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A Practical Transition of Employees Towards Information Systems Adoption: A public Service Perspective

Research Paper

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ABSTRACT

This paper is a case study which studies change management in the pilot study phase of the implementation of an ERP system. This system, when rolled out in its entirety, will affect all parts of the public service and all state departments of an unnamed African country. Amongst the challenges faced is the matrix structure of the public sector, with one department seen as the driver of this change. This wide scope means that particularly skillful change management is required. Nine factors that had previously been identified from research literature on change management, IS adoption models, and different people-centric approaches to change management, that relate specifically to issues concerning the people involved with or affected by the proposed changes, are used as the basis for engaging research participants familiar with the case being studied. This is done in order to verify the relevance of the factors in practice and to show relationships between the factors. The results show that perceptions of change vary widely amongst the people involved and, therefore, inflexible or standardized change management processes are inappropriate. In addition, it is found that where there is a need to implement the system as a modular process, change will be extensive and lengthy and change management practice must take the possibility of change fatigue into account. The organization and the individuals need to be assisted to adapt and accept ongoing change as a norm rather than seeking stable periods after planned disruptions.

Keywords

Adoption models, technology acceptance, people-centric factors, human resources, change management

INTRODUCTION

The introduction of new information technology (IT) and in particular integrated, enterprise-wide information systems is an increasingly common form of change in large organizations. Enterprise Resource Planning (ERP) systems are the best known examples of such systems. The more ambitious the information system project, the higher the risks associated with it; this includes the risk that the system will not be used fully or will disrupt the productivity of the organization (Van Tonder, 2004). This paper studies a case where an ERP system was introduced by the public service in an unnamed African country (country A), and focuses on the way in which change was handled.

Researchers in both Information Systems and Human Resource Management (HRM) study ways in which change related to the introduction of new information systems (IS) can be facilitated. It is apparent that many different points of view exist (Lawson-Body, Mukankusi, Willoughby, & Logossah, 2011). These include a social perspective (Adriaans, 2009; Cordella & Iannacci, 2010; Fearon, Manship, McLaughlin, & Jackson, 2013; Hatzakis, Lycett, Macredie, & Martin, 2005), IS/IT perspective (Ashurst, Doherty, & Peppard, 2008; Davis, Bagozzi, & Warshaw, 1989), and managerial perspective (Coetzee, 2006; Patanakul, 2014). Nevertheless, researchers adopting each of these perspectives all identify issues and factors related to people as being fundamental. Increasingly, those responsible for the design and implementation of IS recognize that it is as important to consider the impact of the change of technology on users of the system as it is to solve technology issues. As part of these efforts, the major employee-related factors, constructs, and determinants need to be identified to enable IS and other managers to introduce change as efficiently and effectively as possible (Borman & Janssen, 2013). Borman and Janssen (2013) also propose that individual issues should be considered as being separate from process issues, project issues, and other universal issues, but all these views contribute to the factors that are critical for individuals to successfully accept the implementation of IS.

Importantly, at all times those charged with bringing about change need to remember that people can be influenced to accept change but change cannot be managed in the sense of outcomes being guaranteed and the process becoming entirely predictable (Mintzberg, Lampel and Ahlstrand 1998: 325 cited by Van Tonder, 2004). Trahant and Burke (1996) agree with this point of view and say that implementing change is generally considered to be an inexact process and hence not easily managed. Nevertheless, there is growing pressure on HR professionals to be the managers of change, including change emanating from the introduction of new IS (Fearon et al., 2013; Kajouri, Fallah, Khodayari, & Mohammady, 2013).

This paper proceeds as follows: The research approach, the context in which it took place, and its planning are explained in Section 2. Section 3 is the literature review and is seen as the first outcome of the research activity plan. Nine factors are identified in that section. The second outcome of that plan, domain understanding, is achieved and explained in the findings (Section 5). Here the nine factors are used in the case study. The third outcome is a reflection on the nine factors and this is done in Section 6, the discussion. A section is then provided in which the research process is assessed and this is followed by a conclusion.

LITERATURE REVIEW

Three aspects of the literature review

This review has three independent aspects. The first simply reports on an earlier review from which nine people-centric factors were derived. The second section (section 3.3) looks at recent literature that studies the introduction of ICT into the public sector as occurred in the case studied. This is disruptive

technology that is intended to transform the public sector. The last section (section 3.4) looks specifically at how change can be managed when e-transformation is intended. This section links recent publications (2009 – 2014) which study the introduction of transformative technology in the public sector to the nine factors from section 3.2. Hence the nine factors are verified in this section.

The nine factors

As mentioned above, a systematic review was carried out as the first part of this research and people-centric factors and determinants in IS adoption and IS related change were identified. This was done in order to establish a key set of factors and constructs applicable to change management related to information system adoption. It was found that people-centric factors used in IS/IT adoption are viewed differently by different researchers and interpretations also differ according to context. Individual acceptance of change was found usually to be linked to organizational change in some way. Hence, in an analysis of information system-initiated change, the bidirectional link between factors related to adoption of systems by individuals and organizational change should not be ignored. The nine factors identified as a result of this analysis are listed in Table 1 and in Figure 1. An analysis in which the factors are linked to common theoretical approaches is given in Table 1.

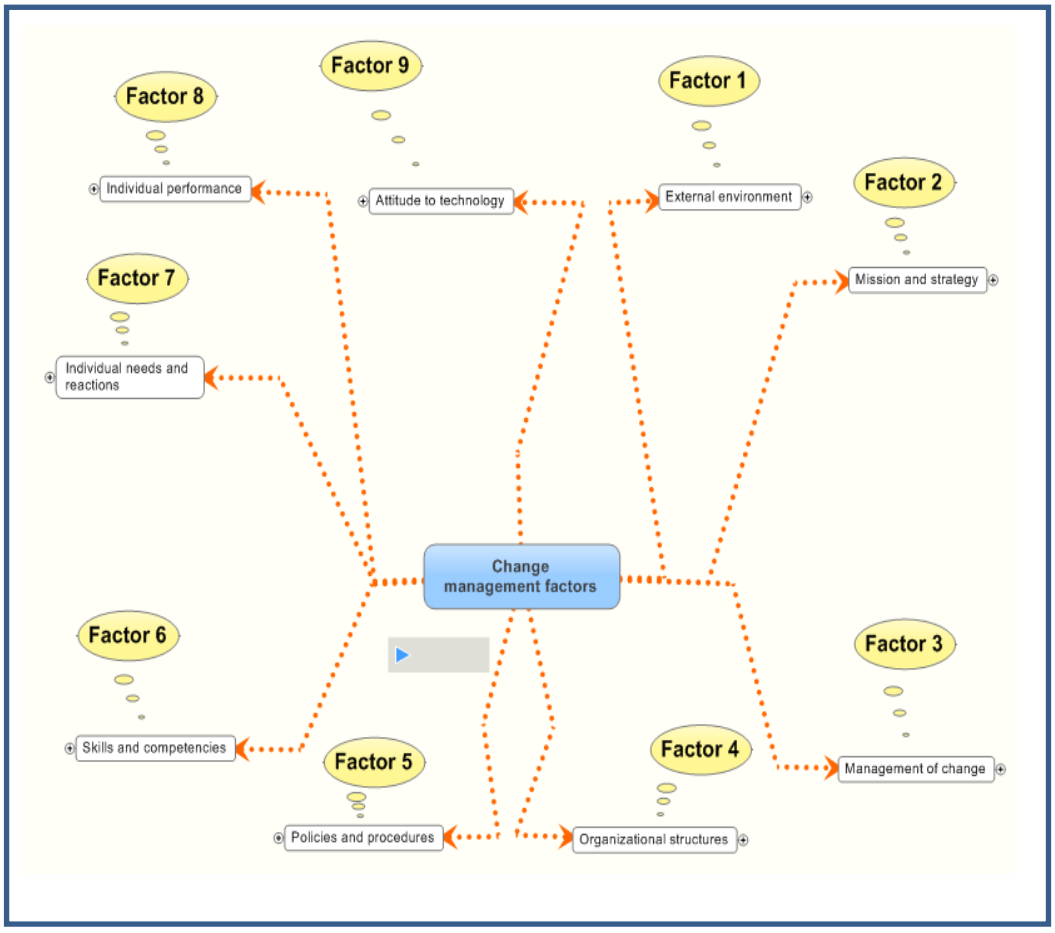

Figure 1. Factors identified from change related approaches

Factor	HR variables obtained from the analysis of the different adoption models	Change Management	Adoption	User-centric
1	External environment	Weak	Weak	Weak
2	Mission and strategy	Strong	Very weak	Strong
3	Management of change	Very strong	Very strong	Very strong
4	Organizational structure	Weak	Weak	Weak
5	Policies and procedures	Medium	Very weak	Extremely weak
6	Skills and competencies	Strong	Very weak	Strong
7	Individual needs and reactions	Strong	Strong	Medium
8	Individual performance	Very strong	Very strong	Very strong
9	Technology	Very weak	Strong	Strong

Table 1. Analysis of factors and sources found in change related approaches

T-Government

Transformation of government using ICT is considered to be the second stage of e-Government (Weerakkody, Janssen, & Dwivedi, 2011). The early stages of e-Government facilitate access to services by the customer (citizen), but transformational government (t-Government) aims to fundamentally re-engineer business processes across government departments so that the idea of a one-stop shop becomes feasible (Weerakkody et al., 2011). This is done so that systems in one department are consistent, compatible, and able to link with those in other departments. This re-engineering of business processes poses particular problems in the public service in terms of complexity and cannot replicate private sector managerial models entirely (Cordella & Bonina, 2012; Cordella & Iannacci, 2010). Implementation of highly integrated systems across many departments requires incremental steps and a high level of participation (Weerakkody et al., 2011).

This "joined up" rationale is one of the motivations for the use of ERP systems and this thinking is aligned to the move to emulate the private sector and improve efficiency (a strategy known as New Public Management) (Cordella & Iannacci, 2010). However, the socio-political context of the public service means that the impacts of t-Government are more extensive, and different in nature to those expected by implementers who focus solely on efficiency and rationalization of administrative and managerial practices (Cordella & Bonina, 2012). In addition, the public sector require strategies that match their underlying raison d'etre, which Cordella and Bonina describe as "the achievement of objectives set by government programs and the delivery of public services to the citizens" (Cordella & Bonina, 2012, p. 516). These same authors go on to say that: "The implementation of ICT in the public sector can be conceived as a tool to build public trust, to enhance confidence, and to promote a more participatory citizen–government relationship, as well as a means for equitable ICT policies" (Cordella & Bonina, 2012, p. 516).

Change management in the public sector

There is a particularly high risk regarding the introduction of systems into the public sector as they are complex, include a high degree of uncertainty, may be politically sensitive, and often involve a large number of partners (Budzier & Flyvbjerg, 2012; Patanakul, 2014). Hence a larger than usual number of public sector ICT projects end up costing at least 25% more than estimated, which can result in damaging condemnation from the public and in the media (Budzier & Flyvbjerg, 2012).

The public sector is bureaucratic and tends to avoid risk, which makes it resistant to change (Van der Voet, 2013). Although a recent and extensive literature found that most change management studies emphasize the content and context of change rather than the implementation process, there is little research on how organizational change can be effectively managed in the public sector (Kuipers et al., 2014). Kamal and co-authors (2013) concur that few if any adoption models or frameworks have been created specifically for public sector organizations and it therefore seems that there is good reason to develop such a framework. Since the context and content of change are found to be more important than process (Van der Voet, 2013), there is a need for advice as to how change can be effectively managed in the context of the public sector.

Leadership is considered to be a factor that needs to be given greater prominence than what is found in the literature currently (Kuipers et al., 2014). This is because leadership contributes to employee willingness to change and the implementation of all organizational change ultimately depends on the support of employees (Kuipers et al., 2014). However, Van der Voet (2013, p. 3) says that "there is little empirical evidence concerning the influence of transformational leadership on employee support for change …, especially in the public sector."

Individual employees

The design, complexity, and technology issues of an IS are expected to significantly impact the organizations' business processes, structures, cultures, performance, motivation, and job specifications as well as the performance of individual employees (Ashurst et al., 2008). It is these individuals that will bear the brunt of the change associated with the implementation of the system (Vilpola, 2009). Research by Shaul and Tauber (2013) has shown that the "people and human dimension" is the cause of 23% of the failures of ERP projects (this is in the private sector as well as the public sector).

Dimensions of organizational transformation in the public sector (publications in the past 5 years)

A review of recent research (published from 2009 to 2014) has highlighted various dimensions for organizational transformation that is enabled by ICT in the public sector (see Table 2).

Reference to paper	Description	Factor
Arduini, Belotti, Denni, Giungato, & Zanfei, 2010	Context (municipality characteristics; regional characteristics), competencies, size of economy, number of e-gov providers	1
Bannister & Connolly, 2011	Public value	2
Bannister & Connolly, 2014	Trust, technology, nature of transformation, aspect of government	7, 3, 4
Borman & Janssen, 2013	Implementation process and operating environment characteristic	3, 4
Budzier & Flyvbjerg, 2012	Organization; IT project decision-making; complexities of IT projects; skills	4, 6, 9
Cordella & Bonina, 2012	The public value perspective; socio political impact of ICT adoption	2
Cordella & Iannacci, 2010	Mutual cycle of reinforcement between: Technology, policy, organizational forms	5, 4
Cordella & Willcocks, 2010	New Public Management vs public value	2
El-Haddadeh, Weerakkody, & Al-Shafi, 2013	Technological theme – particularly dynamic nature of technology impacts on the organizational, political, and social aspects	6, 4, 1
Kamal et al., 2013	Pressure Factors (PF), Technological Factors (TF), Support Factors (SF), Financial Factors (FF) and Organizational Factors (OF)	4, 3
Kuipers et al., 2014	Change management, transformational leadership	3, 6, 8
Larsson & Grönlund, 2014	Social theme predominant but economic, environmental, and technical themes with decision making and infrastructure as cross cutting themes	1, 8, 4
Lawson-Body et al., 2011	Contextual factors, Organizational factors, Hybrid individual-organizational factors (social)	1, 4, 7, 8
Naranjo-Gil, 2009	Environmental and organizational factors; Organizations that combine technical and administrative innovations increase their performance	1, 4, 8
Nograšek & Vintar, 2014	Processes, people, culture, structure at workplace, organizational and inter-organizational levels	7, 8, 4, 1
Norris & Reddick, 2012	Incremental nature of American public administration	3

Patanakul, 2014	Practical, managerial: common problems related to system design and implementation, project management and governance, and contract management	4, 9
Weerakkody et al., 2011	Implementation strategy: Incremental steps and high level of participation	3, 8

Table 2. Dimensions for technology enabled transformation in the public sector in recent literature

These dimensions see human, technical, and organizational issues as mutually influencing each other. Fearon et al. (2013) suggest that: "techno-change projects [ERP type projects] are different from traditional IT projects and [are] complex by their very nature, not simply in terms of adopting new technology and processes, but also the degree to which large-scale changes must be accepted by employees and users." Note that Fearon is referring to both the public and private sector. In other words, neither organizational nor individual nor IS change factors should be seen in isolation. This is evident in the fact that more than one factor is found to be relevant to the majority of recent papers analyzed in Table 2.

RESEARCH METHOD

The partial implementation of an ERP system within the public service of Country A was used as a case study. This was the pilot phase of an implementation which when rolled out in its entirety would affect all parts of the public service and state departments of Country A.

Case studies provide detailed or "rich" descriptions of phenomena in their real life contexts (Ridder & Hoon, 2008) and are appropriate for creating and testing theory within a technically distinctive situation, using factors of interest and collecting as many sources of evidence as possible (Myers, 2009). It is the authors' opinion that the full extent of the partial ERP implementation outlined in this research cannot easily be covered even though it is a single case study. However, this may be seen as a typical instance that represents a number of organizations, all in the same proverbial boat (Oates, 2005).

Brower et al. (2000) say that a good case must *seduce the eye*. This is achieved by showing authenticity, plausibility, and criticality to convince the reader of the integrity of the research. The intention is therefore to persuade the reader to accept the findings of the case study as honestly reflecting the multiple points of view of the participants and the author.

Research questions

Research questions

What are the people-centric factors applicable to this context?

How should the identified people-centric factors be linked to achieve successful IS adoption?

Relevance and rationale of research questions

Public sector adoption of ICT has become common only subsequent to private sector adoption (Shaul & Tauber, 2013), with local government even being described as laggards (Kamal, Hackney, & Ali, 2013). The public sector has emulated the private sector by focusing predominantly on achieving effectiveness and efficiency (Cordella & Bonina, 2012). However, the not-for-profit nature of public sector systems means that different embedded values exist in these systems and that the staff using them have different

motives and need different incentives from those in the public sector (Cordella & Bonina, 2012). Therefore, adoption models and frameworks that work in the private sector in terms of technology adoption and use do not necessarily work in local government authorities (Kamal et al., 2013).

Human or people-centric factors are widely recognized as being largely responsible for poor adoption of new information systems; this is a particularly severe problem in the public service worldwide with the need for change management mentioned by many authors (for example: Kamal et al., 2013; Patanakul, 2014; Shaul & Tauber, 2013).The "technical-side" is perceived to be the easier part of change management since sufficient skilled resources can be provided at the time of implementation. However, technically complete and correct systems are not necessarily used to maximum effect. This leaves researchers concerned about the human or people issues in change management giving rise to the research questions regarding the "people-side" of IS adoption. The major employee-related factors, constructs, and determinants need to be identified so that change can not only be introduced but be institutionalized and sustained.

Knowingly or unknowingly, every institution is confronted with establishing *which* people-centric factors and determinants influence enterprise IS adoption *and also how they are linked*. There are a multitude of IT and IS user acceptance models and managers must "pick and choose" constructs and determinants from the various models or find a "favored model" (Venkatesh, Morris, Davis, & Davis, 2003). This paper analyzes a number of recent models in order to identify common factors and relationships between them with the intention of using these to contribute to a model for use in the public sector.

Research approach

A social-relativist approach (*nominalistic* view of the nature of the world) was followed from "the viewpoint of the organizational agents who directly take part in the social process of reality construction" (Avison & Fitzgerald, 1995). This entails interaction between the researcher and research participants (Brower et al., 2000). Since the primary researcher was working in an environment closely associated with that in which the research took place and the researcher and reality are inseparable in the life-world (as explained by Weber (2004)), the researcher cannot be seen as objective. Instead, the primary researcher was considered to be in a good position to pursue the research through an interpretive paradigm as he has insight into the context.

The authors are diligent followers of Ron Weber when he says that: "interpretivists believe that reality and the individual who observes it cannot be separated. Often, they root their arguments in Husserl's notion of life-world – in a nutshell, that our perceptions about the world are inextricably bound to a stream of experiences we have had throughout our lives" (Weber, 2004).

Qualitative data is used in this research to construct different views of reality relative to time and place and to reflect the views of various role players as far as possible (Sobh & Perry, 2006).

Data collection

Structured and semi-structured interviews are the most important means of qualitative data collection in the social sciences (Luna-Reyes & Andersen, 2003) and hence interviews were conducted with employees in management positions and in operational positions. However, interviews pose some challenges. It is difficult to decide how many people should be interviewed and how many additional, different views are needed (Lee & Baskerville, 2003). It is also challenging to define what is meant by "expert" or "knowledgeable people" and to get such people to participate in the research. Since the

advice to continue interviewing until no new information is received is rarely feasible in practice, as planning needs to precede execution, this study took a fairly pragmatic approach and interviewed as many people as possible in the time available.

Data analysis

Although hermeneutics is primarily concerned with the meaning of text or a text analog such as an interview, it can be used in different ways (Myers, 2009). It was adopted here as a *specific mode of analysis,* that is, as a method of analyzing qualitative data by relating sentences to the context of the full interview in order to understand them properly and also by reevaluating the overall meaning of the interview in light of the specific meaning of a sentence. The intention was to understand the meaning of the text-analogue collected during the research process and of the anomalous comments and the interpretation of the data as the "basis for further discussion and future understanding" (Cole & Avison, 2007). The authors used the paper by Butler (1998) which discusses the application of hermeneutics in a case study context in the Information Systems domain. Analysis was done within appropriate boundaries to create practical utility (Patterson, Watson, Williams, & Roggenbuck, 1998).

Basic Activity Plan

Figure 2 contains the basic activity plan for the research process, which has three sets of outcomes. The first, HR factors, is an analysis of different change management models and IT/IS adoption models found in the literature, resulting in the identification of nine factors; this is reviewed in the Literature Review of this paper. Activities 1 and 2 lead to this outcome. The authors are of the opinion that this analysis is universal and if plausible can be generalized for use irrespective of the context. However, this paper does not discuss this phase of the project in detail; the nine factors are simply accepted as a previously validated basis for the following phase, which is the focus of the paper.

The second outcome, domain understanding, focuses on the case study and involves analysis of the data collected to establish how the different factors unfold in one particular context (see Activities 3 to 7 in Figure 2). This is discussed in the Findings.

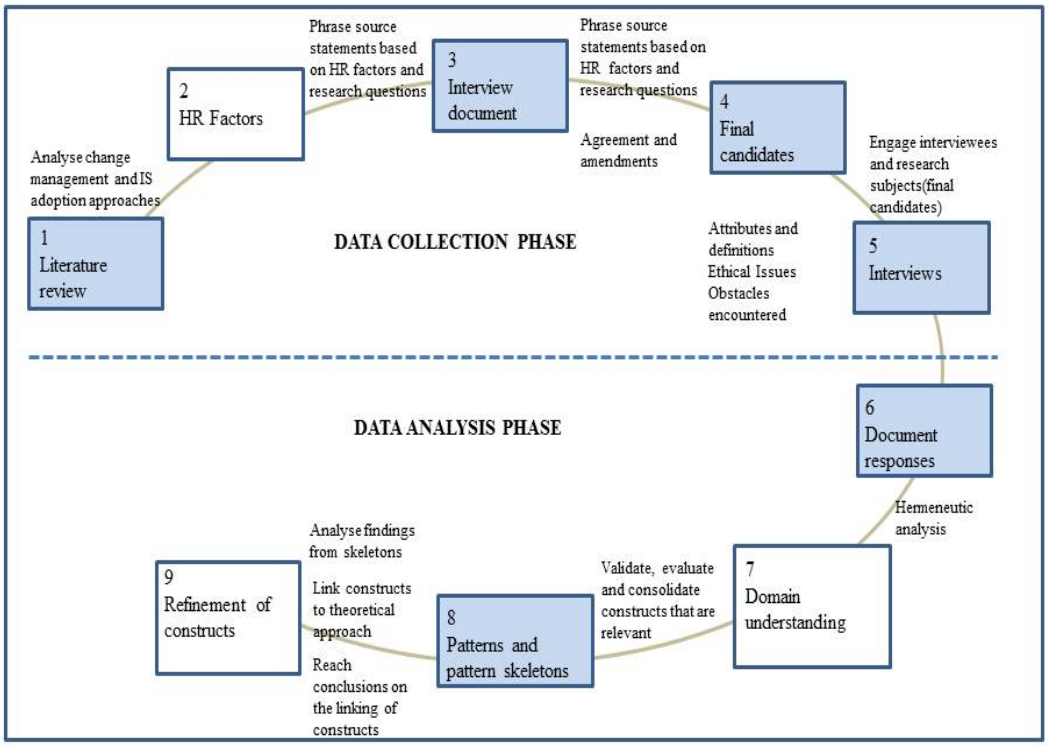

Figure 2. Research activity map

The third outcome, involving activities 8 and 9 in Figure 2, achieves a refinement of concepts. In this paper, this is achieved by reflecting on the concepts and their relationships with one another. Lee and Baskerville (2003) refer to this as "Type TT Generalizability," intended to generalize different concepts to a theoretical. "However, there are presently no explicit, general criteria for assessing the capability of factors, constructs, or other concepts to be generalized or otherwise developed into a theory" (Lee & Baskerville, 2003). The Discussion in Section 6 of this paper refines the concepts.

Generalizations

Two issues affect generalizing in terms of a case study. The views expressed by those interviewed are located in a particular time and place; that is, they belong to a particular context and hence generalizations from a single case study need to be handled cautiously. A further contextual issue concerns the researcher and research subjects as subjective beings. The views expressed by the interviewees are "first level constructs" (Lee & Baskerville, 2003). The fact that the author forms part of the research context and has particular experience in the public service environment attributes the findings as "second level constructs" (construed through the view of the researcher) (Lee & Baskerville, 2003).

THE RESEARCH PROCESS

The ERP Project

This large scale initiative was launched by the public sector of Country A to implement an ERP system to improve its ICT capability for the purpose of congruent reporting on the way it conducts its business.

The public sector consists of more than a hundred state departments organized on two distinct levels – national departments and provincial departments.

Historically, these departments deployed many highly diverse ICT capabilities and systems to conduct business and report to central government. A decision was taken to streamline these ICT capabilities and implement a single ERP system to manage and report on all issues common to all departments. In order to achieve this, a hybrid ERP system was selected rather than an ERP from a single supplier.

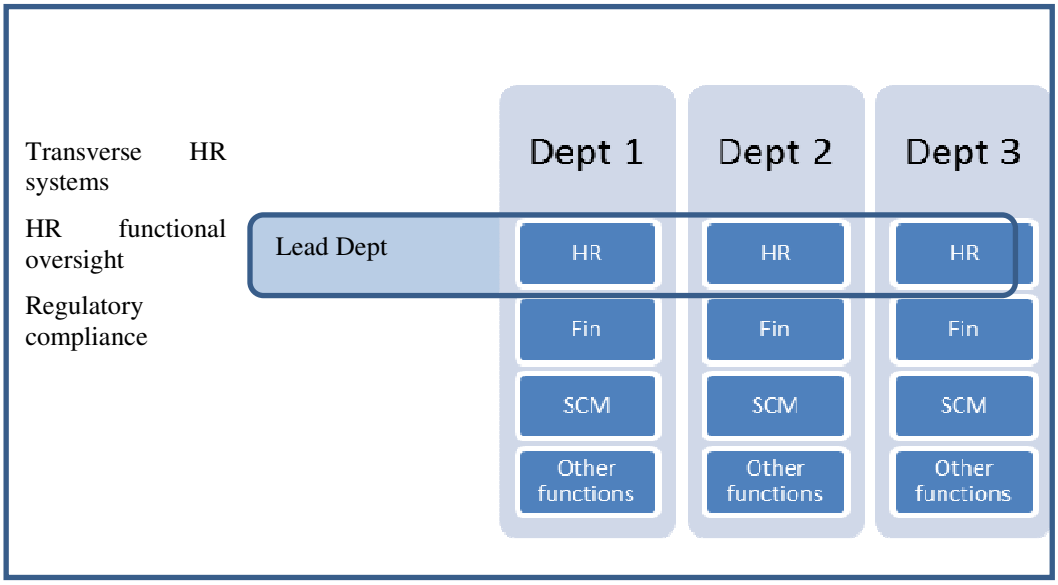

Figure 1. Conceptual view of public service organizational structure

The context within which the research reported on in this paper took place entails studying the lead site implementation (the pilot implementation on national department level) for the HR solution of the ERP implementation. This lead department has an oversight responsibility as the custodian of HR management in this public sector (Figure 3). Hence, it oversees the drafting of HR policies and regulations in accordance with its mandate in terms of national legislation. Apart from this, it oversees compliance to the HR regulatory framework and reports on this to parliament. Although each state department remains responsible for executing its own mandate and HR processes in accordance with legislation, a certain degree of similarity is expected in the execution of HR processes amongst state departments due to the prescriptive nature of the regulatory framework.

Several examples of transversal oversight occur in government and this leads to a "matrix" structure (see Figure 3). Hence various state departments that are assigned functional roles found in most other departments, such as financial and supply change management, oversee those functions across all state departments. In the case of HR, the lead department acts as the system owner for the common HR information system and has a transversal responsibility that spans the whole of the public sector. Nevertheless, individual state departments still take ownership of their own unique ICT capabilities.

Data collection

The nine basic HR factors obtained from the earlier analysis served as the basic structure for drafting questions and topics for the interviews with the participants who were targeted for the research. Cole

and Avison (2007: 824) refer to this as formulating lines of inquiry. It serves the purpose of ensuring consistency of focus across subjects.

The lead department identified a number of "knowledgeable" employees who then participated in the research. This follows the advice of Myers who proposes that "key informants" be interviewed as they are the most knowledgeable in the organization on the topic of interest (Myers, 2009). Eight HR system users were selected from both senior management and non-management levels; these were all operational users, that is, those involved in the daily operations of the lead department as management interviewees have different views on change objectives and on the success of the project from operational users. These people had contributed to the documenting of requirements for the design and testing of the configurations. They also use the system as end-users. Some of them did not play a specific role in managing change – they just experienced how the change was managed. Others were in fact actively managing change.

It should be noted that the opinions expressed in these interviews were not compared systematically or triangulated using other data collection methods. Triangulating data may form part of future research to develop a more comprehensive or rich understanding of that particular phenomenon.

Note that individual events in the process of change management in this case were not studied. Sufficient data was not available to enable a study of the specific encounters and episodes and the research must therefore be seen as being descriptive, identifying a number of factors, rather than a detailed analysis of the process of change.

Interview structures were designed to elicit opinions on how the change management effort was experienced and why the change events unfolded as they did. The positive side (what went right) could simply be attributed to one common reason: "things went according to plan." In order to establish what did not go as was expected (what went wrong), the participants were asked what they would have done differently. Various issues that could have been done differently were discussed.

Extracting patterns

In the hermeneutic analysis of the case study data, the nine factors that were used as the basis for the interviews were substantiated using extracts from the interviews; they were given rich meaning by adding specific detail from those interviews. The underlying principle here is to find the "one best interpretation." Different perspectives are expected to emerge and converge. This is referred to as *fusion of horizons* by Cole and Avison (2007). The themes used when collecting the data were re-used as the codes for the data analysis. Mind maps (based on factors used for structuring the interviews) were drafted that allowed the author to see the "bigger picture" and to develop a conceptual view of the information. The mind maps also served as a mechanism for data reduction.

FINDINGS

Change management as viewed by those involved

The interviewees were identified from various sections and levels in the lead department as explained in Section 4.2. Although the opinions and views cannot be generalized to represent a single, total view, they do represent the views of some of those employees involved in the implementation of the system and *inter alia* in the change management effort. One can therefore assume that these employees viewed the events in these ways because they were part of the events and experienced the events as they actually happened.

The outcome

The system was implemented and was supported by a change management program. Although the system is currently operational, various modifications (configuration and customization) must still be done to perfect it. The change management program achieved some results (as attested to by the participants). The implementation of additional modules of the system will be done over time, necessitating that the change management program continue. Seeing that the roll-out of the system is scheduled to continue well into the future (new versions and enhancement packs of the ERP system being used), it can be expected to involve incremental change and some revolutionary change may also punctuate this process. A clear-cut answer on the final outcome regarding the change process is therefore not possible. This case study can, therefore, only attest to the events as they have been experienced and have played out up to date.

Domain Understanding

The nature of the opinions discussed below needs to be understood within the context expressed by one of the senior managers when he commented that:

"These are individual, untested views. Depending on who expressed the views, I don't think that you can regard them as "expert" views in all cases."

A particular change management strategy had been devised by the prime systems integrator for the lead department to coincide with the implementation of the new ERP system and interviews with management showed that they perceived the strategy to have unfolded in a particular way. However, some interviews showed that operational users of the system experienced the change management effort differently. Hence, a number of significant views were uncovered that could be assessed against the nine factors which have been linked as part of the final analysis. Those interviewed made proposals as to how to overcome the issues that might have influenced change management detrimentally. They also shared their views on how successful the implementation of the system was.

- The changes that coincided with the technical implementation of the system were viewed with mixed feelings by the participants.
- It was found that, to a certain extent, there was a disconnect between the management of change and the actual change.
- Some felt that the strategy was not communicated as was required and that there were various issues that they would have handled differently.
- The need for trust forms an important part of individual needs. People want to know that they are valued and can be trusted.
- The interviewees perceived the new system to be easier to use than the legacy system and hence, according to TAM and TPB (see Table A in the appendix), system adoption could be expected since these models propose that "perceived ease of use" has an influence on the intention of people to use technology and ultimately on their actual behavior. However, from the interviews it is evident that this expected and apparently rational adoption was not followed since the legacy system was retained, perhaps at the cost of the new system, in order to ensure that the payroll ran as it should. Risk avoidance and perceived usefulness outweighed using the easier system.

Some participants found that their resistance to the system decreased as time progressed and this led to an improvement in co-operation. Although the participants observed some resistance, the causes of resistance could not be identified conclusively. To get conclusive results, future researchers could

analyze how individual resistance influences the bigger collective and whether there is a relationship between individual resistance and group resistance.

DISCUSSION - REFLECTION ON THE NINE FACTORS

Factor 1 - Interaction with external environment

As noted in the literature, context and organizational structure are very important when transformational technology is introduced into a complex organization such as the public sector. The lead department does not sell any products to "customers," but provides services to different stakeholders who are employed by other departments in the public sector (Figure 3). This is evidence of the complexity referred to in the literature as an important fact in the public service. These stakeholders form the external environment with which employees of the lead department interact. It is probable that the stakeholder reaction to the system will be similar in other state departments as all state departments will implement the same system based on the same functionality and the same system blue-print. As the implementation of the system gains momentum in the public sector, resulting in a wider client base (external environment) than before, the role of the lead department will have to be reviewed to accommodate their oversight role. The scope of the system will increase the power of this department in relation to other departments and a reaction to this increased power (and not to the system per se) can be expected.

Factor 2 - A mission and strategy

Cordella and co-authors in particular highlight public value as being important to the public sector. This requires appropriate policies and strategies for change. Change management is more than just a colorful awareness campaign involving coffee mugs, slogans, and T-shirts. Change management is intended to implement a "known new state" up to the point of re-establishing stability or equilibrium.

Cascading change management roles and responsibilities down to lower organizational levels requires specific communication and marketing efforts so that a comprehensive, efficient change management strategy can be implemented. Good role definitions in terms of change management responsibilities must coincide with monitoring the efficiency of change management efforts.

Factor 3 - Management of change

A concerted management effort is needed to get everyone on "on the same page" and to manage change actively. In the case studied, the designated change agents are reported not to be functioning well, if at all. Some of the interviewees remarked that in some cases nobody is managing change and the future is unknown. People should be made aware of who is managing change in "their little part of the world."

Due to the modular roll out of the system, timing of change management is a challenge with never ending change and perpetual change management resulting. Both Norris (2012) and Weerakkody (2011) talk about the incremental nature of change in the public sector.

Factor 4 - Organizational structures

If change management is a never ending story, the organizational structure may require re-engineering to improve the abilities of the line managers to act as change managers.

Given the modular implementation of this IS and its constantly changing environment, one may argue that progressing from one stable base to the next stable base is unrealistic as in a punctuated

change model. Task, actors, technology, and structure will never be perfectly aligned and hence the organization should embrace continuous change and the philosophy of a "learning organization." This means that the role of change agents and change champions should be institutionalized as a permanent part of the change network. This promotes the idea of continuous change with the change agents encouraging and supporting all stakeholders in embracing change. The literature supports this view; business process re-engineering must be done in a way that suits the context of the public sector (Weerakkody et al., 2011).

Factor 5 - Policies and procedures

Policies and procedures should guide users towards personal empowerment, self-help, and the ability to cope with the various aspects of change independently. Appropriate tools and aids need to be provided. For example, well-indexed on-line information sources, such as blogs and on-line FAQ, are quicker and easier to access and update than voluminous printed manuals. The skills and preferences of users who access and use such technology should be considered when looking at this option. Skills and capacity building cannot be ignored and ICT can support these.

Factor 6 - Skills and competencies

Assessment of training materials and the training process needs to take into account the individual users' requirements, preferences, and capabilities. Differences in learning styles, pace of learning, and preferences influence how individuals acquire skills and competencies. Individual experience, group learning in a classroom, and computer-based learning should be balanced. Super-users, power-users, and other experienced users should be identified and used to coach new users of the system so that this second tier of users also becomes confident and independent. ICT skills ((El-Haddadeh et al., 2013), decision making skills (Budzier & Flyvbjerg, 2012), and leadership skills are mentioned in the literature (Currie, Lockett, & Suhomlinova, 2009; Kuipers et al., 2014).

Managers and operational staff should not think of training as a "once-off" event, but as part of on-going change management. Training must be synchronized with the system development methodology used (e. g. the waterfall model if that is used) to match the different phases of implementation of system modules.

Factor 7 - Individual needs

Individual resistance to change is known to influence the collective against changing. However, in this case study each person interviewed had his own perception as to what successful change management entails and to what extent he as an individual contributed to achieving the objectives. This emphasizes the need for flexible and individualized strategies as far as is feasible.

Trust forms an important part of individual needs (Bannister & Connolly, 2011). People want to know that they are valued and are trusted and also that managers can be trusted to look after their staff's interests. People also need to feel they have some individual control over change. Group needs and individual needs are not synonymous and should be addressed differently.

Factor 8 - Individual performance

The importance of supporting the *individual* during transformational change is stressed by many authors (Ashurst et al., 2008; Kuipers et al., 2014; Vilpola, 2009). The lead department must outlast growing pains and the individual users must survive in order for the department to survive. Hence individual

performance must be assessed, including the individual's ability to cope with change. Individual performance is currently assessed based on individual performance agreements, but, since soft skills such as adaptability may be difficult to measure as input for key performance area assessments, other means should be found to assess them.

A study of personal reactions to change should be conducted to enable managers to manage individual resistance to change and to understand and overcome the barriers to change that hamper performance.

Factor 9 - Technology

This factor may be more correctly labelled as attitude towards technology as it focuses on the users' perceptions of technology. Users experience the system as "technology" and more specifically conceptualize it as that part of the system that they see in front of them on the desk. If the system functions without any problems, then the technology is not a problem. The ever-changing technology places a burden on both IT developers and end users (Budzier & Flyvbjerg, 2012; El-Haddadeh et al., 2013; Larsson & Grönlund, 2014).

Workflow does not necessarily prevent errors and errors are often obscured from view when they are carried forward in the workflow. This should not detract from the advantages that are in fact possible when workflow automation is implemented to its fullest extent. Automating workflow may, however, contribute to: (1) a feeling that control has been relinquished, (2) uncertainty, and (3) losing knowledge of the history of specific transactions.

Linking the nine factors

The research purpose was to identify the applicable factors in the particular context and establish how these should be linked to achieve successful IS adoption. The multiple, often interlinked factors that influenced the case are discussed in the Literature Review, but an alternative chronological view will also be proposed.

Section 3.1 describes the analysis of the factors extracted from the different change management models and IS adoption models. These factors formed the basis for structuring interviews to elicit opinions from the identified participants (Section 5). Figure 4 shows one way that these different factors can be linked based on the information and opinions collected for this case study.

Ranking in terms of importance

What does come out clearly from the use of the nine factors is that all the factors are perceived to be relevant by the interviewees. The participants were asked to rank the factors, but conclusive findings could not be drawn as to their relative importance.

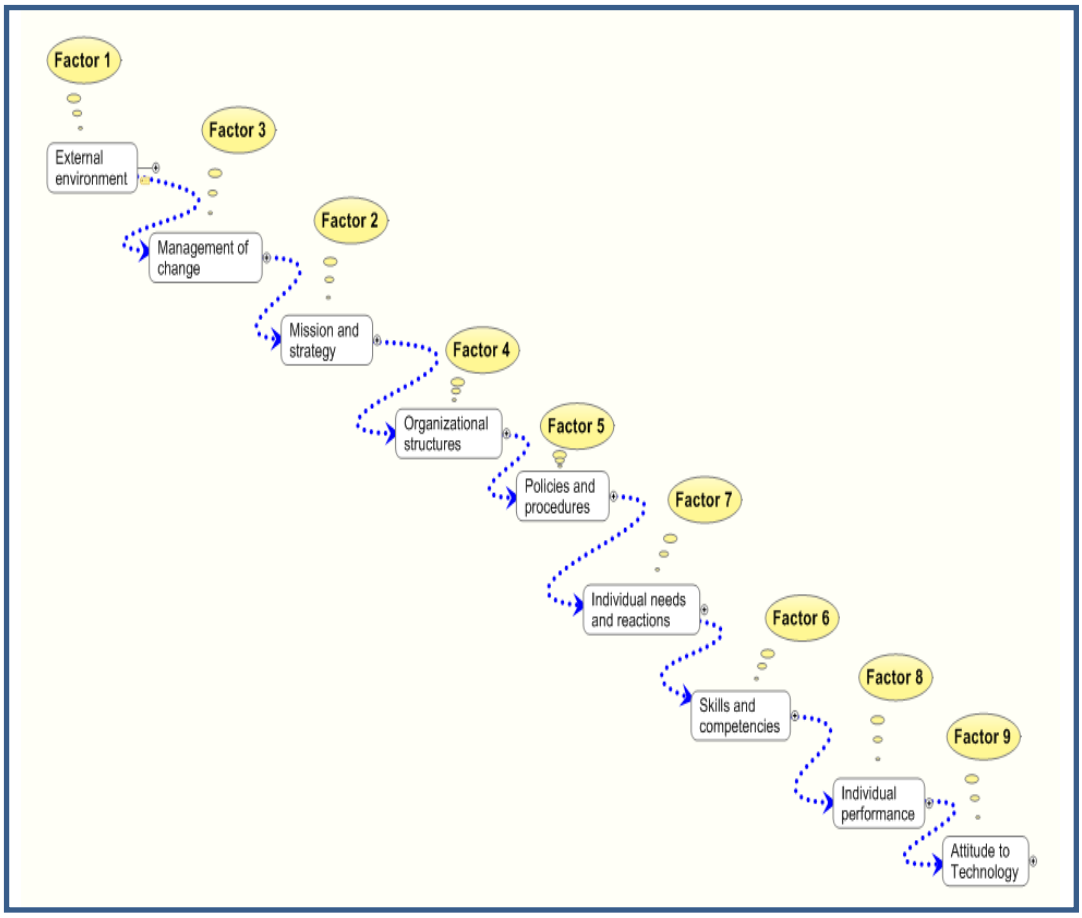

Figure 4. Linking factors

Sequential mapping of the execution of change management

This paper now looks at how the nine factors and the concepts linked to each factor were connected. An interviewee explained how he perceived the factors to be linked; the reasoning behind this view becomes evident from a quote from the interview:

"From a normal perspective, I would deal with it in this way. The external environment impacts on management, who must develop a mission and strategy, provide a structure, and develop policy and procedure, taking into consideration individual needs because we have a unionized [labor unions] environment, linked to improving their skills and competencies linked to personal performance to serve their clients better, enabled by technology."

This line of thought can be represented in a framework as in Figure 4. It shows a sequential mapping of the execution of change management constructs.

REFLECTION ON THE RESEARCH PROCESS

Research lessons learned

During the implementation of the system, various classified (confidential) documents and reports were produced. These included the change management strategy, planning, and implementation records which

the researchers were unable to get permission to view. Researchers should be mindful of the bureaucratic culture of the public sector that makes it very difficult to get access to such documents.

In hindsight, it was concluded that the maturity of the users who were interviewed with regard to providing responses to complex issues was perhaps not adequate. As time progresses and maturity increases (experience of and exposure to the system is gained), researchers may pursue more complex issues such as testing the validity of theories and frameworks for linking different constructs. Readers and researchers should be mindful that employees do not always think in the structured fashion which may be required to accurately answer research questions. In addition, the author was restricted by the number of questions that could be dealt with during interviews. As is, interviews ranging between one and a half and two hours were already tiring for the participants.

It was challenging to effectively engage participants during interviews as they had not previously been expected to think critically about these complex topics. An open mind but also careful preparation is needed to allow for some deviation from the pre-set structure of the interview. Experience showed that participants can be grouped into different levels. Engaging participants was complicated by the fact that the employee post levels and the skills levels of the interviewees differed significantly.

The bureaucratic nature of the public sector presents its own challenges. Researchers should make a thorough study of the structures and decision-making processes in the organization being studied. Navigating one's way through this may be time consuming, especially when seeking approval for research activities and obtaining sign off for the final results.

Future research

The author is of the opinion that as the level of maturity in state departments regarding the implementation and roll-out of ICT in the public sector grows over time, knowledge will be gained by public servants and researchers may be able to gain insights beyond the initial opinions expressed and thus contribute further to the learning process.

As indicated earlier, other state departments must still implement the system. Although these departments, and indeed any reader, could analyze the findings and conclusions of this paper and then apply the analysis as a guide or framework for dealing with change management issues, managers in the public sector should customize the framework for their departments to increase usability.

Future research could possibly analyze and compare the findings of this case study with a wider audience (wider participation from the pilot site and including other state departments) to establish its validity in other contexts. In this regard, researchers should be mindful of the pitfalls associated with generalizing research findings. The need for empowering managers in the lead department to manage change should not be underestimated. Lyytinen and Newman (2008) point out that previous experience in implementing IS change within an organization can be used to "break the endemic cycle of failure."

Authenticity, plausibility, and criticality

The authors have attempted to provide credible results by carefully analyzing the data and seeking findings that are relevant, results that are plausible, and rich insights into the research case. However, the uniqueness of the case and the difficulty of repeating it, as particular people and a particular time are the main influencing factors, is acknowledged.

Authenticity

In line with the approach suggested by Brower et al. (2000), a "thick, rich description" has been provided by giving readers insight into the actual happenings and direct participation by the participants. An effort has been made to show the reader the context of the real life scenario and the context within which the research took place. To further enhance authenticity, the research was given to the lead department to review to ensure that there are no factual inconsistencies.

Plausibility

The results of research must seem to be reasonable and understandable (Brower et al., 2000). The emphasis in this regard is on the findings and the conclusions. The authors have endeavoured to help readers to relate the findings and conclusions back to reality as, if a reality check is not possible, the total purpose of the research becomes null and void. The case study has therefore been documented in layman's language to make it understandable and useful to a wide audience. All efforts were made to avoid jargon.

Criticality

Critical judgement forms an important part of solid qualitative research (Brower et al., 2000). It concerns the examining of existing impressions, assumptions, and individual perspectives (not the perspectives of those in charge).

Limitations of findings

Specific user views were the target of this research. Future research projects could interview more people affected by the change and differentiate between those building the system and those whose work was affected by it to show different perspectives and how these corroborate or expand the findings of this paper.

CONCLUSION AND CONTRIBUTION

Existing literature (change management models, IS/IT adoption models, and people-centric change management approaches) was analyzed systematically to establish the relevant people-centric factors that can influence change management. Nine factors were identified and this contribution used a number of different theoretical bases from the literature and identified commonalities. It is a first step towards a unified theory of change management focusing on the people involved and hence is preliminary theory building.

Since the research project that led to this paper aimed to investigate the views of people that participated directly in the social processes needed to bring a particular "reality" about, the investigation adopted an interpretive qualitative approach. The nine people-centric factors that were found to be common within the literature served as the basis for the interviews. The participants were engaged according to their experiences of the management of change during the implementation of the system and their feedback was used to confirm the relevance of the factors in practice. It should be noted that opinions were influenced by the role of the person (that expressed the opinion) in the project. The contribution of this phase of the research was to verify the preliminary theory to some extent.

The general conclusion from the research is that a change management strategy should not be seen as a checklist but rather as a living document that can be updated continuously as changes occur and as the circumstances in the lead department change. This conclusion is based on the fact that views

and opinions that were expressed differed and the role that the person played in the project seemed to influence this. As a result, inflexible or standardized change management processes are considered to be inappropriate. In addition, the need to implement the system as a modular process means that the change will be extensive and lengthy. The proposals made relate largely to ways of preparing more of the individual staff members for their roles in leading change and learning how to adapt to IS related change. Hence the organization as a whole needs to be prepared to adapt and accept ongoing change rather than seek stable periods after planned disruptions.

A second conclusion is that those interviewed saw no clear separation between implementation and change management. One may conclude from the different opinions and points of view that the solution to change management issues is not just on the level of change management *per se*, but needs to be addressed through normal functional implementation activities.

It was found that, to a certain extent, there was a disconnect between how change was managed and the actual changes that manifested as a result of the implementation of the system. In other words, the intended change management might have failed, might not have been noticed, or might have had unintended consequences.

There seems to be a strong bidirectional link between factors related to adoption of systems by individuals and organizational change and this should not be ignored. In other words, neither organizational nor individual nor IS change factors should be seen in isolation.

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