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BENEFITS REALISATION OF ROBOTIC PROCESS AUTOMATION (RPA) INITIATIVES IN SUPPLY CHAINS

Ashani Piyatilake[1], Imesha Denagama Vitharanage[2], Mavin De Silva[3], Amila Thibbotuwawa[4]
[1,4]Center for Supply Chain, Operations and Logistics Optimization, University of Moratuwa, Sri Lanka
[2]Queensland University of Technology, 2 George St, Brisbane City QLD 4000, Australia.
[3]Extreme Energy-Density Research Institute, Nagaoka University of Technology, Nagaoka, Niigata, Japan.
ashanipiyatilake@gmail.com, imesha.vitharange@gmail.com, s225063@stn.nagaokaut.ac.jp, amilat@uom.lk

ABSTRACT - Robotic Process Automation (RPA) is becoming an integral part of today's businesses that compete in more dynamic business environments as it helps to automate rule-based, repetitive tasks. However, it is necessary to identify benefits realisation key success factors (BRKSFs) applicable for RPA initiatives, given that most of the initiatives are failures. This research aims to identify BRKSFs and hierarchical relationship between BRKSFs relevant to RPA initiatives. Research findings are conveyed as a model which shows the hierarchical relationship. According to the findings, having a clear, well-defined, and immutable process is the most significant BRKSF as its driving power over the other factors is high. Overall, the findings of this study will help researchers and industry practitioners to identify a priority order between RPA BRKSFs.

Keywords: Process Improvement Initiatives; Robotic Process Automation; Benefits Realisation Key Success Factors; Supply Chains

1. INTRODUCTION

Business Process Improvement (BPI) involves improving existing business processes to optimize processes. The literature study conducted by Piyatilake et al.[1] shows that BPI initiatives vastly improve end-to-end supply chain processes. Nearly 20% of company processes provide 80% of improvement potential. The remaining 80% of processes do not have the potential to go for full improvements based on automation, such as Enterprise Resource Planning (ERP) systems implementations. Therefore, the incorporation of low-cost improvement methods is vital to remove inefficiencies in the remaining 80% of processes. Robotic Process Automation (RPA) is a low-cost, digital transformation-based BPI method that uses software robots to automate rule-based and repetitive manual tasks [2], [3], [4]. RPA is becoming an integral part of today's businesses that compete in more dynamic business environments as it helps to replace white collar jobs easily [3].

In the first phase of this research, a Structured Literature Review (SLR) was conducted to identify the existing studies that discuss the benefits, benefits realisation key success factors and challenges of supply chain process improvement initiatives [1]. Findings of this SLR showed a prevailing research gap for comprehensive research that discusses the benefits realisation key success factors of supply chain RPA initiatives. Furthermore, as Nitin [5] stated, a study conducted by EY Global shows that nearly 30% to 50% of RPA initiatives fail, which implies the necessity of identifying and facilitating benefits realisation key success factors (BRKSFs) when taking RPA initiatives.

Hence, this study intends to provide implications on BRKSFs of supply chain RPA initiatives under the following three Research Objectives (ROs): (RO1) Identify the benefits realisation key success factors (BRKSFs) which contribute for RPA initiative success under the supply chain context, (RO2) Identify

the hierarchical relationship among the RPA BRKSFs, (RO3) Identify BRKSFs that are relatively most significant for RPA initiative success.

2. METHODOLOGY

RO1: At the end of the first phase of this study which is SLR, 22 BRKSFs were identified as the common critical success factors that are applicable for supply chain process improvements [1], [6]. Secondly, a survey was conducted to identify the most impactable 15 factors (Factors in Figure 1) for supply chain RPA initiatives. The survey sample comprised with RPA team leaders and team members who are involved with RPA initiatives. Most of the experts involved in the survey have at least three years of experience in both supply chain and RPA disciplines.

RO2 and RO3: Interpretive Structural Modelling (ISM) and Cross-Impact Matrix Multiplication Applied to Classification (MICMAC) analysis were conducted to find the relationships between the above-identified 15 factors. Pairwise comparison responses were collected from 5 experts comprised with RPA team leaders and RPA team members involved with supply chain RPA initiatives. The analysis output was validated using the opinions of another 17 experts. Most of the experts involved in this step have at least three years of experience in supply chain and RPA disciplines.

3. RESULTS AND DISCUSSION

3.1. Relationships between factors and most significant factors

According to the analysis output, aligning the objective of the RPA initiative with the organisation's strategic objectives, choosing the right process for automation, and change management are weak drivers but strongly depend on other factors. Thus, these factors are at the top level of the ISM hierarchy. Prioritizing the benefits that can be gained through the RPA initiative, conducting a feasibility study, having a cross-functional team as the initiative team, top management involvement and support, and having an initiative team leader have strong driving powers as well as strong dependence powers. Thus, these factors are at the middle level of the hierarchy. Furthermore, having clear and well-defined processes is at the bottom level of the ISM hierarchy, indicating a strong driving power and weak dependence power. However, MICMAC analysis which divides factors into four categories based on their driving and dependence powers, shows that there are no autonomous factors. It implies that there are no factors with both weak driving and weak dependence powers. Furthermore, the ISM model in Figure 1 shows the flow of relationships between 15 benefits realisation key success factors.

4. CONCLUSION

In conclusion, this research provides insights for researchers and industry practitioners about the factors that must be facilitated to realize target benefits from RPA initiatives. At the end of the analysis, having clear, well-defined and immutable processes was found as the most independent factor. Therefore, it is located at the bottom level of the ISM model. Therefore, it can be interpreted as the most important factor among 15 factors due to its driving capability of other factors. Software robots in the RPA technique follow rule-based and repetitive tasks. Thus, it is required to make the background clear by making processes clear, well-defined and immutable [6]. However, it is important to note that, the researchers of this study decided to shortlist and limit the number of BRKSFs for the ISM-MICMAC analysis considering the convenience of respondents and time constraints. Furthermore, exploring the benefits of realizing key success factors through case studies can be identified as a future research direction.

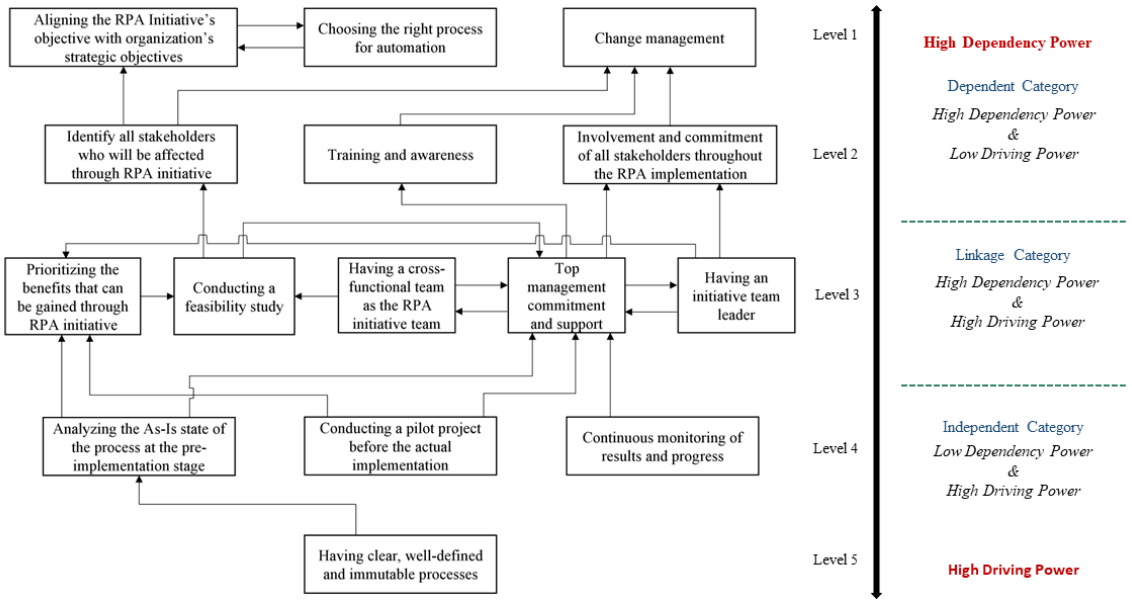

Figure 1. Hierarchical Relationship Model (ISM-MICMAC Analysis Output)

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