A MULTIDISCIPLINARY APPROACH TO ASSESS READINESS FOR CHANGE IN ENTERPRISE SYSTEM IMPLEMENTATIONS

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Abstract
Enterprise systems are information management systems that have broad business functional scope. They provide companies with the ability to improve information flows across the entire organisation enabling improved decision making and action. Although companies face numerous complexities in enterprise system implementations, examination of critical success factors (CSF) has provided insight into successful implementation practices. The main CSFs affecting enterprise system success are people related. In this paper we will identify these factors in the context of change management. A path model is developed incorporating I/O and psychology disciplines demonstrating individual contextual and implementation variables implicated in implementation success. Further, we argue that consideration of antecedents and interactions are essential for understanding change impacts and for development of an effective change management strategy.

Keywords: (Enterprise systems, critical success factors, organisational readiness, change management, resistance, self efficacy)
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INTRODUCTION

Many companies consider enterprise systems as essential infrastructure for daily operations and a critical foundation for business transformation. This belief was especially true during the 1990s when such enterprise systems as Enterprise Resource Planning systems (ERPs) became the standard replacement for legacy systems particularly in multinational companies (Parr & Shanks, 2000). The impetus was especially pronounced in the years proceeding C2000, which signalled a catapulting of these systems into businesses in order to achieve Y2K compliance (Davenport, Harris & Cantrell, 2004; Parr, Shanks & Darke, 1999).

ERP systems are packaged software applications that are integrated, modular, have broad business functional scope and are responsible for transaction processing in a real time environment (Hawking, Stein & Foster, 2003). ERPs enable companies to integrate disparate systems enabling improved information flows within and across complex organisations. This connectivity of information flows allows managers to make timely decisions based on data that accurately reflects the current state of their business (Davenport et al, 2004). ERP systems have evolved over the years as companies requirements have changed so that the system’s focus has moved from only supporting internal transactions to now encompassing transactions with external stakeholders. Additionally these systems support customer relationship management (CRM), supply chain management (SCM), supplier relationship management (SRM) and product lifecycle management (PLM) functionality. As well as being integrated with business intelligence solutions, the evolutionary nature of these systems has resulted in the introduction of new terms including ERP11, enterprise systems and enterprise wide systems. Although there is a tendency for many authors to use the terms interchangeable, ERP systems tend to have a more limited focus on transaction processing. For the purposes of this paper the term enterprise systems will refer to ERP systems and enterprise wide systems.

The benefits that enterprise systems provide organisations have been well documented; such systems are essential for modern businesses (Davenport, 2003; Hammer, 1999; Hawking et al 2003;
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Markus et al, 2001; Somer & Nelson, 2001). However, these systems are complex and for many companies, implementations are associated with project overruns and lack of benefit realisation. Themistocleous and colleagues (2001) found that 66% of ERP system implementations incurred a cost overrun while 58% were delayed. This impact was further supported by a Standish Group report which found implementations took 2.5 times longer than companies expected and only achieved 30% of the promised benefits (Krumbholz et al, 2000). Markus (2004) concludes that ERP system implementations “are notorious for their implementation challenges and problematic organisational consequences” (p5).

The very nature of enterprise systems causes enterprise wide business process changes, job redesign and often an associated reduction in head count (Davenport, 2003). It is clearly evident that these are direct employee impacts. It has been estimated that as many as 75% of organisational change efforts involving technology fail as a result of people’s negative reactions to changes in their work, organisational business processes and in their technology leading people to resist the change (Markus, 2004). Consequently, it is the way in which staff are enabled to positively adapt to this change in their work practices, that has been identified as one of the leading critical success factors in successful implementations; the associated interventions are referred to as “change management” (Aladwani, 2001; Bingi, Sharma & Godla, 1999; Davenport, 2003; Frederico, 2000; Hammer, 1999; Markus et al, 2000; Markus & Benjamin, 1997; Nah & Kuang, 2001; Shang & Seddon, 2000; Somer, et al, 2001).

Clearly information technology provides the catalyst for change. Markus (2004) insists that using IT to trigger major organisational changes, creates high-risk, potentially high-reward situations. She refers to this as “technochange”. It is argued that implementing enterprise systems invoke major technological and organisational changes. In some cases this may well be a deliberate strategy to drive organisational change. A chief executive of a bathroom products manufacturing organisation, explained that his company ‘were implementing an ERP to provide a common technology platform to enable an integrated data system allowing access to real-time data and thus gaining a competitive advantage. The system was to be ultimately rolled out to all manufacturing companies within the Group. However, the CEO was adamant that the business benefits of using the system were not the
primary concern for the implementation, although he acknowledged this would most likely be a by-
product of this system’s implementation over time, it was to be the change in how they conducted their
business that was the driver behind this new technology.

Markus (2004) acknowledges that unlike projects that focus on improving technical
performance, technochange involves greater potential impacts on ‘the users’ (people processes and
organisational performance) and alters organisational behaviour significantly. She contends that these
systems require a different kind of attention to the ‘features of the solution’ and a different change
process from those prescribed by either IT project management or organisational change management
alone (p5).

As an outcome of this, two matters need to be addressed. First, does technology change differ
from general change management, and if it does, in what ways and how are these factors expressed in
possible change management models? Second, does technology impact different constituents in
different ways? Research in this area is important, as we argue that by extracting those aspects of a
change model that relate to particular groups of stakeholders, it is possible to determine their relative
importance for implementation success through being able to predict and therefore manage adjustment
to the new technology that was enlisted to enable change.

This paper will initially draw on enterprise system CSF literature which clearly identifies the
main success factors as being people related providing a direct link to change management. Change
management in this context will be defined and consideration will be given to the relationship to
change bought about by the impact of enterprise systems. Following on from this we will discuss, in
detail, the major organizational psychology concepts that are implicated in IS change management.
We conclude this discussion with an emergent conceptual path model of antecedents, individual,
contextual and implementation variables influencing organisational readiness for change. This
model provides the basis for further research and theorising

**CRITICAL SUCCESSFUL FACTORS**

The identification of necessary factors in order to achieve a successful implementation of an
enterprise system (known as critical success factors - CSF) is of great importance to many
organisations. Enterprise systems require configuration and implementation often over a period of many months or years (Deloitte Consulting, 1999). This process is lengthy and expensive and will usually include extensive business process reengineering either pre or post implementation. Subsequently, the failure to meet business deadlines and budgets and the inability to achieve business benefits from the new system, may often result in substantial financial loss (Parr, Shanks & Darke, 1999).

Rockart (1979) argued that “Critical success factors are, for any business, the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization. They are the few key areas where "things must go right" for the business to flourish. If results in these areas are not adequate, the organization's efforts for the period will be less than desired. As a result, the critical success factors are areas of activity that should receive constant and careful attention from management (p85)”.

In order to provide a foundation to help practitioners in their ERP implementations, numerous critical success factors have been identified in the literature over the last ten years. These have included: top level management support and commitment to the change, clearly defined and implemented communication avenues, presence of a top level sponsor, avoidance of customisation, including key personnel on the project team, good project methodology with clear milestones, providing appropriate end user training with ongoing support, well written and complete needs analysis reports, organisational culture change and process reengineering (Aladwani, 2001; Bancroft, 1998; Bingi et al 1999; Davenport, 2003; Frederico, 2000; Hammer, 1999; Markus et al, 2000; Markus et al, , 2000; Nah & Kuang, 2001; Shang & Seddon, 2000; Somer, et al, 2001).

Although these critical success factors are associated with enterprise wide implementations, some have been identified as being more critical than others. Parr and colleagues (1999) identified critical success factors associated with ERP system implementations from the extant literature. Using a detailed analysis methodology, three major factors necessary for a successful implementation emerged; management support, a project team with the appropriate balance of technical/business skills and commitment to the change by all stakeholders. From this finding, Parr and colleagues (1999)
cautioned project managers “that proceeding with an implementation when one or more of these factors are missing will lead to budget blow outs and time over-runs” (p45).

Managing technology change has always been problematic, but it appears that without major factors to support this change the success of the implementation will be jeopardized. Further research into the literature has confirmed the above findings but has also identified additional critical success factors such as: top management support (including a champion), strong project management and project team competence, interdepartmental cooperation and communication, and commitment to change. The one common denominator is that they are all people related and by definition are directly implicated in change management. Several of the critical success factors such as change management have been ranked at varying levels of importance by some authors; for example research outcomes by Somers et al (2001) ranked change management at #19 whereas Bancroft and colleagues (1998, quoted in Yang, 2004) ranked it at #8. The determination of importance of change management may be related to differing definitions and understanding of the term as well as the contextual matters (company, participants, implementation phase etc) and its link to the technology. Yang (2004) acknowledges that change management as a critical success factor must include: training and education of stakeholders, managing communication, positively influencing organisational readiness for change and post go-live support.

CHANGE MANAGEMENT

Change management is a broad term, which encapsulates many activities and is interpreted differently from company to company. Nah & Sieber (2001) define it as:

“the effort to manage people through the emotional ups and down that inevitably occur when an organisation is undergoing massive change”

In the context of change and technology, Goff (2000) defines change management as:

“a planned approach to integrating technological change. This includes formal processes for assessing the impact of the change on both the people it affects and the way they do their jobs. It also uses techniques to get users to accept a
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"change caused by technology and to change their behaviour to take advantage of the new IT functionality". (p.35)

The second definition identifies a contextual focus for change management, being spurred by the introduction of new technologies that require a particular form of change to work practices - specifically because of the technology. Congruently, there will be flow on effects to the way people work and behave within an organisation and across organisational boundaries due to changes in organizational forms, structures and relationships.

Previous research in Australian organisations suggests that despite what is known about change management in general and technology change in particular, there is a reductionist attitude to managing technology compared to other changes. For example, one such study indicated that in many cases respondents were very aware of the importance of effective change management in ERP implementations (Foster, Hawking & Stein, 2004). However, notwithstanding this awareness, and their high position in the company, many senior IT executives felt that their companies struggled with change management issues. Noteworthy also, is that many of the companies involved were onto their 4th or 5th enterprise wide system implementation/ upgrade but continued to fall short on the effort required for the change process. It is not clear what factors lead to such slow managerial learning in IT implementations where the steps are clearly known and where IT staff have crystal understanding of issues. A qualitative question in this survey required IT professionals to provide a short description or definition of change management in order to assess their understanding of this concept (Foster, et al, 2004). From an analysis of the descriptions, an aggregated definition was developed:

Change management is defined as the process of assisting the organisation in the smooth transition from one defined state to another, by managing and coordinating changes to business processes and systems. Change management involves the effective communication with stakeholders regarding the scope and impact of the expected change; formal processes for assessing and monitoring the impact of the change on the stakeholders and their work processes, and identifying and developing effective and appropriate techniques to assist stakeholders to cope and adapt to the new technology.
This definition although in line with Goff’s (2000) definition, builds on descriptors and definitions from 38 respondents highly involved in enterprise system implementations. More specifically it is argued that this definition is inclusive in that it clearly identifies some of the main critical factors involved in change management and takes a holistic approach. The definition applies to change management in a specific condition; that of technology change. Markus (2004) in her paper on Technochange management, questions the organisational change management literature by asking “how IT alters the problem of organisational change”. She goes further by stating that although organization change management activities can play a very helpful role in successful technochange, they are not sufficient because they do not address the unique aspects of IT-driven organisational change (p6).

We argue in this paper that change programs must establish positive attitudes towards the use of new technology, by identifying employees as one of the most important critical success factors associated with enterprise wide systems implementation (Markus et al, 1997). Factors impacting on the outcome of a major technology implementation: include user satisfaction, job uncertainty, anticipated change in skill set, change of power structure, lack of control, organisational readiness for change (culture) and the impact of various antecedents (Wilson-Evered & Hingston, 2005; Wilson-Evered, Hartel and Rowe, 2003). Many of these factors although impacted upon by a successful change management strategy, evolve from psychological factors implicated in adjustment to change. It is these individual differences and contextual factors that are implicated in technology change and can

Aladwani (2001) asserts that effective implementation of information systems requires the establishment of five core competencies, among which is the use of change management strategies to “promote the infusion of the information system into the workplace” (p32). Hammer (2000) refers to this process as “organisational reengineering” and argues that an essential precedent to any change management strategy is the building of a culture for change.

From a psychological perspective, to develop and influence the emotional capability of organisations as a resource to facilitate change is an important break through in change management strategies (Salovey & Mayer, 1990; Schein, 1988). Cultural theorists argue that the values, beliefs, assumptions, perceptions, behavioural norms, artefacts and patterns of behaviour that are shared by
members of an organisation operate unconsciously, and fashion an organisation’s view of itself and its environment (Handy, 1996; Schein, 1988). The organisational culture is crucial, therefore, in shaping and guiding the decisions and actions of the members of the organisation. There is a crucial need to understand an organisation’s culture in designing and implementing successful change initiatives of any nature (Handy, 1996; Schein, 1988).

Typically, change management theories have focussed on the prerequisites needed for successful change management practices and the consequences of not having these. However, seemingly this knowledge has not been translated into effective change management programs in IT implementations (Boonstra & Gravenhorst, 1998; Mabin et al, 2001). A study conducted into work teams found that although a variety of factors have been identified as important in the successful implementation of work teams, much less is known about the relationship between employees’ attitudes and their perception of organisational readiness to undergo a large-scale change (Eby, Adams, Russell & Gaby, 2000).

**Organizational Readiness for Change**

Although an ‘old’ theory, readiness for change can be explained by Lewin’s (1951) concept of unfreezing – the process by which organization members’ beliefs and attitudes about a pending change are altered so that members perceive the change as both necessary and likely to be successful and thereby provide support (Eby et al, 2000). This explanation suggests that individuals have preconceived notions about the extent to which the organization is ready to undergo the change. These perceptions are likely to develop over time and, among other things, will be impacted by the culture, reason for change and employee relationships, attitudes and beliefs. Readiness for change is conceptualised in terms of an individual’s perception of a specific facet of his or her work environment and the extent to which the organization is perceived to be ready to take on large-scale change such as that invoked by an enterprise system (James & James, 1992; Cunningham et al, 2002).

Three factors are derived from readiness for change research; a demonstrable need for change; a perceived sense of one’s ability to successfully accomplish change (self-efficacy); and an opportunity to participate in the change process. Together, these three factors, contribute to readiness for organizational change (Cunningham et al, 2002: p377). Clearly training, assessment of job role
change and process knowledge as well as end-user competency are key components of change readiness. The preceding explanations suggest that the readiness of the organization to accept change rests principally on individuals within the organization who impact the change process. That being the case, it is evident that change management in ERP or other organizational wide interventions are largely based on people management. What distinguishes technology change from other change is their unique impact on the job a person does, and the attendant impacts on job role change. Therefore, an implementation will be effective, contingent on individuals in the organization supporting and engaging with the change process and managing change at an individual constituent level: For example a manager of an area will need to be influenced to lead the change whereas, a worker using the new technologies will need much deeper consideration in terms of their job role change, training needs and reskilling. Key constituent support can be enabled by an effective change management strategy tailored to match the needs of each group.

At the individual level, predictors of readiness for change include; the type of job roles (passive or active) (Cunningham et al, 2002), level of autonomy (Sehgal & Stewart, 2004), employee attitudes and motivation and judgements about the change agents and leadership, the change network and their work teams (Cunningham et al, 2002; Eby et al, 2000). Other influences include dispositional variables such as openness to change and conscientiousness (McCrae & Costa, 1999) and training, participation and communication (Wilson-Evered & Hingston, 2005).

In the lead up to large-scale change, there are multiple complex influences at play impacting on the perceptions that the organisation might not be ready for the change effort. These influences manifest in uncertainty, ambiguity in roles and responsibilities and in many cases, information overload (Cummings & Huse, 1989). To deal with this chaos and ambiguity, employees attempt to make sense of their environment and draw conclusions about the possible outcomes of the change initiative. Through this process, employees will form impressions about the organisation’s likelihood of sustaining and thriving under change conditions. (Eby, 2000) These perceptions are conceptualised as existing on a continuum from viewing the organisation as capable of withstanding change and successfully adapting to believing the organisation is not ready to undergo such change. However,
such perceptions change overtime and can be influenced by the organization’s change management strategy and an individual’s response to the change.

**Resistance to change**

Perceptions of individuals play a fundamental role in the process of change and in the creation of resistance. Successful management of resistance to change is critical for the positive outcome of an implementation but is often the least acknowledged or understood by implementation teams (Rampton, Turnbull, Doran, 1999). Resistance can be defined as an expression of reservation, which normally arises as a response or reaction to change (Block, 1989). Resistance can be caused by individual factors, group factors and/or organisational factors and has been acknowledged as being a fundamental impediment to change and one of the prime reasons why information systems implementations often do not succeed or do not provide the desired outcomes (Mabin, Forgeson & Green, 2001)

A review of the early literature on resistance to change identified the first known publication by Coch & French (1948) in which was used the term ‘resistance to change’. (Dent & Goldberg, 1999). These authors’ “preliminary theory (was) that resistance to change is a combination of an individual reaction to frustration with strong group-induced forces and that participation is the primary method to overcome resistance” (p31).

Two fundamental sources of resistance are associated with change (Sheth, 1981). The first source is perceived risk which refers to one’s perception of the risk associated with the decision to adopt the enterprise system. In other words, the perception of risk shapes the way in which this new system will affect a particular person. In Australia, one of the expected benefits of implementing such a system is a reduction in employee numbers (Deloitte 1999). Whereas beneficial for the company, for an individual this ‘business benefit’ would be construed as a perceived risk. The other source of resistance is habit. This behavioural repertoire refers to current routine practices with which an employee feels comfortable. The impact of change, especially at the individual job level implied in new technologies, is often associated with the loss of control, routines, traditions and relationships, resulting in resistance to the change (Isabella, 1990; Kanter, 1995). The nature of enterprise wide
systems and their impact on work and process redesign are the likely catalyst in changing the way employees perform their routine duties.

Resistance may be viewed in a number of ways; as politically motivated; as a constructive counter-balance to organisational change; or as the manifestation of difficulties in cognitive restructuring experienced by employees (Mabin et. al, 2002). Some authors view resistance as an unavoidable and natural behavioural response to the perceived threat of change. Other writers frame resistance as problematic – something to be managed and “overcome” to ensure the success of change. In other words, resistance is seen as something which is undesirable. This natural response is much less often recognised as something to be utilised to support a successful change initiative (Dent et al, 1999; Mabin et al, 2001). Dent and colleagues (1999) comment that “overcoming resistance to change has become a universally understood psychological concept in which resistance is sited within the individual and the manager’s task is to overcome that resistance” (p34).

An exception to this view of resistance is provided by Waddell & Sohal (1998). These authors reviewed the traditional views on resistance over the last 50 years and compared them with current practices. Drawing on research from the 1960s and 1970s, they identified resistance as having many advantages: avoidance of group-think, a way of providing alternative ideas for consideration, and initiating a wider set of people to be involved in the evaluation of alternatives. Such an approach may overcome the managerial approaches to managing change and poor success rates. In taking this view, managers no longer experience resistance as a problem - with its inherent difficulties for everyone - but as a normal reaction in organizational life, that with good management will eventually resolve. Similarly, Waddell et al (1998) argue that managers often correctly assess the level of resistance they expect to encounter but fail to determine its nature and possible benefits. When resistance to change is seen as something to be utilised, it provides a pointer to areas requiring consideration, and provides energy and a driver of innovation for change.

More specifically, areas of potential resistance have not been fully understood in terms of impact and importance. Waddell and colleagues (1998) identify a notable absence of change management models and theories that actually incorporate the possibility that resistance has a value and use that can link successfully into an information systems implementation.
Viewing the organization as capable of managing the change is important for staff and impinges on appraisal of self-efficacy.

**Self Efficacy**

Self efficacy is a key construct for understanding and evaluating behaviour change and abundant research has been conducted to explain the role of this construct as an antecedent and consequence in the change process (Bandura, 1977; Bandura, 1982; Bandura, 1988; Bandura, & Schunk 1981; Bell & Kozlowski, 2002; Cunningham et al, 2002; Eby et al, 2000; Gist, 1986; Gist & Mitchell, 1992; Gist, Schwoerer & Rosen, 1989; Lee & Bobko, 1994; Locke, Frederick, Lee & Bobko, 1984; Schaubroeck & Merritt, 1997; Schunk & Gunn, 1986; Stajkovic, & Luthans, 1998a; Stajkovic, & Luthans, 1998b).

Self-efficacy is defined by Bandura (1986) as:

“people’s judgments of their capabilities to organise and execute courses of action required to attain designated types of performances. It is concerned not with the skills one has, but with the judgments of what one can do with whatever skills one possesses” (p391).

Self efficacy (perceived or actual) is a key variable to ascertain employee readiness for change. Gist and colleagues (1992) argue that people who think they can perform well on a task do better than those who think they will fail (Lee et al, 1994). Differences in self-efficacy are associated with differences in skill level; however, efficacy perceptions may also be influenced by differences in goal orientation, personality, motivation and the task itself. Research has identified that past performance is a major determinant of self-efficacy (Locke, et al., 1984). Further, some training methods can enhance self-efficacy in the areas of self management, cognitive modelling and behavioural modelling (Gist, 1992; Gist, et al, 1989; Lock, et al, 1984). Self efficacy has been associated with job self efficacy (Stajkovic et al, 1998a) and computer self efficacy (Compeau & Higgins, 1995; Henry et al, 1999; Hill, Smith & Mann, 1987; Saengratwatchara & Pearson, 2004; Serino & Kacmar, 2004; Vician & Davis, 2004).

Self efficacy can be viewed in a number of ways (Gist et al, 1992; Bandura, 1988; Bandura & Wood, 1989; Wood & Bandura, 189b; Bell, & Kozlowski, 2002). First, self-efficacy is considered to be a judgment of perceived capability for performing a specific task for example in an organisational
context, information derived from the individual, the work task and others in the work environment may contribute to the comprehensive assessment of capability. Second, a person’s judgement of their efficacy changes over time as new information and experiences are acquired (Gist et al, 1992). Third, individuals who have the same skills may perform differently based on their ability and goal orientation (Bell et al 2002). Individuals hold either a learning or a performance orientation towards tasks (Higgins, 1997). A learning orientation is characterised by a desire to increase ones competence by developing new skills and mastering new situations. In contrast, performance orientation reflects a desire to demonstrate one’s competence to others and to be positively evaluated by others. The two types of goal orientation differentially influence individuals in terms of their response to task difficulty and failure (Bell et al, 2002; Button & Mathieu, 1996). Bell and colleagues research (2002) found that learning orientation was positively related to self-efficacy, performance and knowledge, whereas performance orientation was negatively related to performance only.

Using Stajkovic and colleagues’ (1998a) definition: self efficacy refers to an individual’s convictions (or confidence) about his or her abilities to mobilise the motivation, cognitive resources and courses of action needed to successfully execute a specific task(s) within a given context (p 66).

The authors argue that human performance in organisations is especially affected by the self efficacy of its staff. Employees who perceive they have low self-efficacy are likely to cease their efforts prematurely and fail at the task. Self efficacy is not a static concept but is dynamic, changing over time as new information and task experiences are assimilated (Bandura, 1982; Stajkovic et al, 1998b; Gist, 1986). Research indicates that this change can be positive if the person is given appropriate support for their needs (Gist 1992; Bandura 1982).

Judgments about efficacy become more routinised and automatic as experience with a task increases. For example, when tasks are novel, changes have taken place in the person or task which affect performance. Alternatively, when the task is salient or important to the person, a more detailed analysis is likely (Bandura, 1982; Gist, 1986). In these situations, a person may assess in depth the task demands, the environmental constraints and support and his or her own attributes and feelings when forming self efficacy (Lee et al, 1994; Bandura, 1982; Gist, 1986). However, under routine circumstances, the individual may refer to his or her previous performance level and utilise that level
as the primary determinant of self efficacy. On the other hand, self efficacy maybe formed by a combination of these two areas (Hill et al, 1987). It is possible that self-efficacy could mediate the relationship between a person’s learning style and their readiness for change. However, there is no evidence of such an application to technology change in the extant IS literature.

In short, from the literature considered to this point, we suggest that the success of implementation will be influenced by a range of individual variables (eg learning style, self efficacy and job role factors) which interact with contextual variables (organisational capability to manage the change) and this relationship will be moderated by implementation variables (for example training for new technology, job role redesign, communication and participation in the change) to result in readiness or resistance to change and uptake of the new technology.

Our review enables us to answer the question posed at the beginning of this paper. First, we argue that technology change is different to general change management and therefore warrants specific consideration and development of models that explicate those differences. Second, the different impacts for different people is likely to be pronounced in technology change as there is substantive differences for the end user of the new technology in terms of job role change impacting self-efficacy and well being. Third, at the organizational level, a set of variables are implicated in determining perceived competency by employees to manage technology change (organizational efficacy). The implicated factors include change leadership, leaders understanding of the new technology and leaders’ ability to address the unique needs of different stakeholders groups impacted by the introduction of the new technology. The interaction of these collective antecedents at individual and group level will determine the success of the implementation as expressed in the outcomes in Figure 1. below and are designed to answer hypotheses upon which the research will be established.

**Theoretical path model**

Figure 1 demonstrates a simplified path model broadly outlining the predictive relationships among individual contextual and implementation variables implicated in implementation success. And offers an explanation for the way in which individual and contextual variables interact to impact technology change. Examining the predictive relationship among these variables within different groups affected by the implementation will reveal pathways to implementation uptake by stakeholders.
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(end user, manager, IT support, change leader etc). We also argue that consideration of antecedents and interactions are essential for understanding change impacts and for development of an effective change management strategy.

As previously discussed critical success factors are implicated in a successful change strategy. It is therefore important that this model reflects the importance of identifying these factors in the change strategy. Authors are unequivocally aligned in their appraisal of the crucial success factors in technology implementation. This agreement allows for the emergence of a typology of success factors as they coalesce with change management constructs. Future research should test the model through a mixed qualitative and quantitative methodology derived from and integrating both information systems and psychological theories and approaches.

CONCLUSION

Enterprise systems have provided a focal point for researchers. This focus is due in part to their broad functionality and perceived ability to provide organisations with a competitive advantage, lower productivity costs, improve information flows and reduce unnecessary processes. However, for many organisations their perceived benefits were often difficult to attain; some implementations being painful and protracted and costs often outweighed the benefits in the short term. The many problems associated with such large scale implementations have been attributed to the lack of attention to critical success factors in the main phases of the implementation. By analysing the CSF literature it...
was found that the main CSFs are people rather than technology related. These are directly implicated in change management, a CSF that has been identified across implementation reviews and research. Lack of attention to managing the human aspect of change, therefore, is a failing noted by many authors.

Although the CSF literature identifies change management as a critical success factor, little clarity is offered on the implicated constructs to inform recommendations for practitioners in the IS community as well as CIOs/CEOs of businesses. The organisational psychology discipline offers extensive research and frameworks on organisational change management and some limited reference to the variables associated with the successful implementation of information systems (Wilson-Evered, & Hingston 2005; Wilson-Evered & Hartel, in press). A cross-disciplinary approach whereby organisational psychology theories and measures are applied to information system implementations could provide a foundation for deeper understanding of change management in technology implementations. A simplified path model broadly outlining the predictive relationships among individual, contextual and implementation variables implicated in a successful change initiative should provide the basis for identifying the constructs that underlie a change readiness organisation. Such understanding could inform implementation interventions and improve enterprise system implementation and subsequent benefit realisation.
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