

Information Systems Investment and Value: Lessons from Kenyan Higher Education Institution

Kiyeng Philip Chumo, PhD*
ICT Directorate, Moi University

Jerotich Sirma
Lecturer, Faculty of Commerce, Department of Accounting, Finance and Management Science, Egerton University, Nakuru Town Campus College

Abstract

Investment in Information Systems (IS) and related technologies to enhance operational activities as well as leveraging strategic advantage in organizations has become critical. However, this can only be achieved if there is a properly laid down strategy at the corporate level and well planned deployment and implementation strategies at the project implementation level. This paper discusses findings of a research on strategic alignment practices in Kenyan public universities. The assessment focuses on levels of information systems strategic alignment at the corporate planning level and IS project implementation level. The assessment was done using a framework adapted from Luftman's Strategic Alignment Maturity Model (SAMM) assessment framework. The research used sequential explanatory mixed method approach starting with a survey study followed by interviews to enhance the findings from the initial quantitative study. A comparison of the corporate level and IS project implementation level show the later has a higher alignment maturity level. Further probe of the quantitative findings through interviews explains the variations in each of the IS projects and between the corporate and IS project levels. The approach guides the organization in determining the factors requiring attention to improve on the overall maturity level of the organization and therefore realize business value of the IS investments.

Keywords: Strategic Alignment, IS Investments, IS-Business Alignment, Information Systems, Strategic Alignment Maturity Model

1. Introduction

Information Systems (IS) have been used in organisations including universities to support and enhance services. However, increased competition and dynamic global practices in management and delivery of university education has resulted in the need to make IS part of the institution strategy (Pirani & Salaway, 2004). This is achieved through IS strategic planning which involves aligning IS with the corporate strategies and leveraging its capabilities. Information Systems are beginning to be realised as an important component in improving university core business and processes which includes education, research and administration.

Information Systems investments in organizations just like any other investment are expected to yield returns and therefore IS managers are always under pressure to deliver successful deployment of IT projects (Nelson, 2005; Ward & Daniel, 2006). In order to achieve success, project managers ensure that they adhere to prudent project management practices and ensure that IS projects are aligned to the organization objectives (Sauer & Reich, 2009). Wanyembi (2002) found out that it was important for public universities to assess their IT maturity level to enable identification of specific needs to ensure appropriate utilization, exploitation, and maintenance of IT in achieving the organizational objectives.

Successful implementation of IS requires favourable implementation context and appropriate managerial intervention and thus there is need for alignment of IS project plans with the organizational context (Wausi, 2008). In an e-readiness survey conducted to assess the level of preparedness of Higher Education Institutions which includes universities and tertiary colleges in Kenya to use ICT in teaching, learning and management, it was found out that most of the universities had ICT strategy that is not aligned to their goals and use of ICT for learning was low. Universities had also not started integrating ICT into their curriculum. However most universities had a relatively established ICT infrastructure despite ICT not being considered a key strategy priority by institutional leadership (Kashorda & Waema, 2006). According to Makori, Ndirangu and Ogola (2013), there are indications that universities are increasing their investment in IT but the challenge is whether this increased investment is commensurate to improved services.

Literature reveals that strategic alignment has positive impacts to IS project success and organizational performance (Chan & Reich, 2007; Reich & Benbasat, 2000). Therefore, continuous failure of IS projects and hence lack of realization of benefits from investments in IS implies lack of strategic alignment (Henderson & Venkatraman, 1999; Richards, 2007). Stanleigh 2006 as cited in Dyreyes and Manager (2008) and Ward and Daniel (2013) found out that only about 12.5% of the companies evaluate their projects to determine whether they are strategically aligning with business and 68% do not prioritize their projects. Ryan and Harrison as cited

in Bhansali (2007) also found out that over 50% of IT project implementation cost more than twice the estimated cost and time due to human and organizational costs. This is an indication that there is lack of strategic alignment and therefore it is important to understand the link between strategic planning and IS project implementation. To achieve strategic alignment organization's IS projects have to be well aligned with the corporate objectives because they are means by which strategy is implemented (Jenkin & Chan, 2009; PMI, 2008).

The objective of this paper was to investigate how Information Systems Strategic alignment takes place in Kenyan public universities by considering the strategic alignment at the corporate level and IS project implementation level in one of the public universities. The following specific research objectives guided the study;

1. To determine the level of IS strategic alignment at the corporate level and IS project implementation level in the university?
2. To explain the relationship between IS strategic alignment at the corporate and IS project implementation levels
3. Establish the relationship between strategic alignment levels and business value

The findings of this study will assist the university and organizations in general in understanding and appreciating the importance of well-defined policies on information systems implementation, recognition of the alignment of information systems investments to the organization objectives and importance of adherence to the set strategies and policies. Understanding the concept of strategic alignment can enable the university to develop a self-assessment framework to determine the performance of the strategic alignment factors and identify weak and strong areas for improvement and complementing respectively to realise value for IS investments.

2. Relevant Research

Value of information systems investments can be viewed in form of the ability of IS to support the organization business goals which vary from one organization to another. There are many ways of evaluating the value of IT investments, however the main areas of concern is how the IS investment support the organization goals and the direct returns it makes to the organization (Lech, 2007).

While it is generally accepted that information systems affects organization's performance and distinctiveness, different organizations in different sectors exhibit different outcome despite similar investments in IS (Dhar & Sundararajan, 2006). This varied impact is attributed to the assumption that IS impacts on an organization's performance by enhancing processes. The level of impact will depend on the organization's internal characteristics including human resource skills, infrastructure and corporate culture which vary across different organizations and also the external competitive environment which the organization operate (Campbell & Peppard, 2009)

Organizations achieve their objectives and derive benefits from IS investments by implementing IS projects through the process of Strategic Information System Planning (SISP) that ensures that IS strategies and applications are aligned with the business strategies of the organization (Peak, Guynes & Kroon, 2005). According to Jenkin and Chan (2010) it is during the project execution and not during the corporate strategic planning that the key alignment process take place and therefore IS project alignment is an important aspect in achieving strategic alignment in an organization. Jenkin and Chan (2010) considers IS alignment as the degree to which IS project deliverables are consistent with project's objectives which are shaped by organization's IS strategy. To achieve strategic alignment organization's IS projects have to be well aligned with the corporate objectives because they are means by which strategy is implemented (PMI, 2008).

Aligning project implementation and management to business strategy is important in achieving organizations strategic objectives. However, there are challenges because objectives of corporate strategy are not always well communicated and consistent with the project implementation. This results in the implementation of projects which are not consistent with the original organizational strategies formulated by the executives at the corporate level without involvement of the project managers at the tactical and operational level who are mainly involved in implementation and management of IS projects (Gutierrez, 2011).

Motjopolane and Brown (2004) investigated the success of aligning IT strategies with business using a case study of a tertiary institution and found out that despite the high investment in IT to improve efficiency and effectiveness of the administration and academic processes, the achievement of strategic alignment is affected by the prevailing business environment and the congruence between the IS project and the organizational strategies but not the success of the implemented IS project alone. It is therefore important to consider the alignment of IS strategies and the business strategies as well as the prevailing environment.

To meet current demands and exploit advantages of new information systems universities in Kenya are experiencing increased investment and use of information systems (Chumo, Muumbo and Korir, 2011). Kenyan university face various challenges in adopting and using IS and this affects the strategic alignment. These challenges include high cost of deploying the technologies, lack of ICT Institutional Strategies and Policies, lack

of technical skills and cultural issues such as resistance to change. Despite the challenges, universities have been investing in IS for administrative, teaching, research, communication, and networking purposes.

Sledgianowski et al. (2006) developed and validated an instrument to measure IT business strategic alignment based on Luftman's Strategic Alignment Maturity Model (SAMM) and concluded that the tool is useful to organizations as it enables assessment of the current strategic alignment maturity. This facilitates formulation of ways of improving the alignment by implementing best practices from more mature levels. However, they also recommended further research on strategic alignment practices at operational level.

Strategic Alignment Maturity Model (SAMM) Assessment Framework

Strategic Alignment Maturity Model (SAMM) which was developed by Luftman (2000) consists of six factors namely; communication, IT Value measurements, IT governance, partnership, technology scope and architecture and human resource skills. For each of the six factors, there are attributes that determine the level of maturity of each of the factor and eventually the maturity level of the organization (Table 1).

Table 1: Strategic Alignment Factors

Communication	The exchange of ideas, knowledge and information among the IS and business managers, enabling both to have a clear understanding of the organisation's strategies, business and IS environments including communication with consultants, vendors and partners and dissemination of organizations' learning internally.
IT Value/Competence Measurement	The measurement of the organization performance and value of its projects. Evaluation of completed projects to determine the success and failure factors and how to improve internal structures to ensure future success of projects.
IT Governance	The degree to which the authority for making IS decisions is defined and shared among management. Determine whether projects being undertaken are based on the understanding of the business strategy.
Partnership	The relationship among the business and IS managers. It includes IS involvement in defining business strategies, the degree of trust between IS and business managers and how each perceives the contribution of the other.
Scope & Architecture	How organisation's infrastructure, change readiness, flexibility in structure and the management of emerging innovations are coordinated to enable business growth.
Human Resources Skills	Human resource considerations for training, performance feedback, encouraging innovation and providing career opportunities. It also includes an organisation's readiness for IT change, capability for learning and ability to leverage new ideas.

The Luftman's SAMM assessment process considers the six factors in assessment of alignment maturity in an organization as well as to achieve and maintain such alignment maturity. Maturity assessment is based on the popular work done by the Software Engineering Institute and an evolution of the Nolan and Gibson stages of growth (Humphrey as cited in Luftman, 2000). The five levels of maturity are derived through the assessment of the qualities of the attributes associated with each criterion. The alignment maturity level of an organization is determined by the management practices and strategic IS decisions within an organization based on the above six alignment maturity factors (Luftman, 2000). The five possible alignment maturity levels are shown in Figure 1 below.

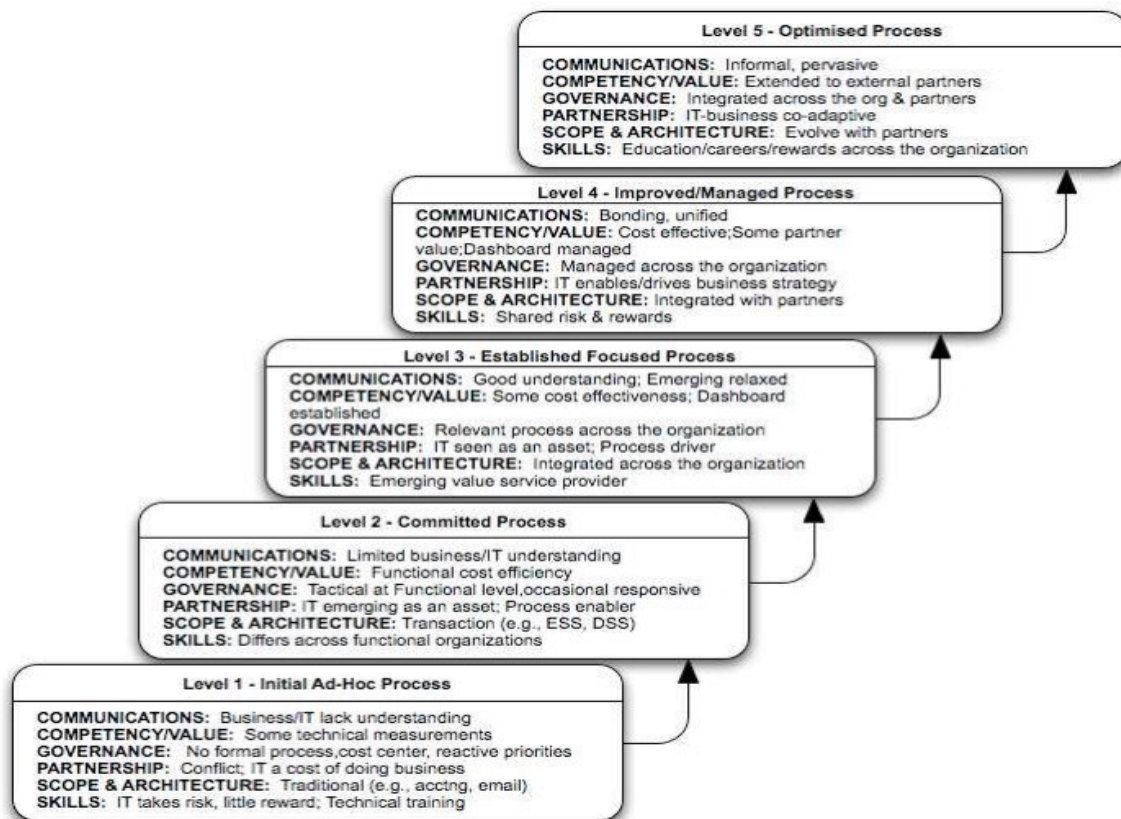


Figure 1: Strategic Alignment Maturity Level Summary adopted from Luftman, 2000

Level 1: Initial or Ad Hoc Process: Business and ICT are not aligned or harmonized.

Level 2: Committed Process: The organization is committed to becoming aligned.

Level 3: Established Focused Process: Strategic Alignment Maturity is established and focused on business objectives. There are established processes (such as a systems steering committee), and activities (such as portfolio management capabilities to evaluate IT investments) to realize strategic alignment.

Level 4: Improved or Managed Process: ICT has been reinforced as a value centre. ICT applications are leveraged across the enterprise to drive process enhancements that sustain competitive advantage.

Level 5: Optimized Process: The organization has integrated business and ICT strategic planning.

The assessment process involves first using SAMA factors to assess the IS alignment maturity level at the corporate level. This gives a view on how organizations plan for IS alignment, the underlying constructs and their relationship. Then the same factors derived from SAMA but with variations in the constructs to suit the IS project context are used to assess IS alignment at the IS project level.

3. Research Process and Approach

This study followed sequential explanatory mixed method design in data collection and analysis (Ivankova, Creswell & Stick, 2009). It involved collecting and analysing quantitative data followed by qualitative data collection and analysis. Each data set was analysed using appropriate methods and the results of phase one informed phase two data collection (Onwuegbuzie & Collins, 2007). Phase one data were collected using strategic alignment maturity assessment questionnaires. Participants were drawn from corporate (decision making) level and IS project (implementation) level of the university. At the conclusion of phase one study, data were analysed and participant were purposefully chosen to participate in phase two qualitative phase. Phase two data mainly involved interviews with key informants. However, document review and observations made during the data collection were used to supplement the interviews.

The strategic alignment maturity assessment questionnaire which was used was developed and validated by Sledgianowski et al. (2006) and based on Strategic Alignment Maturity (SAMA) developed by Luftman (2000). Since the instrument was being used in a different context, to ensure validity and reliability, the five point Likert scale instrument was piloted and necessary adjustments performed.

Phase one data was analysed for descriptive and inferential statistics using IBM SPSS version 22 statistical software. Data from phase two interviews were transcribed, coded and sorted according to the themes of strategic alignment maturity model framework. The final stage involved the integration of quantitative and qualitative data.

4. Results and Discussions

4.1 Introduction

The studied case is a public university sponsored by the government and has been in existence for slightly over ten years. It is located in a rural setting in the western Kenya with six other branch campuses and colleges. The ICT department which had been in existence for about seven years is headed by a director and was initially under the office of the Deputy Vice Chancellor, Academic Affairs (DVC, A&A) but had recently been transferred to the office of the Vice Chancellor (VC). It is charged with the management of ICT infrastructure and resources in order to improve teaching and learning, administrative support for online course delivery and management of the university information systems to ensure continuity and providing user support to ensure students and staff utilise effectively.

At the time of carrying out this research the mainstream ICT directorate had a very lean staff with only nine personnel at the main office and the few distributed in the campuses and at the specific schools/faculties/department ICT laboratories. The IS director was seconded from a teaching department and still performed the teaching duties in the parent department. It appeared that ICT department was not well represented at the university management level and therefore did not play major role on decisions regarding investment in IS projects. The directorate therefore experienced challenges in delivering its services effectively because of these constrains.

The university had fibre connection linking most of the buildings within the main campus. However, connections to the remote campuses was not well established and used third party service providers. The following two key information systems included those which were being used at different departments.

a) *Enterprise Resource Planning System*

The system was initiated to streamline the financial operations and reduce the cumbersome processes in managing student finance records. The introduction of the system was driven by management and headed through the office of DVC Administration and Finance. The ERP also known as Management Information System (MIS) had been in implementation stage for over five years and the usage at some point was very low. The system covers all the finance issues of students, staff and general financial management for the university. Some of the system modules included General Ledger, Accounts Schedule, Fixed Assets, Budgeting, Bank reconciliation, student registration module and exam module.

One of the greatest challenges the system faced was high turnover of staff in the university who had been trained on the system and it appeared that the issue of change management was not properly addressed since it had expected high resistance from users. The users were also not involved and they had not fully owned the system and there was the feeling that the system was forced on them. Initially the system was being driven by the management but with the changes in the senior management the system implementation was affected and ICT personnel had to spearhead the implementation with challenges because most of them were still new.

b) *E-learning system*

The second project was the university E-learning system also called e-campus which was based at one of the campuses in the city. The e-learning service is run by a directorate headed by a director and had its own independent ICT staff. Most of the schools and faculties in the university were running courses on the e-learning platform and was headed by a school coordinator. The e-campus project was started to facilitate online delivery of university academic programmes to learners using modern technologies.

The e-campus is modelled around a web-based Learning Management System (LMS) and all programmes offered at the e-campus are primarily delivered through the internet. However, students attend examinations at the campus at the end of each semester. The centre was at the third year of its existence and it had successfully enrolled over 600 students and was in the process of graduating its first batch of e-learning graduates. The centre aimed to be a fully-fledged open university in future.

The research was carried out between February and December 2013. At the corporate level the head of ICT, DVCs, head of sections in finance and procurement, deans and directors participated. At the IS project level personnel who were involved in the implementation of the two IS projects and users of the systems participated. In phase two, respondents from corporate level and each IS projects participated and included both from ICT and the user departments. Selection of the respondents for phase two followed the embedded sample selection method and therefore respondents were selected as a subset from those who had participated in phase one.

4.2 Strategic Alignment Maturity Scores

The overall alignment maturity score of the university was 3.01 in as scale of 1 to 5 with corporate and IS project level scoring 2.77 and 3.25 respectively. Project one (ERP) had a maturity alignment score of 2.96 and project two (E-campus) alignment maturity score of 3.55. Among the factors partnership had the highest alignment maturity score of 3.21 followed by competence and IT value measurement with an alignment maturity score of 3.16. Human resource skills with an alignment maturity score of 2.76 scored the lowest followed by scope and architecture with a score of 2.85. Table 2 below shows the alignment maturity scores of factors at the corporate

level, two IS projects, project level and overall university. The alignment maturity scores of IS project level is the average of the two IS projects.

Table 2: Alignment maturity scores of the university

Factors/Attributes	Corporate Level	Project1 (ERP)	Project 2 (E-Campus)	IS Project Level	Overall
Communication	3.00	2.90	3.54	3.22	3.11
Competence & IT Value	2.69	3.04	4.23	3.64	3.16
IT Governance	2.74	2.40	4.00	3.20	2.97
Partnership	2.85	3.53	3.61	3.57	3.21
Scope and Architecture	2.82	2.93	2.83	2.88	2.85
Human Resource Skills	2.50	2.95	3.08	3.02	2.76
Overall	2.77	2.96	3.55	3.25	3.01

Note: Project level is average of the two IS projects

At the corporate level Communication factor had the highest alignment maturity score of 3.00 and Human resource factor had the lowest alignment maturity score of 2.50. At the IS project level Competence and IT value measurement scored the highest maturity of 3.64 and Scope & Architecture was the least matured with 2.88. A comparison of individual IS projects show that project one had Partnership as the most matured with a score of 3.53 and IT Governance as the least matured with a score of 2.40. In project two Competences and IT value was the most mature with a score of 4.23 and Scope & Architecture was the least mature with a score 2.83. Figure 2 shows a comparison of alignment maturity scores of each factor at the corporate level and IS projects.

To establish the significance of the difference in alignment maturity scores between the corporate level (2.77) and IS project level (3.25) and in between the two IS projects, Mann-Whitney U test was used. The results show that at $\alpha = 0.05$ the difference was highly significance with $U=1.0$, $p = 0.006$ and sum of ranks equal to 22.00 for corporate level and 56.00 for project level. A comparison of the difference in alignment maturity scores between project one (2.96) and project two (3.55) indicate slight significant difference between the two levels with $U = 6.00$, $p = .055$ and sum of ranks equal to 27.00 for project 1 and 51.00 for project 2. However, at $\alpha = 0.1$ the difference is significant. This shows that the difference in alignment maturity scores between the two levels and between the IS projects is not by chance.

4.3 Explanations of Variation in Strategic Alignment Scores

Complementarity, completeness and explanation approach was taken in mixing quantitative and qualitative phases in this research. The aim was to elaborate, enhance, illustrate and clarify the results of quantitative phase using results from qualitative phase (Ivankova et al., 2006). In phase one we established that the variation in alignment maturity scores between corporate level and IS project level and also between the two IS projects is significant and therefore required more investigation to establish the causes of the difference.

4.3.1 Overview of Strategic Alignment practices at the IS project level.

IS project level had an overall alignment maturity score of 3.27 with project 1 having a score of 2.96 and project 2 score of 3.55 exhibiting a high difference between the two. Project 1 had two factors, Competence and IT value and Partnership at level three and project two had two factors; Competence & IT value and IT Governance at level four, one factor Scope and Architecture in level two and the other factors in level three.

There was a substantial difference in the alignment maturity scores of the two IS projects with no clear consistence in the score rankings among the respective factors. This could be attributed to the fact that project two had its own dedicated ICT staff who were also competent in e-learning pedagogical issues. Competence & IT value factor performance in the two projects was slightly consistent and scored second in project 1 and first in project 2. High performance of Competence & IT value factor in project 1 was unexpected considering that there were no measurement metrics, however for project 2 it had clearly defined metrics and quality measurement factors which were according to the respondents' good pillars to the success of the project and therefore the good performance of the factor is supported.

Comparison of maturity scores of IT governance factor showed significant difference in the two projects and was ranked last and position two in project 1 and project 2 respectively. It was also notable that Competence & IT Value and IT governance scored high alignment maturity values in the project 2. All factors except Scope and Architecture scored higher alignment maturity in project 2 than project 1.

4.3.2 Comparison of the corporate and IS project level

A comparison of the alignment maturity score of the IS project level and corporate level reveals that for all the six factors and overall, IS project level scored higher than corporate level (Table 2). There was also inconsistency in scores of factors at the two levels. An example is competence and IT value measurement which is ranked fifth among the factors at corporate level and returns the highest score overall at the IS project level. However, two factors Scope and Architecture and Human Resource Skills scored position five in corporate and six in project level and vice versa showing some slight consistence.

4.3.3 *Analysis of the overall university strategic alignment practices*

The university had an overall alignment maturity level of 3.01 and according to Luftman's framework puts it at level three called 'Established Focused Process' (Luftman, 2000). At this level an organization concentrates governance, processes and communications towards specific business objectives and IT is becoming embedded in the business. The organization leverages IT assets on an enterprise-wide basis and applications systems demonstrate planned, managed direction away from traditional transaction processing to systems that use information to make business decisions. It is also expected that leveraging of inter-organizational infrastructure is evolving. Three factors; Communication, Competence & IT value and Partnership are in level three and the other three are in level two with IT Governance being very close to level three (refer to Table 2). A review of each factor follows;

Communication factor was ranked third and at level three of the Luftman's alignment maturity framework with a score of 3.11. According to Luftman (2000) assessment model level three for communication factor implies that there is good understanding among the IT and Business and that there is emerging sharing of knowledge. However, this is not reflected from the interview with respondents who disclosed that there was rigidity and low appreciation of ICT by management owing to low ICT literacy initially but this had changed after training and change in management. Most of the ICT personnel who were involved in implementation of project 1 and had become knowledgeable about the system after working with the consultant during the implementation had left and this had impacted the system operations since users had not been fully involved. Project 2 had no serious implementation and operation challenges since it had its own ICT staff who were also knowledgeable on the e-learning and that is why it had high alignment maturity as a project. Communication is an important factors in achieving strategic alignment since it has the potential to impact the performance of other factors (Reich & Benbasat, 2000). Generally, communication factor in corporate and project 1 did not exhibit the characteristics of level three. However, the high maturity of project 2 pushed the overall factor score of the university to level three.

Competence and IT Value with a score of 3.16 was the second most matured factor and at level three of the Luftman's framework implying that though the organization could still be using traditional financial metrics to measure IT and business individually, there was emerging linkage of business and IT metrics across the enterprise. There was also a beginning of benchmarking and formal continuous assessment. From the interviews, it was observed that at the corporate level there was no particular measurement of ICT contribution to the university, however university performance contract targets which were ICT related were cascaded to the ICT department and became part of their targets. The external ratings such as Webometrics rankings which rate universities globally were recognised and used to benchmark with other universities. Project 1 performance was never evaluated due to poor implementation approach which was not well coordinated. However, project 2 high alignment maturities were reflected in the respondents' comments which revealed that there existed internally generated evaluation criteria which was being followed. According to Tallon and Kraemer (2001) evaluation of IT investments including post implementation reviews positively impacted strategic alignment since this gave the management positive view of progress. Therefore, project 2 reported higher alignment maturity because it had evaluation criteria of its project.

IT Governance was at level two but very close to level three of the Luftman's strategic alignment framework with a score of 2.97. According to Luftman's framework for IT Governance, organizations at this level have basic business strategic planning at the functional level and IT strategic planning at tactical level. The head of ICT does not report directly to the CEO and there is some periodic organised communication. ICT is treated as a functional cost centre. Findings of this research during the interviews showed that the ICT department is structurally under the vice chancellor office but the head of ICT who had also been seconded from another department reported to one of the deputy vice chancellors. The lack of full time availability of the head of ICT due to engagements in the parent department and the reporting to the DVC could affect the overall performance. The ICT committee was also not active and only met when there was need.

The maturity level of this factor in project 1 (2.40) reflected the actual conditions in the implementation and management of project 1 which was not well planned and there was no full participation by users. The consultant/vendor had left the site without complete implementation of some modules and most of the initial ICT staff that were trained on the system had left. The findings that management approach and practice when implementing projects affect project alignment is in agreement with that of Gutierrez (2011). The high maturity of IT Governance factor (4.00) in project 2 was attributed to knowledgeable head of the centre who also gotten a doctoral degree through e-learning and therefore passionate about the programme. The e-campus centre was also treated in the same category with the faculties and schools and therefore the head of centre was a member of key university decision making organs such as deans committee. Research reveals that level of maturity of IT governance is directly related to the strategic alignment and organizations with a mature mix of structures, processes and relational mechanisms achieved a higher degree of strategic alignment maturity compared to other organisations (Haes & Grembergen, 2008; Haes & Grembergen, 2009).

Partnership was the most matured factor and had an alignment maturity score of 3.21 which was in level three of the Luftman's framework. Ideally under this level, IT is seen as an asset and business enabler and being considered as valued service provider. There is also some adherence to standards. The high maturity score is not well reflected in the interviews with respondents who do not see full support of university management in ICT development especially in human resource development and systems implementation as was seen in the case of project 1. Project 1 (3.53) system which covers students and finance aspects had very good capabilities but the challenge had been the implementation approach. In project 2 (3.61) there was good working relationship between the technical personnel who were good in both IS and pedagogical issues and the management of the centre as well as lecturers who offered courses through the e-learning platform. According to Kearns and Lederer (2003), integration of business and ICT planning has a positive impact on business performance, though this will also be affected by cultural issues (Pikarti & Hidayanto, 2012). That could be the reason why project two had the best performance since they had good working relationship as compared to project 1.

Scope and Architecture was one of the least matured factors with an alignment maturity score of 2.85 and in level two of the Luftman's strategic alignment maturity framework. According to this framework level two implies there are defined ICT standards and the systems being implemented are transactional such as Executive Support System (ESS) and Decision Support Systems (DSS). There is an attempt of integration and sharing of infrastructure at departmental and organizational level and there is limited infrastructure flexibility. Despite this factor being ranked low there was good backbone infrastructure connecting buildings, however this was not exhaustive since some campuses and buildings within the main campus were not connected. Some of the challenges which delayed the implementation of the two information systems were related to the infrastructure availability and for the e-learning, there was a problem with the internet bandwidth initially and had to outsource the hosting of the e-learning platform. Policy guidelines on infrastructural development were not clearly defined though ICT was being consulted when acquiring ICT related infrastructure. The level of maturity of Scope and Architecture indicated how the organization was investing in emerging technologies to provide customized solutions to its customers and improve service delivery (Luftman & Kempaiah, 2007). The university had not leveraged on available technologies to gain business advantage.

Human resources skill factor with an alignment maturity score of 2.76 was in level two and the least matured factor and according to Luftman's framework at this level the organization has varied characteristics across all functional organizations with innovation dependent on departmental level, change readiness being limited to functional level and minimum career training and cross over. These characteristics were reflected during the interviews and it was noted that due to unattractive terms the ICT department had shortage of staff. The staff felt their skills and competence were not being recognised and the recruitment process was slow. Other key challenge was the management of change during the implementation of ICT projects especially project 1 which users felt that they were not involved in the implementation. This was not the case for project 2 which had handled this element well after initial challenges. Organizations can achieve a higher human resources skills maturity by recognising personal interests of individuals through a form of rewarding system. Human resource is a key resource for efficient and effective success of other alignment factors (Luftman & Ben-Zvi, 2010; Ward & Daniel, 2006)

5. Conclusion, Implication and Further Research

Strategic alignment level portrays extent to which an organization has leveraged information systems to improve its processes and realise strategic advantage which will eventually enhance the services delivery and enable realization of business value from its investment. The Luftman's Strategic Alignment Maturity Model can be used as a guiding framework to generate an instrument to assess the level of strategic alignment between IS and the organization business. This level gives a reflection of how information systems are strategically being used to achieve business objectives and exploit opportunities. From the assessment the organization can identify areas to improve and areas to exploit in moving to the next level of strategic alignment. Methodologically this research explored the use of a mixed method approach in understanding strategic alignment which enables digging deeper into establishing the causes of variation in alignment maturity of factors in an organisation. This research contributes to theory in the area of information systems and organizational informatics strategic management with a focus on IS strategic alignment in education sector.

Strategic alignment assessment of the university case at the corporate and IS project level shown that the alignment level is higher at the IS project implementation level as compared to the corporate. Ideally, if information systems are being implemented in the same organization we expect minimum variation in their alignment maturity. However, the differences show that factors have different effects at different organizational levels. There is also significant variation in the alignment maturity of the two IS projects. This could be attributed to the implementation of the two projects by different teams, approaches in the implementation in terms of the human resources involved as well as other resources such as financial, and the objectives of the projects. The research also established that the higher the strategic alignment level the better the performance of

the services and therefore higher business value from the IS investment.

The results of this study are limited to Kenyan public university setup. Applicability in other sectors is an area which can be explored in other researches.

References

- Bhansali, N. (2007). Strategic Alignment in Data Warehouses Two Case Studies. *Technology*,
- Campbell, B., & Peppard, J. (2009). The Co-evolution of Business/Information Systems Strategic Alignment: An Exploratory Study. *European Journal of Information Systems*, 1–40.
- Chan, Y. E., & Reich, B. H. (2007). IT alignment: what have we learned? *Journal of Information Technology*, 22(4), 297–315.
- De Haes, S., & Van Grembergen, W. (2009). An Exploratory Study into IT Governance Implementations and its Impact on Business/IT Alignment. *Information Systems Management*, 26(2), 123–137.
- Dhar, V., Sundararajan, A. (2006). *Does IT Matter in Business Education? Interviews with Business School Deans. Information Systems* (pp. 1–22).
- Dyreyes, J., & Manager, P. (2008). Strategic Project Management : Aligning Strategic Business Objectives with Project Management Strategy. *Management*, 97204 (February 2008).
- Gutierrez, A. (2011). Alignment of IS Projects with Business Strategy: Evolution of Thinking and Practice. *EMCIS2011*, 501–518.
- Gutierrez, A., Orozco, J., & Serrano, A. (2009). Factors affecting IT and business alignment: a comparative study in SMEs and large organisations. *Journal of Enterprise Information Management*, 22(1/2), 197–211.
- Gutierrez, A., & Serrano, A. (2008). Assessing strategic, tactical and operational alignment factors for SMEs: alignment across the organisation's value chain. *International Journal of Value Chain ...*, 2(1).
- Gutierrez, A, Orozco, J., & Serrano, A. (2008). Developing a Taxonomy for the Understanding of Business and IT Alignment Paradigms and Tools. *Review Literature And Arts Of The Americas*.
- Haes, S. De, Grembergen, W. Van, & Haes, B. S. De. (2008). Analysing the Relationship between IT Governance and Business/IT Alignment Maturity. *Proceedings of the 41st Annual Hawaii International Conference on System Sciences (HICSS 2008)*, 428–428.
- Henderson, J., C., Venkatraman, N., Henderson, J., & Henderson, J.C., Venkatraman, N. (1999). Strategic Alignment: Leveraging Information technology for Transforming Organizations. *IBM Systems Journal*, 32(1), 472–484.
- Ivankova, N. V, Creswell, J. W., & Stick, S. L. (2006). Using Methods Sequential Explanatory Design : From Theory to Practice. *Field Methods*.
- Jenkin, T., & Chan, Y. (2010). IS project alignment—a process perspective. *Journal of Information Technology*, 25(1), 35–55.
- Kashorda, M., & Waema, T. (2006). *E-Readiness Survey of Higher Education Institutions in Kenya 2006. Computing and Informatics*.
- Kearns, G. S., & Lederer, A. L. (2003). A resource-based view of strategic IT alignment: How knowledge sharing creates competitive advantage. *Decision Sciences*, 34(1), 1–29.
- Lech, P. (2007). Proposal of a Compact IT Value Assessment Method. *Journal of Information Systems*, 10(1), 73 – 82.
- Luftman, J. (1996). *Competing in the information age: strategic alignment in practice* (Vol. 10).
- Luftman, J. (2000). Assessing business-IT alignment maturity. *Strategies for Information Technology Governance*, 4(December), 99.
- Luftman, J., & Ben-Zvi, T. (2010). Key Issues for IT Executives 2010: Judicious IT Investments Continue Post-Recession. *MIS Quarterly Executive*.
- Luftman, J., & Kempaiah, R. (2007). An Update on Business-IT Alignment: A Line Has been Drawn. *MIS Quarterly Executive*, 6(3).
- Ndirangu, M., & Ogola, F. (2013). Information And Communication Technology Use Among Teacher Education Students In Universities In Kenya, 2(11), 176–179.
- Motjopolane, I., & Brown, I. (2004). Strategic business-IT alignment, and factors of influence: a case study in a public tertiary education institution. In *Proceedings of the 2004 annual research conference of the South African institute of computer scientists and information technologists on IT research in developing countries* (pp. 147–156). South African Institute for Computer Scientists and Information Technologists.
- Nelson, M. (2005). Breaking Out of the IT Silo: The Integration Maturity Model. *American Journal of Health-System Pharmacy : AJHP : Official Journal of the American Society of Health-System Pharmacists*, 59(20 Suppl 6), S15–7.
- Onwuegbuzie, A. J., & Collins, K. M. T. (2007). A Typology of Mixed Methods Sampling Designs in Social

- Science Research, 12(2), 281–316.
- Peak, D., Guynes, S. C., & Kroon, V. (2005). Information Technology Alignment planning - A Case Study. *Information & Management*, 42, 619–633.
- Pikarti, G., & Hidayanto, A. (2012). Analysis of Perspectives and Organizational Culture Impacts on Strategic Alignment Maturity Level: A Case Study. *ANALYSIS*.
- Pirani, J. A., & Salaway, G. (2004). Information Technology Alignment in Higher Education Key Findings. *EDUCAUSE Center for Applied Research*, (June), 1–10.
- PMI. (2008). *A Guide to Project Management Body of Knowledge. Management* (4th ed.).
- Reich, B. H., & Benbasat, I. (2000). Factors That Influence the Social Dimension of Alignment between Business and Information Technology Objectives. *MIS Quarterly*, 24(1), 81.
- Richards, J. D. (2007). Introduction to IT project management. In *Project Management Journal* (Vol. 38, pp. 90–90). doi:10.1002/pmj.20008
- Sauer, C., & Reich, B. H. (2009). Rethinking IT project management: Evidence of a new mindset and its implications. *International Journal of Project Management*, 27(2), 182–193.
- Sledgianowski, D., Luftman, J., & Reilly, R. R. (2006). Development and validation of an instrument to measure maturity of IT business strategic alignment mechanisms. *Information Resources Management Journal*, 19(3), 18–33.
- Tallon, P., Kraemer, K., & Gurbaxani, V. (2001). Executives’ perceptions of the business value of information technology: a process-oriented approach.
- Wanyembi, W. (2002). *Improving ICT Management in Public Universities in Kenya. Science*.
- Ward, J., & Daniel, E. (2006). *Benefits management: delivering value from IS and IT investments*.
- Ward, J., & Daniel, E. M. (2013). The role of project management offices (PMOs) in IS project success and management satisfaction. *Journal of Enterprise Information Management*, 26(3), 316–336.
- Wausi, A. N. (2008). *Organizational Implementation of Informations Innovations: Case Universities in Kenya. Higher Education*. Nairobi.

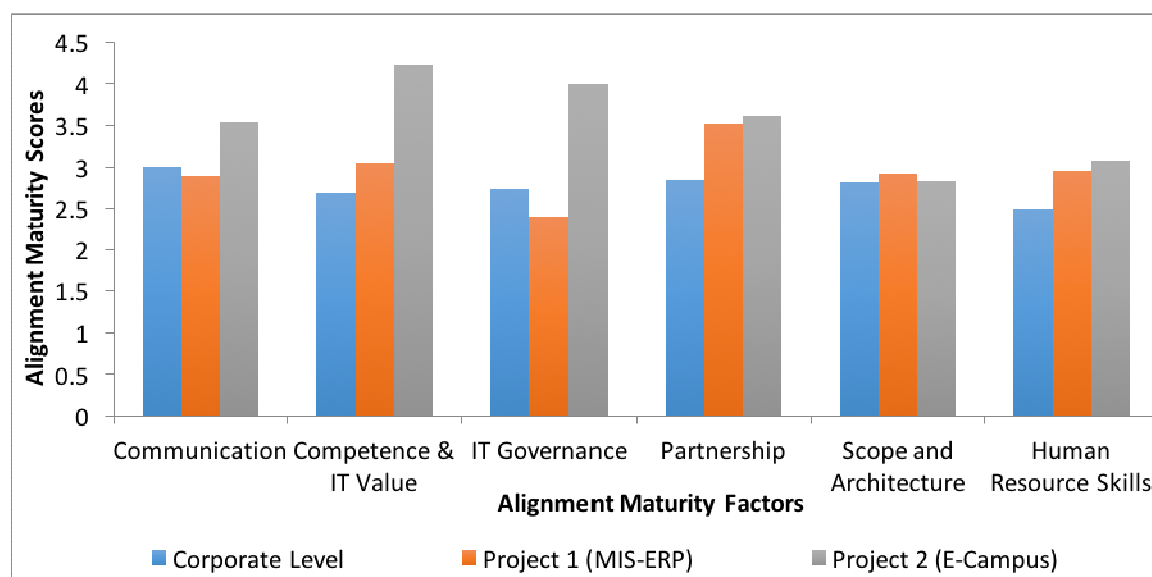


Figure 2: Comparison of strategic alignment maturity levels of factors at project1, project 2 and corporate level