Facilitating unlearning during implementation of new technology
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Abstract
Purpose – One of the critical issues for change management, particularly in relation to the implementation of new technologies, is the existence of prior knowledge and established mental models which may hinder change efforts. Understanding unlearning and how it might assist during organizational change is a way to address this resistance. The purpose of this paper is to present research designed to identify specific factors that facilitate unlearning.

Design/methodology/approach – Drawing together issues identified as potential influencers of unlearning, a survey questionnaire was developed and administered in an Australian corporation undergoing large-scale change due to the implementation of an enterprise information system. The results were analyzed to identify specific factors that impact on unlearning.

Findings – Findings from this paper identify factors that hinder or help the unlearning process during times of change including understanding the need for change, the level of organizational support and training, assessment of the change, positive experience and informal support, the organization’s history of change, individual’s prior outlooks, and individuals’ feelings and expectations.

Research limitations/implications – The use of only one organization does not allow for comparisons between organizations of different sizes, cultures or industries and therefore extension of this research is recommended.

Practical implications – For practitioners, this paper provides specific elements at both the level of individuals and the organization that need to be considered for optimal unlearning during times of change.

Originality/value – Previous literature on unlearning has been predominantly conceptual and theoretical. These empirical findings serve to further an earlier model based on qualitative research into potential influencers of unlearning.

Keywords Change management, Innovation, Communication technologies, Information systems, Australia

Introduction
Technology continues to be a driving force of change in business and indeed in society at large. The introduction of new technologies in the workplace continues to be a challenge for managers and change practitioners alike, and the requirement to effectively handle such changes does not appear likely to diminish any time in the near future. In 2005, it was conservatively estimated that over US$1 trillion was spent on information systems (IS) projects worldwide (Charette, 2005). IS projects often involve the implementation of systems, infrastructure, services, and technology that have not previously existed in an organization, bringing with them alterations to organizational practices and structures, and are often considered radical change for the organization. It is recognized however that many of these projects end in failure (Cozijnsen et al., 2000), or at least fail to deliver
the anticipated or projected outcomes. Although these failures are the result of a range of factors (Nash et al., 2001), it is argued in this paper that some of these failures could have been less disastrous if the organization had put in place a change management process that took into account unlearning.

A change in an enterprise information system (EIS) impacts upon a wide range of practices and procedures and requires those within the organization to behave differently if the changes are to be sustained. Sustaining change means relinquishing old ways prior to, or at least at the same time as, learning the new practices and procedures, a process referred to as unlearning. Unlearning has been defined as “the process by which individuals and organizations acknowledge and release prior learning (including assumptions and mental frameworks) in order to accommodate new information and behaviors” (Becker, 2005, p. 661). The case for considering unlearning during times of organizational change has been made by a number of authors (Cegarra-Navarro and Moya, 2005; Prahalad and Bettis, 1986; Sinkula, 2002; Starbuck, 1996).

This paper focuses on the change management issues involved in the implementation of new technology, focusing particularly on individual and organizational factors that might impact upon an employee’s willingness and ability to unlearn previous practices and embrace change. Based on the growing recognition of the importance of unlearning, this paper extends an existing model of unlearning (Becker, 2008), and identifies specific factors that influence unlearning. The findings contribute to change management theory by clearly identifying factors that impact implementation and adoption of new technology, and identifying specific factors that hinder or assist the unlearning process and points to avenues for future research.

**Literature review**

Whilst there is a wide and diverse literature that provides valuable insights into the implications of unlearning during technology implementation, this research has been limited to exploring the potential factors that might impact on the willingness and ability of individuals to unlearn. Considering the role of unlearning in successful change management, provides insights into the potential issues for the implementation of information technology as a form of innovation, or indeed as a driver of innovation (Phaal et al., 2004). This literature review focuses specifically on how learning and unlearning may impact upon organizational change involving the implementation of new technology.

Those who have used the term unlearning have used it to refer either to individuals undergoing a process of releasing old ways and embracing new behaviors, ideas or actions (Baxter, 2000; Bridges, 1991; Duffy, 2003) or to the organization, as a system, letting go of previous methods and approaches accommodate changing environments and circumstances (de Holan et al., 2004; Hamel and Prahalad, 1994; Harvey and Buckley, 2002; Hedberg, 1981; Klein, 1989). This paper focuses on the individual level issues but acknowledges the impact of organizational context and considers how these might also impact on unlearning.

The one common element within the implementation of any new technology or innovation is the existence of people within the process. As Van de Ven (1986, p. 594) argues:

> [...] a more realistic view of innovation should begin with an appreciation of the physiological limitations of human beings to pay attention to nonroutine issues, and their corresponding inertial forces in organizational life.
In line with this view, if organizations are to achieve the full value from innovations such as new technology, they need to focus on the human element and the impact of innovations on the employees who will be impacted by the change. In focusing on the human element, it is argued that the ability and willingness of individuals within the organization to relinquish past practice and to try new things is critical to overcoming inertia and facilitating effective innovation. In organizations that are heavily reliant on technology, Huber (1996) emphasizes the importance of managing learning during times of technological change.

The relationship between innovation and learning has been explored by a number of researchers (Garcia-Morales et al., 2006; Ismail, 2005; Kalling, 2007), and it has been asserted that “learning is an essential part of innovation” (de Weerd-Nederhof et al., 2002, p. 20). Within the organizational learning literature, unlearning is acknowledged as an integral part of the process. For example, Akgun et al. (2003) have developed a framework of ten components in the team learning process, one of which is identified as unlearning and is characterized by “changing the organizational beliefs, norms, values, procedures, behavioral routines, and physical artifacts” (Akgun et al., 2003, p. 847). These changes do not occur at the moment a technology such as an EIS goes live, rather changes in beliefs, norms and values occur over a significant period of time. Others have also identified that within the process of development, improvement or growth, it is essential to recognize previous habits, knowledge and behaviors that are no longer optimal and relinquish them (Hamel and Prahalad, 1994; Nystrom and Starbuck, 1984). Relinquishing habits requires effort as habits are learned and embedded in individual behaviors.

Within the organizational learning context, there has also been discussion of organizational memory; the extent to which an organization retains information and learning from experience and transfers this history between the members of the organization (Levitt and March, 1988; Paoli and Prencipe, 2003; Starke et al., 2003; Stein, 1995; Tsang, 1997). The issue that is relevant in implementing EIS is that: [...]

It has also been suggested that organizations develop beliefs and behaviors that can inhibit unlearning (Akgun et al., 2006, 2007), and are referred to as organizational defensive routines (Gieskes and Hyland, 2003). It is suggested that these routines create inertia within the organization which can inhibit change and prevent unlearning. It is the existence of this inertia which makes unlearning a critical issue for innovation. Buchen (1999) claims that innovation cannot occur without unlearning, while Assink (2006) identified “mindset” (including the inability to unlearn, lack of distinctive competencies, and obsolete mental models and theory-in-use) as an inhibitor of disruptive innovation. Tidd et al. (2001) likewise argue that innovation involves learning and unlearning, and it requires strategic direction to focus this process.

Whilst a number of the previously mentioned authors refer to unlearning and its importance in change and innovation, few have begun the process of identifying specific factors that might impact on unlearning. Previous research into unlearning by Becker (2008) postulated both individual and organizational issues that may
potentially influence unlearning and are shown in Figure 1. However, these issues were identified as a result of an exploratory case study method, and as such further development of the model is necessary in order to delineate specific issues relevant to change management.

The research reported in this paper was designed as an extension of the research reported by Becker (2008). The research takes this model as a starting point and aims to identify the specific factors that influence unlearning during technology implementation using a quantitative methodology. Therefore, this research addresses the following questions:

**RQ1.** What are the individual factors that influence unlearning during technology implementation?

**RQ2.** What are the organizational factors that influence unlearning during technology implementation?

### Methodology
Following on from the previous qualitative research that identified a range of issues with the potential to influence unlearning (Becker, 2008), this study involved the development, administration and analysis of a survey questionnaire around these potential influencers in an organization undergoing significant change. Creswell (2003) classifies this approach as a sequential exploratory design, and it is suggested that this approach is particularly useful where the research question seeks to first understand more about an emergent theory, prior to conducting a quantitative study (Creswell et al., 2003).

![Figure 1. A process model of unlearning](source: Becker (2008))
Instrument
The survey questionnaire contained a total of 41 statements relating to the perceptions of employees before, during and after the implementation of new technology. The statements were developed from the results of the previous case research and respondents were provided with a balanced five-point Likert scale with labeled end points.

Procedure
The questionnaire was subject to pretesting by an expert panel; a process designed to address tautological issues, to clarify statements and to ensure that the instrument would address the research questions in an appropriate manner (Singh and Smith, 2000). A pilot study was also utilized to contribute to the overall reliability and validity of the instrument (McClelland, 1994). The pilot study respondents, who were not part of the final study, were asked to complete the instrument twice with a gap of approximately two weeks. This gave the opportunity to assess test-retest reliability (Burns, 2000), and respondents were also asked for additional feedback on questionnaire structure and wording, hence contributing to face validity. Comparison of the results from administering the questionnaire twice showed significant correlations on all factors at the 0.01 level (two-tailed), and therefore the questionnaire was considered to have an acceptable level of test-retest reliability.

The results were statistically analyzed using exploratory factor analysis to identify specific individual or organizational factors which may influence unlearning in the workplace. The factor extraction method used in this study was principal components analysis (PCA). When using PCA, it is generally assumed that the original variables (items) are correlated, and that PCA will assist to develop a new group of variables that are uncorrelated (Chatfield and Collins, 1980). The findings from this analysis are provided following a description of the case organization used and the participants in the research.

Case organization and participants
The case organization chosen for the study was a government-owned corporation operating within the Australian energy industry. The organization was formed in the late 1990s when the industry underwent significant restructuring and was a result of the amalgamation of six regional organizations, all with lengthy histories as separate entities. At the time of the study, the organization had approximately 5,000 employees and revenue of over $2.2 billion per annum.

Three years prior to the study, a large corporate-wide project was established to engage all parts of the business in the development and implementation of a new EIS capable of fulfilling the needs of all users. The aim of the system was to replace the many previous systems that were a legacy of the amalgamation and to eliminate the duplication of information and activities. The new system impacted most employees across the corporation in terms of how their jobs were done. As the project required employees to let go of old ways and adopt new ways, and was widespread, this gave sufficient opportunity to analyze the unlearning aspects of the change.

Within the organization, the employees chosen to participate in the study were those in operational positions who had taken a lead role in the implementation of the new system, and therefore had first-hand knowledge of and experience with the changes. This group was comprised of 238 staff located statewide who were invited to be involved in the survey questionnaire on a voluntary basis. The survey was administered...
using an online survey tool which had been regularly used during the change project (for approximately two years at this time of the study), and it was therefore considered the most appropriate method for data collection. A response was received from 189 of the 238 invited to participate representing a response rate of 80.4 percent.

**Findings**

*Respondent characteristics*

Almost 50 percent of respondents were ten years or less from retirement age, indicating a large number of respondents who could be categorized as having substantial levels of life experience, even if they did not have experience in this particular organization or job. For the purposes of this study, the main consideration was the level of work experience of respondents; however, it is acknowledged that other demographic variables such as gender, age and personality may also impact on individual’s experience during change. Table I shows the number of years respondents had spent in the organization (and its predecessor organizations), in the position and in their type of work, respectively. The means indicate that on average, respondents had over ten years of experience in both the organization and their current type of work; however, the average for length of time in their current position was less than three years; something that reflects the many recent structural changes within the organization.

In relation to respondents’ level of change awareness, the large majority of the respondents (66.8 percent) reported being aware of the impending change for over 12 months and therefore could be expected to have had sufficient time prior to the change to establish expectations of the new system and the proposed change process. In addition, 75 percent of respondents reported that they had been using the previous system for two years or more, indicating sufficient experience with the previous system for unlearning to be necessary. Finally, over 20 percent of respondents reported major differences in their job since the implementation of the new system, with a further 67 percent indicating at least some change to their daily routines.

*Factor analysis*

The PCA was conducted, using the scale data collected within the survey questionnaire. It is recommended that all items loading onto only one factor of 0.3 or greater can be considered to be unidimensional (Coakes et al., 2006). Any items that did not meet this criterion were identified prior to any further analysis. In total, four items were not used within the factors, as one did not load onto any factor, and the other three loaded across three factors, indicating that they were not making a clear contribution to one single factor.

The eight factors extracted by the PCA were tested for internal reliability using Cronbach’s alpha which indicates the average inter-item correlation within each of the factors.

<table>
<thead>
<tr>
<th>Experience</th>
<th>n</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years in organization</td>
<td>184</td>
<td>1.00</td>
<td>43.00</td>
<td>13.31</td>
<td>11.50</td>
</tr>
<tr>
<td>Years in position</td>
<td>183</td>
<td>0.20</td>
<td>19.00</td>
<td>2.89</td>
<td>2.23</td>
</tr>
<tr>
<td>Years in this type of work</td>
<td>182</td>
<td>0.20</td>
<td>48.00</td>
<td>14.49</td>
<td>9.72</td>
</tr>
</tbody>
</table>
factors. The factors emerging, individual item loadings, and reliability results are shown in Table II.

Those factors resulting in a Cronbach’s alpha of 0.6 or greater are generally considered to be reliable and therefore useful for further analysis as part of a specific variable (Hair et al., 2006). Table II shows that one factor (Factor 8) fell below the recommended threshold of 0.6 and it has therefore been excluded from further analysis. The seven factors that emerged have been named and described for the purposes of further discussion. Table III shows these factors and their descriptions.

From the resulting factors, a distinct grouping can be identified depending on the focus of the statements; organizational factors or individual factors. Factors 6 and 7, the level of organizational support and training, and the history of organizational change, relate to issues external to the individual. Neither of these factors relate specifically to the individual involved in change, but refer to factors external to the individual that are influenced by wider organizational approaches.

The remaining factors are more closely related to the individual. Understanding the need for change, assessing the new way, positive experience and informal support, positive prior outlook, and feelings and expectations, are related to the outlook, perspective and experience of the person undergoing change, and are therefore considered to be individual rather than organizational factors. It should not be assumed, however, that processes at an organizational level do not impact upon these individual factors. On the contrary, many organizational actions will have direct impact upon the level to which an individual understands the need for change, or the outlook of the individual prior to, during and after the change.

Discussion: the factors in focus
The results of the PCA provide an indication of the factors that influence unlearning during times of change. Based on the individual items grouping to form these factors, it is possible to theorize about the factors and the point at which they might impact upon unlearning. Therefore, the previous model shown as Figure 1 has been further developed to reflect these relationships and is shown as Figure 2, replacing the individual and organizational enablers and inhibitors with specific factors.

The following discussion analyzes each of the factors in turn, focusing on three key issues. First, the factor is discussed identifying the key elements and focal point of the factor. This discussion of factors heavily emphasizes the implications for change management practice. Second, the discussion aims to further support each factor by returning to existing literature that may have previously noted the factor, but not necessarily empirically tested its existence. In this way, the discussion is not only focusing on the emergent factors, but identifying where previously identified factors may fit into a broader model of unlearning. However, even with these factors identified, there is still the opportunity to understand and validate each factor and therefore the final element of the discussion of each factor is the identification of future research needs.

Positive prior outlook
The first individual factor relates to the prior outlook of the individual; with all statements coming from the section of the questionnaire asking respondents to reflect on their opinions prior to the changes taking place. The statements in this factor show
<table>
<thead>
<tr>
<th>Items</th>
<th>Factor loading</th>
<th>Cronbach alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1</strong></td>
<td></td>
<td>0.736</td>
</tr>
<tr>
<td>18. Prior to the change, I thought I would be well prepared for the</td>
<td>0.864</td>
<td></td>
</tr>
<tr>
<td>new way by the time it was introduced</td>
<td></td>
<td>0.781</td>
</tr>
<tr>
<td>19. Prior to the change, I had a positive overall view of the new</td>
<td>0.544</td>
<td></td>
</tr>
<tr>
<td>way</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Prior to the change, I understood why the new way was needed</td>
<td>0.670</td>
<td>0.670</td>
</tr>
<tr>
<td><strong>Factor 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Prior to the change, I felt apprehensive about the new way</td>
<td>0.788</td>
<td></td>
</tr>
<tr>
<td>12. Prior to the change, I thought the new way sounded more difficult</td>
<td>0.561</td>
<td></td>
</tr>
<tr>
<td>than the old way</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Prior to the change, I was worried about whether the</td>
<td>0.532</td>
<td></td>
</tr>
<tr>
<td>organization had made the right decision</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Prior to the change, I expected the change to be difficult to</td>
<td>0.456</td>
<td></td>
</tr>
<tr>
<td>make</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. During the change: my level of experience with the previous way</td>
<td>0.385</td>
<td></td>
</tr>
<tr>
<td>made it difficult for me to make the change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. During the change: my level of comfort with the previous way</td>
<td>0.367</td>
<td></td>
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<tr>
<td>made it difficult for me to make the change</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Factor 3</strong></td>
<td></td>
<td>0.665</td>
</tr>
<tr>
<td>31. During the change: I had the support of my colleagues during</td>
<td></td>
<td></td>
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<tr>
<td>the change</td>
<td>-0.774</td>
<td></td>
</tr>
<tr>
<td>30. During the change: my level of experience in my job made it</td>
<td></td>
<td></td>
</tr>
<tr>
<td>easier for me to make the change</td>
<td>-0.658</td>
<td></td>
</tr>
<tr>
<td>35. During the change: my level of experience in the organization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>made it easier for me to make the change</td>
<td>-0.639</td>
<td></td>
</tr>
<tr>
<td>29. During the change: I had the support of my manager/supervisor</td>
<td>-0.592</td>
<td></td>
</tr>
<tr>
<td>during the change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. During the change: my work colleagues were opposed to the</td>
<td>0.555</td>
<td></td>
</tr>
<tr>
<td>new way</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Factor 4</strong></td>
<td></td>
<td>0.724</td>
</tr>
<tr>
<td>44. My views today: I understand why the organization decided to</td>
<td>0.739</td>
<td></td>
</tr>
<tr>
<td>use this new way</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45. My views today: I think the old way was better than the new</td>
<td>-0.729</td>
<td></td>
</tr>
<tr>
<td>way</td>
<td></td>
<td></td>
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<tr>
<td>47. My views today: I am worried about whether the organization</td>
<td>-0.604</td>
<td></td>
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<tr>
<td>has made the right decision</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Prior to the change, I understood why we needed to change from</td>
<td>0.510</td>
<td></td>
</tr>
<tr>
<td>the old way</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. During the change: once I had heard about it, I was eager to</td>
<td>0.306</td>
<td></td>
</tr>
<tr>
<td>try out the new way as soon as possible</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Factor 5</strong></td>
<td></td>
<td>0.605</td>
</tr>
<tr>
<td>48. My views today: getting used to the new way has been difficult</td>
<td>0.680</td>
<td></td>
</tr>
<tr>
<td>for me</td>
<td></td>
<td></td>
</tr>
<tr>
<td>46. My views today: I am still getting used to the new way</td>
<td>0.663</td>
<td></td>
</tr>
<tr>
<td>49. My views today: the new way is more difficult than the old way</td>
<td>0.602</td>
<td></td>
</tr>
<tr>
<td>50. My views today: at times, I still compare the old way and the</td>
<td>0.524</td>
<td></td>
</tr>
<tr>
<td>new way</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Prior to the change, my manager/supervisor was positive about</td>
<td>0.334</td>
<td></td>
</tr>
<tr>
<td>the proposed new way</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Factor 6</strong></td>
<td></td>
<td>0.628</td>
</tr>
<tr>
<td>36. During the change: my experience with previous changes in this</td>
<td>0.743</td>
<td></td>
</tr>
<tr>
<td>company made me more concerned about this change</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table II. Emerging factors and reliability
that issues such as having a positive overall view and understanding why the new system was being proposed, have bearing prior to the process of unlearning.

For managers responsible for planning and implementing new systems, this offers the challenge to be vigilant in establishing the case for a new system early in the change process, and to ensure that adequate preparation and support will be given to employees during implementation. This is not sufficient however; it is clear that this intention to provide support and ensure that employees are equipped to handle the changes must also be communicated effectively. Whilst communication is usually considered as a key element of a change process (Kotter, 1995; Mento et al., 2002), the importance of providing reassurance and evidence of concrete methods of employee preparation and support will facilitate a positive outlook prior to system implementation. Future research could further explore the strategies that best engender this positive prior outlook.

**Feelings and expectations**

The second factor related not only to a group of items predominantly reflecting on issues prior to the change, but also to some factors that impacted during the change. This group of items contains words relating to emotive or affective elements such as “apprehensive”, “worried”, and “comfort” reinforcing that this factor is a reflection of

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor loading</th>
<th>Cronbach alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. Prior to the change, changes in the organization in the past had been well handled</td>
<td>0.626</td>
<td>0.880</td>
</tr>
</tbody>
</table>

**Factor 7**

39e. The training/information sessions gave information that could be readily applied when I got back to work
39b. The training/information sessions were useful and relevant
39c. The training/information sessions gave real-life examples to help me understand the new way
39d. The training/information sessions gave me a chance to practice using the new way
38b. The written information was useful and relevant
38c. The written information was able to be readily applied to my job
38d. The written information was able to be readily applied when I got back to work

39. My views today: the speed of implementation between planning and then implementing the new way made it easier to change to the new way
37. During the change: the opinion of my manager/supervisor had an influence on my outlook on the new way
27. During the change: I found myself using trial and error when starting to use the new way

**Factor 8**

13. Prior to the change, I thought the old way was quite acceptable and did not need to change
11. Prior to the change, I was comfortable with the old way of doing things
25. During the change: I wanted to see in detail how the new way worked before I had to use it

Table II.
feelings and expectations of individuals prior to and during change implementation. This element relates clearly to the suggestions by other researchers that change will have affective or emotional elements (George and Jones, 2001; Goodstone and Diamante, 1998; Macri et al., 2002). Diamond (1996) also identified as a result of
research into the failure of technology transfer, that there is an emotional component to change and that it cannot be viewed as an entirely rational process.

The implications for this factor link to the previous factor of prior outlook. It reinforces the importance of addressing feelings relating to the change and providing a level of reassurance prior to implementation. Individuals often feel concerned about the implementation of new technology or systems and focus on whether the changes will have significant impact upon their work and how effective they are in their jobs. It is at this stage that employees may also look to previous systems or processes and be concerned about whether or not it should be replaced, often giving the appearance of resistance or inertia. Even those who support the change may have feelings of unease as routines are impacted.

Once an impending change is communicated, most individuals will begin to build expectations about how the change may impact them; it is at this stage that those planning the change have the opportunity to engage with employees and to establish positive but realistic expectations. However, this does not involve just communication but could involve actively engaging individuals in planning and implementing the change. As individuals begin to feel control over their situation and begin to feel that they are shaping the change, their level of concern may decrease. At this stage, some managers may engage the most vocal opponents of the new system or informal thought leaders (often the most experienced with the previous system) to be involved; encouraging them to become champions of the change. It is also worth noting that those who are most experienced in the previous system have the most to lose; they have established credibility based upon their expertise and may therefore be the most resistant to unlearning. In addition to level of knowledge and expertise, it could be anticipated that individual characteristics such as personality traits may play a role in this factor and therefore is an area for future exploration and research.

Positive experience and informal support
Positive experience and informal support is a factor relating to the encounters of the individual whilst the change is occurring, at the time when unlearning is likely to be taking place. The statements that formed this factor relate to the impact of an individual’s direct line supervisor and their colleagues on their experience of the change. Whilst the role of leaders and leadership has been explored in relation to change (Lung and Braithwaite, 1992; Macri et al., 2002; Pearlmuter, 1998), the role peers play is less often a focus. This factor also focuses on the experience of the individual, both in their job and in the organization, and the interplay this may have during unlearning. The term “informal support” is used to differentiate this factor from the organizational support and training factor which relates to formal organizational measures to support change. This factor however relates to a more personal level of support, often occurring informally between colleagues or between individuals and their manager or supervisor.

It can therefore be claimed that encouraging a generally positive outlook with realistic expectations of some disruption to “normal” operation, as implied by the previous factors will in turn translate into a more positive experience during change. Encouraging a climate of support is also critical; something that must be developed with substantial investment of time and resources into the previous factors to build such support. Often, organizations do plan for training, coaching and general guidance;
however, it is also critical that direct line supervisors communicate their commitment to the change in informal ways to encourage unlearning. When employees believe that the new system is seen by their supervisor as an improvement to previous systems, and the supervisor communicates the change as a part of long-term strategy, unlearning will be encouraged. Alternately, if those within the workplace see implementation of a system as yet another passing “management fad”, they are likely to place less emphasis on relinquishing past practice or behavior. Understanding the most appropriate forms of informal support during implementation of new technology would further enhance the ability of organizations to successfully adopt such changes.

**Understanding the need for change**

The items grouping together as the fourth factor, understanding the need for change, relate mostly to the views of the individual after the new system has been implemented. Often, the emphasis in change management is to demonstrate the need for a new system at the beginning of a change process. This factor indicates that the process of understanding continues throughout the unlearning process. After a new system has been implemented, it is still worthwhile to continue to reinforce the need to replace previous systems.

This factor contains statements relating to cognitive elements of the change; understanding reasons for the change, not only prior to the change, but most importantly after the change process has commenced. Even though this is an individual’s understanding, this factor can be expected to be heavily impacted upon by organizational issues, particularly the organizational approach to change, and the time devoted to engaging individuals in the change process.

Those supervisors and managers responsible for change implementation could facilitate this understanding by communicating success stories and by making explicit, the outcomes of the new system in comparison to previous systems. This is not simply about creating the opportunity for “short-term wins” (Kotter, 1995; Mento *et al.*, 2002), but also promulgating these wider to reinforce the need for change. As most project teams track the efficacy of system implementation and outcomes achieved, making the effort to communicate these outcomes to employees may also assist in the process of unlearning. Exploring the most significant information to communicate during adoption and roll out of new technology to encourage unlearning offers a direction for future research.

**Assessment of the new way**

The final factor at the individual level relates to the employee’s evaluation of the new system after implementation. The statements all relate to the individual’s outlook on the new system and whether it is more or less difficult than the previous system after initial implementation. The items within this factor imply a level of comparison and evaluation that occurs between the old and the new way.

For those implementing new systems, this suggests it is important to be aware that assessment and comparison is an ongoing process even after technology implementation. At this stage, evaluations can identify system improvements and enhancements, but only if widespread feedback is sought. Those being impacted by the change not only need an opportunity to voice their evaluations, but also need to be
given the opportunity to hear about the experiences of others. When large and complex systems are implemented, many different levels of impact will be encountered depending on the extent to which the changes affect an individual’s work. Often, when able to reflect on the widespread positive outcomes, it may be possible to demonstrate the potential benefits even to those experiencing short-term difficulties.

**History of organizational change**

History of organizational change is the first of two organizational level factors. The items in this factor are closely related to the history of change within the organization and the impact this may have on the individual’s outlook on the change. This factor can be seen to support discussion of organizational memory as a means of either assisting or hindering learning, change and innovation (Berthon *et al.*, 2001; Levitt and March, 1988; Stein, 1995). Markoczy (1994) also claims that organizational memory provides benefits of efficiency in existing routines but may represent a barrier to adoption of new routines; an argument reinforced by Bessant (2008).

This particular factor presents significant challenge to those responsible for the implementation of new systems; suggesting that an individual may be reluctant to unlearn if previous change has been poorly handled. This presents a dilemma. There is very little that can be done to address past experiences; however, acknowledging the “sins of the past” may be an effective first step to managing change. This factor should also reinforce to those responsible for change, the cumulative effect of ongoing changes and the potential impact of organizational memory on the technology uptake process. It could even be suggested for the future of the organization, that not changing is better than implementing change without careful consideration and planning. Managers of today need to realize they have a responsibility to those who follow. For future research, this factor represents a challenging focus; whether any actions or strategies instigated prior to or during a change will significantly counter the impact of organizational memory.

**Organizational support and training**

This factor relates particularly to the support provided to the individual via training sessions, information sessions and documentation such as policies and procedures relating to the new system. Providing relevant, timely and practical training and documentation can assist the individual during the process of unlearning. Most system implementation projects integrate the delivery of training and documentation as a part of the project plan. The emergence of these issues as an unlearning factor serves to reinforce the importance of such issues. However, it is not merely a factor of providing training and development, but within this intervention recognizing that considerable attention must be given to accommodating or relating to previous methods or systems; ensuring that training is seen as more than just providing information to a clear mind or “clean slate” (Newstrom, 1983). This might entail learning guides or job aids that parallel new processes with old, or documentation that articulates the newer information within the frame of previous approaches wherever possible. Regardless of the approach, unlearning must be more than a passing or indirect consideration. To effectively facilitate learning which enhances relational capital, unlearning must be a prior consideration and not an afterthought (Cegarra-Navarro and Dewhurst, 2006).
Conclusion and future research directions

As with any study, this research has limitations that must be acknowledged when interpreting the results. First, it is recognized that the use of self-reporting carries with it limitations in terms of bias and socially desirable responses. In particular, the study aimed to collect attitudinal data as opposed to observation of actual behavior, so if individuals’ perceptions did not match their behavior, the study was unable to identify this anomaly. The design of this study using only one organization is also recognized as a limitation because the results do not allow for comparisons between organizations of different sizes, cultures, industries or national contexts, which may also have an impact on unlearning. It is therefore important for further research to draw on a larger sample (both in terms of types of organizations, types of changes and other differences), which will allow for further refinement of the factors impacting upon unlearning. Conducting this larger research will make it possible to refine the factors further; potentially identifying those that are relatively consistent regardless of organizational differences, and those that are more context specific.

Regardless of these limitations, this research provides a better understanding of unlearning at the individual level. It also raises questions in addition to those highlighted during the earlier discussion that would be best addressed by further research. In particular, the process of unlearning and understanding how it occurs within an individual and within the organization may provide additional insight into the most appropriate organizational interventions during implementation of new technologies. To understand processes such as this, it is necessary to use other forms of data collection. Longitudinal studies measuring perspectives and attitudes before, during and after change and using workplace observations of behavior would enable this process to be researched without relying on self-reporting. This study used only exploratory factor analysis, and therefore future research would require confirmatory factor analysis on a larger and more diverse sample, and the use of techniques such as Structured Equation Modeling may assist to validate emerging models.

Just as Berthon et al. (2001) argued organizational memory can create inertia and constrain future organizational change, this research found that the history of change can impact on unlearning. In organizations with a poor track record in rolling out EIS, employees may resist change as history and their collective memory tells them the system will not work effectively and learning a new system may not be worth the effort. In this way, individuals develop what Gieskes and Hyland (2003) saw as organizational defensive routines that prevent learning and the acceptance of change. A poor history or positive history of change is linked to individuals’ feelings and expectations. As Akgun et al. (2003) maintained, unlearning involves changing organizational beliefs, norms, and values and an individual’s beliefs and values will influence their expectation and feelings. If individuals expect and feel that technologies such as an EIS are a positive change then they will be prepared to relinquish the old ways. However, if their feelings and expectations are negative, then they will find it difficult to recognize previous habits, knowledge and behaviors as sub-optimal and they will be less likely to relinquish them (Hamel and Prahalad, 1994; Nystrom and Starbuck, 1984).

Van de Ven (1986) argues that we should begin an innovation process by focusing on the human dimension. If organizations want innovations such as an EIS to be adopted and individuals to unlearn past systems and practices, they need to invest in the people
involved in implementing and using the technology. The influence of and need for both organizational support and informal support identified in this study reinforces the need of individuals to be guided and supported through a technology implementation process. Not all individuals need the same level or type of support; some will need formal support and training while others will succeed by seeking out an informal network of support. As Huber (1996) argued, managing and supporting learning during times of technological change is critical to successful innovation.

Traditional learning literature emphasizes that learning requires revising the interpretation of an experience, which in turn influences an individual’s thoughts and behaviors (Mezirow, 1990). Implementing effective change in an organization requires an understanding of the ways in which the interpretations of organizational realities can be re-shaped by learning on the part of individuals. However, what is often overlooked is the critical element of ensuring that individuals relinquish or at the very least refine, existing knowledge and behavior. Being able to achieve this unlearning is a crucial element of the learning process and sufficient attention paid to its facilitation represents a means of accomplishing more efficient and effective learning and change processes. Understanding how such underlying assumptions and beliefs impact on unlearning, and the specific factors that may assist or hinder the process, is a critical contribution of this research. However, it is anticipated that this is just the beginning of an ongoing debate in order to establish exactly how we unlearn in order to learn, particularly during times of change.

The increasing need for all organizations to innovate and remain agile is widely recognized, and implementation of new technologies is often seen as an important step in building a sustainable business. Often, change management and innovation processes are devoid of serious consideration of the impact of such changes at the level of individuals within the organization. Some models recognize individuals, but often as “recipients” of change, and their feelings and needs are lost in the overall structured, objective and clinical perspective on dealing with change. These findings provide those involved in the implementation of new technology with an understanding of the need to provide support and training and to work with all employees before, during and after the implementation process. This research also identifies that organizations must commit resources to equipping both those in supervisory roles and those impacted by the change with the necessary skills to unlearn and to embrace change for successful technology implementation, or indeed any other significant workplace change.

References


About the author
Karen Becker spent 12 years working in HRM and change management roles in industry, and now researches and teaches in this discipline at Queensland University of Technology, Brisbane, Australia. She is currently researching human resource management practices in innovative firms with other researchers in Australia and Europe, and has authored several publications relating to unlearning in the workplace. Karen Becker can be contacted at: karen.becker@qut.edu.au

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