

# **The Effect of Implementing an IT-Supported Business Management System on Organisational Culture: A Case Study**

Megan Seen  
Ph: 03 9903 1950  
Fax: 03 9903 1077  
megan.seen@csse.monash.edu.au  
School of Computer Science and Software Engineering

Christine Mingins  
School of Computer Science and Software Engineering

Nicholas Beaumont  
Department of Management

Monash University  
Australia

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School of Computer Science and Software Engineering  
Monash University  
PO Box 197 Caulfield East Vic 3145  
Australia

## ***A b s t r a c t***

The literature suggests that the benefits of implementing a business management system (BMS) are mixed. While reported benefits include improved work quality and effectiveness and reduction in operating costs, formal certification is seen as a costly and bureaucratic process. This paper describes a project in which an Australian software development firm implemented an information technology (IT)-supported BMS to gain ISO 9001 certification. Survey data was gathered before and after the implementation process to measure the changes brought by the implementation. This paper focuses especially on the analysis of organisational culture. The results indicate that a BMS may have little obvious or immediate human benefit in small organisations or in organisations where a satisfactory work environment already exists. The major benefit may lie in the use of a BMS as a tool to review systematically critical aspects of a business, thereby reducing the risk of business errors.

## *Introduction*

### **Background**

The Foley (1987) and Karpin (1995) reports on quality management have encouraged Australian organisations to invest in many kinds of quality initiatives, especially ISO certification. Many studies have investigated the value of certification, reporting benefits such as improved quality and effectiveness, and reduction in operating costs (Curtis & Paulk 1993; Lee & Kim, 1992; Perry 1992; Tan & Yap 1994).

~~Please regularize these brackets~~ Baker and Rouse (1997) found that certification had greater benefits for organisations initially lacking systematic processes. Despite claimed benefits, certification is seen as a costly and bureaucratic process (Brown & Van der Wiele 1995; Carroll 1996; Zampetakis 1994). The estimated initial cost of the certification effort for an organisation can be as much as \$500,000 including intangibles (Baker & Rouse 1996; Zampetakis 1994), and on-going costs can be up to \$100,000 per annum (Carroll 1996). These costs especially disadvantage small firms (Kean 1995). Given these figures, and the number of organisations registered with the Joint Accreditation Scheme – Australia and New Zealand (JAS-ANZ 1998), Australian organisations could have spent up to \$ 5.55 billion on certification during the 1990s.

Software vendors such as Paradigm Software and Integrated Quality Management Software (IQMS) claim that the use of BMS software can cut costs associated with attaining certification while providing a solid foundation for quality improvement. Both companies use spreadsheets to demonstrate to potential customers the savings that can be made using their software to support a BMS. However, because BMS software has been available only since the 1990s, there is little empirical evidence supporting this claim.

This research project, investigating the use of information technology in facilitating BMS, began in 1998. The first stage of the project entailed designing and implementing a process using BMS software to help a software development organisation gain ISO certification. Data was collected in the areas of organisational culture and customer satisfaction before and after the business management system was implemented. A review of the literature (for example Terziovski (1997), Likert (1967), Green (1993), Porras & Berg (1978) and Kaplan & Norton (1992)) indicated that, in order to measure the outcomes of the process, data should be collected in four key areas: customer satisfaction, work practices, organisational culture, and cost management. However, for organisational privacy reasons, data on costs and work practices were not made available to the researcher.

This paper investigates the impact of implementing an IT-supported BMS on organisational culture. The effect on customer satisfaction is described in Seen, Beaumont and Mingins (2002). Previous papers related to this research project describe the process used to implement the BMS at the software

development organisation (Seen & Mingins 2000) and the process used to identify key performance indicators (KPIs) relevant to the organisation (Seen, Beaumont & Mingins 2001).

### **The Company**

Domain Software (a pseudonym) is a software development company based in Melbourne, Australia. Its flagship product (sold in Australia and overseas) is an application designed to help organisations manage records pertaining to their customers, suppliers, personnel, quality, equipment, documents and images, workflows, scheduling, audits and problem tracking and resolution, and meetings. At Domain Software, the software product was already implemented and in use, but for a number of separate and often isolated functions. A number of ad hoc information processes not integrated with the BMS were already in place to support decision making. The challenge facing the organisation was to expand the internal use of the software product and eliminate ad hoc processes so that the product supported and integrated a comprehensive range of activities across the organisation, thus providing an integrated BMS.

### *Changes in Organisational Culture as a Result of Implementing an IT-based BMS*

#### **The Survey Process**

Culture has been defined as ‘...the deeper level of basic assumptions and beliefs that are shared by members of the organisation, that operate unconsciously and that define in a ‘taken for granted’ fashion an organization’s view of itself and its environment’ (Schein 1989: 73), or as the ‘... unseen and unobservable force that is always behind the tangible activities of an organization which can be observed and measured’ (Sweeney & Hardaker 1994: 4). Researchers and consultants have developed tools to enable data related to this intangible force to be captured (for example Glover (1994) and Richardson and Macneish (1997). In this project, a survey was deemed appropriate, despite the small number of respondents, because of its ability to paint a general picture and provide useful information (Fenton & Pfleeger 1997). At Domain Software, a survey based on Likert’s (1967) survey of organisational culture was used to capture data on staff attitudes and opinions in order to define aspects of the organisation’s culture. This survey was selected because it covered several aspects of organisational life that reflect individual perceptions of the workplace: leadership processes, motivational forces, communication, decision-making, goal setting, quality processes, and training. The survey, comprising forty-six questions, was updated to reflect Domain Software’s participative management style (the original had a strong “staff versus management” tone), and to ensure its relevance to the company. The hypothesis being tested was that ‘use of an IT-based quality system has an effect on organisational culture at Domain Software’.

The 'before' survey was distributed by hand to the five Domain Software management and staff in May 1999 to establish a baseline from which changes could be measured. The survey was completed in the presence of the researcher to allow for clarification of any questions, and to allow comments to be collected on any issues raised by respondents. The same survey was distributed twelve months later in May 2000, this time without the researcher's participation. One respondent had joined the company some months after other respondents had completed the survey. Rather than administer the survey twice to this person, the survey was adjusted so that it asked for the respondent's perceptions regarding the company 'six months ago' and 'now'.

In completing the survey, respondents chose from five ordered and descriptive answers to each question. At the positive end of the ranking (coded by '5' on a Likert scale) the potential answers reflected an organisation in which staff had confidence and trust in their managers, that recognised contribution and achievement, that encouraged staff to participate in decision making and goal setting, that facilitated communication in all directions, that provided resources to support work effectiveness, and that provided training for staff development. At the negative end of the ranking (coded by '1' on a Likert scale) the potential answers reflected the opposite.

## Results

Table 1 reports the specific questions asked, the median response to each question and each group of questions both before and after the BMS was implemented. The median, rather than the mean, was used in the following analysis. Because of the lack of set interval between the five points on the ranking scale, '...the notion of mean is not meaningful for nominal and ordinal measures' (Fenton and Pfleeger 1997: 57) especially in small samples.

**Table 1: Summary of results from organisational culture survey (medians)**

Nº	Survey Question	'Before' Median	'After' Median	Difference
<b>LEADERSHIP PROCESSES</b>				
1.1	How clear is the organisation's vision and mission?	4.0	4.5	0.5
1.2	To what extent are managers seen as role models for their decision making, actions and general behaviour?	5.0	5.0	0.0
1.3	How much supportive behaviour do managers display toward others (eg individuals wanting to change job direction; stressful home situation)?	4.5	4.0	-0.5
1.4	How much trust and mutual confidence is present between management and staff?	4.5	4.5	0.0
1.5	How free do staff feel to discuss important things about their jobs with their immediate manager?	5.0	5.0	0.0
1.6	To what degree is everyone treated fairly, regardless of nationality, ethnic origin, age or gender?	5.0	5.0	0.0

1.7	How often are those affected by the outcome of a decision able to contribute his or her opinion to that decision?	5.0	5.0	0.0
1.8	How often does management use the opinions from staff in trying to solve organisational problems?	4.0	4.5	0.5
<b>Median of differences for leadership processes</b>				<b>0.0</b>
<b>MOTIVATIONAL FORCES</b>				
2.1	How much responsibility is felt by each member of the organisation for achieving the organisation's goals?	4.5	5.0	0.5
2.2	To what extent do managers recognise each person's role as contributing to the overall goals of the organisation?	4.0	4.0	0.0
2.3	To what extent are employees champions of the products and services that are offered to customers?	4.0	5.0	1.0
2.4	To what extent is recognition given to new ideas and innovative problem solving?	4.5	4.5	0.0
2.5	To what extent can people influence what happens to them in the organisation (eg in task allocation)?	4.5	4.0	-0.5
2.6	How satisfied are individuals with their jobs generally?	4.5	4.5	0.0
2.7	What sort of relationship exists between members of the organisation in terms of trust, co-operation and competition?	5.0	5.0	0.0
<b>Median of differences for motivational forces</b>				<b>0.0</b>
<b>COMMUNICATION</b>				
3.1	What are the major information flows?	5.0	5.0	0.0
3.2	How effective is the upward channel of communication from staff to management?	4.5	4.0	-0.5
3.3	How responsible do staff feel for initiating accurate upward communication?	5.0	5.0	0.0
3.4	How adequate and accurate is horizontal communication between peers?	4.0	4.0	0.0
3.5	How willing are management to share information with staff?	5.0	5.0	0.0
3.6	How accepting are staff of requests or information supplied by management?	4.5	5.0	0.5
3.7	How approachable are individuals throughout the organisation?	5.0	5.0	0.0
<b>Median of differences for communication</b>				<b>0.0</b>
<b>DECISION MAKING</b>				
4.1	At what level in the organisation are decisions formally made?	2.5	3.0	0.5
4.2	How much attention is given to strategic direction and organisational policy when making operational decisions?	4.5	5.0	0.5
4.3	How adequate and accurate is the information available for operational decision making at the place where the decisions are made?	4.0	4.0	0.0
4.4	How much freedom is there at all levels for individuals to make decisions regarding how best to perform work?	5.0	4.5	-0.5
4.5	How confident are people that they can make decisions without fear of being blamed for mistakes?	4.0	4.0	0.0
<b>Median of differences for decision making</b>				<b>0.0</b>
<b>GOAL SETTING</b>				
5.1	How are operational goals set?	4.0	4.0	0.0
5.2	How high has management set the overall performance goals of the organisation?	4.0	4.0	0.0
5.3	To what extent do the different organisational levels strive for high performance goals?	3.5	4.0	0.5

<b>Median of differences for goal setting</b>				<b>0.0</b>
<b>QUALITY PROCESSES</b>				
6.1	Where does responsibility for quality lie?	5.0	5.0	0.0
6.2	To what extent is customer satisfaction used to measure work effectiveness compared to other measures?	3.0	4.0	1.0
6.3	How committed are staff to providing accurate performance data when that data are used to guide and manage work activities?	5.0	5.0	0.0
6.4	To what extent is feedback from management used by staff for self-guidance or group problem solving?	5.0	4.0	-1.0
6.5	To what extent is a philosophy of continuous improvement present in the organisation?	5.0	5.0	0.0
6.6	How much effort is spent on finding underlying causes to problems, rather than applying quick fixes?	5.0	5.0	0.0
6.7	How good are work processes compared to what they should be?	3.5	4.0	0.5
6.8	To what extent are work practices consistent across work sections?	4.0	4.0	0.0
6.9	To what extent does work effectiveness depend on a system compared to a few key individuals?	3.0	4.0	1.0
6.1	How flexible are work practices in meeting changing customer or environmental needs?	4.0	5.0	1.0
6.11	To what extent does computer technology support daily work processes?	5.0	5.0	0.0
6.12	To what extent does computer technology support change in daily work processes?	5.0	5.0	0.0
<b>Median of differences for quality processes</b>				<b>0.0</b>
<b>TRAINING</b>				
7.1	How often are new staff members given formal training to help them work effectively?	2.0	2.5	0.5
7.2	How much training in management is provided to interested staff?	1.0	2.5	1.5
7.3	How encouraging are management attitudes for learning and improvement?	3.0	4.0	1.0
7.4	How adequate are training resources?	2.0	2.5	0.5
7.5	To what extent is training seen as an investment that will yield future returns?	2.5	4.0	1.5
<b>Median of differences for training</b>				<b>1.0</b>

From the above table, it can be seen that there was generally very little change in terms of individual perceptions of organisational culture. Of the 47 items, 25 items (53%) showed no change over the time of the introduction of the IT-based BMS. Seventeen items (36%) showed an increase. Five items (11%) showed a decrease. Of the sets of questions, only those items in the group relating to training showed a total overall improvement. The medians for all other groups of questions remained static.

Domain Software personnel have a positive perception of the organisation's culture. With the exclusion of the set of items relating to training, only one item recorded a median response below the midpoint. This item, 4.1, asked about the level within the organisation at which decisions are formally made. The lower median recorded against this item can be explained by Domain software being an entrepreneurial

company dominated by the owner and having a limited number of staff. At Domain Software, responsibility for almost all decisions is lies with the MD.

The exception to the high ratings lies with the last section of the questionnaire that relates to training, where all except one item (7.3) were below the mid-point on the Likert scale. The lower scores for the training section are a reflection of the needs of the company. Individuals were already competent in their roles, and therefore had little need of technical training. Nor, being a small organisation, was there was room for career progression or scope for staff to gain management skills. When confronted with technical problems, staff accessed resources such as manuals and the Microsoft Software Development Network. Curiously, all items in this section relating to training showed an increase over the time of the implementation of the IT-supported BMS. No additional training of any sort was provided during the period of the implementation. The MD's avowed intent to pursue improvement may have changed staff perceptions of management's attitude towards, and provision of, training.

Because the conditions for ANOVA were not met by the data, the Mann-Whitney test was applied. Unlike ANOVA, the Mann-Whitney test is applicable when the data is not normally distributed, when the samples have markedly different variances and, most particularly, when the data is ordinal. In some circumstances the Mann-Whitney test can be more sensitive than parametric tests.

For the survey conducted at Domain Software, the Mann-Whitney test statistic U did not find a significant difference between the two samples ( $p > 0.05$ ) indicating that the null hypothesis - *that use of an IT-based quality system has no effect on organisational culture at Domain Software* - should *not* be rejected.

## **Discussion of Results**

At Domain Software, the introduction of an IT-based quality system appears to have had limited effect on organisational culture. This contradicts earlier studies (for example (Baker & Rouse 1997), (McGeorge 1992) and (von Hellens 1995)) that found that establishing quality procedures enables organisational culture to change. Baker (1997), drawing on the results from two case studies, noted that 'Certification can improve the discipline with which professional work practices are applied, and can be used to effect cultural change through altering work behaviour and then reinforcing the new behaviour through on-going audits.' The chief attitude change described in these earlier studies was staff taking greater responsibility and ownership for work by recognizing that no one individual was a 'hero', but that all had a part to play in creating good products, and by recognising the need to practise, at all times, good software development practices.

The role of management in shaping organisational culture, and the characteristics of Domain Software, helps explain the difference in results between this and earlier studies.

Management is both a cause of and a part of organizational culture (Ivancevich & Matteson 1987). While managerial activities - planning, organizing, leading and controlling — all influence organisational culture, 'leading is the most important' (Ivancevich and Matteson 1987: 32). Glass (1991: 148) emphasises the role of management in creating a 'quality' culture, arguing that '...management must construct and maintain a climate in which quality is fostered and nurtured. This quality climate is one where processes which facilitate quality are enabled and followed'. Fairbairn (1997) points out that small entrepreneurial companies tend to rely on a central figure for strength, and these types of organisations are able to exercise quite strict internal control. In addition, the person at the centre of the company will frequently hire like-minded people, thus propagating the values and attitudes of the leader. He adds that '...If an ISO9000 system is to be successful in such a culture it is clear it must be fully supported by the "Power Authority"... and care taken that this influence is not overbearing' (Fairbairn 1997).

The current study also bears out the importance of the influence of management. At Domain Software, the influence of the MD was particularly noticeable, and this may account for the lack of change arising from the implementation of the BMS. All major decisions and projects were reviewed and approved by the MD. Thus the improvement initiative was aligned with the existing direction and culture of the business and the values of its leader; it did not have a separate life of its own. Staff contributed to the system, but generally their suggestions were additions or refinements, and did not oppose the MD's opinions. A quality system can influence an organisation's culture, but the prevailing organisational culture will powerfully influence the quality system.

Another reason behind the lack of change in the organisational culture was the MD's strong belief in the professionalism of the company's existing work practices. The MD saw no need to make changes to his management style or work practices. Thus the BMS reflected the *status quo* of attitudes and behaviours within the company, and in fact, reinforced them by improving management information and control. While the BMS consequently formalised and fine-tuned existing practices it did not introduce substantially different ways of working that would require a change in organisational culture. In another study, Baker (1996) found that where a quality system was implemented in a well-established company without a change of work practices (due to satisfaction with current work practices and an emphasis being placed on gaining certification for market reasons) there was no change in attitudes.

Third, both the organisations studied by Baker in which cultural change had been achieved were large software houses. The major cultural change observed related to an attitude shift from "star" individuals being responsible for producing the product, to a more equal distribution and recognition of responsibilities, and a greater awareness of the necessity of using best practice software development techniques. At Domain Software, all staff members had key responsibilities and were aware of how their work affected the work of others. In relation to best practice software development techniques, the MD



was satisfied with the results of current work practices (in terms of producing saleable, supportable software) and saw little need to adopt new practices to encourage individuals to greater levels of professionalism.

The current study indicated that there was no significant difference between organisational culture measured before and after the introduction of an IT-supported BMS in terms of staff perceptions of leadership processes, motivational forces, communication, decision making, goal setting, quality processes, and training. When considered in light of earlier studies and characteristics of the company, it becomes apparent that a number of factors mediated the influence of the BMS. The null hypothesis - that use of an IT-supported quality system has no effect on organisational culture - cannot be rejected, but the experiences described in other studies indicate that it should not be accepted without further study.

### **Changes in Work Practices as a Result of Implementing an IT-based BMS**

Because an aspect of organisational culture is 'the way things are done around here' the effect of an IT-based quality system on everyday work practices merits discussion.

The most noticeable changes in work practices at Domain Software were brought about by the introduction of the quality system itself. Although ISO 9001 required the company to show that it was monitoring key processes, and constantly seeking to implement improvements, these changes in work practices do not necessarily reflect a change in organisational culture. The MD's determination to improve the company, as well as the desire to gain an internationally recognised qualification, prompted the decision to invest in ISO 9001 certification. A philosophy of continuous improvement was thus manifest even before the introduction of the quality system.

In order to demonstrate, for ISO certification purposes, that a philosophy and practice of continuous improvement had been adopted, the company undertook to identify critical work processes and define associated key performance indicators (KPIs). The relevant processes and KPIs have been described by Seen, Beaumont and Mingins (2001). The continuous collection of KPI data used to monitor business processes has become part of the regular responsibilities of all staff. Another new work practice has been the review of this data through Business Review Meetings (BRMs). In these meetings, key aspects of the organisation's operations are systematically reviewed and analysed by the management team at Domain Software.

Despite the use of KPI data, a review of the minutes of the BRMs from June 1999 to May 2000 indicates that work practices have changed little since the introduction of the BMS. Most recorded opportunities for improvement tend to be incidental, not systemic. Some of the changes had potentially substantial

business impact despite being small in themselves. One such change was verifying the quality of compact disks (CDs) before bulk burning in order to reduce customer frustration with faulty goods, and to reduce rework.

#### *Explanations for Lack of Changes in Work Practices*

The lack of changes in work practices is not because the BMS was of little use, but because its effects were swamped by other factors.

First, the lack of changes indicated a general satisfaction on the part of the MD with the KPI data, thus obviating the need for major changes to work practices. Positive data from the KPIs was perceived as evidence that the company was on the right path, while downward trends could be rationalised.

Second, because the activities and decisions were made immediately, the BRMs were used only to record and confirm decisions already made, usually by the MD. Reviewing the KPI data at monthly BRMs led management and staff to focus on the work processes that produced the KPI data, thus enabling the MD to finetune work practices by looking ahead to anticipate problems and to prevent past errors from re-occurring. The KPI data acted as a safety net in that it highlighted items needing attention should these have escaped the day-to-day vigilance of the MD. Decisions were rarely initiated as a result of *post hoc* analysis of the KPI data itself.

The actual implementation of a quality system can detract from the everyday operations of a business if staff are more focused on the quality system than on regular activities (Lim 1997). Similarly, the implementation of a new IT system might negatively affect productivity and work practices in the short term as the organisation goes through the challenging process of choosing, or designing and building a system, implementing a system, converting existing data, and training staff. However, these explanations of a lack of positive results do not hold for Domain Software where the IT-based BMS was already in limited use. The company was already experienced with quality management tools especially its own QMS; one of its products is advice in the discipline of quality management. Consequently there were neither technical problems with the software, nor staff resistant to using the application. Given that these common barriers to successful implementation were not present, it might have been expected that more benefits would have been experienced.

#### *Alternative Explanations for Lack of Changes in Work Practices*

An IT-based quality system such as the one implemented at Domain Software produces data that management can use to review systematically the operations of the business. However, the usefulness of such systems is affected by how the information from them is interpreted. In some situations, such as those described below, management and staff may ignore warning signs that could indicate problems or

opportunities for improvement. This again illustrates that a quality system is itself affected by the culture of the organisation in which it is implemented.

First, a tenet of quality system management is that every individual is responsible for his or her activities. However, in some organisations a criticism of a work practice may be interpreted as a criticism of the responsible staff member or manager; finding a weakness in a work practice is synonymous with finding a problem with the individual. Confusing a problem with a person may make the problem difficult to pursue, particularly if the responsible person is in a position of authority. Within a small organisation, even if the person discovering the problem is the leader, because of the leader's close identification with the organisation, the leader (perhaps unconsciously) may be unwilling to delve into the issue. In both situations, it may be psychologically tempting to attribute problems to external factors. Even in organisations that would rate moderate to low on Hofstede's (1997) power-distance index, this may be staff members' more politic action.

Second, recognising a weakness in a work practice should generate corrective action. Fixing the problem will require staff time and perhaps other expenses. Particularly in small companies, resources may be scarce and reserved for activities that will directly and immediately affect balance sheet figures. If there is a problem with a non-core activity that doesn't have this impact (for example, some forms of software testing) there may be no immediate benefit resulting from improving the activity. On the other hand, if the improvement is not undertaken, the person responsible for authorising the improvement is put in an awkward situation by being *seen* not to take action, as well as being responsible for any negative impact in the future from having not taken action.

Interpreters of data arising from KPIs should also be wary of complacency if the data are all internal, and without reference to industry benchmarks. Similarly, if a company rarely takes on new staff, has limited interaction with companies in the same industry, or does not provide on-going education and training, it is unlikely to learn about industry best practice. Under these circumstances, individuals within a company may not be in a position to recognise weaknesses within work practices. Incremental change may not keep pace with changes in the industry.

In each of the above situations, the prevailing organisational culture could limit the effectiveness of the data generated by the quality system.

### **Implications**

Ostensibly, the implementation of the IT-supported BMS at Domain Software had no effect on organisational culture. Work practices were relatively unaffected and there was little improvement in staff

satisfaction. This was despite the company's familiarity with quality management and familiarity with the software application.

The benefits were:

- The company gaining an internationally recognised qualification that is regarded by many as a useful tool to support the gaining of new business (Rayner & Porter 1991); (Weston 1995), especially in Europe and the USA.
- The BMS's ensuring that attention was regularly and systematically focused on activities critical to the organisation's well being. This was particularly valuable for those instances when activities escaped day-to-day managerial attention. While it is not possible to put a dollar value on this 'mistake proofing', it is not inconceivable that it could amount to tens of thousands of dollars or more of errors being avoided. This may be especially important in small organisations for whom losing a single large customer can be a disaster.
- Being able to show through an audit trail that 'due care' had been taken and recognised procedures followed should the company ever be sued over product quality.

The value of the BMS to the company therefore seems to be intangible, and ostensibly, an investment with poor results. However, an investment needs to be considered in terms of its outlays as well as its returns. In this case, the decisive factors are the time and cost taken to implement the BMS. At Domain Software, the implementation of the IT-supported BMS took 135 (costed at \$55,000) person-days over of six months. This excludes the time required to establish and collect the KPI data before and after the implementation. An organisation will typically take 18 months to gain ISO certification (Hockman, Grenville & Jackson 1994). The audit fee for the second-party auditor was \$1000. The market price of the software application for a ten-person license at the time was \$3000. The total cost of the implementation was thus approximately \$60,000 – much less than the costs of \$500,000 claimed by larger organisations (Baker & Rouse 1996; Zampetakis, 1994). Further details of the implementation and costs and factors affecting the implementation costs are given in Seen, Mingins and Beaumont (2000). The chief factors that facilitated the implementation of the BMS at Domain Software were the existence of well-established work practices (many of which were documented) prior to the system's introduction, management's strong commitment to BMS, the small size and focussed business direction of the company, the use of dedicated BMS software, the high level of knowledge within the company regarding BMS implementation and use and the presence of the first author to assist with many of the tasks associated with the system's implementation.

Domain Software's ability to implement its BMS at a cost and within a time frame much less than average suggests that the implementation of the BMS was worthwhile.

The implication of the experience at Domain Software for other companies is that managers need to consider very carefully where they stand before they make the decision to implement an IT-based BMS. While a company with *ad hoc* work practices may stand to gain more immediate benefit from the introduction of the BMS (Baker 1997), the same lack of procedures might hinder the implementation of the BMS and increase implementation costs. In an already well-organised business, the introduction of a BMS may bring about little practical improvement, but the same factors will reduce implementation times and costs. The value of a BMS may lie in the mistakes it prevents; its value may never be manifest. At Domain Software, its chief role was to act as a safety net by ensuring management attended to critical but not urgent activities. In a litigious society, however, being able to show that 'due care' is being taken and recognised procedures followed is essential.

### *C o n c l u s i o n*

This paper describes one set of results from the first cycle of an action research project in which the researcher helped a software development organisation design the implementation of an IT-supported BMS. As part of the project the researcher identified and applied a number of measures by which the changes brought about by the implementation of the BMS could be assessed. A baselining approach was used whereby data was gathered both before and after the implementation process to measure the changes brought about in the areas of organisational culture and customer satisfaction.

This paper reported on the organisational culture aspect of the study. Members of the software development organisation were surveyed to gain their perceptions of leadership processes, motivational forces, communication, decision-making, goal setting, quality processes and training. The results showed, for 52% of items, no change over the time of the introduction of the IT-based BMS. A statistically insignificant but positive change in the perceptions of individuals within the company was shown for 36% of items. Eleven percent of items showed a statistically insignificant but negative change in perceptions. Similarly, a review of the minutes of BRMs indicated that, apart from the changes introduced in order to implement and maintain the BMS, changes in work practices tended to be triggered more by finetuning and the implementation of preventative measures, than by major improvement. The role of the BMS was thus more precautionary than a catalyst for improvement because it ensured that management attention was regularly focused on critical processes that might otherwise be neglected in the day-to-day management of the company.

The lack of change in the perceptions of staff is attributable to a number of factors. First, the introduction of the BMS formalised existing procedures and work practices. No substantially different ways of working were implemented at the company. There were few grounds to expect that staff would perceive any major difference in the way the company was doing business. Second, the MD and owner dominated this small company. The culture of the company was a reflection of his management style. This did not change over the period of the introduction of the BMS. Third, the MD felt that the company was already operating at a professional standard, and had little need of change. Fourth, the activities of the BMS tended to ratify, rather than initiate, decisions.

In some companies, the existing culture may impede change. Recognising a need for change may be equated with defects in current work practices, which could be interpreted as a criticism of those people responsible for those work practices. Change programs require resources that are chronically scarce in small companies. The existing culture may be insular: it may not encourage looking outside the company for new ideas or to see how the company would measure up to external benchmarks perhaps reflecting changes in demand and practice. This is exacerbated if the company rarely takes on new staff or does not encourage staff to attend external training courses.

The introduction of the IT-supported BMS did not bring about major changes in the areas of organisational culture. It did provide a framework through which the attention of the MD was systematically directed at the various operations of the business. Its value thus lies in mistakes that have been avoided, or will be avoided in the future, as a result of systematic attention, and the ability to show that management has been diligent in following recognised procedures. The low cost of implementation also added to the worth of the BMS.

The experiences of this case study show that top management needs to consider very carefully its objectives for the organisation in implementing a BMS, as well as the current state of the organisation. A BMS may bring about little improvement in organisational effectiveness and culture, but this outcome may not be a drawback if the BMS can be implemented at relatively little cost, aid the organisation in gaining an internationally recognised qualification, prevent costly future mistakes, and demonstrate a professional level of management.

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### ***A c k n o w l e d g e m e n t s***

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