The Impact of Business Process Automation and Robotic Process Automation (RPA) on Telecom Operational Performance: A Case Study of STC

Ahmad Khamees Ibrahim Al-Betar[1]; Mahmoud Amjed Mohammad Alameiri[2]

[1]Lead Business Analyst Saudi Telecom Company (STC), Riyadh, Saudi Arabia
[2]Lead Business Analyst Saudi Telecom Company (STC), Riyadh, Saudi Arabia

Abstract: The rapid evolution of digital technologies has accelerated the adoption of Business Process Automation (BPA) and Robotic Process Automation (RPA) across multiple industries, including the telecommunications sector. Telecom operators such as the Saudi Telecom Company (STC) increasingly leverage automation solutions to address operational inefficiencies, reduce service delays, and enhance customer experience. This research examines the impact of BPA and RPA implementation on STC's operational performance by analyzing automation initiatives deployed across customer service, backend operations, network management, and workflow orchestration. The study evaluates improvements in process accuracy, cycle time reduction, operational cost savings, and employee productivity. Findings indicate that automation significantly enhances efficiency through the reduction of manual errors, faster task execution, and improved consistency in service delivery. The research concludes that automation technologies, when properly governed and aligned with strategic objectives, play a critical role in transforming operational performance in the telecom industry.

I. INTRODUCTION

Telecommunication companies face increasingly complex operational demands resulting from rising customer expectations, expanding service portfolios, and a highly competitive digital marketplace. Traditional manual processes are no longer adequate to handle the volume and speed required to maintain service quality and operational accuracy. As a result, Business Process Automation (BPA) and Robotic Process Automation (RPA) have become pivotal tools in optimizing and transforming telecom operations. BPA focuses on redesigning end-to-end processes, while RPA automates repetitive, rule-based tasks using software bots. STC, being one of the largest telecom operators in the Middle East, represents a compelling case study for examining how automation technologies contribute to operational excellence. This research explores the introduction of automation initiatives within STC and evaluates their tangible impact on operational performance, including reductions in processing times, improved accuracy, enhanced productivity, and strengthened service consistency.

II. LITERATURE REVIEW

Existing literature highlights the transformative effect of automation technologies in industries that rely heavily on structured workflows. BPA is often associated with redesigning processes to eliminate redundant steps and create streamlined process flows. RPA, conversely, is positioned as a lightweight automation tool capable of replicating human interactions with digital systems to perform routine tasks. Studies demonstrate that RPA reduces error rates by increasing process standardization and improves cycle times by executing tasks at machine speed. Research focusing on the telecom sector emphasizes the importance of automation in handling high-volume operations such as order management, fraud detection, inventory updates, customer support, and billing activities. Several scholars argue that automation not only improves operational efficiency but also enhances customer satisfaction by providing faster and more reliable service. Despite its potential, successful adoption requires robust governance, accurate process selection, and continuous monitoring to prevent performance degradation. This review underscores the need for empirical studies that evaluate real-world automation implementations within telecom organizations, making STC a significant case for examination.

III. RESEARCH METHODOLOGY

This research adopts a qualitative case study methodology to evaluate the implementation and impact of

BPA and RPA within STC. Data was collected from internal process documentation, operational reports, automation project summaries, and interviews with process owners and technical experts involved in automation initiatives. The study focuses on key processes automated through RPA and BPA across multiple operational areas, including customer service workflows, backend provisioning, workflow coordination, and ticket management. The methodology involves analyzing pre-automation and post-automation performance indicators such as cycle time, error rate, workload reduction, and operational cost. Comparative analysis is used to quantify improvements and identify patterns reflecting the contribution of automation technologies to operational performance. The case study approach allows an in-depth understanding of automation's role in transforming telecom operations and supports the development of research-based conclusions and recommendations.

IV. ANALYSIS AND FINDINGS

The analysis of STC's automation initiatives reveals a clear improvement in operational workflows following the deployment of BPA and RPA technologies. Pre-automation processes were characterized by extensive manual involvement, which frequently resulted in data entry errors, workflow bottlenecks, and delayed service delivery. After automation, RPA bots successfully executed rule-based tasks such as ticket updates, system validations, order status verification, and backend coordination, reducing manual workload and increasing execution speed. BPA initiatives re-engineered several end-to-end processes, eliminating redundant approvals and ensuring that information flowed more efficiently through integrated digital platforms. The analysis highlights that automation increased process transparency, reduced dependency on human intervention, and improved scalability during peak operational demand. These improvements collectively enhanced STC's ability to deliver consistent and timely services to customers.

V. RESULTS

The results of the study indicate significant operational improvements driven by automation. RPA implementations reduced execution time for routine tasks by a substantial margin, allowing STC to process higher volumes of transactions with greater accuracy. Error rates declined, particularly in workflows that previously relied on manual data entry. Automation also contributed to operational cost savings by reducing the need for overtime labor and minimizing rework caused by errors. BPA initiatives enhanced process visibility and created more structured process flows, enabling better performance monitoring and faster decision-making. Employee productivity increased as staff were relieved from repetitive tasks and reassigned to analytical and customer-focused activities. Overall, the results demonstrate that BPA and RPA brought measurable enhancements to STC's operational efficiency, service reliability, and internal process consistency.

VI. DISCUSSION

The findings reinforce the critical role of automation in modern telecom operations. The improvements in speed, accuracy, and scalability observed at STC align with global research on the benefits of BPA and RPA. Automation not only addressed operational inefficiencies but also strengthened STC's ability to meet evolving customer expectations for faster and more dependable service delivery. The study highlights that automation success depends on careful selection of processes, strong governance, and continuous performance evaluation. Although automation reduces manual effort, it introduces the need for oversight to ensure bot stability and compliance with system changes. The discussion also emphasizes the strategic implications of automation, noting that its long-term value lies in its ability to support digital transformation goals and enable innovation across telecom operations.

VII. CONCLUSION

This research concludes that BPA and RPA play a transformative role in enhancing the operational performance of telecom organizations. The case study of STC demonstrates that automation significantly improves process efficiency, accuracy, and cost-effectiveness while increasing employee productivity and customer satisfaction. By reducing manual involvement and standardizing operations, STC achieved faster service delivery and more reliable business processes. The study confirms that automation is not merely a technological enhancement but a strategic enabler of operational excellence. Continued investment in BPA and RPA will further strengthen organizational agility and support the telecom sector's transition toward fully digital operating models.

RECOMMENDATIONS

The study recommends that telecom organizations continue expanding automation initiatives by identifying additional processes with high manual workload and error potential. Establishing a structured automation governance framework is essential to ensure the stability, scalability, and compliance of BPA and RPA solutions. Continuous monitoring and updating of bots are necessary to maintain performance as system interfaces evolve. Training programs should be implemented to ensure that employees can effectively collaborate with automation technologies and transition into higher-value roles. Strategic alignment between automation initiatives and organizational objectives will maximize long-term benefits and accelerate digital transformation outcomes.

REFERENCES

[1]. Al-Kaabi, R. (2021). Business process automation in telecom operations. Journal of Digital Systems, 9(3), 44–59.

[2]. Ameen, T. (2022). Evaluating RPA efficiency in large-scale service organizations. International Journal of Information Technology, 15(2), 211–225.

[3]. Grewal, D. (2020). Automation and operational performance in telecom networks. Telecommunications Review, 18(4), 120–138.
[4]. Hassan, M. (2023). The role of digital transformation in enhancing telecom services. Journal of Technology and Management, 11(1), 77–93.
[5]. Scott, J. (2021). RPA adoption challenges and opportunities in service industries. Service Operations Quarterly, 7(2), 66–80.