Activity Theory Analysis of RPA and Workforce in Financial Institutions

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Abstract: Financial institutions have been at the forefront of using Robotic Process Automation (RPA). Developing countries are moving towards using this emerging technology. Literature indicates various views on RPA and the workforce within financial institutions. This article, therefore, explores how RPA can be productively implemented in financial institutions. Activity Theory (AT) was applied to gain a deeper understanding of the challenges within financial institutions regarding the workforce employed. Using the six tenets of Activity Theory, this article looks at how these various areas impact the RPA adoption concerning the workforce. The use of RPA in financial institutions has assisted in processing mundane, repetitive tasks that do not require human intelligence. However, the AT tenets revealed the contradiction between RPA and the workforce. The challenges arise from a lack of understanding of how the two actors (RPA & workforce) can work in harmony and how both are reliant on one another. This paper uses qualitative methods to unpack the implications of RPA in financial institutions and the impact RPA has on the workforce. Various studies looked at the fear amongst the workforce regarding RPA, yet no empirical evidence exists to prove that RPA causes unemployment. This study demonstrates that communication is essential for introducing new technology.

Keywords: robotic process automation, workforce, activity theory, banking, financial institutions

1. Introduction

Increasingly, financial institutions in developing countries are using Robotic Process Automation (RPA) as an alternative to the human workforce. In this study, the workforce refers to an organisation (financial organisation) employee. Robotic Process Automation is a virtual robot software solution that mimics tasks by automating them into easier execution of business processes (Aguirre & Rodriguez, 2017). Geyer-Klingeberg et al. (2018) define RPA as a virtual workforce that uses robotics software to perform rule-based and repetitive tasks, subject to inaccuracy due to workforce fatigue. RPA is anticipated to free humans from repetitive manual tasks and focus more on critical thinking of business processes (Moffitt, Rozario & Vasarhelyi, 2018).

RPA enables financial institutions to save time from repetitiveness, reduce costs and increase work quality by swiftly performing tasks to meet customers' demands (Anagnoste, 2017). Customer satisfaction demands that some financial institutions remodel their business processes by replacing employees (workforce) with software robots to achieve efficiency and accuracy (Alberth & Mattern, 2017). Rotatori, Lee, and Sleeva (2020) state that the human resources department of organisations needs to have clear requirements for the future workforce that will be compatible with the fourth industrial revolution technologies such as the RPA. Such argument and the potentiality of the RPA imbibe fears in many employees that they might lose their employment sooner than later (McClure, 2018). However, due to tedious monetary transaction processes performed in financial institutions, technologies such as RPA are needed to enhance daily operations and accuracy, as most functions include financial implications.

There seems to be no empirical evidence that suggests that the use of RPA is aimed at replacing the human workforce. Also, activities such as selecting, deploying, and evaluating technology solutions are not carried out in a vacuum, and they require human efforts. According to Geyer-Klingeberg et al. (2018), it is factual that the workforce is needed to identify potential RPA business processes by performing an exercise referred to as process mining. One of the challenges is that the workforce capabilities are underestimated because employees' productivity is compared to automation, which the RPA seems to have made worse (Le Clair, UiPath & Prism, 2018).

Numerous studies have been conducted about the RPA in recent years, such as Asatiani and Penttinen (2016); Moffitt, Rozario and Vasarhelyi (2018); Hofmann, Samp and Urbach (2020); and Willcocks, Lacity, and Craig (2017). None of these studies focused either on the deployment of RPA as a challenge for employees or examined the challenges from the perspective of financial institutions in Africa. Based on the gap identified above, this study aimed to understand the conflict between the workforce and RPA from a financial

institution's perspective. This understanding will allow seamless workforce integration and RPA to provide more efficient, effective, and costless client services. In achieving the aim of the study, we employ the activity theory (AT) as a lens to underpin the study, as this study requires the analysis of the two activity systems, the workforce and RPA. The AT enables and supports the analysis of multiple points of view to spot and follow interactions within systems (Engeström, 1999; Nardi, 1996).

2. Literature

2.1 RPA in financial institutions

Financial institutions are adopting innovative artificial intelligence (AI) technologies such as RPA to improve the workforce (Mamela et al., 2020). RPA assists the workforce by removing tedious tasks to focus on challenging tasks requiring human decisions (Phillips & Collins, 2019). Crosman (2018) argues that the workforce panics whenever RPA is mentioned because they fear robots will take over their jobs. However, Phillips and Collins (2019) state that the workforce should not fear RPA, allowing them skills development time. RPA provides financial institutions numerous advantages, such as 24/7 operations, increased productivity, accuracy, and reliability (Madakam, Holmukhe & Jaiswal, 2019). Bughin (2020) argues that skills development is required for the workforce to be compatible to work hand in hand with robotics for the future workforce.

RPA depends on AI, based on adequate autonomy, the ability to learn, and decision-making instead of a computer. Whereas computers are typically configured to perform a particular task, alternate tasks can be reprogrammed for robots (Huettinger & Boyd, 2020). Most RPA developments have been done in developed countries, and developing countries still need to adjust and learn more about the technology (Zhang & Liu, 2018). Unlike developing countries, developed countries automate their daily processes and have experienced a high return from using RPA (Maloney & Molina, 2016). Investigations have been done on the potential of deploying RPA (Zhang and Liu, 2019). RPA has been implemented in many industries, such as financial, telecommunications, business process outsourcing, education, banking, and legal. In any IT application, there are always advantages or benefits.

2.2 Activity Theory

Activity theory (AT) is defined as a possible or scientifically appropriate general concept or body of principles provided to explain phenomena (Merriam-Webster, 1828). According to Quinlan (2011), theories are built on concepts, and these concepts are aligned with keywords. Activity theory is built on the concept of a subject that has a need leading to an outcome.

As shown in Figure 1, the AT framework consists of six components, namely tools, subject, rules, community, division of labour, and object (Nardi, 1996). The Object leads to the outcome of the activity, as the figure shows that all the components enable the object. The Division of labour is linked to the performance of the community, which could include the Subject and influence the outcome of the Object. The Rules present the conditions of an activity, which have legal documents and guidelines that govern the operationalisation of an activity within a context. The focus, therefore, includes how an actor's actions influence the different levels of activities (Wilson, 2008).

One of AT's key areas and interests is the inseparability of learning and doing (Battista, 2017). The AT conceptualises learning as a fundamental practice within a social system (Engeström, 1999). In addition to understanding what actors do, the theory is also concerned with the transformative process (Yamagata-Lynch, 2010). According to Jones and Holt (2008), AT has several interrelationships and learning features, such as (i) the links between the factors which mediate the activities; (ii) it is outward-looking and transformational; (iii) it emphasises the opportunities for innovation and the improvement of competences; and (iv) it recognises that the learning process creates tension amongst participants (Battista, 2017). According to Yamagata-Lynch (2010:17), activities are "mediational processes in which individuals and groups participate, driven by their goals and motives, which may lead them to use new artefacts or cultural tools".

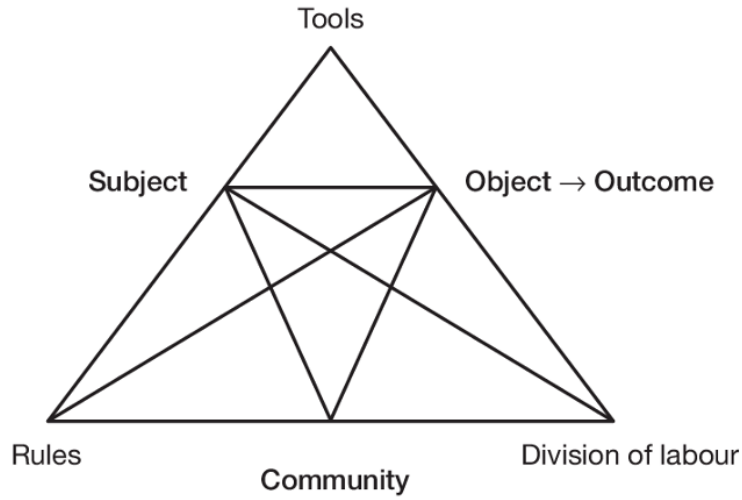

Figure 1: Activity Theory (Nardi, 1996)

AT, therefore, looks at the relationships between the subject, object, and tools and how the rules, community, and labour influence the activity. In the last two decades, the use of AT in information systems (IS) research has increased tremendously (Sekgweleo, Makovhololo & Iyamu, 2017). Some of the areas where it is prevalently applied include technology-mediated change and the implementation of disruptive technologies to improve activities in an organisation. The AT is essential in this study because it identifies contradictions and breakdowns of communication between actors and the systems. According to Dennehy and Conboy (2017), the AT pertinently highlights and categorises problems and how they manifest themselves within context.

3. Methodology

This study applied the qualitative research method through the interpretivism perspective described by Quinlan (2011) that an interpretivist assists in interpreting interactions. Thus, qualitative research methods were used to explore the impact of RPA on the workforce in financial institutions, including understanding the factors that contribute to the workforce's fear of RPA and the workforce not understanding the capabilities of RPA within their working environment. Furthermore, the study seeks to unfold the contradiction between the workforce and RPA that is seen as the organization's unreadiness of the RPA. The use of RPA in organisations is not yet mature. At the time of this study, not much research existed in the body of knowledge on unpacking the factors that influence the conflict between RPA and the workforce. The topics which covered RPA and the workforce were represented in silos, and none covered both RPA and the workforce holistically. Thus, the need to use existing documents through document analysis to combine what exists on RPA and the workforce. Document analysis systematically uses documental evidence to answer to assist in achieving our aim (Cristani et al., 2018). The databases used to obtain the literature included Google Scholar, EBSCO, IEEE Xplore, and Springer, which all contribute highly to the body of knowledge on understanding RPA. The use of RPA has been in organisations for over a decade, but no literature has covered the factors that cause conflict between RPA and the workforce. The years of the search were 2011 to 2021. The articles were categorised as follows:

Table 1: Documents

Topic	Type	Description	Total
Robotic Process Automation	Journal	These articles cover RPA, robotics and automation in financial institutions.	27
	Conference and Workshop		13
	Strategic Documents and White Papers		7
Workforce	Journal	The focus is on how the workforce is affected by using RPA in financial institutions.	14
	Conference and Workshop		2
	Strategic Documents and White Papers		5
Banking	Journal	The articles are related to the banking sector in the context of RPA.	9
	Conference and Workshop		5
	Strategic Documents and White Papers		6

The Activity theory was used as a lens to data analysis to analyse the data collected. Iyamu and Shaanika (2018) state that the use of Activity theory is mostly used in information systems (IS) studies to evaluate the technologies within the organisation. To understand and evaluate technology, the activity theory categories different elements that contribute to the use of technology, which are the tools, subject, object, rules, labour and the community. Activity theory was practically applied in the data analysis section below.

4. Findings

Based on the analysis conducted above, this study gathered four findings. (1) knowledge sharing and upskilling of the workforce, which alludes to having a centralized repository where the organization shares knowledge of emerging technologies such as RPA and upskills the workforce to be able to be in synergy with the capabilities of the technology. (2) RPA ownership within the organization; there should be clear rules and roles between the business units and IT to understand what role they both play when implementing RPA initiatives and maintaining the solutions. (3) Integration between RPA and the workforce; RPA and the workforce cannot operate in silos, the two need each other to be more efficient and to increase productivity. (4) Upgrading of systems and applications; the RPA operates on the top layer of existing systems and applications, RPA operating on legacy systems will derail the full potential and benefits of the technology.

5. Data analysis: Activity Theory

In achieving the aim of the study, which was to highlight the conflict that can escalate and degenerate into a disruption of capacity building and economic activities in the adoption of the RPA in financial institutions. The activity theory (AT) was used as a lens to guide the analysis presented in this section.

5.1 Tools

The tools are used by people (workforce) to perform various activities in enabling an organisation's aims and objectives. RPA is an automation-oriented tool requiring minimum intervention or interaction with people in executing its programmed tasks. Some RPA tools focus on financial institutions' business logic to automate their processes with limited or no programming knowledge (Yatskiv et al., 2019). It is a simplistic approach that allows automated processes to drag and drop functional components (Ansari et al., 2019). On the one hand, the adoption and use of RPA limit the involvement of employees, which increasingly increases fear in employees that some of them are almost certain to lose their jobs. Organisations have impacted operations through reduced costs, efficiency, and fewer errors in automated processes (Rai et al., 2019). These two perspectives are swiftly in conflict, which is, however, fundamental to the sustainability of an organisation. It is critical to explore the trajectory of the conflict and how it manifests.

The conflict arises owing to a lack of knowledge. In "the constitution of the society", Giddens (1984) argues that structural constraint implies that there are limits to actors' knowledgeability, which affects actionability. Most organisations struggle with integrating RPA into their operations, especially financial institutions, as they have mostly legacy systems that are not swiftly responsive and cannot keep up with RPA (Osmundsen & Bygstad, 2019). The use of RPA as a tool for organisational purposes requires the intervention and involvement of employees to identify processes; automate the processes and analyse the outcome within context. Thus, process automation inevitably requires a skilled workforce that understands the life cycle of the RPA, which entails identification, design, development, production, and monitoring of processes (Montero, Ramirez & Enríquez, 2019).

5.2 Subject

In AT, an individual or group of employees can be referred to as subject (Iyamu, 2021). In the deployment and practice of RPA, humans (workforce) constantly remain a focal point of discourse in many financial institutions. The discourse has focused on some vital issues of significance. Staff development is considered a fundamental challenge in many quarters because of the significant role of the workforce. Within this context, Madakam, Holmukhe, & Jaiswal (2019) argue that the workforce is the backbone of an organisation because personnel dictates and determines the processes and activities in the implementation of RPA.

Increasingly, employees in many financial institutions have concerns about their job security because of the deployment of RPA (Madakam, Holmukhe & Jaiswal, 2019). The fear remains persistent when or wherever RPA is implemented or about to be implemented in a financial institution (Rai et al., 2019). The fear is justifiable because RPA is designed to perform tasks that employees would ordinarily perform more accurately and

consistently (Hofmann, Samp, & Urbach, 2020; Yatskiv et al., 2019). Such fear hampers the confidence and motivation of many employees, which affects the environment's productivity. Thus, there is a need to align the subjects (employees) and the technology (RPA). Such alignment can form part of a strategy. Based on the strategy, skills and capacity can be further developed. Subsequently, RPA is better understood and exhaustively applied to maximise benefits.

5.3 Rules

Rules are used as a control mechanism in carrying out activities (Karanasios, Allen & Finnegan, 2015). Directly or indirectly, rules govern the implementation of RPA in financial institutions, creating trust on the one hand. On the other hand, it helps control how involved actors carry out activities (Brownsword, 2020). However, in many financial institutions, it is rare to find how rules are used to stimulate integration between RPA and the workforce's development. Thus, ownership and responsibility become increasingly important. In this context, Trends (2017) argues that rules should be created by relevant actors or authorities to guide the implementation of RPA. The rules will help to trace the implication of the RPA on humans and existing technologies in an environment. During the implementation of a new technology, rules ensure alignment between the newly implemented technology and existing infrastructure (Suzor, 2019).

The RPA is built on rules, by rules, and can be applied within rules in carrying out activities. Both IT and business units apply rules in executing their processes and activities. Thus, rules can be used to ease the tension between employees and the deployment of RPA from two central angles: (1) rules use a regulatory and policy source of power to define how RPA is implemented to avoid a negative impact on the development of human capacity in an organisation; and (2) rules can be used to enact distinctive deliverables by both IT and business units in their use of RPA in an organisation.

5.4 Community

In AT, a community is a group of people who share common interests (Karanasios et al., 2018). Although the group does share interests, they do not share the same values, roles, and responsibilities. This makes the implementation of RPA more interesting and is twofold: (1) the mixture of values, roles, and responsibilities brings fresh perspectives, which manifest into learning, and (2) the differential between these attributes brings about unprecedented challenges. Challenges help expose "blind spots" and reveal opportunities, which can lead to the development of talents, and increase capacity.

For RPA to be implemented, a community exists. The community includes different groups, such as RPA developers, business analysts, and subject matter experts. According to Ansari et al. (2019), RPA necessitates a variety of designated professionals, including solution architects, process analysts, and IT security experts, at various phases of development. More important is establishing each community member's value through interaction and negotiation. The value associated with RPA determines the success or failure of the technology in an environment. Also, the value related to the implementation of RPA influences the relationship between the employees and the use of the technology. This relationship plays a significant role in the return on RPA investment.

5.5 Division of labour

Division of labour is focused on allocating tasks among community members, in which subjects undertake responsibilities (Iyamu, 2021). There are many tasks that are often associated with the implementation of RPA in an organisation. These tasks include gathering requirements, translating of the specification, business and IT alignment, and network configurations. These tasks are not automated but carried out by humans. Also, the execution of these tasks requires specialised skill sets. This is another fundamental reason RPA is inseparable from the human workforce. However, the division of Labour for RPA implementation is rarely defined in many organisations, leading to confusion and lack of synergy (Lacity & Willcocks, 2016). The confusion arises from the lack of distinctive deliverables among community members, particularly between IT and business units (Osmundsen et al., 2019). Another attribute to this challenge is changes to organisational business processes and structures, making people uncomfortable and persuasive to oppose change (Kamat, 2019). This is a challenge that causes the most threat and fear of RPA, which sometimes leads to pushback or rejection of RPA by some employees (Kumar, 2020).

5.6 Object

The future of work, as discussed by Lacity and Willcocks (2016) that these robots would read texts and emails and interpret them. This leads to the understanding that no errors will occur, which leads to higher accuracy once RPA is implemented in the organisation (Wewerka & Reichert, 2020). Programming skills are not required, and the drop and drag mean that the person using this software can create the outcome necessary to produce the result required (Crosman, 2018).

Experience in RPA is very important. In their article, Schlegel and Kraus (2021) discuss several areas where the workforce might require expertise, such as programming skills, Artificial Intelligence or machine learning experience, and experience in the field where RPA is being implemented. These authors argue that the company must determine the necessary skill set beforehand to make the implementation successful. Patri (2021) agrees that there is a lack of experienced staff with RPA expertise. Eikebrokk and Olsen (2019), in their study, did not show any significant dismissals. However, Figueiredo and Pinto (2020), on the other hand, stated that staff members who could not adapt to these changes, they were also offered severance and early retirement packages.

6. Conclusion

This study explored how the RPA can be innovatively and creatively adopted as a necessary 'evil' rather than the contrary. The use and adoption of RPA in most organisations have created conflict between the technology and the workforce. No studies have focused on understanding how RPA has created fear of unemployment and how that fear can be handled by organisations adopting RPA. Various studies have disclosed the fear amongst the workforce at the mention of RPA. However, no empirical evidence exists to prove the unemployment caused by RPA.

The six ANT tenets were used to understand the implication of RPA within the financial institution and how that causes a conflict of interests. There seems to be no clear indication of how financial institutions aim to create common ground and balance between the workforce and the RPA. This could result in most financial institutions still figuring out how to harmonise the workforce and RPA. The use of automation is evolving, and the need for the workforce to upskill to stay relevant in organisations is not negotiable. RPA is highly beneficial in sectors with mundane tasks, such as the financial sector. Organisations are reaping the benefits of RPA and are not vexed with finding a solution and balance between RPA and the workforce.

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