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Influence processes of implementation effectiveness in challenged information technology projects in Africa

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Abstract

Purpose – This research reports on how influence processes (IP) impact on the implementation effectiveness of information technology (IT) projects. Drawing on an innovation perspective that elevate the interplay of factors related to innovations framing, innovations environment and innovation attributes, the study focused on IT projects based in Africa that are generally classified as “challenged” due to the conditions in the environment. The purpose of this paper is to assess how IP related to innovation framing, innovation environment and innovation attributes can be used to determine implementation effectiveness.

Design/methodology/approach – Using an interpretive approach, a case study of institutions under a partnership that has been implementing various educational technologies in five African countries formed the sample. In all, 25 interviews of top-management representatives, project leaders and user representatives were conducted between 2012 and 2013 to assess the implementation effectiveness of these projects. Theoretical thematic analysis, based on a deductive approach, was employed to analyse the data.

Findings – The results show that a majority of these development-oriented projects are “mandated failures” characterized by high framing, a bad internal environment and typically negative innovation attributes. That typically, the institutions engage symbolically in such innovations initiatives which are regarded as “show” projects. Such behaviour can be construed to be a pattern of cynical technology adoption linked to the appeasement of external stakeholders. In addition, participation in initiatives was largely symbolic and is considered as a mere demonstration of a modern organization that is technologically aware, yet the requisite innovation environment is lacking for effective appropriation of the technology. Third, mandated failures result in low morale of employees, who regard themselves as pawns in the process which make them grudgingly participate in the implementation process.

Practical implications – These findings have implications for managing innovations in such challenged environments: the first proposition is that projects in challenged environment for innovation adopting organizations need to be considered as technology transfer projects. Second, the innovation environment and attributes can only be improved during implementation of the conditions related to absorptive capacity of the organization and the individual are addressed.

Originality/value – The research reported in this paper, provides an empirical determination of the concept of implementation effectiveness by using three constructs of innovations framing, environment and attributes. On the basis of the empirical findings, an original contribution is claimed, especially in “challenged” IT project environments where the concept of success is fluid and outcomes uncertain.

Keywords Implementation, Absorptive capacity, Adoption, Technology adoption, Innovation driver/enabler/factors/process

Paper type Research paper



1. Introduction

Information systems (IS) projects success, especially in developing countries of Africa, continue to be characterized as “challenged” in various studies. Since these IS projects are implemented as innovations, we look at success from an innovation adoption perspective. An innovation is considered as a product or service that is new to its developers and/or to its potential users (Klein and Knight, 2005). For organizations to survive and thrive in a changing environment, innovation adoption and implementation are critical.

Innovation implementation means the skilful, committed and consistent use of an innovation by individuals, teams or organizations (Klein and Sorra, 1996). The concept of innovations and project success remain an unresolved issue in many studies with some focusing on process improvements (Grimshaw *et al.*, 2006) while others are related to satisfaction at the client level (Proctor *et al.*, 2011). An innovation is a success if it is implemented effectively – that is, the adopted innovation is used consistently and the benefits are realized. Both the speed to competence and user satisfaction are each seen as two factors for evaluating success. Therefore, “[...] the sooner the innovation can be productively used and the more satisfied its users are, the higher implementation effectiveness is” (Wunderlich and Größler, 2011, p. 7). Klein and Sorra (1996) describe implementation effectiveness as the quality and consistency of the innovations use within an organization as a whole. Hence, implementation effectiveness can be interpreted as the extent of intra-organizational acceptance and usage of an innovation over time.

This paper will focus on influence processes (IP) at different levels (macro, meta and micro). Earlier studies on innovations adoption and implementation have predominantly focused on individual (micro) characteristics to explain how to improve success rates in technology implementation. Sawang and Unsworth (2011) contend that implementation of an innovation is a complex task involving acceptance to adopt and additional IP beyond the individual. Kirschner *et al.* (2004) argued that implementation requires understanding the interplay among organizational units, thus individual characteristics might not be sufficient for understanding and explaining implementation effectiveness as a measure of success in adopting organizations. Dobson *et al.* (2007) state that success in implementation of an innovation might not be replicated in other organizations. Where there has been research focusing on IP or factors that determine innovation implementation effectiveness, the focus is seldom on an integrated view of the three levels and how they influence success. Thus despite long standing innovation research, the nature and patterns of IP at the various levels is still scant and this is evident from research that documents the predominance of failure in IT implementation. For instance, we are not aware of empirical research that explains the influence of conceptualization (framing) of innovations and how such influence intertwine with the organization environment and innovation attributes to influence implementation effectiveness. Given the paucity of research on these aspects, the aim of this paper is to analyse how IP related to innovation framing; environment and attributes can be used to determine implementation effectiveness.

In the subsequent sections, we describe the context of our study by emphasizing the nature of the challenged projects. Then, we provide a background and description of the theoretical perspective that we employ as a lens for understanding and explaining implementation effectiveness. The research methodology section describes the procedures and the analysis employed. This is then followed by analysis of data

and discussion of the findings. Finally, the conclusions and their implications for IS research and practice are presented.

2. “Challenged” information technology (IT) projects in Africa

Projects are the instruments of choice for technology transfer initiatives by various international development sponsors and their partners. Failures in project implementation seem to be the rule rather than the exception in Africa (Ika *et al.*, 2012). Since 2000, the project failure rate for World Bank projects in Africa was estimated at 50 per cent (Chauvet *et al.*, 2010); while the Independent Evaluation Group discovered 39 per cent of World Bank projects were unsuccessful in 2010 (Ika *et al.*, 2012). Various organizational and managerial reasons are proffered, including imperfect project design, poor stakeholder management, delays between project identification and start-up, delays during project implementation, cost overruns and coordination failure (Kwak and Radler, 2002; Youker, 1999; Kilby, 2000; Ahsan and Gunawan, 2010). Matavire *et al.* (2010) identified factors related to IT project leadership weaknesses, task conflicts and institutional fragmentation as contributing factors to project implementation challenges in South Africa. Lungo (2008) plus Sheikh and Bakar (2012), reported on the implementation effectiveness of health IS projects in Tanzania. They illuminate the issue of challenged projects by highlighting the role that relationships play between developer – sponsor; global developer – local developer and local developer – local user groups. These relationships exacerbated the technology implementations in Tanzania.

Some studies link the malaise related to ineffective implementation of IT projects in Africa to a colonial inheritance of very limited technical capabilities by the bureaucracies; authoritarian decision-making processes under generalist administrators and the predominance of patron-client relationships (Berman and Tettey, 2001). Such studies tend to link the failure of projects to a lack of capacity. Peterson (1998) reports on a high-priority IS project in Kenya, which after four years in implementation, realized only nine out of 44 requirements. Likewise, the adoption of IT in Algeria’s banking sector in the 1990s also failed to generate expected results; while South Africa’s Presidential Review Commission concluded that IT assets did not contribute to the expected transformation of service delivery (Presidential Review Commission, 1997; Moussa and Schware, 1992; Berman and Tettey, 2001). Thus given the history of failure of IT projects in Africa, especially from a capacity perspective which is linked to colonialism (Berman and Tettey, 2001; Heeks, 2002a), innovations that are introduced in public sector agencies in Africa mostly are characterized as “challenged”.

Fitz-Gerald and Carrol (2003) consider an ineffective IT implementation as one which may have run over budget, are operational but still not delivering full functionality. They regard this as a partial success and contend that this is an area mostly ignored in research. There are a number of issues expected from such challenged implementations: financial costs associated with provision of additional resources for remediation, data validation, data cleansing, re-programming and re-training (Fitz-Gerald and Carrol, 2003). In this study, we consider a number of such exemplars of projects in a “challenged” project environment by focusing on the institutions in the higher education sector of Africa where investments in information and communications technology (ICT) continue to rise. ICT in higher education institutions (HEI) are portrayed as being instrumental in removing barriers to effectiveness, creating effective services, adding new possibilities for collaboration,

establishing continuous communication and building trust among people, helping in building communities of innovation, radically changing institutional processes and practices and implementing infrastructure and tools that enable people to excel (Dodds, 2007).

But with all the said, the impact of these technologies on education service delivery has been disappointing (Bertrand, 2010; Veletsianos, 2010). This outcome has been termed a form of technology transfer called “Technosclerosis” (Bertrand, 2010). Technosclerosis describes the modern university falling behind the pace of technological change and becoming irrelevant in an interconnected and globalizing world. Oliver (2001) claims that the impact of ICT innovation in HEI has not been extensive as in other fields. He states that there is a detachment between the belief in the potential of ICT in HEI and real application. This results in a lack of belief in technology potential and actual realization of these benefits that accrue from adopting these innovations. This is what has been referred to as “dancing with the devil” (Katz, 1999). While there is literature on adoption, the understanding of what leads to effective implementation once technology adoption has accrued remains blurred (Dong *et al.*, n.d.; Chin and Marcolin, 2001). In addition, information on understanding what exactly would result in enthusiastic technology use is not clear. Most of the models in the literature are on IS adoption. Models like Davis’ (1985) Technology Adoption Model, Rogers’s (1983) Diffusion of Innovation and DeLone and McLean’s (2004) work are heavily cited to explain what causes adoption of technology, but rarely on implementation effectiveness.

This study focused on educational technology innovation projects funded by Partnership for Higher Education, Education Technology Initiative (PHEA-ETI) from the years 2008 to 2012. The PHEA was started as a joint venture of four US foundations in 2000, which later grew to seven foundations which are the: Carnegie Corporation of New York, Ford Foundation, John D. and Catherine T. MacArthur Foundation, Rockefeller Foundation, William and Flora Hewlett Foundation, Andrew W. Mellon Foundation and Kresge Foundation (Lindow, 2011). The PHEA was started with the aim of supporting HEI in Sub-Saharan Africa (Lewis *et al.*, 2010). By 2011, nine different African countries (Egypt, Ghana, Kenya, Madagascar, Mozambique, Nigeria, South Africa, Tanzania and Uganda) had received support from PHEA. The PHEA initiative identified the following four dimensions that the initiative was to address: Effective use of ICT; a diverse student body; creation of high-level professional talent and new ideas; transfer of skills essential for national development and strengthened university management and global engagement (Parker, 2010). PHEA-ETI was designed to support the adoption of teaching and learning. The purpose of the PHEA-ETI component was to expand and enhance the effective use of educational technologies for teaching and learning at seven PHEA-supported universities (Table I).

3. Framework for the analysis of implementation effectiveness

One theoretical perspective for assessing implementation effectiveness of IT projects in higher education for Africa is a set of constructs proposed by Johnson (2001). Johnson’s argument is that in assessing implementation effectiveness, there should be a positive weighting of the three factors of innovation framing, innovation environment and innovation attributes. Each of the three terms is the subject of many journal articles, but typically in a disaggregated manner. The attractiveness of Johnson’s approach is in how the three concepts are used as structuring metaphors for establishing the success of innovation implementation effectiveness. He makes the argument that none of the

Country	University	ETI projects
Ghana	University of Education, Winneba	Enhancing quality of teaching and learning using an LMS Monitoring of staff behaviours in moodle Base line study on e-readiness of UEW
Nigeria	University of Ibadan	Capacity building and digital content Open courseware for science and technology Tele-classroom for general studies Educational radio and mobile phones for distance education
	University of Jos	Departmental education tech initiative (LMS) Educational multimedia and simulations project e-Learning fellowship project
Kenya	Kenyatta University	Digitization of past examination papers Postgraduate research methods course Online eMBA program Creation of chemistry and communications skills modules Executive information systems specification
Mozambique	Catholic University	Digitization of theses and dissertations ICT policy, use policy and strategy development e-Learning project Research project CED electronic support project OER health sciences project
Uganda	Makerere University	e-Content project Gender research project e-Portfolio project
Tanzania	University of Dar es Salaam	Online course migration and improvement Computer science interactive courses

Table I.
PHEA-ETI projects and participating universities (June 2012-2013)

three on their own, are sufficient in determining the success of a project. The structuring metaphors present eight possible conditions for success that arise from a combination of the three factors (Johnson, 2001). Implementation effectiveness success can only be realized if an innovation is properly framed according to stakeholder expectations with an internal innovation environment present and specific attributes of innovations must outweigh the cons (Johnson, 2001). The key determinants in their conceptualization of successful perceptions needs to be inferred as being positive or negative and the result is then used to determine the outcome of the implementation effectiveness (Kazemi *et al.*, 2013).

Johnson's (2001) conceptualization of success is in line with Murphy *et al.* (1974), who concluded that there is no such thing as "absolute success" and that there is only the "perceived success of a project" that changes over time. Ika (2009), states such a conceptualization may imply that success in implementation effectiveness and failure are not necessarily contradictory notions (Fincham, 2002), nor are they a "black and white" issues (Baccarini, 1999). This could be on an analytically continuum to explain various shades of success and failure of innovations. Johnson adopts the above conceptualization and links it to implementation effectiveness based on eight propositions outlined in Table II.

The simplicity and versatility of the classification adopted by Johnson allows for an evaluation of project success without falling into the trap of either an innovation success or not. Using the three concepts of innovation framing, innovation environment and innovation attributes, it is possible to map out IP at the macro level (framing), meta

Implementation outcome	Proposition
Success	Innovation implementation success results from high framing, a good internal environment and pro attributes
Forced success	The condition of forced success, where there is high framing, a good internal environment and con attributes results in partial success
Mandated failure	The condition of mandated failure, where there is high framing, a bad internal environment and con attributes results in a partial failure
Tactical successes	The condition of tactical success, where there is a low framing, a good internal environment and pro attributes, will result in a partial success
Techno-political failures	The condition of techno-political failure, where there is low framing, a good internal environment and con attributes, will result in partial failure
Support failure	The condition of support failure, where there is low framing, a bad internal environment and pro attributes will result in partial failure
Failure	Low framing, a bad internal environment and con attributes will result in failure

Source: Adapted from Johnson (2001)

Table II.
Conditions of innovation
implementation

level (environment) and micro levels (attributes). While there may be other theories for studying innovation implementation effectiveness, the concepts and approach advocated for by Johnson (2001) appears to be uniquely suited to uncovering factors that influence success at various levels, and thus this research fills a gap in IT innovations research focusing on implementation effectiveness. Johnson's (2009) model has been empirically applied in other studies. Therefore, apart from its theoretical soundness, there has been empirical validation in multiple research contexts. For instance, Kazemi *et al.* (2013) looked at the influence of individual and organizational factors and their impact on the innovational environment of banking institutions. Johnson (2009) analysed the interplay of the three innovation processes in the implementation of a health IS. Further, Johnson (2005) assessed how innovation processes impacted knowledge management in a health unit. We therefore have employed the model as an analytical lens to help in understanding and interpreting the collected data.

4. Research methodology

We adopt a qualitative approach, based on an interpretive perspective, seeking to explain the social practice of the discourse surrounding innovation implementation effectiveness of "challenged" IT projects implemented in HCI of Africa. In the next subsections, we describe the research methods that were employed in this study.

4.1 Research design

The research design was based on a case study of seven HEI in five countries in Africa under the PHAE-ETI initiatives. Projects under the PHEA-ETI initiative included: deployment of learning management systems (LMS), developing digital contents, creating multimedia for distance learning, digitization of thesis and past examination papers, developing students' e-portfolios and development of various interactive computing courses.

4.2 Data collection

Interviews were conducted with respondents representing top management (deputy vice chancellors), project leaders and representatives of various users groups (lecturers

and students). In total, 25 interviews were conducted during 2012, which included two vice chancellors, seven project leaders, ten lecturers and six students. In addition, researchers participating in three workshops held in three different countries (Mozambique, Uganda and Kenya) were interviewed to evaluate and monitor progress of the IT projects. The interview questions focused on the respondents' experiences in implementation and use of the various initiatives in the HEI. A deductive process of data coding using a structured content analysis was then employed based on the analysis procedure explained below.

4.3 Data analysis

The study used theoretical thematic analysis or a structured content analysis, which allowed for a rich detailed description of the data that were relevant for addressing the research objective. Theoretical thematic analysis was selected because the data were coded for the specific purpose of determining implementation effectiveness in the seven HEI and in line with critical research approaches (Braun and Clarke, 2006). Latent themes relevant to assessment of implementation effectiveness from an innovations perspective were characterized by the formative constructs of innovations framing, innovations environment and innovations attributes. The metaphors for theorizing what is emergent from the data were therefore from these three concepts. These were regarded as the discursive practices (DP) used for interpretation purposes.

Theoretical coding relied on three constructs of innovation framing, innovation environment and innovation attributes (Johnson, 2001). Thus in the interview transcripts, we thematically coded to align with these three constructs and an assessment was made as to whether they were positive or negative statements based on eight conditions/propositions (Table II). Table III summarizes these DP and the indicators of the DP or discursive types (DT). Atlas.ti Version 7 was used to process the interview transcripts and identify the themes (DT) that were adopted in this study. The three researchers independently coded the data, after which comparisons were made and agreement sought on final data categorization. Selective coding was used to delimit codes to those related to the main categories of innovations (i.e. framing, innovation environment, attributes). As relationships emerged, memos were created and also analysed as secondary data. The aim of the research was explanatory in nature, thus the themes from the adopted research model formed the basis for data analysis.

5. Analysis of results

In line with the deductive research approach above, the qualitative analysis relied on theoretical thematic analysis to analyse and interpret the interview transcripts. The ensuing sections describe the analysis of data and the emerging interpretations.

5.1 Innovation framing and the quest for a stable implementation

Innovation framing is considered as a process that provides organizations with a situated context, which links the innovation to various political and strategic imperatives (Fairhurst and Sarr, 1996). The framing process, typically linked to top management of the organization/projects, is about the quest by individuals for political capital and development of a common conversational tone for an innovation to enable stable implementations (Johnson, 2001). The responses from the interviews were analysed using the three sub-categories (Table III). We discuss these three aspects as follows.

Discursive practices	Discursive types	Text analysis indicators
Innovations framing	Shared conversational tone	Classic communications practices; mindset change; establishing credibility; information control; stakeholder enrollment; innovation mechanism
	Political capital	Controlling resources; insuring quicker responses; managing stakeholder expectations
	Temporal stability	Strategic alignment; mindset change; show programs
Innovation environment	Organizational climate	Rewards for risk taking; organizational resistance; project leadership
	Organizational structure	Nature of formalization; integrated/fragmented; labour mobility; inter-dependence; permeability of organizational boundaries
Innovation attributes	Pros of attributes	
	Cons of attributes	
	Relative advantage (+)	
	Compatibility (+)	
	Acceptance (+)	
	Complexity (-)	
	Risk (-)	
	Trialability	
Observability (+)		

Source: Adapted from Johnson (2001)

Table III.
Discursive practices
and types

5.1.1 Forging a common conversational tone through classic communication practices.

Project management effectiveness typically rests on management of meanings accomplished through framing (Fairhurst and Sarr, 1996). In this study, we see practices of sense making revealed by the various respondents. What is apparent from the interviews is that the sources of project ideas were influenced mostly by external stakeholders (R1); which has an impact on how the project is conceptualized in terms of objectives and expectations. The process of stakeholder enrolment is critical for creating an innovation environment (R2) and is considered part of the framing process. However, this process was fraught with challenges in each of the organizations that formed this study. There was an attempt by the organizations (universities) to “frame” the innovation as a way of reconfiguring various learning processes by using IT (R3 and R4). The reconfiguration may involve changing the way teaching is being carried out; how technology can be useful in research or in information services.

Thus when the projects are considered from a broader perspective, new innovations based on technology are seen as a way of strategically aiding in reconfiguration of key processes. As part of the framing process, the different organizations have been involved in the implementation of various projects known by different names (e.g. KEWL, PHAE-TI, Blackboard, etc.) yet all had similar systems features. Innovations known by various names provided a common conversational tone that ensured resources were marshalled for project continuity, since the projects are regarded as peripheral to the main objectives of the organizations (Table IV).

Forging a common conversational tone was also employed as an innovation mechanism for enrolling internal stakeholders through public lectures (R2). Thus, the

Table IV.
Innovation framing
through a common
conversational tone

Ref.	Text: common conversational tone	Text analysis	Discursive practice
R1	[...] you have this multiple sources of knowledge coming in and when you are using the knowledge sometimes you can't attribute it to one source that this came from PHEA because I for instance I have a lot of things I got from UCT which I use here, there are other things which are used from PHEA so it becomes difficult to actually pinpoint	Project initiation influenced by multiple external collaboration	"Mixed" messages as a basis of framing decisions
R2	I gauge it by the attendance because this was a public lecture, the fact that there are more people coming from various districts to attend this one means there is some impact or there is some awareness going on in educational technology [...]	Public lectures are used to develop credibility	Public lectures as a "Classic Communication Tool"
R3	Yes. It was there but my 1st learning management system was KEWL and then from KEPP to KEWL. That was the 1st management system after blackboard [...]. Yes and then we shifted to Moodle	Experimentation with various alternatives	Innovation mechanism
R4	So it's when we had just started now is Moodle that now we were looking for an angle that is stable, that is used, that is popular and that is when I came in	Experimentation with various alternatives	Innovation mechanism

PHEA-ETI projects were not really the first attempt by the universities to experiment with an innovation, but the external funding ensured some form of sustainability. Throughout the PHEA-IT projects, there were also concerted efforts by project sponsors to target training of particular groups, while orienting the "framing" of the project to certain users for political capital. We recognize that training may have also been meant to help in overcoming a number of unresponsive environments since internal resistance/sabotage is commonplace in these institutions to ensure stakeholder "buy in". What is evident in the approaches adopted for creating awareness is a bias towards critical stakeholders in middle and executive level offices. However, a key constituency (the students) were effectively excluded in attempts to "frame" or conceptualize the projects. This approach, in which idea generators or project sponsors pitch their messages towards external stakeholders for funding reasons and to just a few key internal stakeholders, may lead to minimal adoption of the innovations by the secondary users (Johnson, 2001). Further, no concerted efforts were evident to establish the credibility of the projects among key internal stakeholders; thus attaining a common conversational tone for the innovation is likely to be fraught with user resistance due to lack of credibility.

5.1.2 Acquiring power bases to insure quick responses through champions. One of the innovation framing roles played by individuals is to develop political capital by acquiring power bases to enable them to properly frame innovation decision through pilots and championing. The role of individual champions in these projects was quite remarkable and unmistakable. In all the organizations, champions played a key role, yet the question is whether or not these individual campaigns were effectively. Champions as a critical element are still emphasized through the various transcripts (R5-R7). From a preliminary analysis, we may simply classify these campaigns as an

aid to framing, though a greater role may be in the individuals building their own power bases. In other words, champions play two roles in framing.

The unexpected outcomes of innovations underlie the uncertainty associated with innovations and a champion is typically introduced to minimize unexpected outcomes. Yet champions could be a way of avoiding direct responsibility for these outcomes if they are negative. But champions were predominantly used in these organizations as a way of ensuring quick success of these peripheral initiatives to the organizations. Piloting still plays a crucial role in the implementation of innovations, more so when the innovation process is incremental. All the universities indicated that they piloted the projects. Piloting could also be indicative of uncertainty of innovations and thus for organizations to minimize the risk of failure and a necessary process of the innovation process.

The motivation of champions in projects is matter of concern, since the unpredictability and uncertainty of the success of an innovation makes financial compensation unsustainable. This may make organizations balk at introducing champions as a performance indicator (R8). The indication is that champions may not be acceptable, yet they play a key role in enabling the innovation environment. While the role of champions played a big role in these projects, the limited acceptability of the pilot projects and their nature as demonstration programs limited the effectiveness of champions (Table V).

*5.1.3 Innovation framing: quest for a stable implementation?*² One of the key aspects of framing an innovation is to ensure that the implementation process is stable (Johnson, 2001). A stable implementation process with a clear strategic concept and

Ref.	Text: champions and pilots	Text analysis	Discursive practice
R5	[...] I have been going round sensitizing members of staff [...] I will take it upon myself this Monday to show her the various tools at our disposal. So she is going to organize a training session for her unit because [...] there is nobody with the course unit from her unit, biological sciences	The role of individual champions in the projects	Insuring quick responses
R6	One of the things of course yes I do realize that institutions which are as big as [...] is that you should always look for champions, you should pilot and its only if you 1st pilot and learn the lessons that you can upscale whatever you are interested in	The role of individual champions in the projects	Insuring quick responses
R7	[...] you know I think that's why we said we need champions, we do need champions because the beginning is always difficult [...] and in the beginning yes there was a lot of excitement but as I said when they go back and they are trying to read and reread and do whatever there of course the end result once you have done it wonderful	The role of individual champions in the projects	Insuring quick responses
R8	I think in the beginning when you have champions, we may actually have to think of some financial incentive, the question is how do we come up to know how many hours somebody has you know introduced and issues of sustainability of course come in	The role of individual champions in the projects	Insuring quick responses

Table V.
Champions and pilots

a fully developed innovation ready for users (Tidd *et al.*, 2001) is a critical requirement for realizing innovation effectiveness.

A key check point is whether an innovation is strategically aligned with the organization. Given that most organizations have a few core processes, the IT innovation must be aligned to one of the key processes. A number of respondents reiterated the importance of aligning innovations to the organization, though whether the alignment was actually attained is an open question. The development of an e-Portfolio found a link to student processes (R9), which forms part of the strategic alignment initiative necessary for framing. Aligning the innovation strategically creates a favourable innovation environment by calling for organizational change that influences the organizational climate (R11). However, misalignment of an innovation with the organization's processes neutralizes the effectiveness of the project innovation. Linking key organizational processes as well as performance metrics is key to attaining strategic alignment. The idea of competitive survival may in fact be the single driver for "trying out" the innovations (R12) (Table VI).

Top administrators recognize that for a stable innovation implementation there must be strategic alignment of the innovation with the key processes and strategies of the organization. However, the intentions of the stakeholders, demonstrated through their quest to use champions and pilots to acquire individual power bases, is not conducive to a positive innovation framing but was mostly employed to initiate "show programs". Due to the difficulty of accepting changes by organizational members while taking into account the expectations of external stakeholders (i.e. PHAE-TI), top management had to initiate "show programs" using "out-groups" (R13-R16). The cry for a mindset change may be indicative that the "show programs" and the "pockets of innovations" are not producing the intended outcome. This cry is partly indicative of ineffective project leadership which was ineffectual in framing the innovation idea (R16). Thus change management must be intricately linked to the process of innovation implementation.

Ref.	Text: quest for temporal stability?	Text analysis	Discursive practice
R9	[...] because it ties in with the e-thing, and that is the direction that the university is taking, I feel that it would play a big role in it because when we are talking about the student e-portfolio [...] and I think that is an excellent idea	Alignment with existing processes	Strategic alignment
R10	[...] so if we are looking at teaching and learning, how then can this whole PHEA project come in to facilitate teaching and learning as a direction we are taking in terms of change, so and at the same time right now as I speak we are thinking about reviewing our strategic plan	Alignment with existing processes	Strategic alignment
R11	But if we separate it, there is a danger of being left somewhere on the shelf, something in a document but so we are looking at it in some kind of integration within the teaching and learning processes within the university, it will be more effective that way	Alignment with existing processes	Strategic alignment
R12	[...] you know I think [...] this is something new on the block but something invaluable and which [...] itself has accepted as critical to our very existence if we are to continue	Innovation for competitive survival	Strategic alignment

Table VI.
Temporal stability

One of the critical aspects of the organizational climate is the role that “out-groups” played in the implementation of these innovation projects. In some cases, staff members from outside the department were employed in framing the innovation to enhance trust and acceptability of the innovation ideas. The harnessing of such “out-groups” provided a glimpse of improvisation in project leadership to build trust in innovations. Top management considered out-groups to be a critical element for the innovations not only enabling organizational climate change, but also to move beyond familiarity typical of groupthink in departments. Thus the use of out-groups played a role in spurring adoption (Table VII).

5.2 Organizational IP on the innovation environment

In this section, we focus our analysis at the meta-level processes that influence innovation implementation effectiveness in organizations. Johnson (2001) refers to this level as the innovation environment which relates to the internal tactical environment in which the emphasis is on how the structure and organizational climate. At the firm level, organizational climate refers to the common practices, shared beliefs and value systems of an organization (Schneider, 1990; Chen and Huang, 2007). Individuals perceive organizational climate in terms of the attributes and expectancies that describe the overall pattern of organizational activities (Jaw and Liu, 2003). Thus there are two aspects of organizational climate related to the internal tactical environment: innovation environment at the firm level and innovation attributes that relate to individual members of an organization. In the next two sections, we focus attention on those internal IP that have an impact on innovation implementation effectiveness.

5.2.1 IP in the innovation environment at the firm level. Linking the evidence obtained to the influence of organizational structure is a critical component of the innovation environment. Literature categorizes organizational structure into three elements comprised of formalization, centralization and integration (Robbins and Decenzo, 2001; Sciulli, 1998). Our observations of the seven organizations in this study

Ref.	Text: mindset change	Text analysis	Discursive practice
R13	So the issue of effectiveness is still may be half-half [...] not yet there yet. So even a whole concept of mindset is a big thing so hopefully when the research goes a little bit more detailed in terms of dissemination [...] it will facilitate how people think about this e-thing and when we start that process of changing the mindset may be it will help	Changing mindset as a way of demonstrating power	Mindset change
R14	But how we get that done is still a challenge when we were talking about change management	Change management	Mindset change
R15	So we started with those whom we could go on [...] so some projects and courses now have new role players who even didn't know what blackboard is anyway	Ensuring quick responses through pilots	Mindset change
R16	[...] but I don't think it's just the leadership for one reason or the other somebody was able to meaningfully sell that idea. I also remember the 1st time we were getting quality assurance on board and I called people from certain units to say I want us to go through the quality assurance policy and so on and so forth	Project leadership and “out groups”	Mindset change

Table VII.
Mindset change

are highly formalized and bureaucratic public sector organizations with decision making resting with top management (i.e. vice chancellors). Responses of the various subdivisions showed low levels of integration with a prevalence of a “fragmentation and a silos mentality” (R17, R18). This form of structure does not bode well for realizing implementation effectiveness. Reinforcement of the “silo” mentality is averse to the inter-dependence of departments and organizational units. With such fragmentation, the result is an unsupported innovation environment. Fragmented adoption remains a challenge with pockets of innovations that are not deemed acceptable by other departments (Table VIII).

Another negative aspect related to the innovation environment was the frequent staff changes to the projects (R19, R20). In most organizations, different individuals had been involved with the project at different times. This inconsistency lacked the stabilization necessary for innovation within an organization. The frequent changes may also point to top management attitudes that consider the innovation to be on “the periphery of mainstream organizational processes”. Thus, the likelihood of gaining political capital from such initiatives was minimal. Organizational changes related to frequent staff redeployments negatively impacted the innovation environment creating a situation where the effectiveness of implementation was questionable (Table IX).

Resistance to the implementation of the innovations was also covert. Covert resistance could be gleaned from the manner in which project leaders and top management used their authority to “force” adoption (R21, R22). In some instance, stakeholders responded by engaging in actions that could be construed to imply “sabotage”. Sabotage was not only from the users’ perspective, but frequently the implementers used their authority to subvert users into accepting the system. This kind of behaviour is reminiscent of an innovation environment full of “mistrust”, which is anathema to implementation effectiveness. A number of scenarios indicated that there was some form of resistance/sabotage/subversion to these projects. Thus the forms of sabotage recorded are indicative of an innovation environment that is not supportive and may lack of trust on the part of users (Table X).

Ref	Text: fragmentation	Text analysis	Discursive practice
R17	And you know perfectly well regarded institutions [...] it is very fragmented it still has some challenges. But in the area of educational technology and in the college of distance education it has really made some strides and allows a lot of inputs outside of PHEA	Prevalence of silos mentality	Organizational structure/ fragmentation
R18	[...] yes, a little bit here and there because I logged into I created an account just for curiosity sake to see what is this they are talking about, let me go in and see what it is. So in that there is that interface. But I think the biggest challenge it is still within the people who developed it, it hasn't like gone out into the wider university community perhaps still by design and I see for those who are involved it's kind of effective. [...] you see what happens it is in pockets, a pocket in north, a pocket in education and that kind of thing; even within health itself it is still pocketed [...]	Minimal social interaction climate, except through individual initiative	Fragmentation

Table VIII.
Fragmentation

Ref.	Text: permeable boundaries	Text analysis	Discursive practice
R19	Yes you could work in either. We specified people but then some people may leave for studying or whatever it was. So we found shifting it may be an errand. But also nature of the space because we don't have the right staffroom so you find that the one who could work in the migration could also work for the animation	Blurred roles indicative of short-termism	Permeable boundaries
R20	[...] it was also difficult because some lecturers were no longer teaching those courses and some of these courses had changed names, the codes had changed and some were no longer taught and some of the lecturers have all together gone away. [...] we realized that some were no longer there, some had gone for studies, some went for other universities, some were just no longer teaching the courses, some also are not called in that names	Lack of continuity in initiatives as a result of staff movements	Frequent staff changes

Table IX.
Permeable boundaries

Ref.	Text: organizational resistance	Text analysis	Discursive practice
R21	[...] now it is (old system) switched, we have some months switched I don't know how that man is going on but he has refused completely and he does not want to hear. So the man is very rigid and he is saying he is claiming that his course is in blackboard [the old system] one of the good courses	Sabotage through use of authority and personal power	Organizational resistance
R22	The 4% is like for instance I do remember one instructor has refused completely to go for online course and refused completely to come for Moodle. He is still using blackboard	Sabotage through recourse to personal power	Organizational resistance

Table X.
Organizational resistance

Another aspect related to the innovations environment is an organization's policy to rewards for risk taking by individuals (R23-R26). Risk taking is an important consideration in implementing innovations and compensation is a practice for ensuring innovation success. There were a number of instances where the actions of individuals provided an insight into the nature of rewards for risk taking in the innovation environment. Certain individuals took the risk of spearheading activities related to innovations as part of the "show programs" to build social capital in the organization. Thus, the organizational innovation environment provides "some rewards" for risk taking by individuals when there is a direct link to political capital, which is instrumental in framing the innovation. However, this can only be effective if the individual is "high up" in management which was not frequent in these organizations (Table XI).

Additional financial compensation (R24) to staff played a key role in improving the implementation climate by orchestrating mindset changes as well as ownership transfer. While financial motivation established a supportive organizational climate, there were limitations on financial resources in those organizations. The need to meet the expectations of other stakeholders (i.e. students), after committing to a technology

Ref.	Text: show programs	Text analysis	Discursive practice
R23	[...] we always believe in starting with carrots because let me tell you academicians are difficult, they don't respond to sticks. So originally we use the carrot and for me that's why I believe champions are always [...] because they are coming on board willingly	Importance of approach in rewarding professionals	Rewards for risk taking behaviour
R24	[...] now the money from PHEA helped us now to continue. So the money helped us at least to have transport allowance and whatever for the instructors they came in. this helped us to increase also the motivation for instructors even when the students had started to use the course	External funding enabled some form of financial compensation	"Reward" for risk taking behaviour
R25	[...] also I would be blunt of course with the kind of monies that people get as salary is still a problem here and therefore what would be a problem is that if somebody thinks ok engaging with this, taking more time in this is one thing but if I could use that time to get into a consultancy you know it's much better because it brings results. So I think we have to understand it within that context [...] this can be looked at as a basis for promotion because today we do not [...]	Challenges in incorporating project compensation in organizational routines	"Reward" for risk taking behaviour
R26	[...] and that's an incentive that's why am saying you have to look at various incentives, that here you are, the DVC has been here and has a course and it's online. even if for instance you started off because my challenge is that students pay technology fee, there is a share of the technology fee so it is important for the staff to start putting a few things online because that is actually the carrot and you don't have students revolting online	The idea of the "carrot" is not always related to money	"Reward" for risk taking behaviour

Table XI.
Show programs

(i.e. enhanced learning environment) resulted in top-management resorting the "stick" rather than the "carrot". This again supports the notion that there is some form of forced implementation through the use of authority.

5.2.2 The influence of innovation attributes on implementation effectiveness. At the individual level, innovation attributes of relative advantage, observability, adaptability and acceptance reflect positive characteristics; while complexity and risk are negatively linked to a particular innovation. In our analysis of interview transcripts, the innovation attribute of "complexity" emerged as a barrier to the implementation effectiveness in all organizations (R27). Complexity was visible in terms of technical challenges during project implementation. Technical skills remain a challenge in these large projects and it sometimes calls for collaborative efforts among organizations within the same sector (R28). However, the collaborations were from a regional perspective, which ensured that organizations do not collaborate with those in their competitive space. To shorten the learning and to "minimize risk", organizations attempted to influence the innovation characteristics through collaboration. A number of these organizations attempted to reduce complexity by making the innovations relevant to decision-making individuals and thus acceptable. Interest in innovations was spurred by linking the innovations to individual's interests, which fit within an existing context of organizational processes (Table XII).

Ref.	Text: complexity and risk	Text analysis	Discursive practice
R27	But again we found that we did not have technical skills and it was immature, it was not stable, there were a lot of issues so the instructors because we were trying to shift now from blackboard to this they even got disturbed. So most of the instructors they gave up [...] when they thought the use of technology is just a disturbance	Lack of technical skills and immaturity of technology	Complexity
R28	But again due to the license fees and whatever increase we thought how can we go about it. [...] a university in South Africa approached us [...] it was like an agreement that we can develop that system like KEWL together and use it as an open source	Collaboration to manage complexity	Risk minimization
R29	[...] for example (using it) pedagogy training [...] because we have been saying we all agree we are not trained teachers, won't you want to be a good teacher, yes I would want to. So that does not come as just material online yes it must be put within a certain context. I think that's when we will appreciate it more, it is a broader thing than just using technology to improve teaching and learning and that's why for me it still goes back to the issue of teaching and scholarship	Linking innovations to existing processes	Process alignment

Table XII.
Complexity and risk

The organizations typically used “training” for enrolling various categories of stakeholders to foster “acceptance” of the innovation during the implementation process. During observations and analysis of the interview transcripts, the persistence and constancy of training in the enrolment process is unmistakable (R30, R31). Yet as has been seen from other interviews (R32), the training only resulted in pockets of excellence in user involvement and questions the effectiveness of using training as an “enrolment tool”. Those participants in the training sessions are typically using the chance to enhance their skills and political capital rather than actual adoption of the innovation. Training as a critical factor to ensure adoption of an innovation is questionable, even though the approach comes up as a critical process in building trust in the new system. Champions (R31-R33) are consistently linked to the process of training as a way of familiarizing the stakeholders with the system. The focus on training by a majority of the respondents may ensure acceptability of the project, but the impact on acceptability of the innovation is uncertain. Consequently, user involvement was muted and the stability of the innovations was risky (Table XIII).

5.3 Assessing implementation effectiveness in terms of success

Having analysed the influence of innovations framing and organizational IP, we examine the “nature of success” or failure that was attained in the implementation of the IT projects. The identification of the IP may not have practical implications but they are important in evaluating a project as a “success” or a “failure”. In linking the IP to the nature of project success, we refer to a taxonomy proposed by Johnson (Johnson, 2001). Johnson (2001) recognized that success of an innovation implementation is difficult to determine. We seek to clarify how IP can aid in determining the various degrees of success and failure based on the interplay of various factors and processes.

The three IP of innovations framing, innovation environment and innovation attributes were used in establishing success in the seven organizations. Johnson (2001)

Ref.	Text: acceptability	Text analysis	Discursive practice
R30	[...] I was assigned by my boss to conduct several training sessions and generally we had a different touch of trainings. So me I was involved on what we called basic Moodle training and it was mainly for [...] those who were quite new to the system. [...] I was also involved in training students because in training the instructors and they put their content online, after that we launch student courses and then we teach them how they can access those course materials. [...] but you do that after making sure that that course is in that system. So we received requests from instructors after being trained and we made sure that that course is online	Training being used as an enrolment tool	Acceptability
R31	In one of the trainings we got 2 people from the school of law. For the 1st time law had always eluded us we want to train them nobody is interested but we got 2 members of staff who joined this training. One of them came up and said she wanted to create a course, I created for her a course, well the course has not been populated but the fact that she took that initiative is already a point	Training as a classic campaign tool	Acceptability
R32	[...] then later on when I went around sharing my experiences [...] sensitizing students and also sensitizing members of staff I thought well I have done it. There is a split came out the students didn't participate as much as I thought and I had taken it for granted that this are people who I love with computers and technology	Training was not effective in some instances	"Acceptability"

Table XIII.
Acceptability

contends that the three factors can be used for determining the degree of success or failure of an innovation. By assessing various dimensions of framing, a project can be regarded as having high or a low framing. This is considered critical since framing provides a basis for coordinated action. In a project where there is high framing, the expectations of stakeholders and the parameters of the problem has been effectively established. A low-framed innovation implies the opposite. In the analysis presented above, inferences were made related to organizations engaged in "classic communication practices", "champions and pilots" as well as efforts in attaining "strategic alignment" of the new innovations. All these efforts were geared towards realizing a stable implementation of the innovations, enrolling stakeholders (i.e. internal) and for positioning the initiatives within current organizational processes. However, sometimes the key stakeholders were engaged in framing practices to gain political capital for their own power bases. Despite challenges related to ensuring effective strategic alignment of the new initiatives and "mindset change", the synthesis of the respondent perspectives reveal that the innovations were highly framed, since funding for these initiatives continued as an indication that the expectations of the stakeholders were being met.

Turning to internal organizational processes, the analysis illustrated that the innovation environment was poor based on the reported negative metaphors. The meta-level organizational climate was reported to depict "fragmentation and silos mentality" related to the diversity inherent in such large organizations. In addition, it was acknowledged that these initiatives sat at the "periphery of mainstream

organizational processes” and that they were typically “show programs” by certain stakeholders who sought to acquire political capital. Further, interpersonal dealings related to realizing the agenda of the initiatives was characterized by “mistrust” and “sabotage” as the norm. Such an organizational climate is not supportive for realizing implementation effectiveness and we consequently conclude that for these projects, the innovation environment was poor, even though the innovation framing was high.

Innovation attributes assessed in terms of the pros and cons can be considered to have largely been comprised of negatives in this study. One metaphor that emerged was the perception of technical complexity, which not only characterizes the current innovation initiatives, but also earlier related projects. All the organizations, in an attempt to minimize the complexity inherent in acceptance of these projects, resorted to regional collaboration and training workshops to enrol users. Despite these efforts, user involvement and acceptance was reported to be abysmal. Therefore, the innovation attributes are predominantly comprised of cons, rather than the pros.

How successful were these projects? The results above show that innovations framing was high; innovation environment was poor; while innovation attributes were mostly cons, thus the projects fall under the category of success/failure that Johnson (2001) refers to as “mandated failure” (p. 349). A number of key aspects of the innovation process can be summarized as indicative of the classification of mandated failure: first, a number of the institutions that were studied have participated in similar “show” projects (e.g. KEWL, Blackboard, PHAE-TI) that were touted as successes. Yet this can be construed as a pattern of cynical technology adoption linked to the appeasement of external stakeholders with funding. This is a form of ironic appropriation of technology, where organizational members passively participate in the process, while believing that there are other “real” needs that require addressing. Second, the fact that the organizations participated in similar initiatives (e.g. KEWL, Blackboard and PHAE-TI) is a demonstration that the programs were largely symbolic (Abrahamson, 1991). That is a mere demonstration of a modern organization that is technologically aware, yet the requisite innovation environment is lacking effective appropriation of the technology. Third, mandated failures result in low morale of employees, who regard themselves as pawns in the process and grudgingly participate in the implementation process. This inference is supported by metaphors related to “trust” and “sabotage” that emerged from the analyses.

6. Conclusions

Three inherent assumptions are postulated to be critical to the successful implementation of IS innovations. The first set of factors is related to innovation framing, typically involving “sense making” by top management and external stakeholders who grapple with issues related to the purpose of the innovation and how to coordinate action during implementation. A key attribute of the innovation framing is the satisfaction of the external stakeholders who provide resources, especially in large public sector projects (Johnson, 2001). The second set of factors is related to the innovation environment predominantly associated with middle management creating a supportive organizational climate for the success of an innovation. The third set of factors are related to innovation attributes, which have historically been linked to Roger’s innovation attributes (Tornatzky and Klein, 1982) of relative advantage, compatibility, complexity, trialability and observability. This study recognizes that most studies on assessing the effectiveness of IS implementations failed to recognize the interplay of factors at these three levels as a basis for speculating on the success of

a project. Three main insights emerging from a theoretical thematic analysis based on propositions by Johnson (2001) present the prime contribution of this paper to IS research as follows.

First, the influence of external stakeholders in the framing of IS projects in Africa is quite high, which may partly be explained from a technology transfer perspective. Technology transfer is a goal-oriented process intended to enhance the indigenous technological capabilities of the recipient organizations (Autio and Laamanen, 1995; Kumar *et al.*, 2007). There is a history of dependence on technology transfer projects (e.g. KEWL, Blackboard, PHAE-TI) that the organizations were engaged in. All the projects that were covered in this study (Table III) were initiated by external sponsors and are technology transfer projects. Therefore, as we analyze the nature of innovation framing, implementers of innovations need to be aware of the principles underlying technology transfer projects. The fact that the initiatives are “mandated failures” may indicate that during the innovation framing, stakeholders failed to consider the projects as technology transfer projects. In order to engage in a framing process that is likely to lead to implementation effectiveness, Debackere and Veugelers (2005) support the view that a centralized group of employees experienced in technology transfer should manage the “contract” and “training” issues associated with the technology transfer process. This centralized group of technology transfer experts are charged with a key and distinct governance priority (Amesse and Cohendet, 2001): managing expectations (i.e. external and internal stakeholders) to ensure that technology transferred is aligned to the core mission of the organization. This is necessary since stakeholders to a technology transfer project have multiple goals and effectiveness criteria. These stakeholders consider the impacts in terms of who is doing the transfer, how they are doing it and what is being transferred and to whom (Bozeman, 2000). Such a technology transfer perspective implies that studies of implementation effectiveness in developing countries must consider factors related to determinants of effective technology transfer.

The second conclusion is related to inferences regarding the innovation environment for successful implementation of IS projects. The focus of the study was on HEI in Africa. We recognize that most public sector organizations in developing countries are predominantly innovation-adopting organizations (IAO) as opposed to innovation-generating organizations. For instance, Heeks (2002b) reinforces this view when he reports e-government innovations that were “transferred” to Africa from western countries as forming the basis for challenges related to implementation effectiveness. Despite the “foreign-ness and vagueness” of these innovation from outside, implementation effectiveness still requires a supportive innovation environment based on conditions of the particular organization. The organizational conditions of the IAO is such that they rely more on its managerial and organizational capabilities to select and assimilate innovations requiring that such organizations develop the ability to absorb innovative inputs (Fiol, 1996). The analyses presented above showed that the innovation environment was not supportive of the technologies that were being introduced. In other words, IAO should focus largely on developing absorptive capacity so that the organizational climate and structure becomes responsive to the new external innovation, to assimilate and to use it. The implication for innovation implementation effectiveness is that an assessment of the sources of an organizations absorptive capacity for innovation becomes a critical determinant in the success of innovations.

Lastly, while the classic analysis of the pros and cons of innovation attributes is still critical for assessing the effectiveness of innovation implementation, our analysis

revealed the key roles played by not only champions but also the pilot process. The various influences of champions and pilots in helping spread an innovation may imply that IAO need to consider various approaches in helping the technology diffusion processes. On the one hand, the organization encourages an unplanned process in which champions play a critical role in spreading the benefits of the innovation thus helping in improving the pros related to the innovation attributes. On the other hand, the organization engages in active diffusion of the innovation in which the spread of innovation is planned, formal, often centralized and likely to occur more through vertical hierarchies and pilot projects (Greenhalgh *et al.*, 2004). In effect, the two processes of champions and pilots enhance the absorptive capacity of individuals to use innovations. Therefore from an innovations environment and attributes perspective, responsiveness to an innovation to improve implementation effectiveness requires developing not only the absorptive capacity at the organizational level but also at the individual level. Given the depth and diversity of the concept of absorptive capacity (Volberda, 2010), assessing the interplay of factors related to the innovation environment and attributes need to recognize that innovations in large organizations are complex initiatives. Thus success/failure is not an either/or issue, but that there are various factors that should be analysed taking into consideration the inherent complexity of factors related to framing, environment and attributes.

We view the implications based on the principles of technology transfer and absorptive capacity to be propositions that have emerged from the exploratory nature of this study. We encourage other researchers to undertake intensive and extensive analyses to assess how technology transfer practices can be incorporated as part of the innovation processes. In addition, realizing a supportive environment for IAO remain unclear, thus research can be advanced in this area as well.

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