abstract

In looking at the development of information systems as a strategic resource for a small to medium sized enterprise (SME), the paper attempts to determine the crucial components for success. The paper examines the ability of SMEs to effectively communicate their objectives to all staff and to set critical success factors for each objective in order that they can be monitored.

Effective communication is highlighted as a key requirement for the management of a strategic resource and a model of an information system's position in the communication chain is discussed. A hypothesis that staff in SMEs generally have only a perception rather than an understanding of the company's objectives is presented and an evaluation methodology is used to test what effect managing through perception has on the strategic impact of the company's information systems.

An evaluation methodology developed to test, through face-to-face interviewing techniques, the crucial aspects needed to manage an information system as a strategic resource is presented. The methodology has been implemented successfully on a sample company and the findings are given.

1. INTRODUCTION

From the 1980s onward, commentators including Earl (1989), Porter and Millar (1985), and Robson (1994) have claimed that IT is critical to the success, if not the very survival of a business. With the often high level of costs involved and with the notion that information systems should be utilized strategically, it is not surprising that senior executives are standing back and asking:

- What benefit have we gained?
- What benefits are there still to gain?

More recently, the significance of management processes in determining successful exploitation of IT in SMEs was addressed by Levy et al. (1999). They noted that current research into SMEs gives mixed messages. Specifically, they noted the finding by Yetton et al. (1994) that, in an architecture practice, IS was the basis of a major, successful transformation and its strategic value had been well recognized, while Levy et al. (1997) concluded that manufacturing SMEs typically view IS as a cost. They conclude that the mixed messages are the outcome of a contingent world in which IS strategies are a function of the competitive context and that a major barrier to the use of IS to support innovation is the leadership and technical knowledge of the owner and/or management team.

These conclusions relate strongly to the work that Rockart (1981) undertook when he developed critical success factors (CSF). There are two main functions attached to identifying the critical success factors (those things that must go right for the organization to flourish, or those areas in which, if things do not go right, the business will not prosper). First, the approach encourages managers to focus on those issues which are most important, and it requires the development of shared CSFs within the organization. Second, the approach helps managers think through their information needs and to identify what actual information is needed and how it is most creatively to be used to gain competitive advantage. Remenyi (1991) acknowledged that being able to recognize what information is needed to help a company achieve its objectives is perhaps the most demanding of the management activities of the information system. There are few established guidelines for this, relying almost entirely on the creativity of the personnel.

While the above points are accepted as a basis for strategic planning, there is also a consensus of opinion that, in order to be strategic in its approach, a company needs:

- to have a long term planning perspective,
- to be outward looking to the market in which it is active, and
- that the whole organization should be aware of the corporate objectives.

Given these criteria, it is clear that an organization will need to rely heavily on effective communications. Subsequent to the organization having established a corporate environment in which responsibility for adding value and achieving the objectives is clearly defined, performance measures need to be established in order to control and monitor that which is being achieved. As Remenyi states, "an information system becomes 'strategic' by the management of the system, not through its inherent design."

The proposed methodology to evaluate whether an information system is being used strategically provides an examination of these management skills. It also forms the basis of the hypothesis for this paper: that an information system can only be defined as strategic if there are effective communications and monitoring procedures in place to assist in the planning and control of the requirements of a strategically oriented company.

1.1 The Aim of the Paper

The aim of this paper is to identify the extent to which the business issues that help a company achieve a competitive advantage are in fact perceptions of what staff believe are the processes that are required of them. If a break in the communication chain can be identified where understanding becomes perception, this will expose a breakdown in communication and, therefore, in effective strategic management. Conversely, if the approach shows that there is comprehensive understanding and awareness of the corporate objectives, and staff can demonstrate how their task adds value toward meeting those objectives, it will provide very strong evidence that the information system is being utilized in a strategic manner.

The evaluation methodology will attempt to demonstrate the hypothesis that an information system can only be defined as strategic if there are effective communications and monitoring procedures in place to assist in the planning and control of the above defined requirements of a strategically oriented company.

The proposed methodology is intended for use in small to medium sized companies (SMEs), that are

- in the early stages of managing an information system as part of their strategic planning;

- in need of guidance and direction in developing a strategic approach to utilizing their information system as part of their corporate strategy.

Consequently, the approach is dependent on senior executives allowing extensive questioning across all levels of staff and across all functions/departments on a wide range of business issues. For the evaluation process to be exploited, senior executives should be willing to receive and act upon a report that will expose the identified strengths and weaknesses in the management of the information systems. It has to be acknowledged that there is a potential limitation in modeling the real scenario since much of the methodology is dependent on the responses and attitudes of individual managers and staff.

2. EVALUATING THE BENEFITS OF IT INVESTMENTS IN SMEs

Senior executives in SMEs, while recognizing the need to embrace the benefits of information technology (IT), have genuine concerns that the level of capital that is being expended is not necessarily matched by the business benefits derived (Willcocks and Lester 1993).

While evaluation is perceived by some as an essential management process, there are many others who see it as being expensive, time consuming, and of doubtful reliability. This indicates that there is much to be done to convince the doubters that there are long-term benefits to be gained by undertaking an evaluation process. Where companies are reaching higher levels of maturity in their application of IT, as presented by Remenyi (1991), evaluation is found to be increasingly on the executives' agenda. According to Farbey et al. (1993), a post-implementation evaluation is necessary to assess the benefits that have been achieved: both planned and unplanned benefits will arise. Likewise, they acknowledge that there may be significant amounts of non-benefits, that while they were obviously not planned, they nevertheless do occur.

This unpredictability of information systems remains a problem for companies, and as such draws on the evaluation process to help identify why there is such a disparity between expectation and outcome (Ward 1994). One of the factors that is considered to be a major contributor is that senior managers are frequently unfamiliar with IT and are unable to recognize what can or should be achieved. At the same time, IT specialists are unfamiliar with business issues and have a problem in seeing beyond the technical scope of the system itself. This in itself calls for higher levels of shared understanding between the two disciplines of IT and business management (Moreton 1999).

An attempt to separate aspects for evaluation into the qualitative and quantitative issues was made by Farbey et al. They identified the socio-technical nature of information systems as presenting two key areas of focus for evalua-

tion. The benefits and risk of the social aspect can have at least as much of an impact on the business as the technical side. While social aspects are pervasive, they are also intangible and, as such, the impact of their effect is less predictable in advance of the system being implemented. If an evaluation is to be carried out post-implementation, the stakeholders will have varying viewpoints, which will be difficult to assess unless they are clearly defined at the outset.

This is not an argument in favor of ignoring the social issues but rather emphasizes the need to establish the requirements before attempting to evaluate them. Only in this way can a reliable approach be formulated and carried out. Strategy, as a planned process of achieving objectives, implies a need for measurement in order to control and monitor the implemented plans and, without a benchmark to work from, measurement becomes impossible. It is not surprising, therefore, that there is a hesitancy by senior managers to incur the effort or expense in formulating a procedure for themselves to evaluate what they have most recently installed. The consequence is that companies tend to accept what they have and rely on their faith that, in time, the implementation of the new system will prove to be better than the one it has replaced.

2.1 Supporting an Evaluation Through the Use of a Specific Methodology

The usefulness of a system is considered, in the context of this work, in terms of its organizational impact and, therefore, the evaluation of the information system should be related to the requirements of the individual organization. It should identify which specific factors of the system need to be measured; how they could be measured; and why the chosen factors are of greater importance than others. This is where Rockart's (1981) method of identifying the critical success factors becomes most useful since it helps the company define the benefits most needed in order to achieve shared corporate goals.

It is questionable whether there can ever be a single evaluation methodology developed that will tackle all of the issues that need to be evaluated in a single system. Each company will have different critical success factors and management needs to be able to evaluate processes that vary considerably from one situation to another. No single method will cope with this diversity or complexity within both the business needs and the IT function. A researcher planning to develop a method of evaluation, therefore, needs to define the area that is to be addressed and to tackle that specific area.

In order to evaluate how successfully an organization incorporates its information system strategically, it is necessary to identify how personnel respond to the changes that occur with increased usage of IT. Ward and Griffiths (1996) list the following criteria as likely concepts that personnel will be faced with and that will require management skills to introduce into the corporate culture:

- Need for internal efficiency
- Finding opportunities of increased power at their disposal
- Searching for methods of achieving competitive advantage
- Response to purchasers
- Response to suppliers
- Response to consumers demanding more information and better service
- Response to locking in strategy
- Response to vertical integration

It is insufficient to think that these aspects can be established and then left to manage themselves. Information systems are clearly not static systems; they change constantly with technological improvements, and just as frequently with business changes. This is more difficult for companies to recognize; however, Ward and Griffiths (1996) drew attention to this when they suggested that strategic relevancy will vary in the following ways:

- as a function of the firm
- in respect to the competition
- in respect to the structure of the organization
- in respect of the current management attitude

It is obvious that any one of these criteria can change quite dramatically with a simple change in circumstance; therefore, the information system is vulnerable to obsolescence unless IS management is capable of responding to the dynamics of the business environment. Hence an evaluation process, as a regular means of viewing and assessing the relevancy of the information system, is of significant value to an organization.

2.2 Effective Communication as a CSF for Strategic Information Systems

It can be argued that the concept of assessing the quality and relevance of information has considerable significance to the evaluation of an information system since the quality of information is central to a system's worth. A logical step from this is to recognize that there is a valuable iterative process between communication and information. As communication becomes more effective, so information becomes more valuable. With more valuable information, more communication becomes possible. While this appears to be an obvious statement it is one that, often, appears to have been overlooked

Evaluation of the degree to which the effectiveness of communication impacts the information system is judged to be of significant importance, but it appears to be neglected both by managers and by those developing appropriate

means of evaluating information systems. If managers fail to communicate the overall objectives of the organization, how can anyone control what information is deemed relevant? If managers fail to define and communicate the IT strategy, how can they hope to measure that it is being carried out? If managers fail to communicate objectives for each business function, or for each individual, how can departments or individuals make an assessment of their priorities and how can any members of the organization contribute value to the information system or to the company?

The evaluation methodology proposed in this paper is designed to be one such specific process: to evaluate the management of an information system in terms of the effectiveness of the communication process within an SME. It is contended that this is critical to establishing whether or not an information system can accurately be defined as strategic in its use.

3. THE DEVELOPMENT OF THE METHODOLOGY

The methodology aims to assess the extent to which a company has established its information system as a strategic resource. Certain important factors need to exist, not just as a plan in the minds of senior managers, but as plans for a strategic information system that penetrates and is fully understood and acted upon by the full spectrum of personnel within the organization.

The following are relevant factors that need to be considered and tested:

1. A well defined set of corporate business objectives.
2. A strategic plan to meet these objectives and a method by which they are controlled and monitored.
3. A strategy for the information system with defined objectives that fit the corporate business strategy.
4. Familiarity throughout the organization with the corporate objectives.
5. A structured management process that itself is controlled and monitored so that all personnel know how their role helps meet the corporate objectives.
6. A process to manage the information system to ensure it continues to meet the strategic requirements of the company.
7. An internal communication process to ensure that all personnel know the purpose of the information system and the importance of their involvement with it to meet the business objectives.

It is only when these factors are fully implemented and achieved that strategy is effective and a resource can be accurately defined as strategic.

The assessment aims to expose:

1. How far the penetration of understanding has been achieved.

2. Where in the organizational structure an incorrect perception of the requirements has occurred due to a lack of communication of the defined objectives.
3. Where, in the absence of effective communication, groups or individuals have formed their own perception of what they believe is required.
4. Where, in the absence of effective communication, groups or individuals have formed their own opinion of what *should* be required.

3.1 The Evaluation Process

By testing the effectiveness of internal communications, the methodology will determine the degree to which these factors have penetrated the organization. In carrying out the process, it is important that staff are not aware of the focus of assessment since this could obviously prejudice their responses. The assessment is to be achieved by determining

- the consistency of the responses given, demonstrating the level of shared understanding and, where this does not occur,
- the extent to which staff express a personally held view of what they perceive the objectives to be, or alternatively what they perceive the objectives should be.

Where *understanding* is identified as being only a *perception* in the mind of the interviewee, it can be concluded that effective communication has not taken place. This may be found between management levels within the organization, between functions or between individuals. The position and frequency of the failure to communicate will indicate whether it is a corporate failing, a management failing, or an individual failing and will help to establish the depth to which the information system is being strategically utilized.

The methodology provides a process (shown in Figure 1) that gives a framework for a questionnaire used in the structured interviews, and the subsequent assessment that can be made from the collected responses. The five steps in the process are objectives, measurement, staff skills, staff understanding, and information relevance.

3.1.1 Objectives

The process starts by identifying the objectives, both the corporate objectives and the objectives for the information system. The responses to the questions can then be assessed to determine the degree the IS objectives have been planned within the corporate objectives.

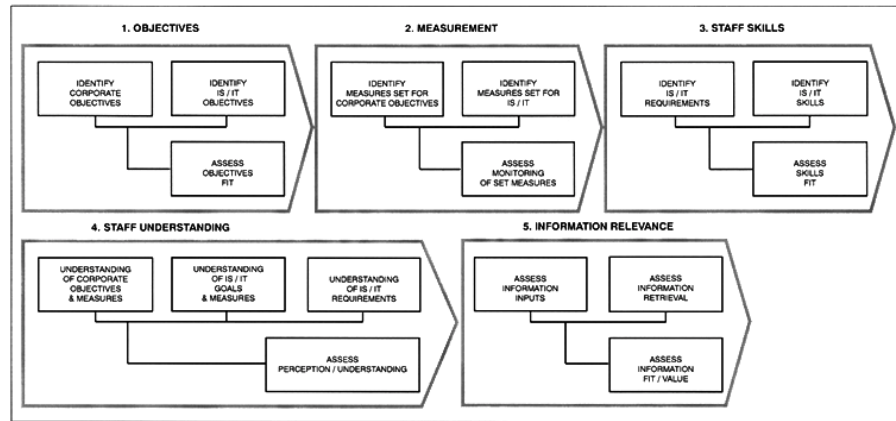


Figure 1. Framework for IS/IT Evaluation Methodology

Remenyi (1991) suggests that there are five stages in the maturity of planning the use of information systems:

Stage 1 No Planning

Here companies may have a certain amount of planning that occurs by top management but they have no formal plans for either the business or their information system.

Stage 2 Traditional IS Planning

The company undertakes the traditional business planning and budgeting, and there are plans for the information system but it is in isolation from the business planning processes.

Stage 3 Reactive Planning

The company develops plans for the information system to reflect the changes in business policy, although they are not dependent on the business plan.

Stage 4 Linked IS Planning

Corporate planning takes place, followed by IS planning. The plan for the information system is derived from the business plan, but there is only one-way communication from the business plan to the IS plan.

Stage 5 Strategic Information System Planning

Corporate planning and IS planning are combined to form a single process. Each is dependent on the other, thus there is an extensive two-way impact on plans.

The questions are designed to assess the stage of maturity the organization has reached in its information system planning and the extent of corporate awareness of the planned usage of the information system.

3.1.2. Performance Measures

Given the principle of Porter (1985) that “strategy needs to be controlled to be effective,” it is necessary to identify what measures are used to monitor the corporate and IS objectives. It also follows that what you measure you must communicate if the strategy is to be effectively implemented by the company. By testing the existence of effective measures in the company, it is possible to gauge the degree to which corporate and strategic objectives are being effectively communicated. If the level of communication is poor, one could anticipate finding that either there is a lack of measures, or, if there are measures in existence, that an inadequate level of monitoring exists. The outcome that can be gauged from the responses would be an assessment of the existence and spread of performance measures that are implemented to assist in the strategic use of the information system.

3.1.3. Staff IS/IT Skills

Staff skills in the use of the information systems must be identified through establishing what requirements an information system has for the organization, across different staff levels, and the different uses each make of it. If each only knows about the information system from their own view point without an holistic view, there can only be a limited degree of communication as to how it can be utilized strategically for the business.

Remenyi (1991) has found that firms who use IS/IT successfully as a strategic resource typically:

- are mature, experienced users of IT,
- have a proactive attitude to helping users get the most from their information system, and
- treat their information system function in much the same way as any other corporate services department.

Ways to explore these aspects are to determine the IS/IT knowledge of the staff, the company’s attitude to training staff in IS/IT skills, and the extent to which the company ensures that the system is supported, both internally and externally. The senior managers’ attitude to IS/IT will be highly indicative of the strategic importance they attach to it.

3.1.4. Staff Understanding

By assessing the staff understanding of the first three aspects of the evaluation process, it will be possible to gauge the degree to which the corporate policies have been communicated. It will expose staff's perception caused by ineffective communication against a real understanding that would be apparent if a thorough strategic policy had been planned and implemented. Responses that commence with "I should think that..." demonstrate a very different style of corporate management from responses that start with "The company's target for growth in market share for product x is...."

3.1.5 Information Relevance

Finally, the information that is held and communicated through the company needs to be tested for its relevance in terms of what data is input into the system and what information is retrieved. If the company determines the former on the basis of its objectives, then this is indicative of a higher degree of strategic use than if it just retrieves useful information because it has been found to be possible to do so. Basing the retrieval of information on what is possible tends to provide information that is nice to know rather than information that the company needs to know. This is not a strategic use of information.

Additionally, it will be important to ask questions to find out the degree to which the various staff view the information system as a strategic resource and to what extent they are aware of its potential as a competitive weapon for the company. If staff are unable to express why information is collected and used in the way it is, it will be indicative of a lack of communication of the strategic purpose for the information system.

3.2 The Structured Interviews

Each stage in the evaluation process outlined above requires a series of questions to expose the strategic plans of senior management, which are then measured against the responses of personnel in order to assess the penetration and accurate understanding across all levels of staff. Each preceding stage helps to build the criteria for establishing the questions for the next stage of the process. In this respect, the evaluation methodology provides the company with a learning process, which can be used to enhance the depth of questioning and increase the extent of the evaluation. The experience of evaluating the strategic use of information systems had the benefit of widening the knowledge of staff

to the potential of IT, and in this additional respect the evaluation proved to be extremely useful. Due to the necessity to interpret the responses in order to gain an accurate opinion of the individual's understanding, and how that understanding has been attained, face-to-face interviews are essential.

The groups of questions that have been formulated for the use with the proposed methodology are listed under the headings shown below. Each group will have relevance to the five factors presented above in determining the strategic value of the information system:

1. Corporate strategy
2. IS strategy
3. IS strategic fit
4. Communications
5. Usage of information system
6. Management
7. Corporate culture

4. AN ASSESSMENT OF THE EVALUATION METHODOLOGY USED IN AN SME

The requirement of the case study organization was for an evaluation of their information system in order to justify to their board that a measurable benefit was being achieved from their investment in technology. The strategic benefit was considered to be of potential long-term value and the company agreed that it was more important to evaluate the information system's ability to serve as a strategic resource than to assess its financial status at a particular point in time.

Three specific areas were identified that would indicate the company's level of success in utilizing their information system strategically, namely: the level of effective communication, the awareness of the potential of information technology and the use of performance measures.

4.1 The Level of Effective Communication

The method of utilizing face-to-face interviews with a prepared questionnaire was found to be very effective. It established what staff knew about specific business policies, how they had attained the knowledge, whether their knowledge was consistent with responses from other personnel, and whether they were basing their knowledge on a perception of what they thought rather than what they really understood.

The company manages its communication by monthly corporate briefings combined with very open access for communication throughout the organization. So, while there is a formal structure in which staff obtain the corporate view, they each are able to build knowledge through individual conversations with the directors. The one-to-one or group conversations may be about a particular problem with their work that only concerns them, or it might be suggestions for improvement of certain important business issues.

This accessibility gives staff a feeling of importance and added value, but it can also encourage a range of activities that can develop in isolated pockets. The evaluation process was able to identify the manner in which accessible communication was a valuable social tool in making people feel responsible for their work, but was also responsible for creating a potential hazard in maintaining a consistent approach to the management of business objectives.

As a result of this finding, it could be assumed that there was no framework for communicating business issues. No value chain or critical success factors had been created for the benefit of groups or individuals, and ways of performing tasks were open to negotiation. The evaluation process provided a demonstration to the company of how communication was being misused and under utilized in a strategically managed manner.

A factor that also became apparent, through the use of cross-questioning staff about what communication links there were in the organization, demonstrated that there was a significant degree of preference for operational staff to take their concerns about their work straight to the accessible directors.

While directors were aware that communication was not a strength of the company, they had not appreciated that the undermining of the authority of line managers that was occurring was one of the principal weaknesses. It was quite apparent that line managers were losing status and, more importantly, the company was losing the ability to manage strategy effectively.

For a company to successfully manage its strategic objectives, it needs to keep the staff informed of business objectives and communicate how the requirements of each individual's role contributes to achieving them. The evaluation exposed that while there were monthly corporate briefings, the objectives for anything but sales performance were not presented to the staff, leaving them open to incorrect perceptions of what the other objectives might be. On testing perception against understanding, it was very obvious where the understanding lay. All staff knew virtually everything there was to know about monitoring sales performance, but ask them about business issues away from this area and they each had their own view. This provided the company with considerable evidence that objectives, well managed and well communicated, are usually met because the staff know about them and work to the relevant priorities. This has given the company considerable motivation to increase the level of communication about the range of objectives.

4.2 Understanding the Potential of Information Technology

The evaluation aimed to gauge the awareness and understanding that exists in the company of the strategic potential that can be achieved by utilizing information technology by testing the knowledge of individuals on aspects beyond their own area of responsibility.

Responses to the questions demonstrated that staff knew how to utilize the information system for their own particular tasks well but there was a major problem between areas of different usage. Those who managed the inputting of raw data were obviously unaware of the potential value of the information to the corporate objectives. This was because they

- did not know what the full set of objectives were beyond those of sales targets, and
- were unable to assess what information would be strategically useful to measure the objectives.

Likewise senior managers, who knew the objectives, were not focused on establishing the criteria for information collected, based on what they needed to know.

Because of this failing, the company had not managed to identify appropriate links, for example, between the information held and the measures that could be attained for product development or the value that individual products held within the product life cycle. While market share for individual products is a specified objective by the directors, the information system is not at present being used strategically to manage this objective.

The evaluation process indicated that the level of the company's maturity, according to Remenyi's steps of maturity described earlier, was probably as high as stage 4 or even 5 for the monitoring of sales but was still at the very early stages for most other business areas.

Cross-examination of individuals demonstrated that there are situations where the same view is held by many staff, but few were aware that the view was in fact shared. This was a particularly valuable use of the methodology when it came to asking staff about the benefit or threat that they might expect if performance measures were implemented. The majority of the interviewees were against individual performance measures but many individuals expressed a desire for measuring corporate performance, seeing it as a way to improve and to give recognition of job value. In spite of accessible communication links within the company, this fact had not been identified, and it was only by carrying out the evaluation process in this manner of questioning and comparing responses that this hidden, shared desire was appreciated.

More significantly, at the same time that these independent positive views to performance measurement were developing in the minds of staff, senior managers were planning ways to implement performance measures against an expectation of resistance. Had the company communicated more effectively about its objectives and the strategy that it was to implement to achieve them, the company might be considerably further along in exploiting its information systems in a strategic manner. By carrying out the evaluation process, directors were reassured that staff would respond positively to the idea, and plans have been put in place to ensure this knowledge is incorporated into the business planning process.

4.3 Summary

These results demonstrate that the methodology addressed the key issues in a focused manner. By repeating many of the questions to all of the interviewed staff, an accurate view of the corporate understanding of the business issues, and the level to which these were being communicated effectively were clearly identified.

While staff across all levels openly expressed their belief that the information system was not being utilized strategically, they were unable to clearly identify why this was the case, and were certainly unable to express how they were going to develop it into a strategic resource in the future. In this respect, the evaluation was of benefit to the company as it identified a number of significant reasons why it was not achieving strategic status. While the process is only for evaluation purposes and does not provide a means by which change can be implemented, it does identify the important issues that need to be addressed.

The evaluation process itself had considerable impact on the company since it demonstrated a way of looking at business management issues that had not been previously encountered. It highlighted the crucial management requirements that are needed for an information system to be used strategically and it exposed areas that the company was aware of, perhaps only subconsciously, that it now recognizes it must bring to its full attention.

Much of the evidence that came out of the evaluation process showed that the operational staff were extremely positive about the company and wanted directors to be much more communicative about their planned strategy than was being demonstrated. At the same time, it was obvious from the interviews held with the directors themselves that they do have strategic plans that are based on a long-term view, with very clearly defined objectives.

Their failings were their unwillingness, first, to communicate the full extent of the corporate objectives to staff and, second, to identify sufficient perfor-

mance measures by which the objectives could be monitored. Where they had effectively communicated the objectives for sales and set targets by which their achievements could be monitored, there was significant evidence that the information system was providing a competitive advantage and that it was being used in line with the strategic plans.

5. EVALUATION AND CONCLUSIONS

Many businesses today are finding that their business decisions have been led by the pressure of keeping up with the advances in technology in order to compete in the market. Having installed an information system, they frequently find that their expectations were different from what they have actually achieved. There is an increasing requirement for an evaluation of the benefits that were planned and have been achieved, while also exposing those areas that were planned but not achieved. Equally, it is of value to expose those areas that would improve the system that were not originally planned or achieved.

This all points to the experience of many companies that the impact of information systems is unpredictable and the reassurance to senior managers that evaluating why they were under-achieving would give valuable guidance as to how they could improve the system.

Remenyi (1991) states that “an information system becomes ‘strategic’ by the management of the information and not through its inherent design.” It is essential, therefore, to examine to the extent to which the proposed methodology has achieved the evaluation of the management of information.

The evaluation method proposed in the paper attempts to develop an insight into this situation. For SMEs, the method has the advantage that it is not costly to utilize. It requires no capital equipment, and experience has demonstrated that while it requires time and the commitment of the staff to participate in thorough questioning, it is possible to achieve an accurate evaluation of the information system by questioning a representative sample of the staff.

The main concern with relying entirely on the compilation of responses given by different people is that one can never be entirely sure the “real scenario” is being evaluated. The way this evaluation focused on this particular aspect was to develop a method of exposing, or assessing, whether individuals were speaking with an authority of the knowledge of corporate opinion rather than a perception. It was found that responses given in a positive and confident manner equated with the areas that were contributing to explicitly stated corporate/strategic objectives. On the other hand, those areas in which staff were hesitant, or were obviously expressing their own desires, were the areas where management was failing to pursue an explicitly stated corporate/strategic goal. The findings support the hypothesis that effective communications are crucial for a company to manage an information system as a strategic resource.

The methodology provides an evaluation of the company's information system; it does not provide a formal proposal for restructuring the information system. It relies heavily on the company being responsive to the findings, and being sufficiently motivated by the demonstration of the potential for information systems to further develop the systems.

Because the methodology aligns its evaluation with an established strategic cycle, it has the benefit of helping companies come to terms with bridging the gap that frequently exists between the users of the system and company management. Since the evaluation process assesses the qualitative benefits of a strategic information system, it provides an evaluation that can complement the more traditional financial analyses that are undertaken to justify the investment in IT.

Finally, the use of the value chain and critical success factors provided the relevant academic underpinning to support the empirical research carried out during the implementation of the methodology. The methodology has demonstrated that, where objectives are linked to specific tasks and are effectively communicated to staff, added value is achieved. By identifying those tasks that must be achieved, and monitoring them, performance levels also have been found to increase. This gives support to the hypothesis that, in order for information systems to be defined as strategic, there needs to be effective communications throughout the organization. In this way, individuals understand their role and the value that they can contribute to the company in meeting corporate objectives.

The methodology can be used, not just as a once-off process, but as a regular activity to ensure that information systems remain aligned to changing strategic policies. One of the observations that occurred in the evaluation process was that, while the methodology could assess the level of strategic benefit that was being achieved, it could also provide a useful learning process of where strategic use could be made of the systems. The methodology was able to highlight elements in the management of the systems that, if enhanced, could increase the level of benefit considerably. Hence, the methodology could prove to be a valuable asset to SMEs in the development and maintenance of their strategic information systems in the future.

6. REFERENCES

- Earl, M. J. *Management Strategies for Information Technology*, New York: Prentice Hall International, Ltd., 1989.
- Farbey, B., Land, F., and Targett, D. "How to Assess Your IT Investment: A Study of Methods and Practice," Oxford: Butterworth Heinemann, 1993.
- Levy, M., Powell, P., Merali, Y., and Galliers, R. "Assessing Information Systems Strategy Development Frameworks in SMEs," in *Proceedings of the Fifth European Conference on Information Systems*, C. Murphy, R. Galliers, R. O'Callaghan, and C. Loebbecke (eds.), Cork, Ireland, June 1997.

- Levy, M., Powell, P., and Yetton, P. "SMEs and the Gains from IS: From Cost Reduction to Value Added," in *Information Systems: Current Issues and Future Changes*, T. J. Larsen, L. Levine, and J. I. DeGross (eds.), Laxenburg, Austria: IFIP Press, 1999, pp. 377-392.
- Moreton, R. "Pervasive IT Systems: Ensuring a Positive Contribution to the Bottom Line," in *Systems Development Methods for Databases, Enterprise Modeling, and Workflow Management*, W. Wojtkowski, W. G. Wojtkowski, S. Wrycza, and J. Zupancic (eds.), Boston: Kluwer Academic/Plenum Publishers, 1999, pp. 349-356.
- Porter, M. E. *Competitive Advantage: Creating and Sustaining Superior Performance*, New York: The Free Press, 1985.
- Porter, M. E., and Millar, V. E. "How Information Gives You Competitive Advantage," *Harvard Business Review*, July-August 1985, pp. 149-160.
- Remenyi, D. S. J. *Introducing Strategic Information Systems Planning*, Oxford: NCC Blackwell Ltd., 1991.
- Robson, W. *Strategic Management of Information Systems*, Marshfield, MA: Pitman, 1994.
- Rockart, J. "A Primer on Critical Success Factors," Working Paper, Center for Information Systems Research, Sloan School of Management, Massachusetts Institute of Technology, 1981.
- Ward, J. M. "Information Systems: Delivering Business Value?" in presentation to the Fourth Annual BIT Conference, Manchester Metropolitan University, Manchester, England, 1994.
- Ward, J., and Griffiths, P. *Strategic Planning for Information Systems* (2nd Edition), New York: John Wiley & Sons, 1996.
- Willcocks, L., and Lester, S. "Evaluating the Feasibility of Information Technology Investments," Oxford Institute of Information Management, RDP93/1, 1993.
- Yetton, P., Johnston, K., and Craig, J. "Computer-Aided Architects: A Case Study of IT and Strategic Change," *Sloan Management Review*, Summer 1994.

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