Information Systems Strategic Alignment Maturity Levels: Corporate and Project Implementation Perspectives

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Abstract

Deriving value from Information Systems (IS) investments has been a great concern in most organizations. IS strategic alignment also known as Business-IS alignment has been argued as one of the approaches of achieving IS investment value. Various researchers have proposed approaches to understanding the importance, achievement and maintenance of strategic alignment in organizations. This research used a strategic alignment assessment framework derived from Luftman's Strategic Alignment Maturity Model (SAMM) to establish alignment maturity levels of public universities in Kenya. The approach adopted considers both Corporate (decision making) level and Project (IS implementation) level in evaluating strategic alignment maturity of an organization. Survey questionnaires were used in data collection and quantitative data analysis was employed. The study found out that the alignment maturity scores was higher at IS project implementation level as compared to corporate level. There was also consistency in alignment maturity scores ranking of factors in the two levels with communication and partnership scoring high at both levels while the human resource skills were ranked lowest at both levels.

Keywords: Strategic alignment, Information Systems Investments, Strategic Alignment Maturity Model (SAMM), IS project implementation

1.0 Introduction

Information Systems (IS) investments have become one of the main items in organizations investment portfolio. To achieve value from the investments in information systems, it is important to ensure that IS strategies and business strategies are aligned. This process is known as Business-IS alignment or Strategic Alignment. For several decades strategic alignment has been one of the top management concerns of most organizations (Luftman, 2005). IS strategies and business strategies do not independently enable organizations to realize performance improvement, but it is the strategic alignment of the two (Henderson and Venkatraman, 1999; Luftman & Kempiah, 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 and Sundararajan, 2006). The varied impact is attributed to assumption that IS impacts on an organization's performance by enhancing processes and that the level of impact will depend on the organization's internal characteristics including skills, infrastructure and corporate culture which vary across different organizations and also the external competitive environment which the organization operate.

Most of the earlier researches considered strategic alignment assessment at the corporate level which does not give a complete picture of the entire organization strategic alignment performance. Strategic alignment process focus should be extended from corporate level where decisions are made to project level by focusing on the process of achieving alignment at the project implementation. Project alignment requires corporate strategic alignment as a starting point and corporate strategic alignment is facilitated by project alignment to successfully implement the organization's alignment strategy. Therefore, the two types of alignment are tightly connected (Jenkin & Chan, 2009). IS alignment leads to more focused and strategic use of information system resources which in turn results to increased performance (Chan, 2002). It is therefore important to understand alignment at both project implementation level and corporate level in order to understand the overall organization Business-IS alignment.

Strategic alignment has positive impacts to IS project success and organizational performance and therefore continuous failure of IS projects and hence lack of realization of benefits from investments in IS implies lack of strategic alignment (Clarke, 2002). Aligning project implementation and management to business strategy is important in achieving organization's 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.

Universities in Kenya are experiencing increased investments in information systems in an attempt to harness the benefits which come with the new information technologies. According to Chumo, Muumbo and Korir (2011), Kenyan university face various challenges both in adoption and use of ICTs and therefore difficulties in achieving 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 resulting in resistance to change. Despite the challenges, universities have been investing in ICT systems for administrative, teaching, research, communication and networking purposes. These have been achieved through initiatives such as Kenya Education Network (KENET) which is a trust aimed at bringing Higher Education Institutions and other education institutions together in consolidating and bargaining for services like the internet bandwidth and other developments.

Despite many researches, propositions and theory approaches there has been no solution to the complexity of information systems strategic alignment which is still ranked highly as a concern by practitioners and researchers (Weiss & Thorogood, 2006). Moreover, there is limited research directed towards understanding and establishing alignment practice in organizations especially in developing countries and specifically in universities. The outcome of this study in terms of theory and empirically contributes to both academic and practitioner field. This study provides an analysis of the findings of strategic alignment maturity levels of Kenyan public universities using a strategic alignment assessment framework derived from the Strategic Alignment Maturity Model (SAMM). The assessment is carried at two levels; the corporate level (IS strategy formulation) and project level (IS strategy implementation).

2.0 Related Literature Review

Researchers have offered different perspectives of strategic alignment. According to Chan (2002) we can roughly distinguish two prevailing conceptualizations of the alignment problem. The first one, based on the work of Reich & Benbasat (1996), focuses on planning and objectives integration and considers alignment as the degree to which the IS mission, objectives and plans support and are supported by the business mission, objectives and plans. This approach is supported by Kearns & Lederer (2000) who argues that by aligning the IS plan and business plan, information resources support business objectives and take advantage of opportunities for strategic use of information systems. The second conceptualization, based on Henderson & Venkatraman (1999), take a more holistic view on alignment by defining four domains including business strategy, IS strategy, business infrastructure and processes, and IS infrastructure and processes that need attention. For each of these domains they identified constituent components comprising of; scope, competencies, governance, infrastructure, processes and human resource skills. This framework is further refined by Maes et al. (2000) who split it up into a business, information/communication and technology column, and a strategy, structure and operations row. This stream of research identifies more alignment components thus increasing both the complexity and the richness of the concept of alignment.

This research takes into consideration the two conceptualizations by considering the planning and objective integration together with the attention on the four domains in the understanding of the strategic alignment in organizations. Generally, organizations are sceptical of the benefits of IS investment owing to difficulties in determining how tangible benefits are achieved, however there is evidence that organizations with clear strategic goals for IT achieve higher levels of strategic alignment and therefore higher IS business value (Tallon & Kraemer, 2003). A research focused on the alignment analysis at process level to gain a deeper insight as compared to other researches on firm's level found that there is an alignment paradox and that strategic alignment can improve the business value of IS but highly tight strategies between IS and business strategy could prevent organizations from the flexibility required to react in a dynamic environment (Tallon et al., 2001; Tallon & Kraemer, 2003). Thus, the business value of IS depends on the organization flexibility to link its strategic process with the IT strategic process.

2.1 Strategic Alignment Assessment Approach

To understand organization's development in business-IS alignment, maturity models are used. Maturity models can be used as instruments for assessing and improving an organization's process in certain functional domain. The alignment maturity level of an organization is determined by the management practices and strategic IT decisions within an organization based on the maturity factors. This research uses an alignment maturity assessment framework derived from the Luftman's Strategic Alignment Maturity Alignment Model (SAMM). The assessment process considers six factors (communication, measurement, governance, partnership, technology scope, and skill) to assess alignment maturity in an organization as well as to achieve and maintain such alignment maturity. This approach for assessing, achieving and maintaining alignment suggest a dynamic

paradigm process to understand alignment (Gutierrez et al., 2006; Gutierrez, Orozco & Serrano, 2008). Maturity assessment is based on the popular work done by the Software Engineering Institute (SEI) and an evolution of the Nolan and Gibson stages of growth (Davis, King & Kraemer, 1984). The five levels of maturity are derived through the assessment of the qualities of the attributes associated with each criterion. A brief description of the six factors is given below;

Communication:
Refers to the exchange of ideas, knowledge and information among the IS and business managers, enabling both to have a clear understanding of the organization's strategies, business and IS environments including communication with consultants, vendors and partners and dissemination of organizations' learning internally.

IT Value/Competence Measurement:
This involves the measurement of the organization performance and value of its projects. Completed projects are evaluated to establish the factors which cause success and failure and then determine how to improve internal structures to ensure future success of projects.

IT Governance:
Refers to the degree to which the authority for making IS decisions is defined and shared among management. Involves determining 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:
Considers how organization's infrastructure, change readiness, flexibility in structure and the management of emerging innovations are coordinated to enable business growth.

Human Resources Skills:
Considerations for training, performance, innovation development and career opportunities for human resource. It also includes an organization's readiness for IT change, capability for learning and ability to leverage new ideas.

2.2 Levels of Alignment Maturity

To determine the alignment maturity level of an organization the scores of the six components of maturity are compared to a five level maturity model shown in figure 1 below;
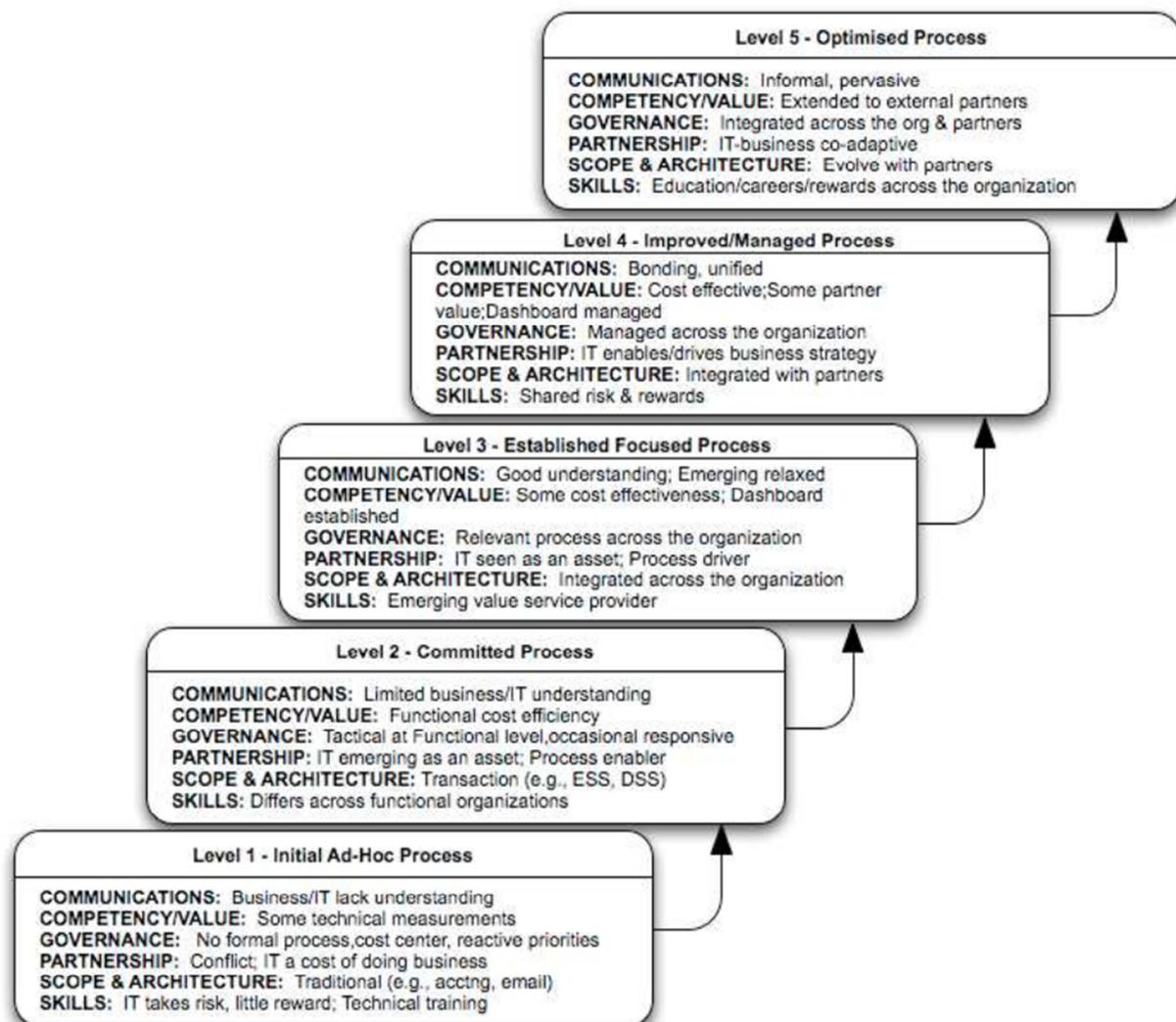
Figure 1: Strategic Alignment Maturity Model Alignment Levels adopted from (Luftman, 2000)

The alignment maturity level of an organization is determined by the management practices and strategic IT decisions within an organization based on the above six alignment maturity factors. Level one is the lowest maturity alignment level and level five is the highest maturity level. The five possible alignment maturity levels shown in figure 1 are defined below;

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

Level 2: *Committed Process*: The organization has 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.

2.3 Information Systems Implementation and Strategic Alignment in Kenyan Universities

According to Nelson (2005) there are four alignment processes which enables IT investment to provide value to an organization. They include; functional automation, cross-functional integration, process automation and process transformation. Strategic IS alignment occurs after the fourth stage and organizations need to be more

responsive and adaptive by changing organizational structures from being functionally oriented and improving cross-functional integration to have a better capacity to achieve IS alignment and therefore benefit from IS investment. However, over time universities still maintain the functional or departmental structures and lack integration of the IS function with the priorities of the organization. According to Pirani & Salaway (2004), IT alignment is determined by IS strategic planning, IT governance, Communication and measurement/assessment metrics.

A case study of transformation of use of information systems at university of Memphis identified main issues facing the development in IS utilization to be both managerial and technical and included; governance, planning, performance management and evaluation metrics (Goldstein, 2004). To enable identification of specific needs it is important for public universities to assess their IT maturity to ensure appropriate utilization, exploitation, and maintenance of ICT in achieving the organizational objectives (Wanyembi, 2002). The study by Wanyembi also found out that universities emphasized more on effectiveness than efficiency and that there is need in change on organizational culture, goals, strategies, and information policy and planning. There are also prevalent biases on technical issues than managerial issues when they should be considered as complementary and therefore there is need for continued emphasis on managerial aspects of ICT along with the technical issues.

Implementation of information systems in Kenyan universities was found to involve both managerial processes that required change management and intervention shaped by organizational context as well as an organizational learning process (Wausi, 2008). For a successful implementation of IS there is need for favourable implementation context and appropriate managerial intervention and thus there is need for alignment of IS project plans with the organizational context and that organizational learning is important for future IS projects. An e-readiness survey conducted to assess the level of preparedness of Higher Education Institutions (Universities and tertiary colleges) in Kenya to use ICT in teaching, learning and management found out that most of the universities had ICT strategy that is not aligned to their goals since use of ICT for learning was low. Universities had also not started integrating ICT into their curriculum. However most universities were generally e-ready despite ICT not being considered key strategic priority by some institutional leadership (Kashorda & Waema, 2006).

A global review of literature on adoption of information systems by universities shows that universities have recognized the importance of adopting information systems starting from improving their functional areas with a gradual move towards making information systems drivers of their business. It is also evident that there are major challenges which the universities have been facing including both technical and managerial aspects. This paper provide an understanding of the level of incorporation of information systems by Kenyan universities by establishing strategic alignment maturity levels of the universities.

3.0 Conceptual Framework and Methodology

3.1 Conceptual Framework

The strategic alignment assessment tool used to assess alignment maturity at the corporate level is the validated instrument developed by Sledgianowski, Luftman & Reilly (2006) and based on Luftman (2000) Strategic Alignment Maturity Model (SAMM). The same instrument was also used at the IS project level with necessary adjustments to suit the context at this level. The following diagram depicts the conceptual framework adopted in this study.

Corporate Level Alignment Maturity Factors
- *Communication*
- *Competence and value of IT*
- *IT Governance*
- *Scope and Architecture of the IT Infrastructure*
- *Partnership*
- *Human Resource Skills*

IS Projects Level Alignment Maturity Factors
- *Communication*
- *Competence and value of IT*
- *IT Governance*
- *Scope and Architecture of the IT Infrastructure*
- *Partnership*
- *Human Resource Skills*

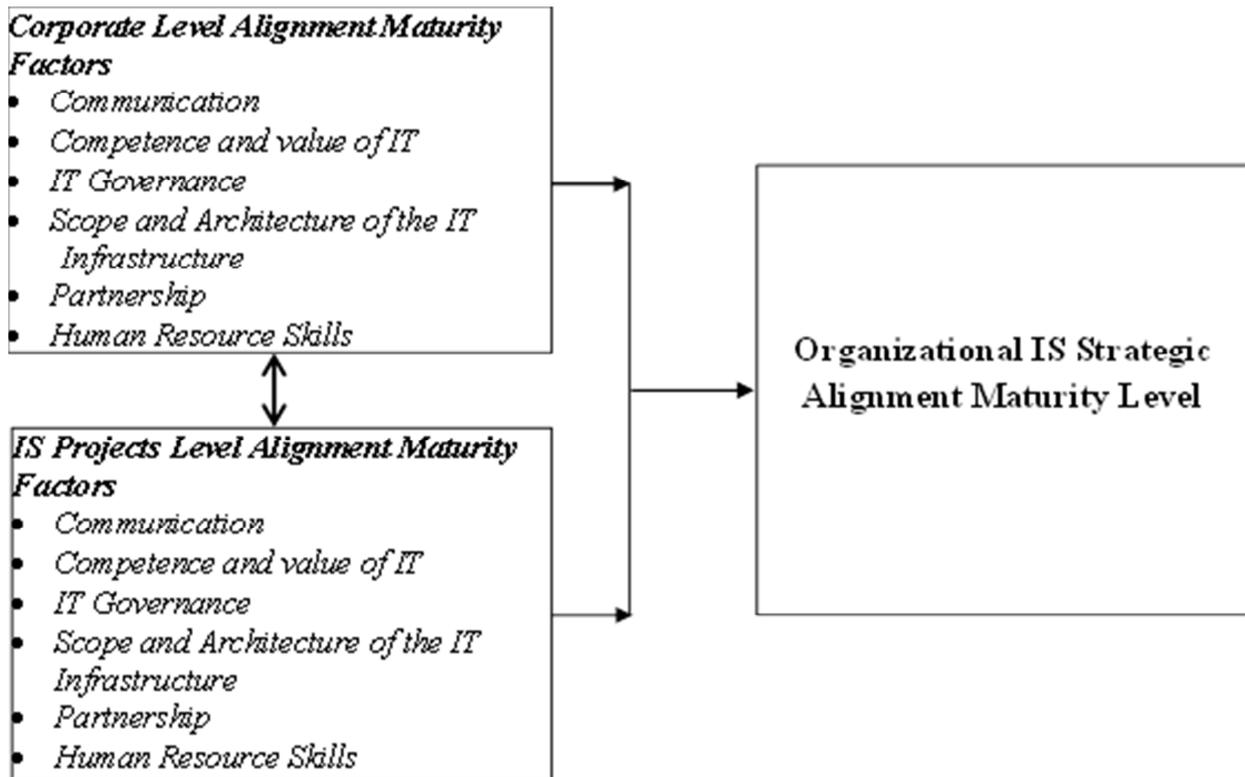**Organizational IS Strategic Alignment Maturity Level**

Figure 2: Conceptual Framework

Assessment of alignment was done at the corporate level and at the IS project implementation level. The overall organization maturity alignment level is the average of the combination of both levels. At the IS project level two projects were assessed in each of the university

3.2 Study Population and Sampling

This study focused on Kenyan public universities which at the time of this study were seven. The universities were at different levels in implementation or incorporation of information systems into their operations to gain strategic advantage. Units of analysis constituted the corporate level of the organization where the IS strategic planning takes place and projects level where IS project implementation takes place. The participants at the corporate level constituted the senior management involved in decision regarding IS investment and at the IS project level constituted people who were involved in the implementation of IS projects consisting of staff from both the IS function and departments or functional area where the information system has been implemented.

At the corporate level purposive intensity sampling technique was used to select participants who were involved in the planning and decision making of IS investments. At the project level snowballing and purposive sampling was used as a strategy to identify participants from the identified projects from the IS unit and unit/department where the IS project had been implemented.

3.3 Research Design and Instruments

The data collected at both the corporate and IS project level was done using the strategic alignment maturity assessment questionnaires which was purely quantitative. The questionnaire was made up of six factors with equal weighting and each factor had five maturity levels. The alignment maturity score of each factor determined the alignment maturity score of the organization. The instrument used was a validated questionnaire and the reliability was tested by comparing the results of our study with those of other studies which have used similar instrument. Prior to carrying out the survey the researcher consulted key participants from the university senior management involved in the IS management to identify the projects and participants for the study.

4.0 Analysis of the Findings

This research involved collection of alignment maturity ratings Kenyan public universities. As at the time of this research there were seven public universities in Kenya, however only six university granted permission to access

their institutions. Respondents were drawn from members of the corporate level (those involved in ICT related decision making) and two key IS projects implemented in the university. The identities of the six universities are concealed and named as A, B, C, D, E and F. Table 1 below shows the respondent's distribution across the six universities at the corporate and the two IS projects.

Table 1: Respondent's distribution per university and level

Level	Universities						Respondents per level
	A	B	C	D	E	F	
Corporate	5	5	8	8	12	5	43
Project 1	9	7	5	8	12	9	50
Project 2	5	7	5	9	7	6	39
Respondents per university	19	19	18	25	31	20	132

For each of the universities two key IS projects which were considered strategic to the university were chosen as shown in table 2 below.

Table 2: IS projects chosen in the six universities

University	Project 1	Project 2
A	Finance Management Information System	Academic Records Management System
B	Finance Management Information System	Students Management Information System
C	Management Information System (Finance and Students ERP)	E-learning System (E-campus)
D	Academic Management Information System	Webmail System
E	Finance Management Information System	Library Management Information System
F	Performance Contract Information System	Students Management Information System

4.1 Comparison of Strategic Alignment Maturity between universities at different levels.

4.1.1 The overall alignment maturity scores of the Kenya public universities

Overall alignment maturity scores is derived from the average of the scores at the corporate level and the average scores at the IS implementation level. The overall alignment maturity scores of the Kenya public universities is 2.95. The highest scoring university had an alignment maturity level score of 3.11 and the lowest is 2.81. It can be realised therefore that the difference in alignment scores among the Kenyan public universities is minimal. Table 3 below shows the alignment maturity levels of the factors in the surveyed universities.

Table 3: Alignment maturity of universities and factors

Factors	University						Factor alignment maturity level
	A	B	C	D	E	F	
Communication	3.05	2.85	3.08	3.19	3.01	3.13	3.05
Competence and IT Value	2.87	3.29	3.36	3.06	2.97	3.49	3.17
IT Governance	2.61	2.87	3.02	2.64	2.77	2.97	2.81
Partnership	3.09	3.20	3.23	2.77	2.97	3.34	3.10
Scope and Architecture	3.04	3.08	2.79	2.67	2.55	2.87	2.83
Human Resources Skills	2.63	2.73	2.81	2.59	2.57	2.89	2.70
University Alignments Maturity Scores	2.88	3.00	3.05	2.82	2.81	3.11	2.95

4.1.2 Alignment maturity levels of the factors

Overall alignment maturity scores of the six factors range from a lowest of 2.70 to the highest of 3.17. Competence and IT value had the highest level of alignment maturity with 3.17, followed closely with partnership with 3.10. The third highest is communication with alignment maturity of 3.05. This is followed in fourth by Scope and Architecture with 2.83 and IT Governance with 2.81. Lastly is Human resource skill with maturity level of 2.70. This is shown in table 3 above.

4.1.3 Alignment maturity scores at the corporate levels

At the corporate level the overall alignment maturity level is 2.88 which slightly lower than the overall organization maturity alignment level of 2.95. Table 4 below shows the corporate level alignment maturity

scores of the factors in the six universities. The highest alignment maturity score at this level is 3.23 and the lowest is 2.56. Communication with a score of 3.06 had the highest maturity score among the factors at this level while Human resource skill has the lowest alignment maturity score of 2.64.

Table 4: Alignment maturity scores of factors at the corporate level in the universities

Factors	University						Alignment factors maturity level
	A	B	C	D	E	F	
Communication	3.25	2.92	3.03	3.25	2.81	3.09	3.06
Competence & IT Value	2.90	3.27	2.88	2.48	2.47	3.47	2.91
IT Governance	2.67	2.67	2.87	2.57	2.70	3.00	2.75
Partnership	2.67	3.89	2.83	2.77	2.93	3.11	3.03
Scope and Architecture	3.50	3.45	2.71	2.60	2.3	2.78	2.89
Human Resource Skills	2.50	3.17	2.49	2.63	2.14	2.92	2.64
Corporate level Alignment maturity score	2.92	3.23	2.80	2.72	2.56	3.06	2.88

4.1.4   Alignment maturity scores at the IS project level

The alignment maturity scores of the implemented IS projects in the universities had an average of 3.04 which was higher than the score at the corporate level of 2.88. The highest scoring university had a maturity level of 3.17 and the lowest had a maturity level of 2.84. For the score of alignment maturity factors, Competence and IT value had the highest maturity score of 3.35 followed closely by Partnership with a alignment maturity score of 3.19 and Communication with 3.11. The factor with the lowest maturity score was Human resource skills with 2.77.

Table 5: Alignment maturity scores of factors at the IS project implementation level

Factors/Attributes	University						Alignment factors maturity level
	A	B	C	D	E	F	
Communication	2.85	2.81	3.1	3.17	3.11	3.15	3.11
Competence & IT Value	2.84	3.30	3.6	3.35	3.22	3.50	3.35
IT Governance	2.54	2.97	3.1	2.68	2.81	2.96	2.94
Partnership	3.50	2.86	3.43	2.77	3.00	3.45	3.19
Scope and Architecture	2.58	2.89	2.83	2.71	2.68	2.92	2.86
Human Resource Skills	2.75	2.51	2.98	2.57	2.78	2.88	2.77
IS project level Alignment maturity	2.84	2.89	3.17	2.87	2.93	3.14	3.04

4.1.5   Comparison of the alignment maturity scores of the factors at the two levels

A comparison of alignment maturity scores of each factor at the corporate and IS project implementation level reveals that all the factors except Scope and Architecture scored high maturity level at the IS project level than the corporate level. This could be attributed to the fact that in most universities IS personnel were the ones who came up with the system and attempted to convince the users to accept the system without prior involvement of the users. It is also noted that at the two levels Human resource skills had the lowest alignment maturity scores. Figure 3 below shows a comparison of alignment maturity scores for different factors at the corporate and IS project levels.
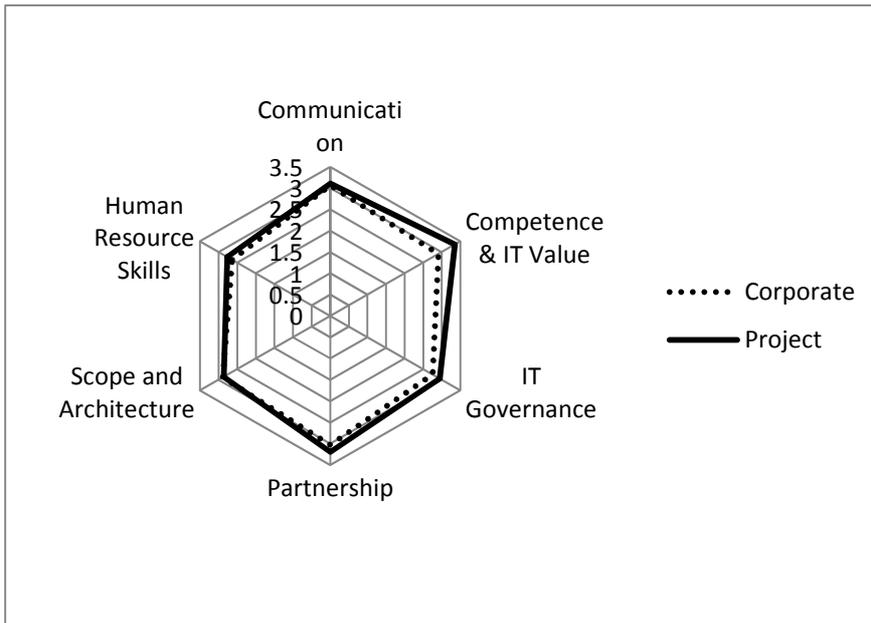
Figure 3: Alignment maturity scores of factors at the corporate and project level

4.1.6   Comparison between the alignment maturity level scores of the corporate and IS project levels

A comparison of maturity scores of alignment factors at the two levels across all the surveyed universities showed that in five out of the six universities the maturity score at the IS project implementation level was higher than that at the corporate level. An observation with the one university with high maturity level at the corporate level shows high level participation by the senior management in decision making and special interest by the CEO of the university in utilization of ICT in the university. Figure 4 below shows the maturity levels of the six universities at both the corporate and IS project level.
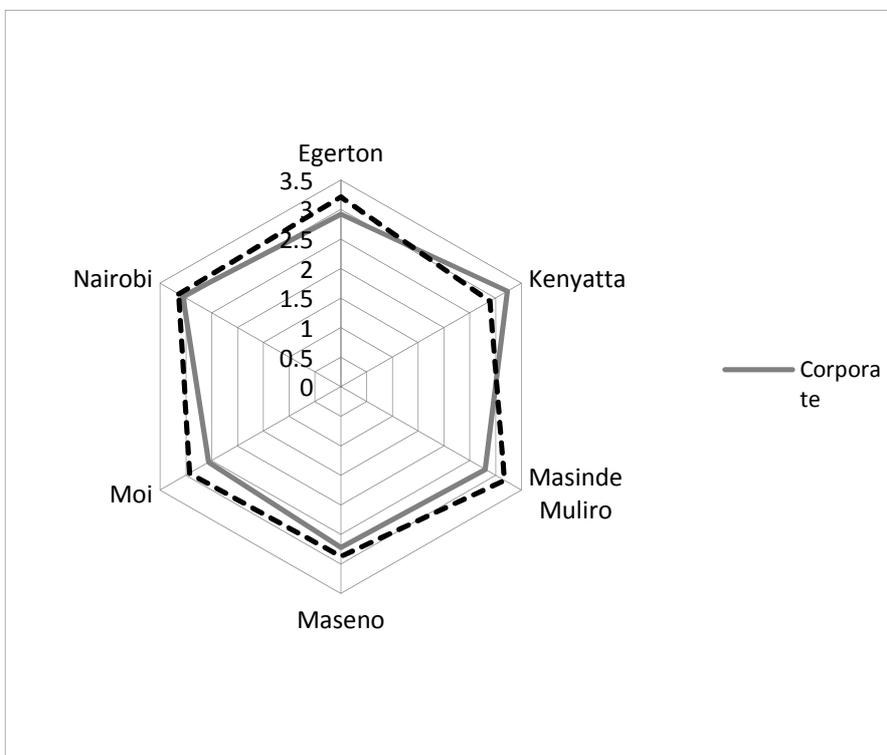

Figure 4: Alignment maturity scores of universities at the corporate and project level

5.0 Conclusion and Recommendation

This paper explored the maturity levels of strategic alignment in organization's by considering the organization corporate level where IS decisions are made and the IS project level where IS projects are implemented in six universities in Kenya. From the research data we can note that generally strategic (business-IS) alignment at the IS project implementation level is higher than that at the corporate level. This is in agreement with the findings by Gutierrez (2011). This research also found out that Kenyan public universities have an alignment maturity score of between 2 and 3 which is consistent with other studies of organizations in similar sector (Luftman & Kempaiah, 2007). There is also a variation in the alignment maturity scores of factors at the two levels. However, some factors maturity scores are consistent across the two levels.

This study contributes to the research in area of strategic alignment theory which is an important aspect in achieving value for IS investments since it explores alternative way of establishing the organization alignment maturity by considering key IS projects alignment maturities and the maturity rating at the corporate level (Ekstedt et al., 2009; Jenkin & Chan, 2009; Gutierrez, 2011). Most of the earlier researches have always considered determining alignment maturity level through assessment of corporate/top level by considering only views from senior management without consideration of those involved in the actual implementation of the organization strategic IS projects (Peppard & Breu, 2003). This research forms part of the new methodological approaches in determining organizations IS maturity alignment by looking at the entire organization in totality. Empirically, the findings from using this approach will help the individual organization to identify the weak areas which need improvement in order to realize a better overall organization strategic alignment and therefore value from the IS investment.

The variation in alignment maturity scores can be understood by carrying out a detailed study using a qualitative approach through interviews, ethnography, documents review and focused group discussions among others. There is also need to evaluate and understand the project management practices in the organization to determine its relationship with the business-IS (strategic) alignment maturity level of the factors.

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