An Interrogation into Strategy-Technology Linkage at the Department of Immigration Services, Kenya

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Abstract
There exists a debate on the nature of strategy-technology linkage. Consensus is lacking on whether strategy informs technology, whether technology informs strategy, whether strategy and technology develop independently but match at a later stage, and whether there is no linkage between strategy and technology. This study aimed to find out the extant nature of strategy-technology linkage at the Department of Immigration Services, Kenya. Through a case study research design, primary data were obtained through personal interviews using a structured interview guide. The interviewees were top level managers comprising of the Director of Immigration Services and Assistant Directors of Immigration Services in charge of regions namely: Coast, Eastern, North Eastern, South Rift/Nairobi, North Rift/Western and Nyanza. The study also made use of secondary data from documents in the Department. The data gathered were then analyzed using thematic content analysis. The findings revealed presence of strategy-technology linkage at the Department of Immigration Services, Kenya. The nature cuts across the four thematic areas, but leans more towards strategy informing technology. Incidences supportive of the finding that technology informs strategy, strategy and technology develop independently but match at a later stage and no linkage between strategy and strategy were found but not as recurrent as those of strategy informing technology. The study findings largely support postulations of Configuration and Resource Based theories. The study concludes that strategy informs technology at the Department of Immigration Services, Kenya. For policy making, the study recommends the Department of Immigration Services expends more effort to develop a robust strategy that will inform appropriate technology with selective juxtapositions of technology informing strategy where necessary. For practice, the study recommends strategy-technology linkage that fits the environmental setting with a keen eye on the ever changing environment. The study acknowledged

limitations on the contextual setting, design, data collection and analysis methods. The design was a case study which means findings might not be generalized. Data collection was through interviews and analysis was through content analysis, both viewed as largely subjective. Interviews were administered to only the top management within the department. Lower cadres were not represented. The study suggests for further research on the subject through different contextual settings, different designs and different instruments.

Introduction

Studies have shown that whichever strategy an organization would adopt, technology would be in the mix (Porter, 1979; Hamel & Prahalad, 1989; Itami & Numagami, 1992). In today's organizations, whether for-profit or not-for-profit, strategy and technology are like conjoined twins. It is hardly possible for strategy to survive without technological innovations but it is also hardly possible for technology to realize a strategy unless aligned to strategic intent. To achieve desired goals, technology and strategy interchangeably guide one another (Itami & Numagami, 1992). For successful execution of strategy, environmental analysis and commitment of resources are inevitable. Technology is both an environmental phenomenon and a vital resource. Strategy-technology linkage is an area of concern to profit seeking organizations for reasons such as competitiveness and increment of market share. Not-for-profit organizations adopt strategy-technology linkage mainly for efficiency and effectiveness.

This study was founded on Miller's (1986, 1987, 1996) strategic configuration theory and the dynamic resource-based view (Helfat & Peteraf, 2003). Strategic configuration theory avers that an organization's mere possession of superior technology does not signify strategic success. Proper alignment of its strategic elements is vital. Miller (1996) argues that mutually supportive elements are the reason behind an organization's strategic success. Elements of strategy, structure and environment interact to form integrated wholes, also referred to as gestalts (Miller, 1987), and as such, approach to strategy should more importantly focus on the interdependences among the elements (Miller, 1996). The dynamic resource-based view considers an organization's resources, both tangible and intangible, as dynamic and not static (Helfat & Peteraf, 2003). The dynamic resource-based view and strategic configurations theory were revisited during the investigation strategy-technology linkage in the Department of Immigration Services.

Literature shows that there are technological innovations in the Department of Immigration Services within areas such as passport processing

(Mwangi, et al., 2011, Kamurua, 2013) and traveler processing (Mau & Guyo, 2014). There is also a strategic plan within the Ministry of Interior and Coordination of National Government (MOICNG) guiding operations in the Department of Immigration Services (GOK, 2014). However, the view in this study was that there existed inadequate literature on whether strategy and technology have any linkage in the Department of Immigration Services, and on the nature of strategy-technology linkage was not clear. The study therefore aimed to investigate the presence and the nature of strategy-technology linkage at the department of immigration services, Kenya.

The Concept of Strategy

The concept of strategy has been differently defined by various writers. Chandler (1962) argued that strategy is determining the basic long term goals and objectives, adopting courses of action and allocating resources necessary to carry out the goals. Mintzberg (1978) introduced a five-pronged approach while defining strategy and explained that all converge at one theme, a deliberate conscious set of guidelines meant to determine decision in the future. The five ways are a plan, a ploy, a pattern, a position and a perspective. Ansoff (1990) viewed strategy as a set of decision-making rules for guidance of organizational behaviour. These rules are four. First rule concerns the objectives and desired goals. The second rule concerns the relationship with external environment which comprise of customers and competitors. The third rule concerns internal relations and processes, and the fourth rule concerns operations. Porter (1980, 1996, 2008) viewed strategy as a competitive position an organization takes in an industry. All these writers were right in their own opinions, but their divergent views lacked consensus on what strategy is (Ronda-Pupo & Guerras-Martin, 2012).

Strategies in organizations are formulated and implemented differently depending on missions and structural configurations. Corporate entities and multinationals have corporate strategies. Corporate strategies encompass decisions about business portfolios, product breadths, market scope and geographical diversity of business units (Johnson, Scholes and Whittington, 2008). They also involve decisions about product diversification and divisionalization (Galan & Sanchez-Bueno, 2009), strategic alliances (Zamir, Sahar & zafar, 2014) and mergers and acquisitions (Gwaya & Mungai, 2015). Salimian, Khalili, Nazemi and Alborzi (2012) argued that activities in corporate strategies involve vertical and horizontal alignments. Business level strategies involve decisions about bases of competition, achieving competitive advantage and detailed choice (Johnson, et al., 2008). Functional level strategies involve making decisions concerning operations in each functional area. Such areas include production, accounting, human resource and

marketing. These levels of organizational strategy need coordination. Technology plays a vital role in the coordination.

One important area of investigation on strategy-technology linkage in an organization is whether strategy has a role to play in informing technology. Hamel and Prahalad (1989) demonstrated how an organization's future technological ambition can be shaped by current strategies. Itami & Numagami (1992) argued that strategy cultivates future technology since current strategic decisions have long term technological implications of an organization. This is enhanced by accumulation of knowledge, skills and experience which build on future technological innovations.

The Concept of Technology

Various writers have differently approached the concept of technology. Itami and Numagami (1992) view technology as a systematic body of knowledge about how natural and artificial things function and interact. Itami and Numagami further viewed technology as a body of knowledge embodied in human brains and muscles, machines, and also in software and standard operating procedures of an organization. Fleck and Howells (2001) argued that there is no precise definition of technology. Instead, various disciplines such as industrial relations, organizational behaviour and operations management have working definitions simply to suit their contexts. Fleck and Howells then introduced a multi-disciplinary approach to defining technology which they called "technology complex". Wahab, Rose, and Osman (2012) echoed views by Fleck and Howells (2001) that no writer has precisely defined what technology is and alluded that definition of technology need to encompass knowledge or technique and "doing" things.

Technology in organizations is manifested in corporate, business and functional levels. Corporate level decisions involving technology include on resources to be allocated for technological innovations and how a particular technology can be shared by various business portfolios (Hax & No, 1992). Corporate technological decisions also help coordinate various technological activities across business and functional units (Arasti, Khalegi & Noori, 2010) which include a balance between vertical integration and diversification of technology (Christensen, 1998; Arasti, et al., 2010). Technology at business level is meant to coordinate technological activities across functional areas of an organization and requires management processes such identification, selection, acquisition, exploitation and protection (Gregory, 1995, cited by Phaal, Farrukh & Probert, 2003). Business level strategies that need technology include determining the competitive position of an organization (Porter, 1980), cultivating a future position for the organization (Hamel & Prahalad, 1989) and adapting to an organization's environment (Rothaermel

& Boeker, 2008). Functional level technology is embedded in technological platforms such as R&D and other operations within the functional areas (Drnevich & Croson, 2013).

Various writers have expressed their views on the role played by technology in informing strategy. Porter's (1980) competitive strategies, for example, are best realized through technology. Itami and Numagami (1992) demonstrated the effect of current technology on future strategy, where technology at hand brings about awareness of a future strategy worth pursuing. Burgelman, et al. (2009) bring out the usefulness of technology in shaping an organization's strategy through R&D, innovations in the value chain and product market competitiveness.

The Department of Immigration Services

The Department of Immigration Services in Kenya is a government agency under the Ministry of Interior and Coordination of National Government. It plays the roles of security and service delivery. Its security role is through control of entry and exit of travelers crossing Kenyan borders and control of residence of foreign nationals through issuance of entry permits and passes. Service delivery is by issuance Kenyan passports and other travel documents such as temporary permit, emergency travel document Certificate of identity and nationality (CIN) and United Nations Travel Document (UNTD). It also offers services in foreign missions abroad. The department derives its mandate from the Constitution of Kenya, the Kenya Citizenship and Immigration Act (KCIA), 2011, and the Kenya Citizens and Foreign Nationals Management Service Act (KCFNMS), 2011. It is also guided by visa regulations and international treaties and conventions, for example, the Geneva and OAU Conventions.

The vision of the Department of Immigration Services is "To be one of the best providers of immigration services in the world". The mission is to contribute to safety, security and socio-economic development of Kenya by facilitating international travel and regulating entry, exit, residency and citizenship. Core functions include regulation of entry and exit of persons, issuance of secure travel documents to Kenyans, registration of foreign nationals, regulation of residency and employment of non-Kenyans, investigation and prosecution, Kenyanization, granting of citizenship to non-Kenyans, issuance of Kenyan visas, provision of consular services in Kenya missions abroad, liaison with other government security agencies, and border control management.

The Research Problem

There exists a debate on whether strategy informs technology (Itami & Numagami, 1992; Vernet & Arasti, 1999), or technology informs strategy

(Itami & Numagami, 1992, Vernet & Arasti, 1999), or if strategy and technology develop independently and later get to match at some point (Itami & Numagami, 1992). There can also be a possibility of each developing independently and not matching at all. Arasti, et al. (2010) shone some light on strategy-technology linkage but their focus is on between business level and corporate level technology and its contribution to vertical integration and diversification strategies. Much of other literature about strategy-technology linkage is on IT (Oshikoya and Hussain, 1998; Uys, Nleya and Molelu, 2004; Krubu and Osawaru, 2011) and not on technology in totality. Study on Kenya Petroleum Refineries Limited (Bett, 2013) and Nairobi County Government Mogoi (2015) support importance of strategy-technology linkage in an organization, but the contextual settings were different from that of this study.

Various researchers have had interests only on technological innovations embraced by the Department of Immigration Services but not their linkage with strategies. Mwangi et al. (2011) demonstrates how technological innovations in the Department of Immigration Services have improved efficiency in service delivery, but do not show the linkage between the department's strategy and the technological innovations. Muthama (2012) highlighted the department's e-government implementation platform areas such as machine readable passport system, PISCES, file movement and how it has been useful in security and service delivery within the Department of Immigration Services, but does not explain if these technological innovations are have a link with the department's strategies. Studies by Nyundo (2013) and Yator and Shale (2014) highlighted how adoption of ICT has greatly improved efficiency and effectiveness in Kenya's Immigration Department but do not highlight the linkage between the department's strategy and overall technology. Kamurua (2013) pointed out that adoption of technology in monitoring and evaluation services in Kenya's Immigration Department has improved service delivery, but not how technology in monitoring and evaluation is linked to strategy. Mau and Guyo (2014) demonstrated the efficiency and effectiveness of electronic strategies involving e-visa and e-verification systems adopted by Immigration Department but did not capture any linkage between the department's overall strategies and these technologies.

The objective of this study was to establish the nature of strategy-technology linkage at the Department of Immigration Services, Kenya. Scholarly works about strategy and technology in Kenya's Department of Immigration Services have inadequate literature about strategy-technology linkage. Empirical studies in existence also do not highlight the nature of strategy-technology linkage. This study was an effort towards addressing the identified gap. What is the nature of strategy-technology linkage at the Department of Immigration Services, Kenya?

Theoretical Foundations

Investigating strategy-technology reminds the researcher of the configurations theory. Various scholars have offered their opinions on what configurations entail. Miller (1996), views configuration as the degree to which an organization's elements are orchestrated and connected to a single theme. That theme may be a vision, a unique talent, culture or a strategic objective. Configurations, also referred to as archetypes or gestalts (Dess, et al., 1993), are common alignment and interdependence of elements towards a strategic goal (Miller, 1996). This alignment connects interrelationships among domains such as environment, strategy and structure (Dess, et al., 1993). These domains, leadership in addition, constitute what Miller (1987) views as configuration imperatives. Important among these imperatives is environment which Miller (1987) points as the precursor of technological innovations. Miller's (1987) views, combined with the views of Dess, et al. (1993), bring about a more holistic picture of configurations from the point of both causality and mutuality. Technology therefore, can be viewed as both a causal element as well as a bridge among various elements of configurations.

The resource-based theory advocates for a match between organization's resources (tangible and intangible) and the environment (Helfat & Petraf, 2003; Newbert, 2007). Technology is a vital resource exhibited in both tangible and intangible form. It is also a vital platform for an organization's adaptation to the environment. Helfat and Petraf (2003) argued that resource-based view is static yet environments keep changing and that resources have a life cycle. Therefore resources and capabilities should be viewed as dynamic. The dynamic resource-based view coupled with configurations theory guided this study in the analysis of strategy-technology linkage.

Strategy-Technology Linkage

As discussed earlier, strategy and technology in organizations run across corporate, business and functional levels. So is the strategy-technology linkage. The world of technology is broad and complex (Fleck & Howells, 2001) and strategy-technology linkages involve application of the right technological elements to realize the right strategies. Various works on strategy-technology linkages are inclined towards ICT. Examples involve technology in competitive and comparative strategies of African organizations and countries respectively (Oshikoya & Hussain, 1998), technological innovations in management strategies for higher education in Africa (Uys, Nleya & Molelu, 2004), technology and strategies in Nigerians Libraries (Krubu & Osawaru, 2011), and technology alignment with business strategies in Kenyan commercial banks (Wachinga, 2010; Ouma, 2011). However, some writers have discussed strategy-technology linkages outside of ICT. Examples

include Bett (2009) on change management in Kenya Petroleum Refineries Limited and Mogoi (2015) on strategy implementation in Nairobi County Government. Betts's (2009) and Mogoi's (2015) contexts are different from that of this study. Secondly, Bett (2009) emphasized on a fit and not dynamism between strategy and technology.

The nature of strategy-technology linkage has two broad perspectives. The first perspective involves having non-technology related strategies and bringing on board technology to execute them (Arasti et al., 2010). The second perspective involves technology related strategies which also require technology to execute (Drnevich & Croson, 2013; Vernet & Arasti, 1999). Arasti, et al. (2010) captures the usefulness of technology in vertical integration and diversification but the linkage is between corporate level technology and business level technology and how it contributes to the success of vertical integration and diversification strategies.

The subject of strategy-technology linkage invokes a debate on the nature, and absence if any, of the linkage. Itami and Numagami (1992) introduced three perspectives to analyze strategy-technology linkage. First perspective concerns the effect of current strategy on current technology. Second perspective is the effect of current strategy on future technology. Third perspective looks into the effect of current technology on future strategy. This study will also investigate if there exists a fourth perspective, the zero effect of technology on strategy and vice versa.

Current Strategy Capitalizes on Current Technology

Itami and Numagami (1992) argue that technology develops on its own dynamics and that strategy is within the technological limits of an organization. The goal is for strategy to match current technology. Technology here is applied in three ways. First, as a weapon to guard an organization's superior technology against possible competition. Secondly, as a constraint to adapt to, and thirdly, as a threat if competiton's technology is superior. Itami and Numagami (1992) also point out that the relationship between current strategy and current technology is directional and static. Directional because technology determines strategy and not vice versa. Static because the aim is to find a contemporaneous fit between strategy and technology.

Itami and Numagami (1992) view technology as a static resource which an organization either controls or has to adapt to yet today's technological environment is unstable. This instability makes a matching strategy unsustainable (Helfat & Petraf, 2003). Even among the not-for-profit organizations, the customer is within the changing environment and might demand services at varied technological platforms (Yator & Shale, 2014). As opposed to (Itami and Numagami, 1992), Vernet and Arasti (1999) do not view technology as developing on its own but on the foundation of strategy.

They argue that an organization develops, adopts, adapts and exploits new technologies to fit within the overall strategy (Vernet & Arasti, 1999).

Current Strategy Cultivates Future Technology

Itami and Numagami (1992) posit that technology accumulated through current strategies may be used for future consumption as well. Studies supporting this argument include the learning curve where skills of workers are honed through repeated performance; experience curve from more business volume and larger market share; invisible assets such as technological knowledge, product portfolio management, organizational culture and reputation, and portfolio management; and economies of evolution and multiple projects where technological innovations overlap and support one another (Itami and Numagami, 1992).

The notion that current strategy cultivates future technology augurs well with the dynamic resource-based view where an organization's resources are seen as dynamic and not static (Helfat & Peteraf, 2003). This view however delinks an organization's consciousness from the dynamism of resources since technological resources pursued for current strategy by chance stretches to support future technology. The argument that an organization's current strategy drives for the development, adoption, adaptation and exploitation of new technologies (Vernet &Arasti, 1999) has a conscious dynamic angle. Studies on Schumpeterian organizations (Nicholas, 2003) also show that current technological strategy of an organization can be to deliberately develop a superior future technological innovation to outwit a competitor.

Current Technology Drives Cognition of Future Strategy

Technology at hand creates a mindset of awareness of a future strategy worth pursuing. Itami & Numagami (1992) opine that strategy is dependent on technology and that a strong knowledge base committed to a particular technology activates idea generation. Technology then channels the idea generation processes into common direction with strategic value. A strong technological base makes it easier for a strategy to be accepted. Integrating various technological ideas bring about a viable future strategy. Vernet and Arasti (1999) argue that technology strategy implementation leads to new technological competencies on which new strategies are developed.

The view that current technology drives cognition of future strategy does not put into account the environment under which cognitions are nurtured. It may not automatically happen that technology generates ideas about a future strategy unless there is coordination of elements (Dess, et al., 1993; Miller, 1996) necessitating this cognitive atmosphere.

No Linkage between Strategy and Technology

The concept of strategy, as discussed by various writers, (Chandler, 1962; Mintzberg, 1978; Ansoff 1990; Johnson, et al., 2008) encompasses long term objectives and means of achieving them. Technology on other hand encompasses body of knowledge embodied in human brains, muscles, machines, operating procedures (Itami & Numagami, 1992; Wahab, Rose, and Osman (2012). Strategy-technology linkage injects a long term effect into the technological pursuits of an organization.

An organization may have sound strategies and frequent use of technology but strategy-technology linkage may lack. A technological innovation in an organization may be to solve a particular problem and not have any long term effect on the position of an organization. For example, routine technological operations such as photocopying and vacuum cleaning may not have any strategic meaning.

Consensus lacks on the debate about the dynamic nature of strategy-technology linkage. First, the highlighted contemporaneous matches do not show the dynamism in the linkage yet resources have a life cycle (Helfat & Peteraf, 2003). Secondly, the notion that strategy unconsciously cultivates future technology ignores organizational ambitions (Hamel & Prahalad, 1989) on future innovations. Thirdly, the notion that technology arouses cognition of future strategy does not specify the conditions necessitating the cause-effect elements. Miller's (1996) strategic configurations theory plays a vital role in analysis of the cause-effect elements. Itami and Numagami (1992) elaborated the dynamic nature of strategy-technology linkages but within an industrial organizational setting in Japan and USA. This study approached strategy technology linkage in a not-for-profit organizational behaviour setting in Kenya's Department of Immigration Services.

Studies on strategy-technology have either leaned towards ICT (Krubu & Oswaru, 2011; Muthama, 2012; Nyundo, 2013) or taken a contextual setting different from the Department of Immigration Services (Bett, 2009; Mogoi, 2015). This study aims to find out the nature of strategy-technology linkages in the Department of Immigration Services, Kenya, and the direction of the dynamism as discussed above, or if there is no linkage at all.

Research Design

The research was a case study, which is an empirical inquiry into a contemporary phenomenon within a context where phenomena are studied in depth and within a single context (Zainal, 2007; Baxter & Jack, 2008), and as opposed to other designs such as survey whose study involves cross-sectional collection of data from various contexts for generalizations. Debates on what a case study is and what is not (VanWynsberghe & Khan, 2007; Zainal, 2007) and the scope of its validity (Flyvbjerg, 2006; Zainal, 2007) notwithstanding,

case studies still provide the best option to analyse a single context in depth. According to Baxter and Jack (2008), a case study is vital for four reasons. When to answer 'how' and 'why' questions, when the researcher cannot manipulate the behaviour of those involved in the study, when to cover relevant contextual conditions, and when the boundary between phenomenon and context is not clear.

This study aimed to investigate a single context in depth with Strategy-technology linkage in Kenya's Department of Immigration Services as the context of study. The researcher was seeking answers to the 'how' in the nature strategy-technology linkage in the Department of Immigration Services and did not manipulate the behaviours of the interviewees. Therefore, other designs such as survey were inappropriate.

Data Collection

The researcher collected both primary and secondary data which was largely qualitative. Primary data was gathered using a structured interview guide. The guide was developed using literature review and some adoptions from previous studies within and without the Immigration Department. Such studies include strategy, technology and innovation in low cost housing (Okumu, 2014), effect of technology in strategy implementation in Nairobi County Government (Mogoi, 2015) and the effectiveness of strategy monitoring and evaluation in the Ministry of Immigraton, Kenya (Kamurua, 2013). The Department of Immigration is divided into six regions as follows: Coast, Eastern, North Eastern, North Rift/Western, South Rift/Nairobi and Nyanza. The researcher interviewed the Director of Immigration Services (DIS), and the Assistant Director of Immigration Services (ADIS) in charge of each region.

Secondary data were collected from literature by various Government agencies such as Ministry of Interior and Coordination of National Government Strategic Plan 2013-2017 (GOK, 2013), Kenya Citizens and Foreign Nationals Management Service Strategic Plan, 2013-2017 (GOK, 2014), the Kenya Citizenship and Immigration Act, 2011(GOK, 2011) and Economic Recovery Strategy for Wealth Creation and Employment Creation: 2003-2007 (GOK, 2003).

Data Analysis

The researcher made use of content analysis. Content analysis has both qualitative and quantitative manifestations (Hsieh & Shannon, 2005; Prasad, 2008; Mayring, 2014). Hsieh and Shannon (2005) argued that qualitative content analysis involves a systematic classification process of coding and identifying themes or patterns of data. Prasad (2008) posit that content analysis is about making valid, replicable and objective inferences about a message on

the basis of explicit rules. He gave materials for content analysis as diaries, newspaper contents, folk songs, short stories, messages of radio, television, texts or symbols. Kothari and Garg (2014) argue content analysis involves analyzing the contents of documentary materials such as books, magazines, newspapers and verbal materials that are ether spoken or written. All these definitions point to building meanings from written and spoken data and drawing inferences.

Prasad (2008) and Mayring (2014) argue that content analysis has several steps. First step involves formulation of the research question or problem. Second is selection of communication content or sample. Third is developing content categories which involve determining which word elements to be checked for frequency. Fourth step is defining the word categories, with examples if possible. Fifth step involves determining units of analysis by deciding the minimum and maximum text components as well as the sequence in a sentence such as syllables, words, sentences and paragraphs. Sixth is coding with the help of category system. Seventh is establishing and comparing frequencies, and lastly, the description and interpretation of results.

Data collected through interviews contain verbal and non-verbal materials. This qualitative nature makes content analysis a more preferable method than other forms of data analyses. The knowledge and perception of the interviewees concerning the unit of analysis will be analyzed as well. Content analysis on secondary data was biased towards elements touching on strategy and technology.

Findings

The objective of the study was to establish the nature of strategy-technology linkage at the Department of Immigration Services, Kenya. Both primary and secondary data was collected. Data analysis was through content analysis.

Kedar and Shewale (2015) highlighted two types of content analysis, conceptual and relational. The former involves establishing the frequency of concepts in data while the latter involves examining the relationship among concepts in data. The study employed relational analysis since lone concepts might exhibit different meanings.

The study targetted two categories of interviewees, the Director of Immigration Services (DIS) and six Assistant Directors of Immigration Services (ADIS). Each ADIS targetted was in charge of an immigration region. The study mapped out six immigration regions, namely, Coast, Eastern, North Eastern, South Rift/Nairobi, North Rift/Western and Nyanza.

First, the study aimed to gather a list of the technological innovations within the department, whether being implemented or completed. Secondly, the study was to find if these technological innovations have a strategic angle

through prior appearance in the department's strategies. Thirdly, the study aimed to find if there could be some technological innovations being implemented or being pursued that might not be informed by strategy hence not appearing in the department's strategies. Fourthly, the study aimed to find if departmental technologies not associated with the departmental strategies would be aligned to the strategic objectives at some time in future and lastly, if adoption of technology could have brought forth recognition of some strategies.

Technological Innovations at the Department
        The study wanted to establish the technological innovations embraced by the Department of Immigration Services, Kenya. The interviewees gave both IT based and non-IT. IT based technological innovations were given as passport management information system (PMIS), e-citizen, electronic foreign nationals services (e-FNS), IPRS and PISCES. Non-IT based technologies given were ICAO standard passport and traveller processing technologies.
        On being asked to elaborate on PMIS, the interviewees said it is a database where a person's details of currently and other previously issued passports can be stored and retrieved when required. The study also found that PMIS has both local area network (LAN) and wide area network (WAN) to enable information sharing within and across passport processing offices. Concerning IPRS, the interviewees said it was a database for biographical information of Kenyan citizens and registered residents.
        The interviewees gave e-citizen as a portal enabling Kenyan citizens to apply and pay for passports and temporary permits online unlike before when they would have to visit the nearest immigration office to manually fill a form and pay for services. Through e-citizen portal, the study discovered one can also apply and pay online for a Kenyan visa, also referred as e-visa. The interviewees explained that e-FNS is a portal where foreign nationals can apply and pay for a pass (student or special), work permit, alien card, permanent residence and Kenya citizenship.
        When asked about PISCES, the interviewees said it is an acronym whole full version is Personal Information, Secure, Comparison and Evaluation System. The study discovered that PISCES was a border management IT based technology through which a traveler's information could be verified against existing data of prohibited or watch-listed travelers. The study also found that PISCES is connected with other non-IT technological devices such as Passport and fingerprint scanners.
        Other non-IT based technologies given by the interviewees included forensic document examination equipments such as retro-checks, sidelights, UV lights, retro reflective lights, magnifiers, microscopes and video spectral

comparators (VSC) such as Regula® 4307 and Foster+Freeman® VSC 6000 in the fraud detection unit (FDU).Interview with the DIS revealed that from January 2016, the Department of Immigration Services is bound to start processing e-passports. These passports would bear an embedded chip device containing hidden biographical and biometric information of the bearer.

Nature of Strategy-Technology Linkage at the Department

The study aimed to discover the nature of Strategy-technology linkage at Kenya's Department of Immigration Services via four thematic areas: whether strategy informs technology, whether technology informs strategy, whether strategy and technology develop or have developed separately but will match or have come to match at some point in time, and whether strategy and technology have no linkage at all. The study revealed e-passport processing hardware and software systems had already been installed.

Strategy Informs Technology

To find if the above mentioned technological innovations were among the departmental strategies, the researcher asked whether the mentioned technologies are highlighted in the strategic plans and a description of the operational activities linking technology to strategy. All interviewees said that strategy informs technology at the Department of Immigration Services. The Director of Information Services observed:

> "All departmental strategies come from the ministerial Strategic Plan of 2013 to 2017. These strategies determine our core functions and operational activities."

From the Ministry of Interior and Coordination of National Government (MOICNG) Strategic Plan 2013-2017, the study found strategies related to technology which include installation of e-passport issuing systems, adoption of online application processes and transmission, installation of e-border system and interconnection to relevant databases, installation of foreign national management system, and, strengthening fraud detection units (FDUs) in all entry/exit points. The study further viewed each strategy against its related technological innovation and the corresponding operational activity as given by the interviewees in order to confirm if strategy informed technology. Table 1 shows a list of technology-related strategies as highlighted in MOICNG Strategic Plan 2013-2017 (GOK, 2013) arranged against technologies from each strategy and operational activities as given by the interviewees.

Table 1: Strategy informs Technology at Kenya's Department of Immigration Services

Strategy	Technology from the strategy	Operational activity within the technology
Installation of e-passport issuing systems	e-Passport issuing systems and the e-passport itself as the product	E-passport issuing systems being installed.
Adopt online application processes and transmission	e-citizen	On-line passport application, payment and submission. Online verification of submitted passport applications and payments by backend immigration staff. Online application, payment and submission of visa applications. Online verifications of visa submissions. Online verifications of visa submissions and payments by backend immigration staff. Online applications of temporary permits, payments and submissions. Online verification of temporary permits
		Submission and payments by backend immigration staff.
	Electronic foreign nationals services (e-FNS)	Online application, payment of application fee and submission of requests for: Passes (student and special passes), alien cards, work permits, permanent residence and Kenyan citizenship.
Install e-border system and interconnect to relevant databases	Linking PISCES across ports of entry and exit and central control office.	Capture traveller biographical and biometric data. Biometric data is in form of image capture and fingerprint scans. Verification of travellers data against existing data of prohibited and watch-listed persons. Traveller history analysis and reporting.
Install foreign nationals management system,	Foreign nationals system (FNS)	Use of computer software to process applications for student passes, special passes, work permits, permanent residence and Kenyan citizenship.
	magnifiers, microscopes, IPI readers.	Front-end document examination
	Backend forensic document examination equipment.	Backend examination of questioned documents.

Source: *MOICNG Strategic Plan, 2013-2017 (GOK, 2013) and KCFNMS Strategic Plan, 2013-2017 (GOK, 2014).*

Technology Informs Strategy

On whether there are any departmental strategies developed out of technology, all of the interviewees gave their responses as none, except one who gave this response:

"Before KCIA (Kenya Citizenship and Immigration Act), 2011 came into operation, we had the repealed Kenya Immigration Act, CAP 172 Laws of Kenya. There was no provision to capture biometrics in CAP 172 but still biometric enrollment from travellers at selected ports of entry and exit were on-going without a legal backing. When KCIA came into operation, we realized the enrollment of biometrics had been included in Section 48(3). This, I believe, was to help curb unforeseeable legal issues from unwilling travelers."

Upon visiting section 48 (3) of KCIA, 2011 the researcher found this clause:

'An immigration or other authorized officer of the Service shall capture biometrics in the course of discharge of the mandate of the Service.'

The study discovered from the interviewees that biometrics capture involved capture of a traveler's facial image and scanning their fingerprints, and storing them in a PISCES system for future comparison.

Strategy and Technology Develop Independently But Match Later

On inquiring whether strategy and technology at the Department of Immigration Services develop independently but match at a later stage, the researcher asked about presence of technological innovations not being highlighted in the departmental strategies but later get aligned with strategies. The interviewees said there was none so far, except ADIS-South Rift/Nairobi, who responded as follows:

"Prior to the year 2003 when strategic planning was introduced into Kenya Government MDAs, technology was evident in passport booklet processing and personalization. Such technology was in form of temper proof security features within passports such as water marks, infra-red visible image and delicate laminate security features. When strategic plans were introduced, technology was captured as one of the strategies since it had been highlighted in the Economic Recovery Strategy of 2003."

The researcher revisited the Economic Recovery for Strategy for Wealth Creation and Employment Creation (ERS) (GOK, 2003) and discovered it emphasized on adoption of information and communication technology as well as science and technology. For example, among the cross-cutting issues, ERS advocates for ministerial strategies that would enhance adoption of technology. The researcher singled this statement:

.. ministries will be required to develop strategies for capacity building in beneficiary organizations to empower them to make demands on service providers, thus making science and technology demand driven." (ERS, 2003, pp. 44).

No Linkage between Strategy and Technology

To discover the possibility of lack of linkage between strategy and technology in the Department of Immigration Services, the researcher asked the interviewees whether there were technological innovations being formulated, implemented or completed that were not aligned with the departmental strategies at all. Here, the study aimed to establish the possibility of strategy and technology taking parallel pathways.

On the possibility of no linkage between strategy and technology, ADIS/Eastern said:

> "I don't think the acquisition and operation of office equipment such as copiers, paper printers, vacuum cleaners and telephones have a strategic meaning other than providing office solutions to routine operational problems."

Discussion of Findings

The objective of the study was to establish the nature of strategy-technology linkage at the Department of Immigration Services, Kenya. The study found that the Department of Immigration Services has embraced various forms of technological innovations, both IT based and non-IT. IT based technological innovations discovered included the passport management information system (PMIS), e-citizen, electronic foreign nationals services (e-FNS), IPRS and PISCES. Non-IT based technologies discovered in this study were found in the personalization of passport booklets and in traveler processing.

On the nature of strategy-technology linkage, the study was organized into four thematic areas namely: technology informs strategy, strategy informs technology, strategy and technology develop independently but match later, and no linkage between strategy and technology.

The study found existence of strategy-technology linkage in the Department of Immigration Services, Kenya. The nature of strategy-technology linkage is dynamic in the sense that strategy informs technology, technology informs strategy and when strategy and technology develop independently, they link. The study also discovered cases of non-linkage between strategy and technology. This dynamism notwithstanding, the study found a stronger prevalence of the nature that strategy informs technology than the other three thematic areas.

The nature of strategy informing technology was discovered in the technology based departmental strategies which led to acquisition of both IT and non-IT technologies. On technology informing strategy, the study found that the strategy to legalize capture and storage of biometrics at ports of entry and exit was preceded by the technological operation itself. Incident of strategy and technology developing independently but matching in the future

was discovered. It was based on the advent of strategic planning in MDAs when technology was already present, then strategies cam into operation and afterwards there was linkage. Incident of strategy and technology taking parallel pathways was explained in the acquisition and operations of office machines such as copiers, printers, vacuum cleaners and telephones just to solve routine office problems.

This study was founded on strategic configuration theory (Miller, 1986, 1987, 1996), the dynamic interaction between strategy and technology (Itami & Numagami, 1992) and the dynamic resource-based view (Helfat & Peteraf, 2003). Strategic configurations theory advocate for proper alignment of mutually supportive elements to realize a strategic success (Miller, 1996). Findings of this study confirm the importance of alignment between technology as one mutual element on one hand and strategy as another mutual element on the other hand to realize strategic goals.

The dynamic resource-based view (Helfat & Peteraf, 2003) considers an organization's resources, both tangible and intangible, as dynamic. Findings of study show varied technological applications to realize strategic goals. Some are anchored on others. For example, e-visa being carried by e-citizen portal and biometric enrollment process being executed through PISCES.

Itami and Numagami (1992) introduced three perspectives of dynamic interactions between strategy and technology. The first perspective was that current strategy capitalizes on current technology. The second perspective viewed current strategy as cultivating future technology. The third perspective was that current technology drives cognition of future strategy. These interactions are mainly based on interactions between technological strategy and technology. This study found cases of linkage between non-technological strategy and technology. For example, biometrics technology drove cognition of a legal status.

The first perspective viewed a particular strategy as being determined by a particular technology so as to enhance a contemporaneous match. Findings of this study confirm that strategy-technology linkage is meant to realize strategic goals. In the second perspective, a particular technology pursued currently might unconsciously turn out to be helpful in the future. Findings of study were on current strategies consciously being meant to pursue future technology. Concerning the third perspective, findings did not find both elements of technology and elements of strategy as closely related. It found a non-technological strategy recognized from a technological strategy. Itami and Numagami (1992) did not provide a possibility of non-linkage between strategy and technology. Findings of study showed some technological pursuits are not aligned with strategies.

Like Chandler's (1962) findings that structure follows strategy, this study found that strategy-technology linkage is more of the nature that technology follows strategy. The study also highlighted various other studies on strategy-technology linkage, but were found to be inclined towards ICT (Oshikoya & Hussain, 1998; Uys, Nleya & Molelu, 2004; Wachinga, 2010; Krubu & Osawaru, 2011; Ouma, 2011). Findings in this study contribute to this debate by confirming technology is complex (Fleck and Howells, 2001) and extends beyond ICT. Findings by Bett (2009) and Mogoi (2015) revealed strategy-technology linkages in Kenya Petroleum Refineries Limited and Nairobi County Government respectively. Bett (2009) emphasized on a fit and not dynamism and Mogoi (2015) on the effects of strategy implementation. Both Bett and Mogoi (2015) had different contextual settings from that of this study.

Findings on technological innovations add more literature to studies on e-government implementation platform areas such as machine readable passport systems, PISCES, file movement and permit systems (Muthama, 2012) and technological innovations in passport processing and border operations involving traveller processing (Mwangi, et al, 2011; Nyundo, 2013; Yator & Shale, 2014; Mau & Guyo, 2014).

Summary and Conclusion

The objective of the study was to determine the nature of strategy-technology linkage at the Department of Immigration Services, Kenya. It approached strategy-technology linkage within Kenya's Department of Immigration Services in four ways. First, on whether strategy informs technology. Secondly, on whether technology informs strategy. Thirdly, on whether strategy and technology develop independently but link at some point and lastly on whether there lacks linkage between strategy and technology.

The study revealed that strategy and technology at the department of immigration are intertwined. On whether strategy informs technology, the response was positive from each interviewee. Secondary data also supported in the affirmative (GOK, 2010, 2013). The responses from interviewees allude to some form of a blend between current strategy directing current technology and current strategy shaping future technology.

Cases of technology informing strategy (GOK, 2011) and strategy and technology developing independently and matching later (GOK, 2003) were found. So were incidences of lack of linkage between strategy and technology.

Findings show that the nature of strategy-technology linkage at the Department of Immigration Service's, Kenya is varied. There are incidences of strategy informing technology, technology informing strategy, strategy and technology developing independently but matching later and no linkage between strategy and technology.

All these incidences appear at varied levels of recognition. For example, the notion that strategy informs technology is readily recognized since every interviewee answered in affirmative. Moreover, literature on strategic plans has highlighted technological strategies way before their implementation (GOK, 2006, 2009, 2013).

The other three strategy-technology linkage incidences were discovered as well but their presence was highlighted by every interviewee was the case that of strategy informs technology. Some like, technology informs strategy and strategy and technology develop independently but match later were found to be historical since they were reported to have happened sometime in the past. Reported cases of no linkage between strategy and technology were based on acquisition of and routine operations of technological equipment such as copiers and office printers which the interviewees felt did not have strategic implications.

Recommendations for Policy and Practice

Based on discussions of the findings, the nature of strategy-technology linkage discovered in the study is fourfold: strategy informs technology, technology informs strategy, strategy and technology develop independently but match later and lack of linkage between strategy and technology. However, the study discovered the nature that strategy informs technology is more prominent than the other three.

The study found that the nature that strategy informs technology has more presence in planning and subsequent operations. Therefore for policy, the study recommends its consideration for formality during strategic planning and to a large extent, in strategy implementation. Possibility of strategy and technology developing independently but matching later is not recommended in the current technological environment. Non-linkage between strategy and technology is not recommended unless on technologies without strategic angle. For practice, the study recommends a consideration of the nature that strategy informs technology as well as timely adoption of the most suitable nature of strategy-technology linkage with a keen eye to the environmental changes during implementation.

Limitations and Suggestions for Further Research

The study aimed to find the nature of strategy-technology linkage at the Department of Immigration Services, Kenya. Four thematic areas were chosen, strategy informs technology, technology informs strategy, strategy and technology develop independently but match at a later stage and lack of linkage between strategy and technology. Probably the subject may bring forth different results on different thematic areas and contexts.

The study adopted a case study hence findings cannot be generalized. The study interviewed the Director of Immigration Services and Assistant Directors of Immigration Services in charge of regions namely, Coast, eastern, North Eastern, South Rift/Nairobi, North Rift and Nyanza. These interviewees are among the high ranked officials. Sources of data were not well represented by rank and experience. If, for example, lower ranked officials were included in the study, perhaps the results would be different. Data collection method was through interviews and data analysis method was content analysis. These methods are to a large extent subjective.

In efforts to investigate the nature of strategy-technology linkage at the Department of Immigration Services, Kenya, this study engaged four thematic areas. They were strategy informs technology, technology informs strategy, strategy and technology develop independently but match later, and no linkage between strategy and technology. These thematic areas are not collectively exhaustive. Perhaps in future, another study could use more or different methods to investigate the nature of strategy-technology linkage in the Department of Immigration Services and anywhere else.

The study adopted a case study. Van Wynsberghe and Khan (2007) viewed a case study as an intensive study of a single unit whose generalization depends on other case studies. Therefore, the findings in this study can only be generalized if other researchers conducted similar studies on different contextual settings.

Data collection was through interviews of the top management at the Department of Immigration Services. Since not every rank and file was represented during data collection, another researcher may also conduct similar study in the same contextual setting but use either different design or different instruments.

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