ISSN 2409-2665
Journal of Logistics, Informatics and Service Science
Vol. 11 (2024) No. 4, pp. 351-366
DOI:10.33168/JLISS.2024.0421

A Model for Supporting Information Technology Solutions Selection and Evaluation in a Nigerian Bank

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Abstract. The relevance and reliance on information technology (IT) solutions continue to increase, yet challenges experienced by some banking institutions are not reducing. In some discourse, the challenges are argued to emanate from the interaction and relationship between actors, which affect and influence the support and management of IT solutions. The problem is twofold: firstly, the influencing factors are unknown. Secondly, how the factors of influence manifest to enable or constrain processes and activities are unclear. A Nigerian bank was used in the study, following the interpretive paradigm. A sociotechnical theory, the actor-network theory was selected to underpin the study. From the analysis, six factors were found to be of fundamental influence. Based on the factors, a model was developed, which can be used to gain a better understanding and, therefore, guide support of IT solutions in an organisation.

Keywords: Information technology in banking, actor-network theory, Managing IT Solutions in Nigeria banking.

1. Introduction

Despite the numerous known and unknown changes, organisations increasingly rely on information technology (IT) solutions, including hardware, software and network protocols (Avgerou et al., 2016). In response to the need to deliver efficient and competitive services, banking institutions in Nigeria are increasingly investing in IT solutions (Oluwatolani et al., 2011). However, there are numerous challenges such as systems downtime, system performance, systems' coexistence, and network complexities, which affect and influence the implementation and use of IT solutions in banking institutions.

The IT solutions used for service delivery are unreliable and pose a challenge to effective banking activity in Nigeria (Okechi & Kepeghom, 2013). Thus, evaluation of implemented IS/IT solutions has become a necessity for organisations engaging their services to enhance and support business processes (Mashabela & Pillay, 2017). This is because evaluation can help determine whether benefits are accruing from implementing and using these solutions. According to Venable et al. (2016), without evaluation, organisations will only have an unsubstantiated notion that the artefacts adopted will be useful for meeting their goals and objectives. Ababneh et al. (2017) argue that evaluation can also be useful in determining the value accruing from the adoption of IS/IT solutions.

Banking institutions in Nigeria are increasingly investing their financial resources in IT solutions. This is to enhance their competitiveness, profitability, and sustainability. To meet their objectives and goals, Nigerian banks engage the services of information technology (IT) solutions in the processes and activities that are involved in the delivery of their products and services. The problem is that poor services continue to be rendered to the clients and business partners. Thus, there is a need to find out whether the IT solutions that are selected and deployed for business activities meet the purpose for which they are implemented.

2. Literature Review

Over the years, information systems and information technologies (IS/IT) have gradually become integral to society's daily life, including banking institutions. According to Madonsela et al. (2013), IS/IT consists of a wide array of technologies, systems, devices, and services used for data processing; systems interaction; and telecommunications transmission and communication. The array of technologies engaged by banks and other organisations to achieve their business objectives include artefacts such as hardware, software, networks, processes, as well as people (Ekwonwune et al., 2016). Examples of the technology artefacts that are engaged in facilitating IT solutions' activities in organisations include desktops and laptops; personal computers (PC); the internet; computer software; applications; technology equipment; mobile technology and personnel who use and manage these artefacts (Baporikar, 2016).

Even though IT solutions bring many benefits, there is still a high percentage of IT projects that fail to achieve their aims and objectives, especially in developing countries (Ebad, 2018). Many banks in Nigeria have been seriously challenged with the adoption and use of IT solutions for their service delivery (Ekuobase & Olutayo, 2016). The reasons many IS/IT solutions employed by organisations fail to meet expectations are complex and multi-factorial (Iyamu, 2021).

The challenging factors are both technical and non-technical, from business and IT units' perspectives (Hussain et al., 2017). On the technical front, the challenges include factors such as low systems availability, low performance, lack of infrastructure and security challenges (Triche & Walden, 2018). From the non-technical viewpoint, the factors include failure in processes, misalignment of strategies, cultural differences, lack of skilled IT personnel, management challenges and knowledge gap (Almalki et al., 2017). Shaanika and Iyamu (2015) suggest that addressing the technical and non-technical factors in the implementation and use of IS/IT solutions can help organisations achieve their IS/IT objectives. This is a challenge that many banking institutions in Nigeria, and some other developing countries, have not been able to address (Udo et al., 2017).

Despite the advantages electronic banking services have brought, effective service delivery by Nigerian banking institutions continues to be challenged (Amin et al., 2018). Asiyanbi and Ishola (2018) note that consistent electronic transaction failure continues to be a challenge to quality banking services delivery in Nigeria. Ehijiele et al. (2018) suggest that electronic banking services have brought new challenges to banking service delivery. Poor services exist because the IS/IT solutions used in service delivery are challenged by issues which include faulty systems and poor internet (inter) connectivity. Babatunde and Ishola (2018) argue that other factors that challenge the quality of electronic banking services include security issues and persistent failure of electronic transaction processes.

Evaluation activities can be used to generate information which can enhance the effectiveness of IS/IT solutions. According to Nikpay et al. (2016), information is critical for the enhancement of decision-making with respect to the management of IS/IT solutions. The information generated from the evaluation can help to gain a better understanding of the IS/IT solutions. Ceric (2015) suggests that an understanding of how IS/IT artefacts are adopted can contribute to the solutions' performance in each organisation's context. Cronholm and Gobel (2016) argue that this understanding can help in the better management of these artefacts. Ahmadian et al. (2015) affirm that evaluation is an important aspect of IS/IT development and implementation activity that can reveal the strengths and weaknesses of systems.

3. Actor-Network Theory

The primary tenets of the ANT are actor and network. In ANT, an actor is both human and non-human (Callon, 1986), and a network consists of actors (Latour, 1986). This means that neither actors nor networks operate in a vacuum (Chitanana & Govender, 2018). Also, this means that ANT does not distinguish between human and non-human actors (Bencherki, 2017). A critical aspect of the theory is its view of society as a network of entities (human and non-human) that interact and negotiate to pursue an agreed goal. One of the key components of ANT is translation (Callon, 1991). Iyamu and Sekgweleo (2013) argue that negotiation happens through translation, based on which both human and non-human actors work together to deliver information systems as requested by an organisation.

In ANT, translation is the process by which network builders recruit actors and ensure their alliances of faithfulness (Iyamu, 2018). It is the stage where connections are created between actors by aligning the interests of other actors with those of the focal actor within a network (Callon, 1986). Iyamu and Sekgweleo (2013) explain that the process of translation leads to the creation of an actor-network. Latour (1987) asserts that translation encompasses the mobilisation of human and non-human elements in different directions including the result, which is a slow movement from one place to another. This is the point that a relationship is formed, and a common interest is agreed upon. Translation comprises four moments: problematisation, Interessement, enrolment and mobilisation (Johnson & Iyamu, 2019; Callon 1986). According to Nehemia-Maletzky et al. (2018), moments of translation are a process where an activity transforms or is given a meaning.

Problematisation is the first moment of translation, where an issue is identified towards creating a solution (Nehemia-Maletzky et al., 2018). According to Callon (1986), problematisation is a stage where a focal actor assigns roles to other actors, convincing them to join the network. Interessement is the moment where other actors are keyed into place by principal actors by interposing themselves (Heeks & Stanforth, 2015) – interposing in the sense that the focal actor comes between two entities, thereby cutting the link or weakening the link between them in their original network. Enrolment entails enlisting actors, and commitment by each actor is formally defined to make it part of the shared memory of the social system. According to Latour (1987), this is achieved through a series of strategies and negotiations. The last moment of translation is Mobilisation, meaning all actors have been enrolled successfully into the network (Dery et al., 2013). At this stage a "spokesperson" is appointed or volunteered, to translate the interests, roles and activities of the network (Callon, 1986).

A successful translation can lead to the creation of a powerful enough network of actors to carry technology through (Vidgen, 1997). However, when the expected technology change fails to accomplish its purpose, this can be considered a reflection of the inability of actors to build a strong alliance with the other actors. The theory helps to gain insights into actors' activities, interactions and negotiations within a network, which provides an understanding of a technology-driven change (Lourenco & Tomael, 2018). The moments of translation from ANT's perspective are employed to focus on how human actors carry out negotiation in the use of IT solutions for banking services. The black-box, also from ANT's perceptive, is used to gain an insight into the hidden complexity as events and processes were carried out in a repertoire manner, for banking purposes.

4. Methodology

Within the interpretive paradigm, the qualitative method was employed based on the subjective nature and objectives of the study. An understanding of factors challenging the Nigerian banking institutions from the IT perspective was gained by investigating the perspectives and behaviours of the people in these situations and the context within which they act. The qualitative methods can allow scholars to access many parts of the empirical field and collect different types of data (Goldkuhl, 2019).

The case study approach was employed in the study based on three main reasons: (1) the approach focuses on the empirical inquiry of a contemporary phenomenon within its real-world context (Milani et al., 2016); (2) it enables the study of phenomenon in its natural settings and to answer the "how" and "why" questions, to gain more explicit information (Yin, 2014); and (3) it assists with clarifications particularly when the boundaries between what is being studied and its context are not clear. Based on the objective of the study, a set of criteria was used to select the case: (1) the organisation carry out banking operations in Nigeria, (2) the banks deploy IT solutions, to support and enable products and services, and (3) the bank gives consent to be used as case for the study.

The organisation has a bank staff strength of over 1600 working in the head office and over 150 business offices and cash centres across the country. A third of the organisation's business offices are situated within Lagos, the biggest commercial city in the country. The organisation uses these business offices to promote its products and services to its customers. Products and services offered by the organisation to its clients and business partners include retail banking, SME banking, corporate banking, treasury, trade and financial advisory services to individuals, commercial, and corporate clientele. The IT structure is headed by the chief information officer (Head of IT). He oversees the activities of the different units that make up the IT department and reports directly to the managing director of the organisation. The duties of the CIO include (1) Developing and implementing strategies for the IT department; (2) Aligning IT strategies with business objectives; (3) Planning and overseeing the organisation's IT projects; (4) Managing the organisation's IT resources; (5) Develop and manage the departmental budgets; and (6) Hire the required skills to optimise IT resources performance.

The semi-structured interview technique (Myers & Newman, 2007) was applied in the collection of qualitative data. A set of criteria, such as years of service and units were used to select participants. Purposely, this was to ensure the richness of the data. A total of 18 employees were interviewed at a point of saturation, meaning a point of diminishing return (Marshall et al., 2013). As shown in Table 1, the participants were at various levels in the organisation. Intentionally, this was to gain balanced views of the participants.

Table 1: Participants

Unit	Position	Participant	Years in service
Technical IT	IT Managers (A, B, C)	3	7, 9, 4
	IT governance, risk and compliance (A, B, S, D)	4	6, 8, 5, 4
	Network administrator (A, B)	2	9, 5
	IT Application support (A, B, C)	3	14, 4, 5

Non-technical Business	Business manager (A, B, C)	3	20, 8, 8
	Operations compliance officer (A, B)	2	5, 11
	International trade Operation officer	1	4
Total		**18**	

To maintain anonymous status, the participants as shown in Table 1, were assigned codenames: SBN01 to SBN18. Each interview obtained from the participants was transcribed and labelled according to the codenames. ANT is applied to guide the analysis, with particular focus on: (1) establishing and examining the various networks that exist, concerned with the support and management of IT solutions including how networks are formed in the organisation; (2) understanding the relationship between actors and their roles in the process of selecting and managing IT solution for organisational purposes.

5. Data Analysis: Southern Bank of Nigeria

The four moments of translation of actor-network theory were employed in the analysis of data collected from the organisation, Southern Bank of Nigeria (SBN). The IT personnel needed the businesspeople, to formulate the requirements for the support for deployment purposes and evaluation of IT solutions. Also, humans require some non-human factors such as processes, requirements, and standards to guide eligibility and appropriateness in the support for selection, deployment, and evaluation of IT solutions in the organisation. This means that humans could not do or operate without non-humans in the process of fulfilling their tasks in this context. The separability between human and non-human actors is well explained by ANT in its asymmetry notion. According to Bengtsson and Agerfalk (2016), it is inseparability that leads to the conscious or unconscious creation of networks.

Moments of translation

There are four moments of translation; problematisation; interessement, enrolment and mobilisation (Callon, 1986). These moments allow and enable the shifting and transformation of activities from one stage to another, and in the process, negotiation and participation happen. The activities as they happen in the selection, deployment, and evaluation of IT solutions in the organisations are viewed from the moments of translation standpoint.

5.1. Moments of translation: Problematisation

In the last five years, the Southern Bank of Nigeria (SBN) has considerably invested in IT solutions. The investments in IT solutions were to support their growing business network, which was critical for their competitiveness, sustainability and profitability. The implementation of the solutions was more about change in fulfilling the rapidly changing needs of clients and partners, including environmental factors. To initiate change is considered a problematisation in ANT. Such an action refers to a moment where a focal actor identifies and defines a problem to other potential actors.

In SBN, there were established processes followed in carrying out such an action (of problematisation) in the selection, deployment and evaluation of IT solutions. The approach followed was vital in achieving business goals and objectives. The processes and activities began in the business division. In a specific case, the deployment of a Virtual Banking Application (VBA), the end-users from the business generated the requirements which were presented to the business manager. The business manager as required by official obligation presented the requirements of the VBA to the CIO and his team. The approach followed was the bottom-up approach. The significance of the approach was explained by one of the respondents as follows:

> "The business requirements which were generated by the end-users formed the basis for the criteria that were used in the selection and evaluation of the IT solutions" (SBN04, 64:2147-2149).

The requirements gathered by the end users were critical in that they define and influence the selection, deployment and evaluation of IT solutions for the organisation's purposes. The significance of the end users' actions was that they had the power to shape the IT solutions as deemed fit. In addition, the approach used gave the users a sense of ownership which influenced their commitments. The outcome of the users' activities was influenced by three factors: commitment, knowledge and interaction. These factors were key to better understanding the business needs.

The CIO as the head of IT was responsible for the management and implementation of IT solutions. This included gathering systems' requirements significant for meeting business requirements. As obligated by his position, the CIO received the requirements from the business manager. In turn, the CIO presented the requirements to his team for analysis and transformation to systems' requirements. The systems' requirements were critical for the selection and deployment of the IT solutions. An interviewee explained the importance of the approach followed:

> "The process is perfect because it is based on standard and standard guides practice. When implemented to the letter the desired result will manifest" (SBN01, 16: 530-531).

The CIO further assigns (problematises) the requirements he receives from the business (end-users) to the members of his team (direct reporting line). The teams consist of individuals, teams and managers from the different units of IT. The units included the Applications Development and Support, Network Infrastructure, Application Services and Operations, IT Governance, and Core-Banking Transaction Processing Unit. In the IT division, the presentation of the requirements took different forms, depending on the nature of the requirements. The form of presentation was influenced by the volume, variety and sensitivity of the requirements.

The CIO adopted the group meeting approach during the presentation of the core banking applications' requirements. This was due to the volume of processes and dependencies required to be considered before the selection of a newer version. This mode of presentation was to enable inclusivity and wide-ranging input from the different units. One of the respondents explained as follows;

> "The processes and activities involved in terms of changing core-banking solutions are enormous. This was because there were a whole lot of dependencies that had to be considered. IT had to cater for all those dependencies and identify the key stakeholders to make that project a success" (SBN01,3: 99-101).

5.2. Moments of translation: Interessement

Each time an activity about selection, deployment or evaluation of IT solution was initiated (problematised) in the organisation, the focal actor assigned tasks and responsibilities to other employees. This is a situation where the focal actor locks in other actors in proposed activities. At this stage, the actors start changing their affiliation to form actor-network(s) and align their interests with that of the focal actors. In SBN, the interest in the processes and activities involved in the selection, deployment or evaluation of IT solutions manifested at different levels. For example, in the deployment of the Virtual Banking Application (software), the interessement began at the ender users' level, then progressed to the middle level (unit managers) and finally moved to the senior management level. Interest was shown by both individuals and groups in both business and IT, in the change of activities, and deployment of the Virtual Banking Application (VBA). The other interested groups included the vendors, product owners, and consultants.

In SBN, different units showed their interest in the processes and activities involved in the selection, deployment and evaluation of IT solutions because it allowed them to let the management know about the processes that hindered the effectiveness of their services. The expression of their interest in the activities allowed them to display their knowledge of the processes and abilities to improve them and their services. Some of the groups who showed interest in the change activities related to the Virtual

Banking Application included the branch operations, foreign trade services, treasury, and credit and marketing units. The interest of some of the business units triggered the interest of the individuals and teams with the IT unit supporting the IT solutions. IT units that showed interest included the Application Services and Operations, Desktop Management, Data Centre, Network Infrastructure Centre, Infrastructure, and Core-Banking Transaction Processing Units

On the organisational front, interessement was influenced by obligatory individuals and groups' roles and responsibilities. In line with their contracts, individuals and groups within the organisation were obligated to be interested in activities related to their purposes. For example, a network administrator was bound to be interested in the selection and evaluation activities of network infrastructures. In business, the end users were obligated to be interested, as it was their duty to provide services, interface, and receive feedback from the clients. The feedback coming from their interactions (interfaces) with the clients formed the basis of business needs and subsequently, the requirements. One of the participants explained the importance of feedback gathered from the ender users:

> "The users' feedback is important for the selection or development of IT systems that are required to meet business goals and objectives" (SBN06, 66;2204-2206).

The interest of the business manager was based on his position and responsibility in the organisation. It was his responsibility to drive business goals and objectives. For example, the business manager had to be interested in the bulk e-mail solution proposal. This was because it was within their purview of duty to ensure that customers received their statement of accounts monthly and regularly. Meeting business needs and requirements was one of the business manager's core mandates. The CIO and his team's interest was activated by their obligatory duties in the organisation. The CIO and his team were responsible for IT resources in the organisation, including its management and security. It was also their responsibility to receive, analyse and transform business requirements into technology solutions. The executive management's interessement was based on their expectations as defined by the board of the organisation. Their purposes included overseeing the daily operational activities of the organisation to ensure that its goals and objectives are achieved. This was to enhance competitiveness, profitability, and sustainability.

5.3. Moments of translation: Enrolment

Not every individual and group that showed interest in the Virtual Banking Application, bulk email and other IT solutions participated in the actual selection, deployment, or evaluation activities. In ANT, the art of participation is referred to as enrolment, which Iyamu (2021) describe as a moment where actors accept the tasks, roles and responsibilities that have been defined and assigned to them by the focal actor. The allocation of tasks, roles and responsibilities in the selection, deployment or evaluation of IT solutions were influenced or dictated by various factors, such as the power bestowed on the focal actor, skill set, and organisational structure.

The enrolment happened at three main different levels within the organisation's structure. It began at the end user's level, where some of the users assisted in gathering the business requirements for the solution (such as the Virtual Banking Application). The participation of the technical experts was the second level. Those with technical expertise and experience were selected. Finally, some senior management took part in the management of the process, approval of the financial budget, and lobbying their executive colleagues to buy into the initiative. One of the participants explains the significance of the approach followed in the organisation:

> "The processes followed in the selection and evaluation of IT solutions is of significance. This was because it allowed the users and other stakeholders to participate in the selection process" (SBN04 .51:1721-1722).

The three levels of enrolment as described above made the processes and activities that were involved in the selection, deployment and evaluation of IT solutions rigorous. Also, this could be attributed to the fact that the selection and evaluation of IT solutions were based on certain streamlined factors, which were considered sacrosanct and required to enhance the effectiveness of the IT solutions that were deployed in the organisation. This was to ensure their competitiveness, profitability and sustainability. The factors included functionality, scalability, reliability, speed, support and cost of IT solutions. Different skills (actors) were required to carry out evaluation, to ensure the effectiveness of the use of IT solutions. Some of the actors enrolled to carry out the evaluation included software developers, systems analysts and IT administrators.

In SBN, the enrolment of the individuals and teams who participated in the evaluation activities was random. This was because the organisation did not have a dedicated evaluation team. The absence of a dedicated evaluation team implied that there was no framework guiding the processes involved in the evaluation of the IT solutions. The organisation was often reactive, meaning that events often happened before detected and resolved. One of the participants explained how evaluations were carried out in the organisation:

> "There is no established evaluation process in the bank. The only form of evaluation that happens is an IT audit. Though there is a department called IS control, they also do like a review, but it is not on a deeper scale like that of the IT audit" (SBN02, 27:897-899).

The implication of this was that the activities related to the evaluation of IT solutions were inconsistent. In addition, this approach also left room for IT managers to assign tasks, roles and responsibilities as desired. The CIO and unit managers had the absolute power to assign roles as desired. In ANT, though, power can be the catalyst for the acceptance of obligatory passage point (OPP). In ANT, OPP is the point other actors must go through to get into the network (Callon, 1986). However, the use of power may be counter-productive (Twum-Darko & Harker, 2017). The incoherent assignment of roles can provide a basis for illicit practices and conflicts of interest.

The enrolment of the CIO was also statutory. This was because they and their teams are responsible for all IT activities within the organisation. It was their duty to oversee the selection, deployment, evaluation, management and support of technology in the organisation. In addition, the group was responsible for the transformation of business requirements into system requirements and subsequently to technology solutions. In the processes and activities that followed, the CIO received the business requirements from the Business Manager who then presented the requirements to the team for analysis and development of system requirements. The system requirements were critical for the selection, deployment and evaluation of IT solutions. The CIO assigned the task to the team as deemed fit. The process followed in the IT group was explained by a participant:

> "When the business requirements got to the IT department, we analyzed the requirements and their expected implication on the existing infrastructure of the system. After that, we come with the systems requirements" (SBN01, 4: 107-109).

> "The major challenge in selection and evaluation is actually with our requirement definitions. This is where things go wrong" (SBN02,22:739-740).

The other groups that were enrolled in the selection, deployment, or evaluation activities included external entities such as software vendors, business processing re-engineering (BPR) units, executive management, the project office and vendors, and the original equipment manufacturers (OEM). A technology change comes with changes in business processes. The BPR was enrolled to review changes in processes and impact. This was a standard procedure in the organisation. Within the organisation, the project office was responsible for vendor management. Based on their roles and responsibilities, the unit participated in the activities related to the selection, deployment, and evaluation of IT solutions.

The vendors were mainly to convince the employees, including the technical staff and senior managers, about the significance of their products (software). This was often done through the presentation and demonstration of their IT solutions. Also, the vendor's activities were guided by another external entity, which was the Central Bank of Nigeria. An interviewee stated as follows:

> "The introduction, adoption and use of NIBSS, Form M single window platform and the export processing platform was mandated by the Central Bank of Nigeria. This was to bring uniformity and efficiency into the system" (SBN10, 90: 3025-3026).

5.4. Moments of translation: Mobilisation

At this stage, spokespersons emerged to speak on behalf of the passive actors (Callon, 1986). To mobilise is an effort and mechanism to convince audiences and interested parties, including enrolled entities, to buy-in or accept the outcome of an activity (common interest). In SBN, the common interest was to select and deploy functional and reliable IT solutions to fulfil business needs and objectives. This was to ensure that the organisation's increasing competitiveness, profitability and sustainability in Nigeria was maintained.

In IT, the CIO was the focal actor and spokesman as mandated by his position. Though, in similarity to the business, different spokespersons emerged at different levels within the group. The spokespersons at the lower and middle levels within the group reported to the CIO. The unresolved issues were often presented at the group's meetings for review and resolution. These meetings were to develop IT strategies that aligned with the business strategies and generate system requirements, based on which IT solutions were selected, deployed and evaluated. The system requirements formed the basis for the selection, deployment and evaluation of the IT solution used.

The two main focal actors (spokespersons) at the operational level were the business managers and CIO. At the strategic level, the CIO became the spokesman for the alliance by presenting the requirements to the executive management. This was in line with his official roles and responsibilities. The onus was on the CIO to present to the management of the organisation the plans, strategies and requirements that are needed to achieve the organisation's goals and objectives. His ability to convince the management is of the essence for budget approval and mobilisation of the other stakeholders whose participation was critical for the successful selection, deployment or evaluation of IT solutions. The system requirements presented to the management formed the basis for the consistent evaluation of IT solutions selected and deployed.

In SBN, the emergence of spokespersons at the different levels was based on two factors: first, it was the roles and responsibilities which span from the organisational structure; and second was the knowledge and expertise of some individuals that enabled them to speak about entities. At the operational level, there were two focal actors; the business and IT managers who mobilised the other actors in their respective groups to participate. At the strategic level, the CIO became the spokesperson for the alliance.

The spokespersons at the different levels were challenged by both human and technical factors. The human factors manifested in the form of personal interest and quest for power such as the desire for recognition and growth at the lower and middle levels. This often resulted in the disruption of workflow, decreased productivity and project failure. On the technical front, knowledge was of significance. Inadequate knowledge often resulted in inappropriate requirements definition and scoping. The selection of inappropriate IT solutions leads to the non-alignment of business/IT goals and objectives.

6. Discussion of Findings

From the analysis of the data, the factors that influenced the selection, deployment and evaluation of IT solutions in the organisation were identified. As shown in 1, the factors are requirements, process-oriented, internalisation, IT governance, externalisation, and change management. The factors are interrelated as illustrated in Figure 1. The discussion that follows should be read in line with Figure 1, for a better understanding of how the factors relate to each other and together influence the selection, deployment and evaluation of IT solutions.

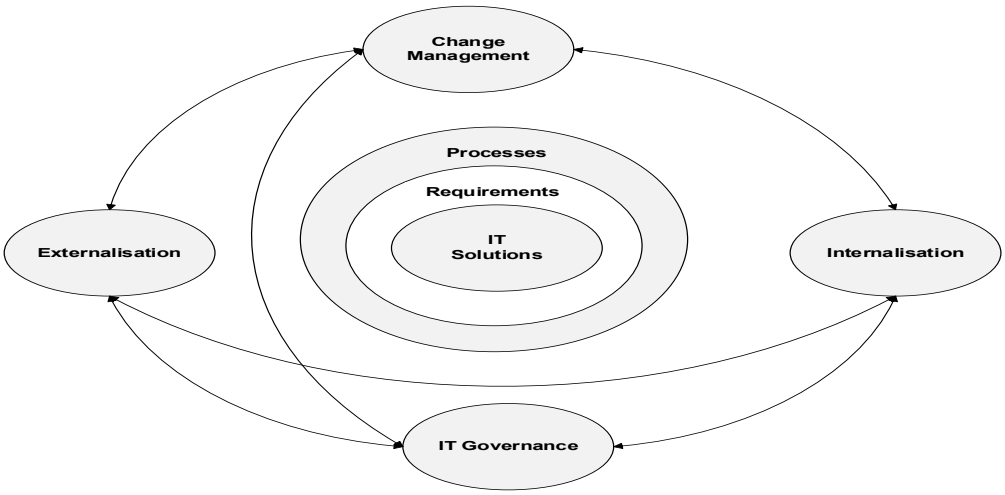

Fig. 1: Support model for IT solutions

6.1. Requirements

Requirement is a factor of influence in that it is a fundamental condition that needs to be fulfilled, to accomplish a specific task. Requirements are considered essential for achieving specific objectives. Requirements are essential in finding solutions to problematised items. In organisations, requirements can include business processes, activities, events, skills, and technology tools that can be used to facilitate the achievement of business goals and objectives for competitiveness. Thus, requirements are critical in the selection and deployment, or evaluation of IT solutions used by organisations. The ability to effectively fulfil, define and address business requirements can enhance competitiveness, profitability and sustainability.

In SBN, two types of requirements influenced the selection, deployment or evaluation of IT solutions: the business and system requirements. The business requirements were derived from the activities of the business division, while the system requirements were defined by the IT division. The business requirements were shaped by those obligations that needed to be fulfilled to meet their client's and business partners' business needs. For businesses to fulfil the clients' demands, requirements were at the forefront, to guide the IT division in support. Also, the business requirements formed the basis for generating (or extracting) system requirements. System requirements refer to the basic characteristics that IT solutions must possess in enabling and providing support to business logic and processes. They are the basic conditions and capabilities that IT solutions in development must meet to be able to solve business needs. The ability of an organisation to satisfy these requirements is vital for the selection, deployment or evaluation of an effective IT solution.

6.2. Process-oriented

A process refers to interrelated activities and decision points that collectively lead to an outcome (Dumas et al., 2013). It is a set of activities designed to achieve a specified output. Its iterative approach

and dependency make a process-oriented. Alkoot (2019) refers to processes as activities that take into consideration certain inputs and add value to them, to produce an expected output. As such, a process enhances the chances of accomplishing specific objectives; the processes followed are of the essence. Vanpoucke et al. (2014) affirm that the appropriateness of processes followed is critical for satisfying related requirements and being competitive. In SBN, some processes were followed in generating requirements used in the selection and deployment or evaluation of IT solutions. The processes followed were of significance in defining the requirements with which the selection, deployment and evaluation of IT solutions were done.

A strong process refers to activities that are well-planned, tested, executed and result-oriented. In organisations, where there are no strong or tight processes followed, there are bound to be challenges in appropriately defining the requirements critically needed for the selection and deployment of an effective IT solution. This is because, in the absence of a strong or tight process, the activities and events involved in defining requirements will be uncoordinated and not focused. Hence, the activities and events will not be business process-oriented. This will mean that there will be no defined line of action in information gathering, analysis, and collaboration. These factors are essential for adequately defining requirements which shape the IT solutions selected and deployed. The implications of such an approach include (1) Misalignment of business/IT objectives; (2) incompatibility; (3) inappropriateness of IT solution selection, deployment or evaluation: and (4) continuous requirements creeping. The persistence of these factors will negatively affect the organisation's goals and objectives.

6.3. Internalisation

In the context of this study, internalisation refers to the organisation's integral parts (or factors) that influence IT solutions. These factors can either be tangible or intangible (Mazikana, 2019), which act as drivers or barriers in attempts to achieve an organisation's goals and objectives (Susilo, Wahyudi & Demi Pangestuti, 2020). Some of the factors are available skill sets, principles, standardisation and facilities, including processes and artefacts. For example, in SBN, principles and skill sets played critical roles in the selection, deployment and evaluation of IT solutions used for organisational activities and purposes. Based on the guidelines and standards of the organisation, certain activities and events in the selection, deployment or evaluation of IT solutions were managed by the project management office. This included the management of the IT solution vendors and companies. The appropriateness of IT solution companies is vital in the deployment and use of IT solutions.

Managing internal factors is of significance in achieving organisations' goals and objectives. The inability to effectively manage internal factors can negatively affect the selection, deployment and evaluation of IT solutions. For example, in the absence of proper policies and standards, processes and events might not appropriately be guided and coordinated. Some of the consequences are (1) poor process execution; (2) lack of process sequence, which leads to a zig-zag approach; (3) process misalignments; and (4) ineffective processes. For example, in the two organisations used in this study, there was no framework to guide the evaluation or assessment of processes and events. In addition, there was no dedicated evaluation team that specialises in the evaluation of IT solutions' implementation and use. According to Jeston and Nelis (2008), in the absence of proper governance processes, process design and strategy will be misaligned. The appropriateness of internal factors such as processes, standards, stock of knowledge, and policies negatively affect the selection, deployment, and evaluation of effective IT solutions.

6.4. IT Governance

Information technology (IT) governance consists of policies, standards, and principles. It is primarily used to enforce enterprise architecture (EA). This is mainly because both EA and IT governance collaborate in the areas of policies, standards, and principles. The IT governance guides business

processes, activities and technology solutions engineered by the EA. Hirst (2000:24) refers to governance as "how an activity or an ensemble of activities is controlled or directed." This is mainly to ensure the activities follow a defined path to achieve the expected outcomes. In the field of IS, governance refers to established procedures and policies followed to ensure that IT solutions deployed sustain business goals and objectives (Iyamu, 2011). In SBN, there was an IT governance, risk & compliance unit. The responsibility of the unit was to ensure that established procedures and policies relating to IT activities were adhered to.

The EA is used to transit from a current state to a desired state (Iyamu, 2021). In the absence of proper governance, the processes, activities and events involved in the selection and deployment or evaluation become incoherent. The implication is that those activities will not take into consideration the broader organisation's requirements and business objectives. The implications of such incoherent and unfocused activities will include (1) non-alignment of business/IT goals and objectives; (2) inappropriateness of IT solutions to business processes; (3) compatibility and usability challenges and (4) business value will not be delivered by IT solutions deployed. This negatively affects the organisation's goals and objectives.

6.5. Externalisation

Externalisation refers to external factors that can influence events in an organisation. According to Mazikana (2019), external factors can influence the success or failure of IT solutions in an organisation. In SBN, the selection, deployment and evaluation of IT solutions were influenced by certain external factors, such as regulations, interactions and relationships between actors. For example, Central the Bank of Nigeria dictated the selection, deployment, or evaluation of IT solutions used for foreign trade operations. The Central Bank of Nigeria regulates all banking activities in Nigeria.

In SBN, for example, the determination of certain IT solutions selected and deployed was based on requirements and assessments gathered from third parties (organisations) that had experiences with the same technologies. The requirements and assessment were based on regulations and interactions between actors. For a successful selection, deployment, or evaluation of effective IT solutions, there is the need to be able to identify these factors and effectively manage them through regulations and interactions. The inability of an organisation to identify and manage external factors has consequences which include: (1) business-oriented process will continue to be challenged; (2) inappropriateness of evaluation criteria; (3) selection and deployment of ineffective IT solutions; and (4) system incompatibility. The implication of these factors will hurt the organisation's competitiveness, profitability, and sustainability.

6.6. Change Management

Organisations introduce change initiatives to enhance business processes and activities. Kawtar et al. (2019) refer to change as a transformational process that leads an organisation from its current state to an improved future state. This is carried out through EA in many organisations because it transits both business processes and IT solutions from current to future states. A change challenges the norm in an environment. Also, it alters structures, methods and processes through rules, regulations, and interactions. To derive the expected benefits, change needs to be effectively managed. Change management involves managing and coordinating people, business processes and systems (governance) to ensure that the purpose for which the change was introduced is achieved.

Change management takes cognisance of both internal (internalisation) and external (externalisation) factors in organisations. Poor change management can have implications such as (1) the selection and deployment of ineffective IT solutions; (2) disruption in business processes and activities; (3) non-alignment of business/IT goals and objectives; and (4) ineffective resource management. The persistence of these factors will negatively affect the organisation's goals and hence its competitiveness, profitability, and sustainability.

7. Conclusion

The banking institutions' role as a facilitator of economic activities in any economy makes it imperative for them to deliver quality services. The quality of the services the banks provide to their customers is critical for the development of the country. It is therefore of paramount importance to understand the factors that influence the enabler of the banking processes and activities. This study has successfully revealed the factors of influence and comprehensively discuss how the factors emanate from interactions and relationship between actors and manifest to influence support in the selection and management of IT solutions. Some of the factors were known but there was no empirical evidence for them. It is on this basis that we are confident that the study will assist some of the managers in addressing challenges relating to the factors.

The model is a foundation that managers of IT solutions can build upon, and develop a template for each of the factors. The templates address potential challenges and guide appropriate in the selection and management of IT solutions. Through this approach, IT solutions can be applied proactively and enhance competitiveness, sustainability and profitability.

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