

# Understanding IT Management in SMEs

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**Abstract:** There is evidence in the IT literature indicating that IT management is one factor that influences IT success. In addition, there is much literature indicating that IT management is important in the SME context. However, much of this literature has focused on the important role of the owner and/or other senior managers. For example, Thong et al (1996) focused on top management support and its influence on IT success. This paper argues that top management support is only one aspect of IT management and other aspects of IT management have received little attention in studies of SMEs. The study commenced with a review of the literature which identified many different definitions of IT management. However, the broader management literature indicated that the classical functions of planning, organising, controlling and leading provide an excellent way of conceptualising the many activities involved in managing (Carroll and Gillen, 1987). The management literature also provided working definitions for the four management functions. A multiple-case study approach was then used to collect evidence from four SMEs (with between four and 50 employees). The data identified IT management practices associated with each of the four IT functions, ie, IT planning, IT organising, IT controlling and IT leading. For example, one firm had an IT committee made up of staff from different levels of the firm. Some on the committee would be assigned specific IT responsibilities, eg, training of other staff. This practice provided an example of IT organising, ie, of defining tasks and assigning personnel. Similarly, many other IT management practices were both identified and classified. The results provide a significant foundation for researchers of IT management in SMEs. For example, the conceptualisation indicates four IT management functions. Also, the definitions clarify important aspects of IT management. The study also indicated that some aspects of IT management have received little attention in prior studies. For example, while IT planning has received considerable attention, IT leading in SMEs has only been examined in the narrower context of top management support. Furthermore, few studies have examined the role and importance of IT organising and IT controlling in the SME context. Thus the study also indicates directions for future research, including the identification of IT management best practices.

**Keywords:** small business, IT management, IT management practices, accounting firms

## 1. Introduction

Although the significance of IT management in the context of small firms has been emphasised in the IT literature, so far a consensus has not been reached with respect to the definition of this construct. At present, we have a poor understanding of the concept of IT management, particularly in the small firm environment.

This study aimed to characterise 'IT management' in the context of small firms with a view to exploring the concept of 'IT management sophistication', that is, of some firms being more sophisticated than others in their approach to IT management. For example, a firm that had no agreed IT plan would be considered less sophisticated in terms of IT management than a firm that had an agreed IT plan. Similarly, a firm that did not review its IT plan would be considered less sophisticated than a firm that reviewed its IT plan annually.

The research objective was addressed using case study research of four small chartered accountancy firms in New Zealand. The case studies explored the IT management practices of small firms. The evidence was used to derive a pool of indicators that can be used to measure IT management sophistication in small firms.

This paper is organised under five sections. The literature review is presented next and then the research approach. This is followed by a discussion of the case study data and the resultant pool of indicators that characterise IT management sophistication in small firms. Research conclusions and limitations are also presented.

## 2. Literature review

This study focuses on the concept of *IT management*. As different authors define the term IT management in different ways, we start by clarifying the term *IT management*, before proceeding to discuss the concept of *IT management sophistication*. In this study *IT management* is viewed as a broad concept incorporating topics like managing the IT resource as a competitive weapon as well as the development and operation of information systems (Luftman, 2004). Thus it includes the

management of IT resources including personnel and technical infrastructure, and management of information systems. The definition recognises that some of these management processes are not carried out by IT personnel. This was particularly important for the study's focus on small firms as many small firms have no IT department (Cragg, 2002).

There have been a number of attempts by IS researchers to characterise IT management. For example, as early as 1973, Nolan referred to the important IT management activities of planning, organising and control. Planning, organising and controlling are common to many frameworks characterising IT management (Earl, 1989; Raymond and Pare, 1992; Gupta et al, 1997). However, some studies include aspects not shared by other frameworks. For example, IS/IT leadership, relationship building and business systems thinking are identified as core IS capabilities by Feeny and Willcocks (1998), but these aspects were not incorporated by others. Thus researchers have adopted a range of different dimensions to characterise IT management, indicating that there is no commonly accepted characterisation of the term IT management.

With a lack of a consensus within the IT literature, we turned to the management literature for clarification of the concept of 'management'. The management literature also shows a range of definitions of what is meant by *management*. However, many authors refer to the 'functions of management'. For example, Daft (2000) refers to the "The four management functions of: planning, organizing, leading and controlling" (p. 5). Schermerhorn (1989) uses exactly the same framework.

Overall, the IT literature shows no consensus for the term IT management. Some researchers have referred to IT management in as few as three dimensions. Others view IT management having many more dimensions. However, many frameworks incorporate three dimensions that reflect the three management functions of planning, organising and controlling. The management literature agrees with this typology but adds 'leading' as a fourth function. The study thus initially viewed IT management as the four functions of IT planning, IT organising, IT leading and IT controlling. The following brief definitions from Schermerhorn (1989) proved useful in clarifying what each function referred to.

- Planning – determining what is to be achieved, setting goals, and identifying appropriate action steps. Planning centres on determining goals and the means to achieve them.
- Organizing – allocating and arranging human and material resources in appropriate combinations to implement plans. Organizing turns plans into action potential by defining tasks, assigning personnel, and supporting them with resources.
- Leading – guiding the work efforts of other people in directions appropriate to action plans. Leading involves building commitments and encouraging work efforts that support goal attainment.
- Controlling – monitoring performance, comparing results to goals, and taking corrective action. Controlling is a process of gathering and interpreting performance feedback as a basis for constructive action and change.

### **3. Research methodology**

This study relied on the case study method. This method was found to be useful in small firm studies and also in IS research leading to theory development (Caldeira and Ward, 2002; Yin, 1994). A multiple-case design was chosen. An 'exploratory case' was followed by multiple case studies. The objective in seeking subsequent cases was to identify additional dimensions of IT management and confirm those dimensions already identified. Also, the firms were selected with the aim of covering a wide range of practices related to sophistication of IT management in the small chartered accountancy business sector.

The unit of analysis identified for the study was the individual 'firm'. Small and medium sized, independently owned and operated chartered accounting (CA) firms were targeted. Independence was an important criteria as the IT management practices of subsidiaries (or branch units) of larger organisations are often influenced by the parent organisations. CA firms were selected because CA firms allowed the study to focus on IT management sophistication rather than technical sophistication.

Most CA firms employ similar IT and use IT in similar ways. Thus choosing CA firms helped minimise distractions due to differences in technical sophistication.

The case studies were conducted in four small CA firms in Christchurch, New Zealand. These are subsequently identified in this paper as CAF1, CAF2, CAF3 and CAF4 respectively. Interviews were the primary data collection technique. In all cases, interviews were held with a partner who had a senior role within the firm, was a shareholder, and was responsible for IT. Interviews were also held with other staff with IT responsibilities. These discussions lasted about one hour each and were guided by open-ended questions. A detailed questionnaire was not used. Instead, questions were asked about the following four broad areas of IT management: planning, organising, controlling and leading, based on the literature review. The sessions were audio recorded and the content transcribed. Follow-up visits and the telephone were used to clarify matters arising from the interviews.

In addition to the four case firms, data was also collected from three IT consultants, who were closely associated with CA firms. These investigations were identified as Consultant 1, Consultant 2 and Consultant 3 (abbreviated to CON1, CON2 and CON3 respectively). These professionals were familiar with the broad range of IT management practices and other aspects such as use of technology and the issues and problems related to IT in CA firms. Such supplementary information strengthened the validity of the study through triangulation.

The background information of the CA firms investigated is given in Table 1. The total staff ranged from 3 to 50 and the number of partners ranged from 1 to 9. Two firms were using PC networks while the smallest firm (CAF2) used standalone PCs. A variety of accounting software was used by these firms. Obtaining the services of a designated IT consultant was a feature in the three larger firms.

**Table 1:** Profile of the case study firms

|                            | <b>CAF1</b><br>(CA Firm 1)                                    | <b>CAF2</b><br>(CA Firm 2)      | <b>CAF3</b><br>(CA Firm 3)  | <b>CAF4</b><br>(CA Firm 4) |
|----------------------------|---|---------------------------------|---|----------------------------|
| Number of partners         | 3   | 1                               | 6   | 9                          |
| Number of accounting staff | 15  | ½ (part-time)                   | 20  | 45                         |
| Total number of staff      | ~20   | 3 ½                             | ~25   | ~50                        |
| Computer system            | PC Network (14 pcs )  | 2 stand alone                   | IBM mini system with 14 computer terminals plus two PCs                 | PC Network (~50 Pcs)       |
| Accounting software*       | CA Systems (MYOB practice systems), moving to MS Windows base | Attache Moving on to CA systems | Customised accounting package with IBM system<br>APS for tax processing | APS                        |
| Principal Contact          | Partner (in-charge IT)  | Principal                       | Business Service Manager  | Partner/<br>Director (IT)  |
| External IT Consultant     | Yes   | No                              | Yes   | Yes                        |

(\* CA systems, MYOB, Attache, APS are PC based software packages)

## 4. Case results

This part of the paper reports evidence of IT management practices in SMEs, under the four dimensions: IT planning, IT organising, IT controlling and IT leading.

### 4.1 IT planning

*“Planning – determining what is to be achieved, setting goals, and identifying appropriate action steps. Planning centres on determining goals and the means to achieve them”.*  
(Schermerhorn, 1989, p. 20)

The cases provided considerable evidence of IT planning activities. For example, some firms had embraced a rigorous planning process. Some managers viewed this as more sophisticated than an informal, ad-hoc approach to planning. Furthermore, some firms review their IT plans to accommodate the changing needs of the firm. In one firm this review was undertaken formally every year by the senior management team. Ad-hoc reviews were conducted by a partner during the year.

*“Oh, yes definitely [we place a high priority on IT planning]; because [in the] long term whatever solution you decide on is going to be cheaper, the better plan it is”. (CAF3)*

The case studies revealed that the IT plan in a small firm may range from a simple reflection of the owner/manager, to a detailed written plan identifying requirements, time frame, cost structure, personnel requirements and possible constraints. The firms highlighted two important characteristics of a plan: they should be written and they should be comprehensive.

*“We start off saying what we intend to do for next year or two... And then we specify exactly what we need technically, what gear we need what training we need, and we set up a time table and try and work for that. “ (CAF4)*

*We have a blueprint, say for the coming year which we try and work towards. So we don't get diverted”*

*“You certainly have to know where you are trying to go to; but you have to be very flexible as well because, the ground rules change”. (CAF4)*

Many CA firms have a practice of gathering and sharing IT related information, particularly with peers. In part this reflects the requirement for all practising accountants to engage in professional development activities, which include seminars where they meet and engage with their peers. In addition, the software suppliers run user-groups where accountants share their experiences with peers from other CA firms. These formal and informal information gathering activities can be viewed as part of the planning process where information can spark a new IT project or feed into analysis, e.g., when evaluating alternatives.

*“...in the last user group they were talking about converting (from DOS environment) across onto windows. We spoke about the need for having to get the hardware right. That has been a major problem in the firms that have converted across”. (CAF 1).*

## **4.2 IT organising**

*“Organising turns plans into action potential by defining tasks, assigning personnel, and supporting them with resources”. (Schermerhorn, 1989, p 20).*

One common practice in large firms is to have an IT department with specialist IT staff, who take much of the responsibility for IT. While none of the CA firms had an IT department, some employed staff who are IT specialists, i.e., they have formal IT training, e.g., a degree or diploma in computing/IT, and their job focuses primarily on IT activities. However, most CA firms do not have an IT specialist on their payroll. Instead they tend to delegate IT duties to at least one of their staff. This person is often a qualified accountant with some IT in their education, plus on-the-job IT experience within the firm. In addition, CA firms rely on external IT support. For example, many CA firms have contracts with local computer firms who they call in on an as-needed basis to fix problems, typically operating problems.

*“We have had (trained IT staff) once. Like in any accounting firms there is always staff turnover. In the past we had two very good people that were very knowledgeable about computers. I got it (i.e. management function of IT in the firm) by default when (they) left”. (CAF1)*

*“[It is] left to me on a day-to-day basis. I [i.e., partner in-charge of IT] am the only one who does backups”. (CAF1)*

*“It's really me [in-charge of IT]. I own it, so, I basically look after that. I keep up-to-date; see what's available”. (CAF2)*

Many CA firms also have an IT committee that includes staff from different levels of the firm, and includes those with specific IT responsibilities as well as those without IT responsibilities. The IT committees have been set up for many reasons, but particularly for IT planning, adoption and implementation.

*"[We have identified a] small little IT group in our firm which; we'd say, OK, you are in charge of training and installation". (CAF4)*

*"We have two ways of managing our firm I suppose. We've a lot of staff training – external and internal; we have a small IT committee, and we work with outside consultants". (CAF4)*

Many CA practices employ the services of an IT vendor. Some firms prefer this practice over employing internal IT specialists and believe that it places them in a stronger position.

*"[We employ] one. ... He has his own firm and he would deal with network problems, installation of new hardware [and] software. If there is anything wrong with the network [or] something like that then he would come in and attend to it." (CAF3)*

In addition, CA firms use IT consultants. We use the title 'consultant' to differentiate these activities from the typically technical support activities carried out by IT vendors. IT consultants are called on to offer advice. For example, to provide independent advice about a new technology, e.g., should they upgrade to Vista? In addition, consultants are often used in the hardware and software selection process, sometimes in a significant way, e.g., as project manager, and to make a recommendation after identifying possible alternative systems.

While many CA firms have an IT committee, and when needed create an IT project team, they also need to maintain relationships with external IT providers like consultants and vendors. This is another important aspect of organising, as it reflects a mechanism for co-ordinating tasks.

### 4.3 IT controlling

*"Controlling – monitoring performance, comparing results to goals, and taking corrective action. Controlling is a process of gathering and interpreting performance feedback as a basis for constructive action and change". (Schermerhorn, 1989, p. 20)*

The CA firms provided considerable evidence of monitoring practices, including procedures for staff. The monitoring practices in some firms reflected strong involvement of staff, and some of the monitoring was conducted by external providers. The firms monitored IT projects using a mix of both formal and informal techniques. For example, it was common for any IT committee to seek progress reports on IT projects.

*"We've got meetings with all the staff every fortnight and computers is one of the issues that is discussed every time. Probably our monitoring is based on identifying how many problems we have... if it is running smoothly. We are OK". (CAF1)*

The controlling activities included procedures that had been devised and implemented. In particular, data security was an issue, partly because CA firms hold and analyse financial data for clients. Some firms took few risks with this data.

*"At the moment internally we don't really have much [internal] security. Our systems are open; Just about everyone in the office can actually look at anything in the system." (CAF4)*

Other examples of procedures include version control, when to replace hardware, and who has internet access.

*"There is no control over what software has been loaded on the PCs... there is often different versions of all software on all the PCs depending on when they brought them". (CON2)*

Procedures also relate to the IT adoption process. For example, to increase project success, CA firms monitored their IT implementation plans.

Many CA firms also provide training to their staff. Providing training can be viewed as part of the firm's policies and procedures that ensure high quality work, ie, to minimise risks and increase the chances that things will go well in the future.

*"Yes, we do [value staff training on IT very much and spend a lot of money on training.] I think more time than money". (CAF4)*

#### **4.4 IT leading**

*"Leading – guiding the work efforts of other people in directions appropriate to action plans. Leading involves building commitments and encouraging work efforts that support goal attainment". (Schermerhorn, 1989, p. 20)*

The case studies indicated that the leadership qualities of managers have a strong impact on the effectiveness and efficiency of the IT systems of the firm. Reference was made to a number of broad issues of leadership and the leadership qualities of managers relating to IT. The cases showed that top management involved themselves in many different ways. Strategy and planning was one key area with a partner often in charge of IT.

*"High priority [is given] to the [IT review] team". (CAF3)*

One firm displayed a strong IT management focus that had eliminated people whose attitude towards IT was not supportive. Encouraging and promoting positive attitudes and ensuring staff satisfaction are characteristics of strong leadership.

*"They (partners) have just said go with it (new IT proposals). So they've been very supportive". (CAF4)*

There was also evidence of senior managers taking responsibility for IT by, e.g., 'pushing IT staff':

*"If some one does not push people in the [IT] team, they would just reach the comfort zone and stay at that level I think". (CAF4)*

Some IT partners were also very close to operational issues. For example,

*"It's really me [in-charge of IT]. I own it, so, I basically look after that. I keep up-to-date; see what's available". (CAF2)*

Small CA firms do believe that staff training on IT is important for success. For example, some firms had regular training programmes and placed a high priority on staff training.

*"Yes, we do [value staff training on IT very much and spend a lot of money on training.] I think more time than money". (CAF4)*

## **5. Discussion**

The most important contribution of this study is that it identified four dimensions that characterise IT management sophistication in small firms: IT planning, IT organising, IT controlling, and IT leading. To a large extent, this major finding conforms with past research findings. For example, IT planning, IT organising and IT controlling have been identified as three major dimensions that determine IT management in the context of large firms (Earl, 1989; Gupta et al., 1997; Nolan, 1973) and in small firms (Raymond and Pare, 1992). Also, leading has been well recognised as a function of management within the management literature (Schermerhorn, 1989) and within a growing body of IS literature (Feeny and Willcocks, 1998; Karahanna and Watson, 2006).

However, of the eight studies that attempted to define IT management that were identified in the literature review, only Feeny and Willcocks (1998) refer directly to IT leadership as an important dimension of IT Management. Thus IT leading has not been regarded as a major sub-dimension of IT management by past researchers, although others have referred directly, or indirectly, to this aspect of managing information technology. For example, Caldeira and Ward (2002) recognised the importance of managerial skills in gaining IT success in SMEs. Gupta et al. (1997) had a measure related to the leading role of top management under IT integration (i.e. *"In my firm, top management perceives that future exploitation of IT is of strategic importance"*). Although the small firm instrument

by Raymond and Pare (1992) has a measure of *top management involvement*, it did not treat IT Leadership as a major factor. This study indicates that IT Leadership is a major aspect of IT management sophistication in small firms. This important finding supports many prior studies of IT in small firms, e.g., Caldeira and Ward (2002), Cragg (2002).

Compared to IT Planning, relatively much less IS research has examined the concept of IT Organising, although many authors discuss aspects of topics like IT outsourcing, IT governance, and the structure and location of the IT department (Earl, 1989; Gupta et al., 1997; Nolan, 1973). Of three existing instruments, only Raymond and Pare (1992) paid much attention to IT Organising.

This study focused on small firms, unlike most prior studies of IT management. Importantly, the study provides evidence that dimensions of IT management discussed in the large firm IS literature are also applicable in the context of small firms, i.e., IT planning, IT organising, IT controlling and IT leading.

Another significant contribution of this study is that it identified indicators of the four dimensions that make up IT management sophistication in small firms. Importantly, these indicators could be used by other researchers to, for example, examine all or a selection of the dimensions. However, other researchers must recognise that further testing should be conducted on the indicators, for example, of validity and reliability using survey type data.

## 6. Conclusions

This study of IT management sophistication within small firms identified many indicators of IT management sophistication in SMEs, covering the four dimensions of IT planning, IT organising, IT controlling and IT leading. These results fit well with the findings from past research. Many of the indicators relating to planning, controlling and organising have been used in prior research to characterise IT management sophistication. IT leading emerged as a relevant factor of IT management sophistication in small firms according to the current study. Past research and the case study evidence also supported the inclusion of indicators pertaining to IT external expertise.

The study's major contribution is the characterisation of IT management as four dimensions. This understanding can help IS researchers characterise 'IT management sophistication in small firms' and further explore the relationships between this and other related constructs, such as IS success, IT enabled organisational performance, and competitive advantage. The characterisation may also help practitioners determine strengths and weaknesses of IT management in small firms. These results could then be used to help formulate appropriate strategies aimed at improving IT management sophistication in a small firm.

A major limitation of this research was the restriction of the study to four small and medium sized chartered accountancy firms in New Zealand. Given the diversity within the small business sector, this element restricts the generalisability of the findings. Furthermore, most of the firm level data was collected from one senior person within each firm, who could present a biased view of IT management within their firm.

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