[1] IMPLEMENTING OPEN SOURCE SOFTWARE TO CONFORM TO NATIONAL POLICY

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Abstract:

Purpose
This paper investigates the implementation process of an Open Source Enterprise Management System in the South African Public Sector. Change management was observed in relation to challenges and opportunities in the alignment of the internal organisational changes to the imperatives of the national Free and Open Source Software policy.

Design/methodology/approach
An interpretive case study, using interviews, observation and document review was used.

Findings
Alignment of the organisational environment, change management strategies and technology is required to address many of the 'common' change management challenges. However, ICT policies are formed and adopted in a highly complex environment and have embedded property and power relations which impact the nature and direction of their implementation. In this case one of the main challenges arose from the alignment of internal organisational change to a national policy which did not seem to have the full support of the agency which was tasked with implementing it.

Originality/value
Many of the challenges faced by the Public Sector Department are commonly described in change management literature, such as inadequate consideration for the social context in which the change was to take place. What emerges from this paper is a caution that there is not a single voice within government and in a multi-levelled and multi-sectoral institution there exist many different rationalities. The internal alignment of the divergent voices within government would be a prerequisite for the organisational environment, change management strategies and technology to be aligned.

Keywords: change management, alignment, open source, South Africa

1. Introduction

Castells (2000a, 2000b) describes in voluminous detail the impact of globalisation on the economy where the new form of business operates through the networked economy, largely facilitated through Information and Communication Technology (ICT). ICT development and deployment and supporting policies take place within this fiercely contested globalised political economy. For organisations there is a pervasiveness of change processes, often

[1] This paper is based on the paper 'Aligning national policy imperatives with internal information systems innovations: A case study of an open source content management system in the South African public sector', which was submitted for the 2009 IFIP 9.4 conference in Dubai. However, the original paper has been significantly extended and the main conclusions are different after continued reflection and from further comments received.

externally imposed, which are rising with these globalising effects. This not only implies that the context in which organisations are situated is continuously changing, but also the nature of the organisation itself is subject to change (Van Tonder, 2004). However, the external influences imposed on an organisation are often heterogeneous and make the management of adapting to the external environment extremely complex.

This paper explores one such externally imposed change around the implementation of a contentious national policy. This entails not only dealing with the more usual dimensions of change in an organisation, but also the implications of the national debate and contentions around the national policy playing out in the local setting of the organisation. This paper explores the movement within a government department from a proprietary Enterprise Content Management (ECM) system, herein after referred to as the proprietary system (PS), to an open source ECM system, herein after referred to as the open source (OS) system. Two main aspects of the change process are explored. The first is the impact of the national open source policy on government departments - an externally imposed change of mission, vision and values. The second is how internally the government department changed its internal work processes and information systems to comply with that policy. These two aspects are intertwined. Alignment of the organisation mission, values and objectives, with the proposed technological innovation and change management models emerges as a necessary condition for managing change. However, what emerged as a more challenging issue was whether internal organisational changes can be aligned with contentious national policy imperatives.

To highlight this challenge this paper is accordingly structured. The next section reviews the Free and Open Source Software (FOSS) Policy of the South African Government. To understand the change management implications of the movement to FOSS, we look at one theoretical change management approach which has been used specifically in relation to change management and IT. The research approach followed is described in Section 4, with a description of the case study following in Section 5. Challenges faced in terms of alignment of the internally proposed changes with the national policy are discussed in Section 6 and the proposed framework outlined in Section 3 is used to assess these challenges. We conclude that this framework is useful in attaining greater alignment between the organisation, change management and information technology. However, the divergent voices in the organisation need to be harmonised for the broader alignment to be achieved.

2. The Free and Open Source Software (FOSS) Policy of the South African Government

The South African government policy regarding the use of FOSS has evolved over a relatively short space of time. The following documents represent key events in the unfolding process and are discussed in the text below:

NACI report	2002 (updated in 2004)
GITOC strategy document	2003 (updated in 2006)
Recommendations to the PNC	2004
Go-Open Task Team strategy document	2005
FOSS policy	2007

Table 1: South African FOSS policy documents reviewed

These documents are also supported by information provided by a senior civil servant during an in-depth interview. This interview provided contextual information on the environment and time period in which the documents were written. Furthermore, aspects of the process of the development and implementation of the FOSS policy were provided by the informant, which were not included in these written documents.

The South African Government's journey on the adoption of FOSS started in 2001 when the Presidential International Advisory Council raised issues on FOSS and consequent questions were asked in Parliament. Perhaps the single most important catalyst for development of policy in this area was the National Advisory Council on Innovation's (NACI) report[2] (2002). NACI formulated the use of Open Standards to be an enforced base for ICT in the public sector as, according to their study, FOSS would promote interoperability and universal access to the South African government's online services without exorbitant costs, restrictions because of licensing, or other related obstacles. It would also reduce the risk of being 'locked-in' by specific vendors of ICT commodities and services, and this would in turn drop the entry barriers for local software developers who are able to offer ICT solutions to the public sector.

The report also identifies a number of important broader developmental and societal aspects to the arguments presented. Apart from arguing that FOSS provides a "useful tool to allow developing countries to leapfrog into the information age", the report also indicates how the "arrival" in this information age is not only more viably achieved using FOSS (a cost argument), but also that the use of FOSS fundamentally effects the nature of this information age.

Byrne and Jolliffe (2007) note that the arguments made in the NACI report, which are habitually ignored or downplayed in the policy and strategy documents to follow, are:

1. the threat propounded by broad software patents to the development of FOSS and how to fight this threat;
2. relating the right to free software usage and development to freedom of expression and the free exchange of ideas, and;
3. the acknowledgement that individuals, academia, businesses and NGOs already make use of FOSS, not because they are forced to do so by means of a policy, but because they have the freedom to do so.

It is significant to note that the NACI report uses the terminology 'Open Software', instead of 'Open Source' or 'Free Software'. This was done as NACI considered the use of the term 'source' to be too technical and they wanted to emphasise the importance of the non-technical arguments they were presenting (Byrne and Jolliffe, 2007).

IT officers in government were asked to respond to the NACI document. A Standing Committee (SC) consisting of Government Department Chief Information Officers (CIOs) was formed to address what the Government was to do about FOSS (Otter, 2002). In 2002 the SC held its first meeting which was attended by 3 people. Perception and awareness on FOSS in Government was investigated as an initial first step in the development of a FOSS strategy. The findings indicated that there was little awareness on FOSS and a perception existed that FOSS was unthinkable in Government systems as this would imply using software that was unreliable, without support and developed by a group of people doing their own thing. Interestingly, in 2001, in terms of infrastructure, such as internet relays, web servers, DNS servers and web proxies, most of Government's systems were already running on Open Source Platforms. This could be attributed to the fact that it was much easier to just

2 The National Advisory Council on Innovation (http://www.naci.org.za/) is a body set up by the South African Act of Parliament to advise the then Minister of Arts Culture Science and Technology, as well as Cabinet as a whole, on science and technology issues.

download and use the appropriate software, than to go through the whole government procurement process which was very lengthy. Alternatively (or additionally), it could point to a lack of FOSS awareness of users of Government's systems and what systems they are using.

In January 2003, the then Department of Arts and Culture, Science and Technology, made a second FOSS submission to Cabinet. The document focused on raising awareness of the benefits of FOSS to Government (GITOC, 2003). This submission, which encouraged the utilisation of FOSS in Government, was a proposed FOSS policy for Government (Cabinet Memorandum No. 29 of 2003) and was fully backed by the GITOC (GITOC, 2003). The GITOC submission borrowed extensively from the NACI report, but did not include all the richness of the original reasoning and mainly concentrated on arguments of OSS efficiency and effectiveness, as reflected in the title which talks explicitly of OSS (Byrne and Jolliffe, 2007).

The basic strategy in the policy was stated as:

> Government will implement OSS where analysis shows it to be the appropriate option. The primary criteria for selecting software solutions will remain the improvement of efficiency, effectiveness and economy of service delivery by Government to its citizens (GITOC, 2003, p.24).

Whereas the familiar benefits to society are outlined, the primary emphasis is on finding solutions to the challenge of IT deployment in Government. Where that challenge can be met with FOSS it is to be encouraged. If proprietary software is "more appropriate" then it should continue to be used.

The apparent lack of enforceability in the GITOC report was picked up by another report, this time commissioned by the Presidential National Commission (PNC) on Information Society and Development in January 2004[3]. The PNC report (Levin *et al.*, 2004) notes the slow progress towards implementation of the GITOC strategy and makes a number of recommendations aimed at enhancing the existing strategy. In particular the basic policy foundation quoted above is expanded with the provision that:

> When OSS is *not* implemented, then reasons must be provided in order to justify the implementation of proprietary software (Levin *et al.*, 2004: 4)

Besides the policy enhancements aimed at providing teeth to the existing policy, the report reasserts the responsibility of Government to impact on and facilitate the wider use of FOSS in society, i.e. it can and should do more than simply work on Government becoming a model user of FOSS.

The PNC report reflected frustration at the slow pace of implementation of existing FOSS strategy within government. Many of its findings and recommendations made its way into the next significant attempt to shape government policy - the Go-Open Source Task Team Conference of August 2005, Johannesburg (Levin *et al.*, 2005). The Go-Open campaign was a joint initiative aimed at promotion and awareness rising around FOSS in South Africa. It was supported by the Shuttleworth Foundation[4], the Meraka Institute of the Council for Scientific and Industrial Research and Hewlett Packard. The policy recommendations which

3 "Open Source Software and the Information Society – Policy and strategy recommendations to the Presidential National Commission of the Republic of South Africa", July 2004 available from http://www.gissa.org.za/special-interest-groups/open-source/foss-documents/open-source-software-and-the-information-society/view

4 The Shuttleworth Foundation is an organisation set up in South Africa by Mark Shuttleworth, creator of the Ubuntu linux distribution.

emerged were substantially similar to those of the PNC report, including a timeline for concrete implementation proposals and projects.

In 2005 and 2006 several civil society organisations petitioned the Minister of Public Services and Administration, asking her to make sure that Government implemented the FOSS policy. The civil society organisations were of the opinion that if Government, which was the biggest procurer of IT products in South Africa (around 60% of money spent on IT), adopted FOSS it would result in better FOSS skills and better FOSS support. This would make it easier for civil society organisations to also adopt FOSS. By 2006 it was evident that the tide was beginning to turn. In his speech during Software Freedom Day - a yearly international celebration of free software - the Director General of South Africa's Department of Science and Technology, said that lack of technology access due to insufficient funds and infrastructure is the primary challenge in Africa and that FOSS seemed to be ideal to solve this problem (DST, 2006).

In 2006 and 2007 Cabinet requested the SC (comprising the Governments' CIOs) to report on the implementation of FOSS in Government. The SC submitted a reworked policy to Cabinet (DPSA, 2006). The new policy mandated three things: Open Source, Open Standards and Open Content. This policy aimed at an entire open philosophy to be developed in Government. According to this, all new systems developed by Government should be based on FOSS. The policy contains a clause that allows people to use proprietary software for valid reasons such as privacy or security issues (mainly needed by the Department of Defence). The policy contains three statements: firstly, FOSS will be used unless there is a valid or justifiable reason that it shouldn't; secondly, FOSS methodologies will be used in a collaborative open licensed way and everything should be Open Content, unless there is a valid reason, such as security or privacy issues; and thirdly, that Government will not only use FOSS but will also encourage the use of FOSS and Open Content (DPSA, 2006).

The South African Cabinet approved a FOSS policy and strategy on 22 February 2007 and agreed that all future software developed for government would be based upon open standards and that Government would migrate its current software to FOSS (DPSA, 2006).

The revised FOSS policy is as follows (DPSA, 2006):

1. "The South African Government will implement FOSS unless proprietary software is demonstrated to be significantly superior. Whenever the advantages of FOSS and proprietary software are comparable, FOSS will be implemented when choosing a software solution for a new project. Whenever FOSS is not implemented, then reasons must be provided in order to justify the implementation of proprietary software.
2. The South African Government will migrate current proprietary software to FOSS whenever comparable software exists.
3. All new software developed for or by the South African Government will be based on open standards, adherent to FOSS principles, and licensed using a FOSS license where possible.
4. The South African Government will ensure all Government content and content developed using Government resources is made Open Content, unless analysis on specific content shows that proprietary licensing or confidentiality is substantially beneficial.
5. The South African Government will encourage the use of Open Content and Open Standards within South Africa."

Important to note from this policy is that South Africa has adopted a preferred OSS strategy. A preferred OSS strategy is very different to a mandating OSS strategy, as the latter is a

more radical approach in that it commands the use of OSS systems throughout Government, which implies replacing the entire existing proprietary infrastructure. Such a strategy entails large implementation and training costs and is quite clear in terms of what government departments are required to do - change all existing proprietary software to OSS, and only procure OSS in future (Wong, 2004).

Government departments were to include FOSS in their planning. A project office was to be established by the State Information Technology Agency (SITA), with the Council for Scientific and Industrial Research (CSIR). SITA was tasked to ensure the smooth implementation of the FOSS policy throughout South Africa. A SC to implement the policy, consisting of the DGs of the Department of Science and Technology, Public Service and Administration and the CEO of SITA, was formed, and subsequently a Programme Office at SITA was established. This committee now plays an oversight role of the Programme Office at SITA, which is tasked to ensure the implementation of FOSS in all Government departments. The responsibility of implementing the policy still lies with the CIOs of every national Government department due to the unique nature of each department's systems. Synergies between departments should be coordinated by SITA.

It is imperative to mention that there isn't unanimous support for the FOSS Government policy. Government departments, with the exception of a few, seem to be rather unwilling to jump onto the FOSS bandwagon. Although SITA was given the task to set up an Open Source Programme Office to ensure and coordinate the implementation of FOSS in all Government departments, the FOSS policy had by June 2008 not even been implemented in SITA itself.

3. IS change management models

Emergent approaches to the management of change (Burnes, 1996) evolved out of the need to gain a broader understanding of change management in a complex environment. Prescriptive approaches to change and conceptualisations of change as a linear sequence of events did not appear to be working (Macredie *et al.*, 1998: 8). As each change context is unique, process oriented theories help understand the underlying nature of the change and encourage an enabling rather than a controlling approach to managing change. One such a model is the Improvisational model of Orlikowski and Hofman (1997), which is based on two major assumptions: change is an ongoing process; and not every technological and organisational change can be anticipated in advance. This model is therefore ideal for situations where it is intricate to predefine the exact changes that will occur when implementing new technology and consequently difficult to determine the impact that these changes will have on the specific organisational context.

Orlikowski and Hofman (1997) describe the conditions under which an improvisational change model can be effectively implemented, as (i) aligning the key dimensions of the change process and (ii) dedicating resources to provide ongoing support to the iterative change process. The key dimensions they refer to are the technology, the organisational context, and the change model (see Figure 1). When considering the relationship between the technology and the change model, the improvisational model seems to be fit for situations where the technology is new and unique and has an open-ended and adaptable character. Similarly, when considering the relation between the change model and the organisational context, a flexible change model is more suitable in an informal and cooperative organisational culture than in a strict control-oriented culture; and finally when contemplating the relationship between the technology and the organisational context, the nature of the technology should be compatible with the organisational culture. It is important to note that the alignment of the three dimensions does not happen unconsciously, but it requires explicit and ongoing assessment and continuous fine-tuning or modification. This

makes the allocation of mechanisms and resources (with sufficient authority, credibility and influence) crucial for continued support of the ongoing change process.

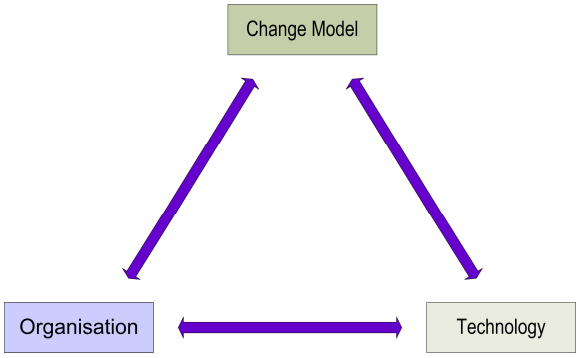

Figure 1: Aligning the key change dimensions (Source: Orlikowski and Hofman, 1997)

When trying to understand or to make sense of the complex environment in which IT is to be implemented (and therefore the organisational context within which the change will take place), Du Plooy's comprehensive framework (in: Weilbach and Byrne, 2010), which he calls the 'human environment affecting IT adoption and use', can be utilised. In this framework Du Plooy emphasises the cultivation and nurturing of the human and social environment in which IT is implemented, to facilitate adoption, use and the integration of IT in a socially responsible manner. Du Plooy addresses the social factors present in this environment, through the inclusion of six social contexts: people; organisations; groups; tasks; environments, and; technology. These contexts are different in their natures, but should be viewed as a collective that is tied together by the notion of a human environment. Du Plooy (*op.cit.*) refers to the social characteristics which describe these social contexts as "… organisational culture; organisational learning and emergence; the power bases of individuals and groups; empowerment/disempowerment of workers through information technology; resistance to change; … the influence of technology on the values and judgement of an organisation; the influence of technology on business processes, organisational learning and internal communication; …" These characteristic could be useful to describe the organisational context within which the change takes place.

From this brief discussion two aspects of the change management debate emerge as of interest to this research and are drawn upon in the rest of the paper. Firstly, change is ongoing and alignment of the organisational context with the technology and a change model is needed. Secondly, change in organisations should be viewed as multi-dimensional and the social characteristics of Du Plooy's six social contexts could assist in obtaining this perspective.

4. Research method

An interpretive approach, using a single case study (Walsham, 1993: Walsham, 1995: Barrett and Walsham, 1995) was used to gain an in- depth understanding of the dynamics present during the process of rolling out an OS ECM system at one of the national Government departments in South Africa.

The collection of data took place from the 26th of March 2008 to the 22nd of August 2008. A total of 10 meetings were held throughout this period on a weekly basis. The meetings were held at the Government department's premises and were aimed at keeping all stakeholders informed on the progress of the pilot project, and determining actions to be taken during the upcoming time period. About twelve people attended these meetings when the project started. Parties involved were: the Government department (where rollout would happen);

SITA; and the external OS Service Provider (who would be responsible for setting up and implementing the new OS ECM system). The meetings were chaired by a representative from SITA. All meetings were minuted and approved in the next meeting. One of the authors also documented the meetings separately in more detail for later use in the data analysis.

Throughout the project, data was collected by means of direct observations by one of the authors made during the weekly meetings and through regular visits to the Government department to observe the change process. Though initially designed as overt non-participatory observations, the skills of the researcher were sought during the process for support in designing the evaluation of the change to the OS ECM system. Positively, this move can be associated with an increase in trust in the researcher by the various stakeholders, and enabled the researcher to become more involved in the research process by actively designing the evaluation of the change. However, becoming more of a participant, observation meant that the researcher's focus was shifted to designing and engaging in debates around the evaluation. This could mean that some insight was lost in not being able to observe the process from a distance and some of the interviewees may have been less forthcoming with opinions if they perceived the researcher as part of the implementing team. The latter was though not confirmed.

Semi-structured interviews were conducted with all the end-users after the implementation and training. These included the Deputy Director and two assistant administrators in the DG's office. Each interview lasted about an hour and was tape recorded. The interviews were transcribed, read through and verified by listening to the tape recordings on another occasion. The topic guideline was built around the change management aspects of Orlikowski and Hofman's model (1997), and was also guided by the six social context's of Du Plooy's model (in: Weilbach and Byrne, 2010), thus questions were asked about the interviewees' background, their previous and current experiences with technology, change management practices, the organisational vision and structures and the social context..

A three stage process to the synthesis and analysis of the data was used. Firstly, one of the authors read through all the data collected (minutes and research records of meetings, interview transcripts, and internal documents) and made use of analytical memos to describe situations and to identify possible patterns and tentative explanations for these patterns as the case study unfolded. Secondly, given the paucity of published documents on FOSS within the South African Government, most of the details on FOSS detailed in Section 2 were obtained through an in-depth interview with a key government official and supported where possible with unpublished written documentation. This was an important stage in being able to understand and describe the context and participants involved in the change process. Thirdly, thematic analysis was used to discover the themes in a two stage process. Initially, the data was analysed and themes emerged inductively from the data. These included: unfamiliarity with the new OS ECM system; insufficient communication to end-users on the change to the OS ECM; insufficient training of end-users on the new system; positive attitude towards the reliable OS ECM system implementer; discontent about the duplication of and change in work processes; and uncertainty about the capabilities of the new OS ECM system. Later in the process when the researcher was more familiar with the context and issues arising, the change management dimensions of Orlikowski and Hofman's model (1997) and the six social context's of Du Plooy's model (Section 3) were then used to deductively analyse the data. These themes, in conjunction with the themes which emerged inductively, were used to write up the case study.

5. Case Study

The case study was conducted in the public sector at one of the Government departments. The Minister and CIO of this department were in favour of FOSS and were strong supporters

of the new national FOSS policy. The case study depicts the process followed in changing from a proprietary ECM system to an OS ECM system.

5.1 Rationale

The main reasons for choosing the OS ECM project as a first OS pilot project given in the interviews with the CIO and other staff at this government department were that the current document management system solution was very costly and the OS implementation would make a significant difference on the department's software budget. Furthermore, the department was not happy with the technical abilities of the PS and the support they got for the system was considered insufficient. However, who constituted the 'department' was not elaborated upon, but as the case progressed it was obvious that the people unhappy with the technical specifications were not the users of the PS ECM, but rather top and middle management.

5.2 Process of change

The anticipated change was the piloting of the OS ECM at the beginning of March 2008 with the aim to be completed by the end of May 2008. The new system (OS ECM) would run in the Minister's office only. However, what emerged in terms of the boundaries of the pilot project was different. The exact location and boundaries for the pilot project were called into question in an informal meeting attended by the ECM PS specialist, the external OS service provider, one of the authors, and two of the ECM users in the Minister's office. The two users noted that it would be difficult to confine the pilot project to the Minister's office. There were only two to three things per month which were handled solely by the Minister's office – the rest of the requests were sent down as workflow to various other people in the department, who had to respond to the requests and who had to provide feedback on their actions to the users in the Minister's office. One suggestion was that the pilot project could be narrowed down to a particular workflow of documents at all levels in the Ministry over the next 3 months. This would have the implications that more users would need to be trained and that the old and new ECM would need to be run in parallel, resulting in increased workloads for the users. A further meeting between the ECM PS specialist, the external OS service provider, and the supervisor of the users in the Minister's office, agreed that the document tracking/workflow line between the Minister's Office and the DG's office would form the pilot project. Consequently the duplication of the two systems would be restricted to the Minister's and the DG's offices, resulting in the DG office users also being trained.

The anticipated plan was to evaluate the implementation on completion of the pilot phase, and if found to be successful, the department would embark on rolling out the OS ECM to the rest of the department as a second phase of the project. To circumvent any time delays in the commencement of the second phase of the project - the roll out to the rest of his department – the CIO applied for a Request for Proposal (RFP) for the second phase alongside the implementation of the first phase (see below for further details on RFP). All of this was to be accomplished by the end of 2008. The CIO of the Government department appointed the current ECM PS specialist to lead the new OS pilot project.

There were two main communication mechanisms initiated. The first mechanism was the weekly meetings of the stakeholders involved in the project. This comprised: from SITA: the project chair person; the secretary, and other representatives; from the Government department: the CIO (when available), the ECM PS specialist, a representative from the Minister's office (a super user), and representatives from the IT section; from the OS ECM vendor: the person responsible for rolling out the new OS ECM; and from an outside company: one of the authors as independent observer. The meetings took place at the premises of the Government department. The minutes of the weekly project meetings were generated and distributed by SITA. The format in which the minutes were written created a

concern by the Government department. In keeping with the FOSS policy the representative of the Government department, namely the CIO, argued that all project communication, e.g. minutes of project meetings, should be done using FOSS. However, though SITA was the implementing office for the FOSS policy, it still was in a transition phase to migrate to FOSS and as this was only scheduled to happen in June/July, SITA felt that they could not comply with this request. The CIO of the Government department mentioned that the project members should not wait for the entire SITA to migrate to FOSS. The project manager requested the CIO of the Government department to write a letter to SITA to request that all the team members get Open Office installed on their computers to facilitate the request by the CIO.

The second communication mechanism was through agreement and signing off on a number of official documents. These included: Request for Proposal (RFP); Purchase order; Appointment letter, and; Project Charter.

- *Request for Proposal:* An RFP is a document published by a Government department when services from outside vendors are required. In this case SITA was responsible to publish a RFP for OS ECM software and supporting services from outside vendors or service providers. As noted above the CIO suggested starting the RFP process for the second phase of the project – the roll out to the rest of the department – alongside the pilot project. During the first weekly meeting the CIO accused SITA of holding up the phase 2 process, as the RFP for the pilot project was submitted to SITA in November 2007, but the service provider was only appointed in January 2008 – a process which should only take 2 weeks. The project manager (from SITA) requested that a business case be built for procurement of the second phase. He suggested that they try and get the phase two tender out in the middle of this pilot project, so that the Minister's office would not be hindered by the further roll out and delays in commencing the second phase.

- *Purchase order:* On receiving the proposals from outside vendors or service providers, SITA evaluates these in conjunction with the Government department and then issue a purchase order to the chosen provider.

- *Appointment letter*: Furthermore, before embarking on any service delivery in Government, the service provider needs to be in possession of an appointment letter. SITA therefore had to issue an appointment letter to the chosen OS ECM vendor. At the first weekly project meeting it was quite obvious that the Government department's CIO was unhappy with SITA in relation to the issuing of this appointment letter. The CIO claimed that the OS Service provider only received a purchase order. SITA was of the opinion that an appointment letter was unnecessary in this particular case. The department's CIO insisted on a letter as his department wanted SITA to ensure that there was no risk in accepting the OS service provider's appointment.

- *Project charter*: The project charter is a document that describes the intended project. It includes details on the stakeholders, their responsibilities, project boundaries, project deliverables, and project time lines. There was yet again disagreement on this document. In the first meeting one of the Government department employees complained that some of the paragraphs in the project charter were 'loaded'. The chairperson of the meeting (who was from SITA) suggested that the meeting went through the project charter to identify such phrases, so that they could be restructured. While this was done, the CIO of the Government department also pointed out that he could not see SITA's responsibility towards the project explicitly outlined in the project charter. He wanted to know what in the project

charter would show him whether SITA has performed or not and suggested that SITA's responsibility be added to the charter in a separate clause.

Although there were several suggested changes to the project charter, the chairperson suggested that the charter was signed by the Government department as it was, and that the issues with the charter would then get minuted. He would then get a Change Control Proposal (CCP) from SITA so that the project would not be delayed again – according to him if they changed the proposed charter, it would take another two weeks to go through language editing. The CIO agreed to sign but was not convinced that the changes would be incorporated by SITA if he signed the incomplete version. The project manager then suggested that he signed "subject to changes as minuted". This was agreed upon.

Once agreement had been reached on the timeframe and boundaries of the pilot project all necessary documents were signed, albeit with caveats attached to some. However, other conflicts arose between SITA and the Government department. At one meeting the Government department's CIO raised the problem of a competing proprietary ECM system which was currently available to other Government departments for purchase and supported by SITA. The CIO was of the opinion that this would lead to confusion in Government departments with respect to promoting the governments' FOSS policy, that is, how could SITA be seen to be supporting a proprietary system simultaneously with an FOS system which had the same functions and still be viewed as promoting FOSS? He further indicated that he knew of other departments rolling out this other proprietary system and that they were able to do so without a proof of concept i.e. without any evidence that the system is viable and capable of solving the departments' particular problems. He therefore said that they would want the pilot project's FOS ECM system to be as flexible, in terms of procurement and functionality, as the proprietary ECM, in that it would fit all the current processes of Government departments. In this way the FOS ECM system would be as acceptable as the proprietary one.

Another debate which arose in the first meeting was the issue of evaluation of the pilot project. SITA was tasked to come up with an evaluation 'tick-list' to evaluate the project after implementation and was to make use of the evaluation criteria used for a previous Government tender (the so called 'Tender 398') or the New Zealand Government specification. Concerns were raised over the timeframe for the evaluation metrics to be developed (CIO of the Government department); alignment of the metrics with the request for quotation (RFQ) (OS service provider), and; the inclusion of a user perspective in the evaluation which was currently focusing only on a technical evaluation (author).

5.3 Project Outcomes to date

The pilot project started at the beginning of March 2008 and was to be completed by the end of May 2008. During the project several incidents caused the completion date to be extended. One of the main delays was in conducting the training. During the first meeting the ECM PS specialist noted that the training would not be able to take place at the times as stipulated in the proposed project plan. The trainees would be out of the office on official business during this period. The project schedule had to be changed accordingly. The Government department's CIO added that he wanted an extra day's training to be included on Open Office, as he believed that it would add to the success of this pilot. The new OS ECM would require users to manage documents and these documents were, because of Government's OS policy, soon to be only OS documents, and the users were not yet familiar with this either. In a later meeting the external service provider raised a concern in this regard. He was afraid that the users might give the new OS ECM system a bad evaluation, as they might perceive the change to the generation of documents in OS to be part of the new ECM system.

User training proved problematic in terms of lack of commitment of users (they left the training to attend to other office business), separate one-to-one training being scheduled, and the DGs office cancelling training and being unavailable for the month of June. Apart from this having financial implications for the project, it hampered the project schedule, as the Minister's office started to populate the document management system, but the workflow part of the system could not be utilised before the training of users in the DG's office was completed.

Other setbacks included delays in providing the external service provider with the necessary workflow so that the system could be set up accordingly, and; defining the scope of the pilot project, i.e. determining which offices in the department would be involved in the project. The user evaluation, which was the final project task to be completed, was conducted on the 22nd of August 2008. Feedback from the PS ECM specialist at the end of February 2009 indicated that the pilot project had been completed, although the final report from SITA was still outstanding. The Government department's top management had though approved the second phase to roll out the OS ECM to the rest of the department.

6. Findings

From the case study it is quite evident that changing from the PS system to the OS system is an on-going process, as one change inevitably led to another. All changes couldn't be anticipated in advance and managing these changes in an improvisational manner seemed to be crucial for the adoption of the new OS system. Furthermore, both enabling conditions as pointed out by Orlikowski and Hofman's improvisational change model (1997) seems to be important as the allocation of specific resources to the change process (such as the PS ECM specialist) without the alignment of the three key change dimensions, meant that the change from the PS system to the OS system was difficult to implement. These three key dimensions of the improvisational change model are discussed in further details.

6.1 Change Management Strategy

Throughout the project the phrase "change management" was merely used in the minutes to address issues regarding the training of the new OS ECM system's users. The broader question of change management was raised by one of the representatives of SITA when he asked the PS ECM specialist what change management had been done on the project. He replied that the department organised a session with users from the Minister's and DG's office during which they were informed about the Government's FOSS policy and given the reasons for moving to the new OS ECM system. During this session they were also notified about the user evaluation which would be done at the end of the pilot, as well as the dates which were set to train them on both Open Office and the new OS ECM system. The SITA representative replied that change management had to be included formally and properly during the second phase of the project, as he believed the success of the second phase would depend on it. The content or process of the change management was not detailed. Though a training plan was developed, there was no plan to evaluate the possible impact of the change; to include a fully fledged communication blue print; or to come up with a stakeholder management plan. Thus, in terms of Orlikowski and Hofman's model, there was little included in the change management strategy to ensure alignment of the vision of the department, SITA, and the users, with that of the national vision.

However, there were even some concerns on the training and orientation sessions which were included under the change management banner. During the interviews the users in the DG's office complained that the training they received on the new system was insufficient in the sense that they didn't have enough time to learn and implement what they learned on the new system.

I did attend the training, but after I came back from the training, I didn't have enough time to practise what I've learned. ***Respondent 1***

As a result they didn't find the new system easy to use. The fact that they had to run the old PS and the new OS systems in parallel increased their work load, and this added a lot of stress to their jobs. Because of this, they didn't have time to update both systems one after the other (as one would expect them to), but some of them sent the document via the old system and would only duplicate it on the new system the following day.

All the users agreed that the support they got from the PS ECM Specialist, who assisted them whenever they needed it, was invaluable and was what kept them going on the new system.

I'm satisfied with the support that I'm getting, because the person that is helping us is always there. ***Respondent 1***

I think the training time was too short, but maybe we are too privileged to have 'the PS ECM Specialist' – he will come in and give us some lessons whenever we need it. ***Respondent 2***

It was therefore clear that the PS ECM specialist acted as a 'champion' for the project and one has to deduce that his dedication and support contributed immensely to achieving the end result, which could otherwise have been very different. This also echoes one of Orlikowski & Hofman's (1997) enabling change conditions - that of "dedicated resources to provide ongoing support for the ongoing change process."

We can conclude that there was no official plan or blue print for change management at this level and the process followed fits well with the Trukese way of open sea navigation as discussed by Orlikowski and Hofman[5] (1997). It was apparent from the project meetings that change management was viewed as no more than training and evaluation of the training. Only on one occasion had the proposed users been informed of the FOSS policy and the planned changes which were to take place.

6.2 Internal and External Organisation

Political play surfaced throughout the change process between the Government department and SITA. This was apparent in the accusations made by the Government department's CIO that SITA wasn't committed to contribute to the success of the pilot project and that he couldn't find their responsibility towards the project in the project charter. It is also clear that there were serious trust issues between the Government department and SITA, with the CIO of the Government department accusing SITA of delaying the whole process from the start. This was also evident in his initial unwillingness to sign the original project charter without the words "subject to change as minuted".

At the organisational level there was clearly tension between SITA who did not appear to embrace the FOSS policy and the CIO of the Government department who was keen to do so. Cabinet commanded SITA to ensure that FOSS was rolled out and coordinated in all Government departments, but SITA's commitment to this process was questioned by the CIO, as SITA had not even transformed their own IT policy to correspond with Government's FOSS policy. However, even within the government Department, where there was management commitment to the process, there was no attempt to align the various actors to the Governments' FOSS policy. Information sessions on the rationale which led to the

[5] The Trukese navigator commences the journey with an objective and navigates the open sea in an *ad hoc* manner in pursuit of the objective. The Trukese navigator responds to the sea and weather conditions during the journey. This distinguishes the Trukese navigator from the navigator who uses a plan devised before the journey starts to navigate the open sea ORLIKOWSKI, W. & HOFMAN, D. (1997) An Improvisational Model for Change Management: The Case of Groupware Technologies. *Sloan Management Review,* 38**,** 11 - 21.

Government's FOSS policy and the reasons why the CIO of the Government department was pushing so hard to implement the new OS ECM system, would have been useful for cohesion of that vision for the people involved in the move in that department. Additionally, a forum in which this vision was discussed with SITA might have provided SITA with the opportunity to explain their reservations in the FOSS migration process before the project even started.

6.3 Technology

At the individual level greater effort could have been put in to understanding, for example, the technological frames of reference of the users before implementation (Du Plooy, 1998). Few of the users were even familiar with computers and the software used in this particular context, never mind the difference between OS and PS. This general unfamiliarity with and perceptions of technology were not addressed.

Although the new system did not seem to change the reporting structure in the department, it seemed to have an influence on the power play (Du Plooy, 1998), as some of the users described how the new system shows exactly where a document is, who has to work on it, and what has been completed on it.

> *… she'll (my boss) send me a document and she can still see whether there was action done on the document, or not. Now I'm going to be productive – like you know, I'll know that this document – by looking at the urgency of the document – it has to go somewhere and my boss can check whether I've sent it on.* ***Respondent 1***

Determining whether the new system would increase/decrease their productivity was impossible to verify, as the increased workload perplexed their ability to evaluate this.

> *It's not a difficult process, but at the moment, you know, it actually takes a lot of our time, because you have to save your document in 'the PS system', then export the document to 'the new OS system' – stuff like that.* ***Respondent 1***

When asked to compare the new system with the old one, and to elaborate on the new system's ease of use, it was clear that the users had not worked with or seen most of the new system's functionalities, such as document tracking, security, etc.

> *I can think the new system has everything it needs. I haven't seen it all, but they told me so…* ***Respondent 1***

> *At the moment it's used only for document management – I don't really know what else it can do.* ***Respondent 2***

This raises a concern, as one of the aims of the pilot project was to determine whether the new system would be considered a sufficient replacement of the old PS system and the interviews clearly showed that this could not be determined.

Although the new system seemed to have all the functionality of the old ECM system, some of the users mentioned that the old ECM system used a document number to identify a document uniquely, and that they found the new system to be lacking in this regard. As the users used this document number to refer to a document habitually, the lack of its existence in the new system reveals an important overlooked change in the existing work process which could lead to user resistance.

> *What I like about 'the PS system' is the document numbers – like after saving the document you'll get a number – say like 1, 2, 3, 4 or 5 – so you can only use that number in your diary – then you know those are the documents that you've been sending through and which you need to track. 'The new OS system' does not have these numbers to refer to a specific document loaded onto the system.* ***Respondent 1***

Were any of the three key dimensions of Orlikowski & Hofman's (1997) model therefore aligned? It is apparent that the technology (OS ECM) was aligned with the Government's FOSS policy, but there was a clear lack of internal alignment within the organisation in terms of attaining a shared vision. The technology and the change management strategy were also not aligned. The system was however implemented across the Government department (although it is not evident if this occurred as was anticipated, or whether it was used as extensively as was planned). The fact that the PS ECM specialist was a "dedicated resource to provide ongoing support for the ongoing change process", could have contributed to the latter.

7. Discussion and Conclusion

Orlikowski's and Hofmans' improvisational model (1997) with Du Plooy's human environment model (in: Weilbach and Byrne, 2010), assist in understanding the complex human environment in which technologies are used, and reveals how one can 'cultivate' this human environment within which technology is to be implemented. Such an approach to change could, for example, highlight key activities which should have taken place in the above case study. For example, looking at the philosophy behind the national policy and getting buy-in at departmental level may have been advisable before proceeding with the implementation of the new OS ECM system.

Many of the challenges raised are common oversights in change management literature, such as inadequate consideration for the social context in which the change was to take place. However, what makes this case different to the standard change management case is that one of the main challenges arose from the alignment of internal organisational change to a national policy which did not seem to have the full support of the agency which was tasked with implementing it. It is hard to see how the key challenge to the implementation of the new system could be addressed within the organisation – a contentious national policy will be a contentious internal policy if representatives of the same stakeholders are involved at both levels.

Practically, a lot of value could have been added to enhance the possible adoption of the new system, if special attention was paid to nurturing or cultivating the social context, as described by Du Plooy (1998), within which the system was to be implemented. Gaining an in-depth understanding of the organisational culture and politics and acting perceptively could have prevented the DG's office from cancelling their scheduled training at the last minute. The implementers could have pre-empted this if the culture of the group, relevance of the new system to the users, users' knowledge and perceptions of IT and their attitude towards management were investigated earlier. Additionally there was an inherent assumption that the users were a homogenous group of people in terms of IS adoption and a 'one-size-fits-all' training was designed and planned.

Specifically, some of the recommendations for government practitioners emerging from this case study are:

- Compose a formal change management strategy and plan before embarking on similar projects, i.e. ensure alignment of the vision of the department, other partaking government agencies or departments, and the users, with that of the national vision.
- Be sure to have a project champion on board (a dedicated resource to provide ongoing support for the ongoing emergent change process)
- Study the organisational culture and politics of all partaking institutions and agencies to gain an in-depth understanding in order to act wisely.
- Gain an understanding of the relevance of the new system to the users, users' knowledge and perceptions of IT (their frames of reference) and their attitude towards management

before embarking on such a project. This understanding should inform the change management plan.

On a theoretical level, can changes in internal organisational practices therefore be effectively aligned with contentious national policy imperatives? Models can increase our understanding and reveal how one can 'cultivate' this human environment within which technology is to be implemented. However, the process of developing the understanding of how national policy was developed and the rationale for it is important, as is developing an understanding of the rationale of this particular department for choosing to be a pilot site. Perhaps by adding to or expanding on Orlikowski and Hoffman's (1997) model to include a fourth element, indicating the external forces in the environment, such as government regulations; government policy; and the debate on global and national FOSS versus PS (see figure 2), may highlight the need for this external alignment as well as prevent the focus on internal alignment only.

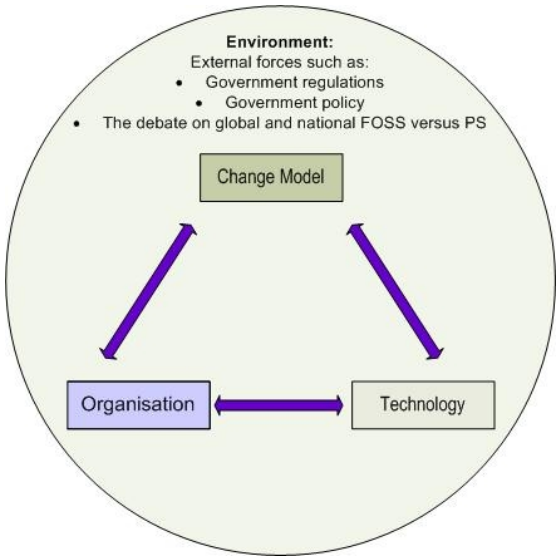

Figure 2: Adjusted improvisational change model (Adapted from: Orlikowski and Hofman, 1997)

What emerges from this paper is a caution that there is not a sole voice within government. The internal dynamics and differences of government departments are inadequately understood, especially considering the huge changes which the Government of South Africa has undergone since independence in 1994. In a multi-levelled and multi-sectoral institution there exist many different rationalities. Alignment of these rationalities within an organisation is a prerequisite for alignment of the organisation, the change management strategy and the technology. Certainly our case illustrates with many examples where the lack of alignment caused many emergent changes to occur, which could have been prevented if greater focus on alignment had been provided. Our conclusion is that an awareness of the social context of the organisation and the environment in which it is to be implemented, might at least provide an understanding of what the contention is about, if not the solution on how to address it.

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