

Benchmarking IT Practices in Small Firms

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Abstract

Much attention has been focused recently on benchmarking, a practice by which firms learn from other firms to help improve their own business processes. Numerous benchmarking tools exist for small firms and they typically cover a range of activities, including strategic leadership, quality, performance, and other key processes. However, most pay no or little attention to IT. Thus this study aimed to identify IT management practices in small firms that could be included in benchmarking tools. Existing literature and multiple-case studies identified IT practices. A second phase comparing IT practices amongst leaders and laggards. Managers of small firms could use the resulting set of practices for benchmarking while researchers could use them to examine IT sophistication in small firms.

Keywords

Benchmarking, small firms, case studies, IT practices, TQM.

INTRODUCTION

Benchmarking has been used increasingly during the last ten years and many see it as a natural evolution of total quality management. For example, Zairi (1992) claims that much of the first part of the TQM journey was about raising awareness and recognising problems and opportunities, while the second leg utilised benchmarking to optimise operations through finding and implementing better practices (Zairi 1992).

An important aspect of benchmarking is the focus on external rather than internal standards. Andersen & Pettersen (1996) consider learning from the best within your industry as 'competitive' benchmarking, while learning from excellent firms regardless of industry as 'generic' benchmarking. Cortada (1998) refers to these as 'best in class' and 'world class', respectively.

Cox & Thompson (1998) provide a sobering view of benchmarking in light of it being very popular among large firms. They argue that benchmarking can "only ever hope to achieve second best" (p. 19). Thus benchmarking is inappropriate under many circumstances, particularly if firms are seeking to be leaders based on unique competencies. However, they recognise that benchmarking can help firms catch up with competitors so they support benchmarking where it is applied appropriately, and particularly when firms focus on business activities that are critical to their success.

The growth in benchmarking activity has spawned a number of benchmarking tools to help firms identify how they stand relative to similar firms. Firms can use this data to then decide what aspects if any they may wish to improve. These benchmarking tools cover a wide range of topics. For example, the DTI's benchmarking index includes leadership, quality systems, impact on society, and business results (DTI 1998). However, this and other benchmarking tools give little attention to IT. This is disappointing considering the e.business revolution and the concerns of Government regarding small firm competitiveness.

Thus the aim of this research was to identify appropriate items that could be used to benchmark IT. In line with the ethos of benchmarking, the study decided to focus on IT management practices rather than the technology itself.

IT CONTENT OF CURRENT BENCHMARKING TOOLS

Numerous benchmarking tools exist that are aimed at evaluating many aspects of a business. Some of these tools are based on the business excellence model. This is the basis for annual awards by the European Foundation for Quality Management (EFQM), who devised a reduced version of the model for SMEs (EFQM 1998).

The business excellence model has a total of nine variables or criteria. Five of these are considered as 'enablers' and four as 'results', where 'enablers' influence 'results'. The 'enablers' are: leadership, policy and strategy, people management, partnerships and resources, and processes. The 'results' are: people satisfaction, customer satisfaction, impact on society, and key business performance results.

While the model emphasises the acquisition, understanding and management of information which may lead to improvement or change, it makes little direct reference to IT. However, under the enabler termed 'resources', one question refers to 'how information resources are managed' which is concerned with the availability of data. Another question refers to 'how technology and intellectual property are managed', including the exploitation of technology and its support for the business (EFQM, URL).

The DTI in the UK has their own benchmarking tool for small firms based on the business excellence model and is presented in a booklet suitable for self assessment. It contains the five enablers and four results of the business excellence model. Results from over 900 small firms have been combined to report relative practices and performance of SMEs across various sectors (DTI 1998). This tool includes two questions related to IT under 'resource management'. Both questions relate to the use and availability of information within the firm (DTI 2000).

The Australian Quality Council's self diagnostic is based on their version of the business excellence model and contains three items related to IT. All three items relate to IT use, including the collection of data, support for decision making, and the use of knowledge (AQC, URL).

The USA's Malcolm Baldrige Award is based on seven areas of assessment, including 'information and analysis'. This topic includes three items related to IT use, including the selection and use of data to review and improve company performance (Baldrige, URL).

Some other benchmarking services in the UK are based on the CBI's PROBE tool, including versions for small firms called Microscope and PILOT. These are based on a 'world class manufacturing model' that links business practices to operational and business performance (Voss et al. 1998). The areas of practice focus on manufacturing and design, and include: innovation, total quality, organisation and culture, product development, logistics, lean

production, concurrent engineering, and engineering and manufacturing information systems. It is the last of these areas that attempts to benchmark IT practices using the following six items: bill of materials management, access to relevant data, engineering change order and release process, engineering application tools, computer aided design tools, and integrated systems (Hanson et al. 1996).

Their data has been used to indicate how many sites had achieved ‘world class levels’. Thus they were able to show that, for example, about 65% of firms were engaged in best practice for ‘bill of materials management’, while a much lower 25% had best practice for ‘integrated systems’. Their six items focus on systems rather than how systems are used or on how they are managed. As the technology is readily available to most firms, it was not surprising that none of their six items seemed to differentiate leaders from laggards. Instead, it was “innovation management that distinguished the leaders from the rest of the pack” (Hanson et al. 1996, p. 11). Both Microscope and PILOT were derived from PROBE for use in small firms but neither have an IT component.

Benchmarking Tool	Total number of questions to cover company practices and performance	Number of questions devoted to IT use	Number of questions devoted to IT management
AQC	22	3	0
EFQM	32	1	1
Malcolm Baldrige	20	3	0
PROBE	46	6	0
UK Benchmarking Index	34	2	0

Table 1: Summary of the IT coverage of benchmarking tools.

These benchmarking tools give some attention to IT, but their emphasis is on the data resource rather than IT management processes. The EFQM does address IT management. For example, one question refers to how the organisation "identifies and evaluates alternative and emerging technologies in the light of policy and strategy". Also, how the business "harnesses technology in support of improvement in processes" (EFQM, URL).

In addition, other aspects of some of these tools could be used to reflect a firm's approach to IT. For example, under 'leadership & innovation', "how it creates alignment to its purpose", under 'strategy and planning processes', "how the organisation uses its resources and assets to maintain and increase its value into the future", and under 'innovation process', "how the organisation acquires, evaluates and implements creative ideas to accelerate business performance" (AQC URL).

IDENTIFYING THE IT PRACTICES TO BENCHMARK

The objective for the study was to identify IT management practices in small firms that could be incorporated into a benchmarking tool. The research commenced with a literature review followed by four case firms to help better understand IT management practices in small firms. Subsequent research involved interviews with both leaders and laggards.

Many studies of IT management have tended to view management as consisting of various activities. A typical example is Earl's description of information management as planning, organization and control of information resources (Earl 1989). This set of activities is similar to the view of management offered by Schermerhorn (1989). Like other authors of management texts, he views ‘management’ as the four functions of planning, organizing,

leading and controlling. Some researchers of IT in small firms have focused on these functions of management, for example, IT planning (Levy et al. 1997) and IT leadership (Thong et al. 1996). The two functions of IT organising and IT control have received relatively little attention, other than in relation to IT implementation projects.

Raymond & Pare (1992) argued that IT management and IT use were two dimensions of IT sophistication. Furthermore, they defined IT management as having two dimensions: functional sophistication and managerial sophistication (Raymond & Pare 1992). Thus their concept of IT management in small firms included: IT personnel, role of the IT function, decision level, type of development, position of the IT function, user participation, organizational objectives, top management involvement, IT investment, IT adoption process, consultants, planning, control and evaluation.

Many studies of IT success in small firms have included some of the above elements of IT management when examining significant influences on IT success. For example, Thong et al. (1996) confirmed that both CEO involvement and external IT expertise significantly influenced IT success in small firms. Both of these factors reflect IT management practices, and to a certain extent they are controllable by the small firm.

Levy et al. (1998) provided evidence of IT management practices being related to IT use. Their four 'competitive scenarios' were based on IT use. For example, in 'efficiency' firms, "there is no recognition of the role of information in supporting the achievement of business strategy" (p. 5). In 'innovation' firms, "IS are an integral and tightly woven part of the business strategy" (p. 6).

Case studies

Management practices were likely to vary by firm size, industry, and country, based on the experiences of Sohal et al. (1999) and Voss et al. (1998). Thus it was important to focus the current study on similarly sized firms (20-100 employees), within one industry (engineering of metal products), and within one country (UK).

The first stage of the study involved four firms from the metal products sector. All were manufacturers, independent, and had between 20 and 100 employees. Semi-structured interviews were conducted with one senior manager in each of the four firms. In addition, any IT specialist was interviewed. The questions and the analysis were based on McKinsey & Co's Seven S's, as described by Pascale & Athos (1982) (see Appendix 1). This framework was selected as it provided a broad view of the concept of management which had proved to be useful when examining IT maturity (Galliers & Sutherland 1999) and business excellence (Peters & Waterman 1982). The case evidence identified numerous management practices for each firm. The within case analysis involved sorting the practices for each firm into each of the Seven S's. The cross-case analysis combined the results for the four firms for each of the Seven S's.

Six different frameworks were used to help identify IT management practices in the absence of a consensus on the definition of IT management. Two of these were based solely on the small firm literature (Hall 1992, Storey 1994), two on the IT in small firms literature (Pollard & Hayne 1998, Thong et al. 1996) and two on the large firm IT literature (Cortada 1998, Galliers & Sutherland 1999). Each of the six frameworks identified some IT management practices and these were classified according to the Seven S's model.

THE SIGNIFICANT IT PRACTICES

The above analysis provided two sets of IT management practices for small firms. Some items were identified during both phases of the case analysis, while other items were only identified during one phase. The two sets showed many similarities. For example, both identified IT alignment, the involvement of senior managers for IT leadership, and rigorous evaluation. Also, the shared values were similar, with both the cases and the literature emphasising a focus on customer service, quality, continuous improvement and empowerment.

Importantly both the cases and the literature complemented each other as they both identified some different practices. For example, the cases indicated the importance of shared IT leadership within the senior management team, and also the involvement of the full management team in an ongoing process of regular meetings, with specific individuals taking on important roles and responsibilities. The literature indicated the importance of building partnerships with stakeholders, particularly consultants, and the need for firms to take action.

A major area of difference between the two sets of practices concerned the use of consultants. While the literature indicated consultants to be important, little reliance on them was indicated in the cases. The latter indicated a need for both IT and project management expertise, but from within the firm.

Thus the two analyses complemented each other. The cases informed the study and the literature acted as a check on the case analysis.

Strategy: While both the cases and the literature identified IT alignment and continuous improvement, the literature added the concept of building partnerships with stakeholders.

Structure: both the cases and the literature identified senior management leadership, but the cases identified the concept of shared IT leadership and the involvement of the management team.

Systems: both the cases and the literature identified similar stages to projects, eg, IT planning as part of business planning, careful selection, shared decision making, customising of systems, etc. The major area of difference regarded the use of consultants. While the literature indicated consultants to be important, the cases indicated little reliance on consultants.

Staff: The literature seems to say little about the role of IT expertise within the small firm other than senior managers taking an interest in IT. The cases indicated IT expertise to be important for firms to keep IT moving ahead, as well as keep systems running.

Style: While both the cases and literature identified the important role for senior managers, and IT as an integral part of the business, the cases indicated there was an ongoing process of regular meetings, with specific individuals taking on important roles and responsibilities. The literature emphasised the need for taking action.

Skills: The cases showed that hands-on IT skills were required within the firm, also project management expertise. The literature focused more on senior managers taking a keen interest in IT and recognising its strategic potential.

Shared values were similar, as both focused on customer service, quality, continuous improvement and empowerment.

IT PRACTICES IN LEADERS AND LAGGARDS

The aim of the second stage of the study was to create 'mini-descriptions' of IT leaders and IT laggards. An existing benchmarking database was used to help identify potential leaders and

Iaggarads. As no IT management data was available, the selection was made based on other business practices and firm performance. Interviews were used to gather evidence based on the earlier findings. The results are summarised in Table 2, in the style used by Microscope (WLTC 1997). These practices cover most of the Seven S's as well as the enablers of the Business excellence Model. Thus they cover a broad rather than narrow range of management activity.

	IT Laggards		IT Leaders
Role of IT within the business	IT assists with many processes but provides no or little advantage over competitors.	Most IT provides value to the firm and some advantage over competitors.	IT is viewed as strategic and provides considerable advantage over competitors.
Responsibility for IT.	Responsibility for IT is left to an employee who has no or little IT training.	A senior manager takes responsibility for IT.	A senior manager leads IT with enthusiasm and commitment and ensures that IT is highly linked to the needs and direction of the business.
Senior management commitment to IT.	Some senior managers prefer to ignore IT issues unless in a crisis.	Some but not all senior managers are enthusiastic about IT.	All senior managers are enthusiastic about IT, regularly discuss IT issues, and share responsibility for IT projects when necessary.
Seeking out new uses for IT.	Managers rarely explore possible new uses for IT.	Managers occasionally explore possible new uses for IT.	Managers regularly explore new uses for IT through discussions within and outside the firm, and at exhibitions and seminars, as part of the firm's commitment to continuous improvement.
Customisation of new IT systems.	Packaged systems are purchased and undergo no or little customisation.	Packaged systems are purchased and undergo some customisation.	Either bespoke systems are developed or packaged systems are purchased and undergo considerable customisation.
IT specialist	An employee with no formal IT training manages IT on a daily basis. IT problems are usually fixed by technical experts from another firm.	Staff have developed sufficient technical expertise to fix most IT problems and manage most IT projects, but occasionally need to seek help from external experts.	The firm employs an IT specialist with years of formal IT training. This makes the firm relatively independent of IT service providers.
IT development skills.	No one within the firm can develop small systems with either database or spreadsheet software.	We have sufficient hands-on skills to develop small databases and spreadsheets.	Our system development skills allow us to customise new systems and build significant systems with database and spreadsheet software.

Table 2: Levels of IT management sophistication in small firms with between 20 and 100 employees.

KEY FEATURES OF IT LEADERS

- IT is viewed strategically.

IT leaders take IT very seriously, ie, as an important part of the way the firm does business. IT is used to provide competitive advantage and in ways that help differentiate the firm from its competitors. Thus the IT leader uses IT across much of the firm, and particularly in areas where it supports important business objectives, like product and service quality. (This commitment to IT is similar to their commitment to quality, but without any certificates on the wall to show for it).

- A senior manager is responsible for IT.

A senior manager is responsible for IT, but is unlikely to have any formal training in IT. Instead they are enthusiastic about IT and have a keen sense of the firm's

direction. In many small firms the MD takes responsibility for IT. IT initiatives are linked to other plans and initiatives for the business, but with agreement and commitment from others in the firm.

- The senior management team is committed to IT.

All senior managers show commitment to IT by supporting people who have IT responsibilities, rather than just leave IT to someone else. This support is shown through IT issues being regularly discussed when managers meet, being there to bounce ideas off, and being proactive regarding new IT initiatives that effect their area of business. For a major IT project, responsibility could be shared by two or more senior managers.

- New IT ideas are sought and valued.

IT leaders are frequently scanning their environment for new initiatives and this includes IT. Thus senior managers in IT leaders seek out and explore new ideas regarding IT. They see new ideas in the news or in magazines or in other firms and discuss these with others. They explore these ideas further by visiting exhibitions, attending seminars, and discussions with managers in other firms, including customers. This makes IT part of the firm's commitment to continuous improvement.

- New systems are made to meet the firm's needs.

Senior managers in leading firms provide clear focus and direction for new systems. They then carefully select any new IT, typically after seeing it work successfully in another firm. Numerous senior managers take part in the selection process to ensure that a system meets the needs across the whole firm. Any packaged system is likely to be significantly customised to meet specific needs. If necessary, the firm will have a system written to meet their specific needs. Thus an IT leader is willing to invest significant money into IT projects.

- Firms employ an IT specialist.

An IT leader may employ an IT specialist, ie, someone who has had some years of formal training in IT. However, not all IT leaders will employ an IT specialist, but this is more likely in firms with over 50 employees. The IT specialist brings technical expertise to the firm, and some of their most important responsibilities are to keep networked systems running, implement upgrades, manage system security, and advise and assist others regarding IT issues. Duties would include assisting senior managers when researching possible new IT initiatives. The IT specialist would typically report to one of the senior managers.

- Firms possess IT development skills.

Even if they do not employ an IT specialist, at least one individual within an IT leader will have developed hands-on system development expertise over the years. This means that the firm can be relatively self-sufficient when it comes to many smaller tasks, including the creation of small databases and spreadsheets. This way the firm is able to implement new systems that typically help individuals with specific duties. However, any customisation of a major new system is left to the software supplier rather than be attempted by someone within the firm.

CONCLUSIONS

This study focused on IT management practices in small firms and identified practices that could be included in benchmarking tools. The initial research analysed four case firms to identify common IT management practices. This was followed by examining leaders and laggards to determine how practices differed.

These leading practices may only apply to firms in the metal sector and to independent firms with between 20 and 100 employees. Importantly, world class standards are dynamic, therefore it must be recognised that best practices may be temporary. In time, some best practices will become standard practices as other superior practices emerge. Furthermore, different firms have different IT strategies (Levy et al. 1998). Thus some leading practices may make most sense only to those firms that wish to use IT strategically. Further research could examine if practices vary by type of firm, and for example, by IT strategy (Levy et al. 1998).

The study provided considerable support for the existing literature. For example, it reinforced the importance of topics like IT alignment, the involvement of senior managers for IT leadership, and the need for rigorous evaluation of new projects. However, the study provided no support for external IT consultants as important sources of expertise and guidance. This contradicts prior research studies, particularly Thong et al. (1996). Instead, the case firms showed a preference to develop and rely on internal IT expertise. This difference questions the importance of IT consultants as a major influence on IT success. It seems possible that many small firms may now have sufficient IT experience and wisdom for IT to succeed without the use of external IT consultants.

The research also indicated the importance of benchmarking in assisting firms to increase their competitiveness and has identified a weakness of many of the self-assessment tools: the tendency to omit direct reference to IT practices. The impact on small manufacturers of such modern processes as e.business suggests that good IT will be an essential enabling resource. The study may have provided a taxonomy for improving this aspect of the benchmarking process.

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APPENDIX 1

The Seven S's (Pascale & Athos, 1982, p. 81)

Strategy	Plan or course of action leading to the allocation of a firm's scarce resources, over time, to reach identified goals.
Structure	Characterization of the organization chart (ie, functional, decentralized, etc).
Systems	Procedural reports and routine processes such as meeting formats.
Staff	"demographic" description of important personnel categories within the firm (ie, engineers, entrepreneurs, MBAs, etc). "Staff" is <i>not</i> meant in line-staff terms.
Style	Characterization of how key managers behave in achieving the organization's goals; also the cultural style of the organization.
Skills	Distinctive capabilities of key personnel or the firm as a whole.
Superordinate goals	The significant meanings or guiding concepts that an organization imbues in its members.

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