

Actor-Network Theory Perspective of Robotic Process Automation Implementation in the Banking Sector

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ABSTRACT

Banking institutions are increasingly exploring ways to improve service delivery rather than the extreme focus and obsession of financial profitability. This has led to localising the internationality of solutions through the implementation (adoption and practice) of robotic process automation (RPA) to advance service delivery. However, the uniqueness of environmental culture and the critical roles of human actors increase challenges in some banking institutions. Consequently, the adoption of RPA poses a challenge, different from the many norms, which some banks encounter. In some institutions, this is fundamental and disruptive and questionable to human development. This study explores the challenge by following the actors using the interpretivist approach, from actor-network theory perspective (ANT). From the analysis, five fundamental factors were found to be essential to banking institutions' operations in their quest to implement RPA. The findings provide fresh perspectives and a mixed trajectory to the adoption of RPA from the South African banking institutions' context.

KEYWORDS

Actor-Network Theory, Banking Institutions, Information Technology, Robotic Process Automation

1. INTRODUCTION

Robotic process automation (RPA) does not mean physical robots but software applications that mimics processes previously performed by humans, by applying artificial intelligence (AI) and machine learning (ML) (Romao, Costa & Costa, 2019). In the same line of argument, Moffitt, Rozario and Vasarhelyi (2018) emphasized that RPA is a software for rule-based business processes. From banking institutions' viewpoints, RPA emerged as rule-based, tedious, and mundane tasks using conditions to process commands in a structured and recognised ways (Aguirre & Rodriguez, 2017). It is therefore considered as the new evolution for addressing tedious and repetitive business processes, which give businesses more power and prospect in streamlining and reducing costs of operations

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(Leshob, Bourgouin & Renard, 2018). Although the promises of RPA are attractive, the technology comes with its own challenges. Leshob, Bourgouin and Renard (2018) suggest an understanding of the challenges and how they can influence implementation of the technology in an environment.

For various reasons, many financial organisations across the world are adopting Robotic process automation (RPA) (Cooper et al., 2019; Lacity, Willcocks & Craig, 2015; Leshob, Bourgouin & Renard, 2018). Some organisations adopt RPA for technology advancement (Siderska, 2020; Willcocks, Hindle & Lacity, 2018), whilst other institutions employ the technology for efficiency and effectiveness purposes (Willcocks, Lacity & Craig, 2015). In South Africa, some banking institutions, particularly the largest ones are exploring the implementation (and practice) of RPA, to advance competitive advantage. Despite the growing interest, there is a mixed bag of factors that influence implementation of the RPA, which are not well understood (Mamela, Sukdeo & Mukwakungu, 2020; Ndoro, Johnston & Seymour, 2020).

Also, implementation of RPA is relied upon because of its ability to address human-errors, due to their repetitive and tedious nature (Romao et al., 2019). Also, RPA is adopted to transfer business operations swiftly and efficiently (Coetzee, 2018). The technology has made many businesses to rethink of processes that can be automated for the purposes of value add and cost effectiveness (Van der Aalst, Bichler & Heinzl, 2018). To some organisations, RPA is implemented to relieve humans from performing challenging tasks, and to provide consistency in quality and standard while efficiently executing processes (Lhuer, 2016; Wisskirchen et al., 2017). Notwithstanding the automated nature of the technology, its implementation does require humans as it cannot activate or control itself (Xing, Marwala & Marwala, 2018).

Despite the benefits attributed to RPA, are in its ability to address some challenges often encountered by human efforts. Some of the examples are capability to trace and track events; consultative ability; ability to identify use cases; and consistent automated update of rules (Lamberton, Brigo & Hoy, 2017). These are some of the reasons perceived to pose threat to humans' job security. Consequently, employees' resistance to the implementation of the technology is a major challenge for many financial organisations (Kamat, 2019; Swacha-Lech, 2017). This challenge is critical in the South African environment owing to the need to develop human capacity in the country (Chigbu & Nekhwevha, 2020; Mamela et al., 2020; Ndoro et al., 2020).

The main problem is that the significance or impact of adopting RPA is not properly understood in the South African banking institutions' environments. This is attributed to challenges such as awareness and limited practice cases. These challenges have also deprived some banking institutions from adopting the innovation, which could enhance service delivery and foster competitiveness. The challenges could only be better understood by following the actors, from both humans and technology perspectives, to gain insight of the significance or impact of adopting RPA by the banking institutions in the country. The study examines the roles and activities of the actors in adopting RPA in the South African banking institutions by employing the actor-network theory (ANT).

Actor-network theory is a sociotechnical theory that focuses on constantly shifting negotiation, human and nonhuman actors, formation of network, and translation of processes and activities (Bruni & Teli, 2007; Latour, 1987; Callon, 1986). Nehemia-Maletzky, Iyamu and Shaanika (2018) describe ANT as a theory that is most suitable in the analysis of qualitative data in gaining an understanding of actors' activities in the development and implementation of technologies, because they entail negotiations at various levels. The theory has been used in IS various studies for over three decades (Birke & Knierim, 2020; Steininger, 2019; Latour, 1996). The theory is often employed to examine the relationship between information technology (IT) solutions (such as software development and infrastructure deployment) and the factors associated with the development, implementation, and practices (Avgerou, 2019; Öbrand et al., 2019; Gao, 2005; Prout, 1996).

The questions this study seeks to answer are (1) what are the factors that influence implementation (adoption and practice) of RPA; and (2) what are the implications of practice of adopting RPA in the South African banking institutions? This is done by following the actors as empirically detailed

in literature. This paper presents a comprehensive and detailed process and outcome of the study, in nine sequential sections. The sections can be viewed in two parts, first consists of sections 1 to 4, while the remainder, sections 5 to 9 is the second part. This is purposely to illustrate the logical flows.

The introductory section creates awareness of the topic including the gap which the paper intends to address. In the section that follows, justification of the study is presented. It is an expansion of the gap that is briefly highlighted in the introduction section. It therefore provides opening for both review of literature and methodology applied in the study. The review of literature is presented in the third section. It focuses on RPA, its applications and challenges, specifically in banking institutions. It does not concentrate on South Africa because of limited materials from the country. In the fourth section, ANT is discussed, with primary focus on inscription. The theory, through inscription underpins the study, meaning it is used as a lens to guide analysis.

The analysis and discussion of the findings are presented in the fifth and sixth sections, respectively. Both sections are conducted following the interpretivist approach. From the analysis, using the inscription of ANT, fundamental factors of influence to RPA adoption and practice were found. The findings are interpreted, to associated context and relevance meanings with the factors. This leads to establishing the implications of practice, in section 8. In section 9, it concludes with carefully crafted contributions of the study. Intended benefiter of the study are identified. Also, presented as part of the conclusion, is the limitation, area worth considering for future studies.

2. JUSTIFICATION FOR THE STUDY

At the time of this study in the year 2020, no banking institution in South Africa has completely implemented RPA solution. However, there were two, identities reserved for ethical purposes, of the major banks that were in the processes of either considering or implementing the solution. This means that the banking institutions have no cases or terms of reference, to draw experience and learning that could help shape their strategic and operational pursuit of RPA. Also, there seem to be little or no academic study that focuses on the implementation of RPA, specifically in the South African banking environment. Even though studies have been conducted about the implementation of RPA in banking (Romao et al., 2019; Vishnu, Agochiya & Palkar, 2017) in other countries such as Norway (Kedziora & Penttinen, 2020), Singapore (Kumar & Balaramachandran, 2018), and Finland (Stolpe et al., 2017), factors of influence such as technology platform, which affects co-existence and cultural landscapes are not the same (Coombs et al., 2020; Lacity et al., 2015) with the South African environment (Mamela, Sukdeo & Mukwakungu, 2020).

Thus, the main justification for this study is from two main perspectives: (1) to provide significant insight for the South African banking institutions and banking institutions in other African countries who might want to follow suit; and (2) to contribute to knowledge economy from Africa and RPA perspectives. The inscription of ANT is employed in the study, primarily aimed to gain useful insight about the factors that influence and allow RPA to be implemented with minimal or no disruption to the core technology platform and business operations. The inscription is used to assess the interaction that happen between the actors, and how the interaction manifests themselves in the process of operationalising RPA solution in an environment.

3. LITERATURE REVIEW

Robotic process automation is a software innovation which is being used by some banks to fast-track tedious processes that are usually assigned and performed by humans (employees) (Ohene-Afoakwa & Nyanhongo, 2017; David, 2015). It is considered as one of the benefits of this era of digitalisation. The banks take advantage of the technology, to significantly improve daily transactions that require fast paced processing (Panda & Joy, 2020; Schlogl & Sumner, 2018). Increasingly, organisations share the view that the use of RPA has transformed many daily banking services by providing efficiency

in production (Osmundsen, Iden & Bygstad, 2019). There are other similar views that claims the use of RPA does not only provide efficiency and effectiveness for banking institutions, but it has also proven to improve performance and quality that maximises time and reduces cost (Lhuer, 2016). What is however not empirically known is the impact which the implementation of RPA has on employees in the South African banking sector (Schlogl & Sumner, 2018). The implication from human perspective can be a constraining factor in attempts to reaping the benefits of RPA in an organisation (Romao et al., 2019).

Due to confidential nature in processing and storing of critical information, some banking institutions get sceptical of adopting new technologies that have not been fully assessed (Tornjanski et al., 2015). Lacity et al. (2015) argue that RPA can process services which many IT solutions of some banking institutions are not capable of handling at fast-paced due to slowness of their legacy (old) systems. Bircan and De Haas (2020) suggest that the financial sector does not know how to efficiently adapt to RPA in its use to enhance productivity, reduce costs, and increase revenue. The suggestion is because many banking institutions focus more on costs savings instead of automating processes that generate more revenue. On this basis, it is critical for banking institutions to understand both the technical and non-technical attributes of RPA before its implementation and practice. Coetzee (2018) states that banking institutions should upskill their employees to understand the attributes of RPA, to remain relevant in the new digitalized era.

Research shows that RPA is not yet fully blooming in banks in developing countries (Ohene-Afoakwa & Nyanhongo, 2017). Also, some developing countries are often challenged in adopting new technologies due to shortage of skills and resources (Frey & Rahbari, 2016). Another important factor is that the implementation of RPA raises concern about the security of jobs (Lewicki, Tochowicz & Van Genuchten, 2019). A study by the World Bank reveal that a high number of job losses due to automation are more in the developing countries (Frey & Rahbari, 2016). Wisskirchen et al. (2017) explains that as employees lose jobs because of automated processes, organisations need to be more innovative and creative to job security. This raises the question about the factors that influence implementation of RPA in the South African banking institutions (Parschau & Hauge, 2020).

The implementation of RPA brings about skills shortage to the banking industry due to lack of capacity development and awareness of new technology, which create gap and challenges for organisations (Noppen et al., 2020). In addition, not all processes can or should be automated, thus, banking institutions require special skilled employees that know how to identify potential automation processes (Romao et al., 2019). Another major challenge for banking institutions is choosing processes to automate and an understanding of the significance and implications. The choice of RPA is significantly critical for automation of processes and creativity, accuracy and consistency. Thus, there is a need to understand the factors that influence implementation including the implications of practice of RPA for banking institutions.

4. ACTOR-NETWORK THEORY

Actor-network theory is a sociotechnical (ANT) theory that is used in both science and technological studies (Bencherki, 2017; Callon & Law, 1997). In ANT, actor is human or non-human, and a network consist of actors (Michael, 2016; Callon, 1986). The theory focuses on shifting of negotiation (Iyamu, 2021). Subsequently, it helps to discover the relationship of actors in a network to understand the connection between them (Rydin & Tate, 2016). Therefore, ANT is concerned with social construct of one or more actors in a network working together (Bencherki, 2017), which are encapsulated through its tenets, such as inscription, translation, and immutable mobile (Callon, 1986).

The inscription of ANT is employed to assess and understand the relationship between employees and environment in the adoption of RPA in South African banking institutions. There is the importance of human relationship with technology for explication of business processes and activities. Thus, human relations should be identified, situated, and stabilized to enable trace and track between itself

and technology such as the RPA. Also, in the process of studying the use of technical solution, there is inevitably shifts back and forth between the technologies and users (Akrich, 1992). Robson (1992, pp 691-692) describes an inscription as “a material translation of any setting that is to be acted upon. Inscriptions have to travel between the context of action and the actor remote from that context”.

The notion of inscription be a duality in that programs of actions can be inscribed into a technology, and the technology in-return, can be used to impose the inscribed action on its users. It is therefore safe to say that “an inscription is the result of the translation of one’s interest into material form (Callon 1991, p 143). In general, any component of the heterogeneous network of skills, practices, artifacts, institutional arrangements, texts and contracts establishing a social order may be the material for inscriptions” (Monteiro & Hanseth 1996, 330). The notion of inscriptions can be viewed from four main aspects, which is applied in this study as shown in Table 1.

ANT has been applied in information systems for many years, including studies where financial institutions were used as cases. In research where telecommunication strategy was developed, Gao (2005) draws on ANT, to conduct analysis on the socio-technological construction of activities. Iyamu and Roode (2012) applied ANT as a lens to analyse the prima facie evidence of the relationships that existed between social factors, technology, and the organisation in the development and implementation of IT strategy in a financial institution. In recent research, van der Wagen and Pieters (2020) draw on ANT to examine cyber victimization in three empirical case studies. Birke and Knierim (2020) employed ANT to gain an understanding of how actors interacted in the use of IT solution (such as application) to enable and support agricultural activities.

ANT notion of inscription encompasses how it is attuned to different patterns of negotiation. Through the negotiations, unclear boundaries in an episode such as the adoption of RPA can be identified and clarified. As shown in Table 1, the negotiation is prefixed with “what, who, why, and how”. These are scientific enquiries embedded in procedures of inscription (Latour, 1987; Latour, 1991). This is an exercise that reveals inscriptions of effective alignment between an organisation and technology.

5. METHODOLOGY

This study opted for the qualitative method from the interpretivist approach primarily because it allows the researcher to apply his or her thoughts and experiences in the phenomenon being studied (Hennink, Hutter & Bailey, 2020). Interpretivist approach seeks to understand the relationship that exist between people, objects, or subjects (Goldkuhl, 2012). Thus, the qualitative method and interpretivist approach were most useful, and guided the collection of materials that were examined to gain an understanding

Table 1. Inscription of technology

#	Inscription	Description
1	What is inscribed?	Identify the material for the inscriptions. Identify the inscription of object (technology solution). Also, inscribe the anticipations of use. In addition, establish the effort required to oppose an inscription.
2	Who conducts the inscription?	identify actors, human and non-human; human actors’ interests; and promoters and inhibitors of alignment between the actors in an environment.
3	Why was inscription conducted?	This encapsulates difference that the inscribed object (technology) has or can have including the power the inscribed technology imposes on an environment. Understand how to inscribe patterns into episode, rational for use, and actual use.
4	How is inscription conducted?	Through inscription, translate: (1) interests into patterns; (2) scenarios into use cases (designing use-cases); and (3) inscribe use cases into further developments.

of the relationship that exists between employees and RPA implementation in an organisation. This includes establishing the factors that fortify or constraint the different relationship at various levels in the process of adopting and practicing of RPA in South African banking institutions.

At the time of this study, only four South African banking institution have partially implemented RPA tools, which means that the technology was still being floated more as a theoretical initiative. Thus, it was not possible to employ the case study approach for this study. As a result, document analysis was considered most appropriate for data collection. Document analysis is a well-documented approach in IS research. It is mostly used in qualitative studies, to gain deeper understanding from analysis of existing documents relating to the phenomenon being studied (Bal & Saha, 2016). Analysis of documents enables following the actors in different circumstances as presented in literature. This includes tracing how the strategic and operational ideas about RPA are inscribed into the stakeholders in organisations.

Related literature was gathered from major or most popular electronic databases and indexes such as AIS eLibrary, EBSCO, IEEE Xplore, ProQuest, Science Direct, and Springer in the fields of IS and IT. To be more precise and gather the most relevant articles, the following keywords were used in conducting search: robotic process; robotic process automation, process automation in banking; RPA in South African banking; RPA adoption in financial services; and actor-network theory and robotic process. A total of seventy articles were gathered. This is attributed to the newness of the topic in the banking as well as the South African environment

Two criteria were used in gathering articles used in the study: (1) article that focus on RPA in financial institutions anywhere across the globe; and (2) the article must be less than 5 years old, meaning between 2015 – 2020. This is to ensure that the most recent, related peer-reviewed articles are gathered. The articles were gathered to ensure that all areas were covered, from robotics automation to banking process automation. The articles are categorized into three groups as shown in Table 2. These were to cover a spread of historical perspectives and consistency of the meaning that has been associated with the concepts, benefits, and challenges as described by Iyamu, Nehemia-Maletzky and Shaanika (2016).

The analysis focused on the fundamental factors: (1) Rationale for RPA in financial institution RPA; (2) Employees' interaction in the process deploying; and (3) Managers' actions in the deployment of the technology. The inscription of ANT was used as lens to guide the analysis. An overview of inscription and ANT is provided in section 4. The analysis followed the inscription attributes as presented in Table 1. The focus is to gain a more cohesive insight about the factors of influence as well as the implications of practice of RPA in the South African banking institutions.

5.1 Rationale for deploying RPA

Through the analysis it was gathered how automation of finance processes such as accounts receivable and accounts payable were communicated (inscribed) in an organization. The selling point was that

Table 2. Documents as data

Topic	Description	# Articles
Robotic Process Automation	This covers robotic automation, robotic process, and process automation from the perspective of banking institutions.	29
Banking and RPA	The focus is on the relationship between banking institution and RPA within the boundaries of the South African environment.	24
ANT and IS	Overview of ANT as a sociotechnical theory that covers both human and non-human interaction in achieving a common goal including the application of ANT in IS studies.	17
Total		70

such automation brings about competitive advantage through improved efficiency and effectiveness (Madakam et al., 2019). Applying ANT helps to follow the interaction between employees that establishes rapidity of change that RPA implores, which was argued by Kedziora and Penttinen (2020).

5.2 Employees' interaction

Constantly, there were shifting of negotiations between employees-to-employees; employees-to-managers; and managers-to-managers, which were viewed through the lens of ANT. By following the actors, the interactions that happen between the employees and managers as they consciously congregated themselves into network of allied interest were traced. According to Lamberton et al. (2017), consultative ability is based on interactions. In addition, ANT's concern of network formulation helps to view and gain understanding of the influencing factors, from the functions, roles, and responsibilities of the groups or units (Nehemia-Maletzky, Iyamu & Shaanika, 2018) in the adoption and practice of RPA by South African banking institutions.

5.3 Managers actions in the deployment of RPA

Through the ANT as a lens for analysis, observations were reached on how managers' actions were influenced by the interactions that happened between them and the employees, in the deployment of RPA. This was consequential, especially the fact that it has been highlighted in other studies that human perspectives constrain RPA utilization (Leno et al., 2020; Romao et al., 2019). Thus, how managers can avoid the negative consequences by inscribing the benefits of the technology into the employees were traced in the analysis.

6. RESULTS FROM THE ANALYSIS

The analysis followed the interpretivist approach, guided by the inscription of ANT as presented in Table 1. The table is repeated but with the description of the analysis as shown in Table 3. The discussion that follows is the analysis of the literature that was gathered as explained in section 5.

6.1. What is Inscribed About RPA?

Humans are consciously involved in inscribing the deployment and use of RPA in South African banking institutions. This action is often motivated by the features and *prima facie* evidence of about the technology solution. RPA and associated features including its configuration and support

Table 3. Analysis guided by inscription

#	Inscription	Description
1	What is inscribed?	The RPA including its rationale for deployment are inscribed in both the banking institutions and the employees. Also inscribed is the process for RPA deployment.
2	Who conducts the inscription?	The senior managers in both IT and business units including some IT specialists are responsible for inscribing RPA and its processes in the banking institutions.
3	Why was inscription conducted?	Rationale for inscribing RPA into the banking institutions and the employees of the organisation are to improve effectiveness, efficiency, and cost effectiveness that led to sustainability and competitive advantage.
4	How is the inscription conducted?	The inscription is conducted through various means such as: (1) negotiations using channels that include team meetings, workshops, and trainings; (2) at different levels of the organisational structure; and (3) within the business and IT units.

mechanism are inscribed at different levels and various ways. Stolpe et al. (2017) describe the design process and how it delivers business objectives. While Enríquez et al. (2020) give detail account of the configuration and the role of the developers programming needs. The inscription become even more critical in that RPA is designed to mimic human action, because the technology must interact with data within the presentation layer of platforms and applications (Devarajan, 2018).

The RPA performs are typically rule-based, structured, and repetitive tasks, which include transfer of varying data types (Syed et al., 2020). Thus, measures to identify these various processes and activities must be inscribed through constant interaction between humans, as well as humans and non-human actors, toward a successful implementation (Fernandez & Aman, 2018). Also, the measures require regular assessment as business needs and criteria change. These actions can produce different or unprecedented outcome or shape the solution; hence the roles and responsibilities of the inscription are critical.

6.2. Who Inscribe RPA for Banking Services?

The RPA is promised to bring great values to banking institutions (Patri, 2020). Consequently, it is critical to be certain about who defines, designs and deploys the RPA in an organisation. Another crucial role is that of the inscriptors of the objective into the employees and stakeholders. The objectives (or motives) and processes cannot be less of context and relevance in associating RPA with factors such as integration and use. Thus, who develops and implement the features including providing technical support must be skilled in both technical and non-technical factors (Madakam, Holmukhe & Jaiswal, 2019).

Although RPA presents numerous benefits to the banking industry (Kamat, 2019; Crosman, 2018). However, there are challenges. Romao et al. (2019) highlights severe limitations of RPA in practice. Patri (2020) explicitly argues that there is scarcity of RPA skill in the banking industry and the available few do not possess the required talent for automation as many of the employees have non-technical backgrounds. Also, currently, there are limited materials and training facilities for RPA in South Africa.

6.3. Why is RPA Inscribed for Banking Services?

Humans are not always better at emotional work, particularly, in dealing with abusive or irate clients. The RPA-based systems are better executing tasks that are related to emotion because they are not reactive to provocative or offensive behaviour (Crosman, 2018). However, the technology does not operate itself. No matter the brilliance of the technology and its benefits, humans enable or constrain its operationalisation (Kamat, 2019). Also, the rapid changing and evolving nature of the RPA require diverse and skilled expertise (Kedziora & Penttinen, 2020).

The RPA solution poses challenges when transforming human-executed operation into automated routine (Rutschi & Dibbern, 2020). Consequentially, this can manifest to bigger challenges if the technical and non-technical operations are not ascribed into the governance and architecture of the organisation. This is primarily because the operations are often subsequently influenced by variance of individual human routine and performances.

6.4. How is RPA Inscribed for Banking Services?

The implementation of RPA can bring immediate benefits and value to an organisation's business processes such as accounts receivable, accounts payable, and data migration. However, each bank needs to define its own RPA models to actualise improved efficiency and effectiveness due to the uniqueness of operational models (Madakam et al., 2019). This is the connectedness between units within an organisation. The diversity of the stakeholders makes it necessary to employ the enterprise-wide approach in inscribing the RPA solution in organisations. This can be done at different levels of the organisational structure at both business and IT units. In addition, various techniques and tools, such as contractual and business case requirements.

The impact of the RPA on organisational structure and processes can potentially have a positive or negative impact on individual employee or the banking institution (Fernandez & Aman, 2018). This depends on how the principles and value of the organisation are inscribed into the technology, to program and control the features. The RPA comes with a variety of features that can be customised to fit the operations of an organisation (Lacity et al., 2015). This necessitates holistic negotiation for wider buy-in; explicit communication to facilitate better understanding; and training for reskilling of employees.

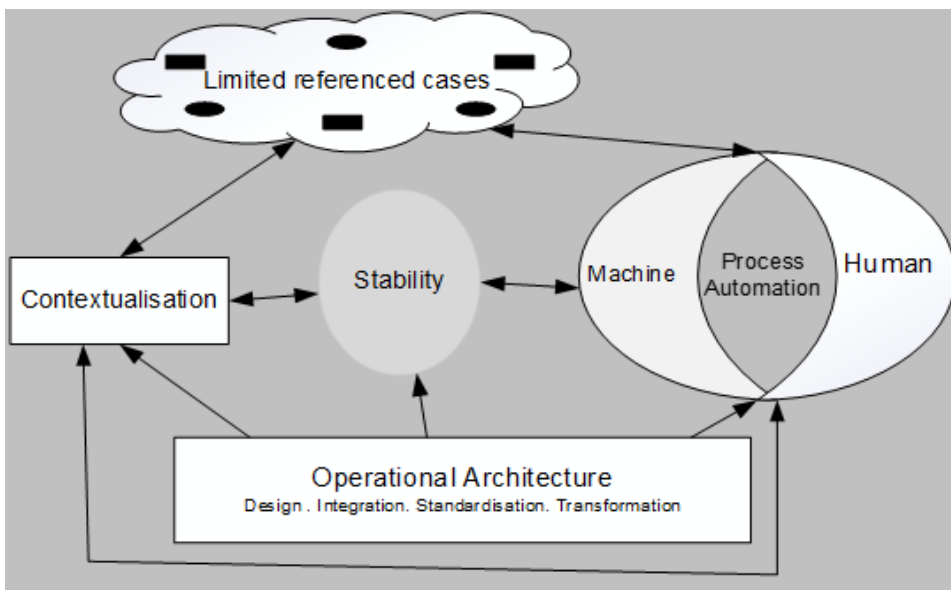
7. DISCUSSION OF THE RESULTS

From the analysis, five fundamental factors that can be of essentiality to banking institutions in South Africa in their quest to implement RPA were found: (1) Limited referenced case; (2) Balance – between humans and machines; (3) Contextualisation – define within context; (4); Stability of RPA in an environment; and (5) Operational architecture – that encompasses both business operation design and IT solutions (applications). Figure 1 illustrates the relationship between the factors. The discussion that follows explains how the factors can manifest and influence RPA's implementation, use, as well as potential conflict between workforce (employees) and employers in the banking institutions. Thus, the discussion should be read with Figure 1 to gain better understanding of the contribution and value that the paper presents.

7.1. Limited Referenced Case

Despite the growing interest in RPA, it is hard to find reference cases in the South African banking environment. Also, there seem to be no empirical studies or evidence as at the time of this study. This leaves employees and employers with little or no option but to base their actions and fears on hypothetical assumptions. As a result, employees do not have clear understanding or pragmatic idea on how the deployment of RPA will affect their jobs security or roles and responsibilities. Also, there are no chains of references to assess or measure the complicity or implication of sliding RPA into any of the banking institutions in the country. This includes identifying the factors and heterogeneous

Figure 1. RPA implementation



actors that can enact and manage the ascribed standards and principles, which form's foundation for operation architecture.

Banking institutions do not seem to have a grip with the impact which automation will have on reducing head counts (workforce) in the future (Kamat, 2019). Crosman (2018) highlights that the implication of reducing human workforce poses serious challenges to job security. Willcocks and Lacity (2016) argue that RPA has potential to be disruptive of conventional people centric. This potential consequence is due to lack of readiness assessment. Also, the readiness assessment can be used to provide guidance on how empathy is in-built into some RPA-based systems.

7.2. Balance – between Humans and RPA

It is significantly essential to find a balance between human (employees) and RPA solution. This ascribes' layers of negotiation, to express its motive and desirability. ANT notion of inscription encompasses, and it is attuned to different patterns of negotiations. Through negotiations and clarification of boundaries in an episode, the adoption of RPA can attain certain level of balance. This is primarily because the elucidation of the alignment between humans and RPA can be influenced by human actors' sensory experiences to job losses, sustainability, or transferability from one point (or unit) to another, which Latour (1987) refers to as *immutable mobile*.

Immutable mobile is described as somethings moves around but retains its shape in the sense of stable knowledge (Srinivasan et al., 2010). When this happen, expected learning of human actors is no longer situated in action and a black-box in the form cognitive occurs. In the realisation of this, the employees become resistant in different forms. By black boxing, the focus lies on the RPA rather than inscriptions of tasks, roles and responsibilities in the use of RPA. Bampouras, Cronin and Miller (2012) consider "Immutable Mobile" as output of black-boxed activity. The solution inscription of fundamentals into creating balance between human actors and non-human actor (RPA) and its processes.

7.3. Contextualisation – Defined within Context

The adoption of RPA by South African banking sector is cumulative of three main layers: business processes (von Solms & Langerman, 2021); customers' demand for improved services (Moloi & Iredele, 2020); and cost reduction program (Mamela et al., 2020). These are different layers in attempts to sliding the technology into South African banking institutions, which is synonymous to the process of inscription. Thus, the inscription helps or can facilitate the process and boast the strength of adoption of the RPA. This could also be attributed to the fact that adoption is coerced through interaction. In ANT, interaction between actors enacts negotiation and stabilises. Activities take form based on interaction among actors. The RPA cannot be successful if it is slide into an environment without negotiations that are centred on enrolment of actors from various networks through which inscription takes place. "The notion of inscription refers to the way technical artefacts embody patterns of use: 'Technical objects thus simultaneously embody and measure a set of relations between heterogeneous elements' (Akrich, 1992, p. 205)."

Inscriptions enable the exercise of comparative between current state and the desire to employ RPA. Also, it normalises judgement about the suitability of RPA in the context of the three layers within an environment. These in turn permits negotiation and action from both management and other employees including the technical staff, to ostensibly have a platform for smooth adoption and better management of the RPA solution. In addition, in addressing constraints, Greenhalgh and Stones (2010) suggest that the process of inscription can employ various devices which may help to stabilise a network at various layers.

7.4. Stability of RPA in an Environment

Stability of RPA solution is reflective of negotiated actors' situated actions. This is critical from both technical and non-technical perspectives in ensuring smooth shifting negotiation between actors. The stability encompasses programming codes, procedures, standards and materials which are inscribed

in the technology-in-focus. According to Greenhalgh and Stones (2010), whether consciously or unconsciously, human efforts can enable or constrain the deployment or potential use of technology in an organisation.

Although inscription is particularly valued for its enablement of stability. However, it is not immune to change of actors with a network. The success of inscription to stabilise a network is embedded in the use of technology to conduct processes and activities. Thus, it requires program of actions to ascribe sociotechnical arrangements in the deployment of RPA solution to ensure composite and heterogeneous enrolment of human actors at various levels. This helps to establish different groups of people, interconnect tools (other technologies), and finds unclear boundaries between these artefacts. (Akrich,1992).

7.5. Operational Architecture

The operational architecture encompasses both business operation, design and integration, management of IT solutions (applications or systems) including its processes and interrelationship. The deployment of RPA gets more complicated for banking institutions primarily because of the challenges it poses (Kamat, 2019). The ability and capacity to select appropriate processes to automate, to maximize the benefits and output is one of the many challenges confronting some financial institutions (Patri, 2020). This is attributed to three factors: (1) the sensitive nature of the financial sector does not encourage disclosure information; (2) there is scarcity of RPA expertise; and (3) the difficulty in the integration of RPA with legacy systems. Hence an architecture is required, to holistically defines integration and standardisation including operationalisation of process automations, activities, roles and responsibilities.

The strength of inscription depends on the transformations of traces from one point to another. It grows as the network increases. Thus, flexibility, standardisation, and integration are vital to contain and govern the processes, activities and operations. In the process, inscription (an ascribe activity) makes black box visible (Srinivasan et al., 2010). It is critical to employ governance, to balance centralisation and decentralisation including defining reusability standardisation toward transformation to desire state (Kedziora & Penttinen, 2020). These are components that are embedded in operational architecture.

8. IMPLICATION IN PRACTICE

The adoption and practice of RPA by South African banking institution have implications. The implications entail addressing or putting into operation the findings that are discussed in section 7. The implications, through four main factors, Documentation requirement, Readiness assessment, Critical success factors, and Multifaceted governance can be shared between the key actors, organisation and employees as shown in presented in Table 4.

The implications help to strength the practice of RPA through maintenance of continually shifting negotiation and operationalisation of its processes and activities. Also, this guide practice of governance and integration of RPA with other technologies to automating unique and individual processes to suit the needs of a banking institution (Hofmann, Samp, & Urbach, 2020).

9. CONCLUSION

Although this study focuses on the South African environment, the outcome can be used in other countries, particularly those that share similar challenges or environment. Also, it is not limited to financial institutions, the outcome can be customized for use in order industries. Primarily because this study addresses the need and implication of the RPA solution for business operations as offered by literature. More precisely, the study focuses on the implementation of RPA in the South African banking institutions, and its implications for employees including the consequence for the economy of the country.

Table 4. Implication of practice

Factor	Organisation	Employee
Documentation requirement	Intentionally, to ease documentation of requirements, which are often than not, a barrier to accessing financial services such as opening account and securing loan in South Africa and many other countries in the continent	Understanding the key fields that are required for documentation and creating user friendly documentation formats to allow and enable adoption of RPA, to swiftly perform validations and processing of documents.
Readiness assessment	Consciously, to routinely detect potential risks, define profitability, and leverage requirement and automation of tasks. Carden et al. (2019) argue that despite the interest and much publicized benefits that are associated with RPA, the details that can ensure its successful implementation are not well known.	Training and upskilling, to gain deeper understanding of the usefulness of RPA, and willingness to learn and facilitate the adoption of the technology, to enhance productivity and efficiency towards competitive advantage.
Critical success factors	Despite the existing similarities, each organisation is unique. Thus, contextually define value add measurement factors.	Develop weight and measurement criteria that can be automated processes with less human interaction. Thus, increasing sustainability and profitability than banking instructions so desire.
Multifaceted governance	Culturally, create method which removes impediments caused or influenced by business and co-existence of technologies. According to Herm et al. (2020), 'up to 50% of RPA projects fail', which can be associated with many factors such as lack of governance.	Ability to operationalised innovation (adoption and practice of RPA) and development governance framework, to control and manage processes and activities including integration of co-existence of technology solutions.

Thus, this study provides specific and clear insight to the reader, about RPA including the scientific solutions that it proposes, and the unconscious job security that prevails. Thus, a framework (Figure 1) is proposed to facilitate the ability and capacity in implementing the solution. The findings and the implications of practice provide bases and foundation for negotiation between the stakeholders, specifically, the employees and employers. Also, the factors discussed in section 7 can help reduce fear of job insecurity among many of the employees. In addition, this study enriches employers with knowledge about the trajectory and derivation of what they did not know about employees' fears and expectations, and how to mobilise stakeholders on the needs for RPA in the organisation. The paper adds to literature, which is a benefit in the areas of RPA implementation, banking, developing country, and ANT's evolutionary use in information systems research.

This is primarily because, through inscription of ANT, the factors of influence in implementing RPA in South African banking institutions and have implicitly explained how the challenges can be addressed were identified. On these bases, this study has successfully exposed the implications of implementing RPA solution without thorough assessment, in the South African banking institutions. The rigour of the study was fortified using inscription from ANT perspective, as a lens to guide the analysis and discussion of the findings. However, future studies may explore the implications in detail using different lenses. Also, the challenges and implementations may be different in other sectors and other developing countries. Thus, the case study approach is recommended.

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