

A Moderated Mediation Model of RPA Implementation Impact on HRM Efficiency: An Analysis in the Indian BFSI Sector

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Abstract

Robotic Process Automation (RPA) is transforming Human Resource Management (HRM) by automating repetitive administrative tasks, driving efficiency, scalability, and operational sustainability. In the Banking, Financial Services, and Insurance (BFSI) sector, RPA ensures sustainable growth through cost efficiency, compliance, accuracy, and seamless integration with artificial intelligence (AI). This paper examines the sustainable impact of RPA in HRM within BFSI, addressing key use cases such as employee relations, recruitment, training, payroll, and benefits administration. BFSI-specific applications further include accounts payable, collections, customer service, credit processing, underwriting, and compliance management. The study relies on the UTAUT, TOE and TFF models, and concludes that mere implementation of RPA does not enhance the HRM efficiency, rather efficient RPA methods significantly contributes towards efficiency of the human resource management.

Keywords: Robotic Process Automation; Human Resource Management; BFSI; Mediation Analysis; SEM.

1. Introduction

The public, academic, and corporate sectors around the world are paying a growing amount of interest to the concepts of sustainability (Patrício et al, 2023). The goal of robotic process automation (RPA) is to automate rule-based process tasks in order to lower process costs and increase process efficiency. Owing to business process automation's paramount significance in the industry, RPA is also garnering more and more interest in academia (Wewoka & Reichert, 2023). Robotic Process Automation enables the automation of repetitive processes. RPA aims to substitute the productivity and dependability of virtual automation technologies for repetitive, error-prone physical labour (Rao & Mookerjee, 2021). RPA can enhance Human Resources (HR) data management. RPA automates rule-based, transactional HR operations that do not need human participation (Rajkhowa & Joshi, 2020). Software robots conduct high-volume, repetitive HR activities using RPA. These include onboarding new personnel, processing payroll, benefits enrolment, employee well-being, employee training, development, and compliance reporting. RPA can reduce HR-related expenses and improve data processing accuracy and speed. HR in every firm plays a crucial role in assisting employees and enriching the workplace environment to do their jobs well (Mer & Viridi, 2022). The vast volume of data management form filling, updating & verifying information, and request processing – immerse HR managers in administrative work. Human Resource Automation allows firms to substantially reduce tedious procedures by automating repeated operations, freeing HR professionals to focus on more productive and strategic duties for corporate growth (Willcocks et al., 2017). RPA in HR operations focuses on micro-tasks, combining activities that huge legacy systems could not. RPA can

change the HR business by improving efficiency and boosting employee standards. As a non-invasive technology, RPA works in the background without human attention (Anagnoste, 2018). BFSI are the major customers of the IT industry. RPA mostly automates tasks rather than entire processes. Robotics is a breakthrough field in HRM and BFSI that will make work speedier and more accurate. To deploy RPA in a process, an appropriate process model must be established (Mohamed et al., 2022). This paper investigates the sustainability of Robotic Process Automation (RPA) in Human Resource Management (HRM) within the Banking, Financial Services, and Insurance (BFSI) sector. It evaluates RPA's transformative role in automating repetitive, rule-based processes to enhance efficiency, accuracy, and compliance.

The study is structured as follows: Section I introduces the research topic; Section II presents a detailed literature review, identifying gaps in understanding RPA's sustainable impact on HRM in BFSI; Section III outlines the research methodology and data analysis techniques addressing key research questions; Section IV discusses the analysis and discussion, and Section V concludes with insights into RPA's long-term sustainability and future potential, along with policy recommendations and future scope.

2. Review of Literature

2.1. Artificial Intelligence and Robotic Process Automation

In smart cities, the integration of AI and RPA technology improves service delivery, expedites administrative procedures, and permits data-driven decision-making. Through resource optimisation, better environmental management techniques, and increased climate change resistance, AI and RPA support sustainable development goals. Cities can fully utilise AI and RPA to create smarter, more resilient, and sustainable urban environments for all citizens by implementing comprehensive strategies, encouraging stakeholder engagement, and embracing an innovative culture (Venigandla et al., 2024).

Since the magnitude of the resulting value of decision support models for the implementation of RPA does not aim at the integration of three pillars of sustainability, the topic of how to implement RPA sustainably is expansive and of great interest to researchers (Patrício et al, 2023). Software robots can be created with RPA to perform repetitive and rule-based tasks by emulating human actions and interacting with different applications, systems, and data sources. Businesses can improve operational efficiency, lower errors, and reallocate resources to higher-value tasks by utilizing software robots to handle repetitive tasks (Kundurur, 2023).

RPA technologies have matured over the past five years and are now significantly influencing the banking and financial services sector. Every part of the banking value chain may benefit from these technologies, from client acquisition and onboarding through loan processing, deposit management, and investment management (Mookerjee, 2021). Fintech has witnessed rapid growth in recent years. India's active population and literacy levels will continue to climb rapidly over the next two decades. The firm must excel in serving the wants of a higher percentage of the population in India (1.3 billion people). Even if the specialized items are successful, they will have to decide if their target market will accept their pricing or if they will fade away quickly (Albastaki, 2021; Mookerjee & Rao, 2021a, 2021b). Financial institutions may avoid money laundering efforts by properly adopting evolving digital technology into their financial processes, which will reduce the overall amount of illicit conduct and eventually benefit society (Javor, 2020). The adoption of technologies varies significantly across sectors. Robotic Process Automation (RPA) has emerged as a sustainable, cost-effective solution, enabling end-to-end automation of standardized banking processes. Its seamless integration with workflow systems has driven widespread acceptance in the banking sector. In contrast, the adoption of advanced AI technologies—such as machine learning, image processing, and natural language processing—has been slower. However, major banks are now investing heavily in AI to enhance operational efficiency. As a disruptive force, RPA accelerates the automation of digital and

manual tasks, sub-processes, and entire workflows, fostering sustainability and innovation in banking operations. Robotic process automation, as opposed to other automation technologies, is thin-client and simulates human behaviour by interacting with IT systems only at the presentation layer (Herm, et al., 2023).

2.2. Robotic Process Automation in Human Resource Management

Disruptive technologies like Artificial Intelligence (AI), Robot Process Automation (RPA), and the Internet of Things (IoT) have drastically altered how HR procedures are managed in contemporary corporations. Administrative tasks like issuing IDs, approving access requests, and setting up orientations for new hires have been aided by RPA and AI systems. Additionally, it is capable of managing orientation meetings, sessions, programs, and documentation verification. HR is also greatly impacted by RPA in the area of training and development (Hirwe et al., 2023).

Chat-bots that use Ui-Path to automate HR tasks have been developed to support HR personnel and expedite communication with employees. The RPA has automated several HR tasks, including the hiring process, onboarding, and work distribution. Since the chat-bots are hosted by different corporate entities, significant effects have been observed, unleashing disruptive digital transformation. Routine HR tasks now require, on average, 80% less time and effort and 60% less money to complete (Nedumaran et al., 2023).

Trivedi and Pillai (2020) study the discovery and significance of digital transformation in human resources management and how HR departments use RPA Gupta et al. explain that 96% of recruiters say technology makes recruiting better, quicker, and cheaper. Recruiters believe technology might help them predict employee turnover (Gupta et al., 2018). Avliotis (2019) discusses that RPA can transform financial services and manufacturing by reducing human errors, fraud, and waiting time. Stanley & Aggarwal (2019) speak those innovative technologies make HR user-friendly and efficient. It is essential and changes HR's functioning. Organizations need disruptive technologies. Disruptive technology reduces costs and boosts profits. A focus on automating business processes using AI, and RPA will be the next big game-changer in business. RPA will serve as the first step in a long-term roadmap for robotic automation and the evolution of robotics (Kaya et al., 2019). Using both may reduce repetitive duties on a corporate, organization, and personal level of work. One can see how RPA may bring back work previously done outside the organization. However, using RPA to reverse outsourced labour should not be assumed to be a panacea for every problem (Kosonen & Lappi, 2020). It is becoming increasingly common for leading human resources and talent management firms to implement a digital transformation strategy. Moreover, when HR departments push for an automation-first strategy to improve competitiveness, they become strategic agents of change in a business (Sebel, 2020). The possibility to conclude that the incentives for utilizing RPA and outsourcing might be comparable, especially regarding intellectual intensive supporting services (Poornima & Chitra, 2020).

Gharia et al (2020) explain that anxiety, autonomy, and job control had little influence on the employees' life orientation. This affects the employees' work attitude, which affects their work-life balance. RPA adoption is stymied by employees and managers with various views of RPA, resulting in management either not believing in RPA or having excessive expectations (Taşdoğan, 2021). RPAs need to be designed and implemented so that employees' usage is more widely accepted, and these variables are used to make recommendations for how to do so (Wewerka & Reichert, 2021). Administrative operations traditionally performed by administrative workers are now being automated as part of the digital revolution (Watai, 2021). Views on the link between technology and HRM may be skewed due to creating a response pool (Saukkonen et al., 2019). HR analytics is regarded as a vital component. Resignations and poor performance may be traced back to certain patterns fed into AI systems to improve the accuracy of future forecasts (Samarasinghe & Medis, 2020).

Organizations undergoing digital transformation must assess their personnel's skills and capabilities. The consulting industry's growing roles raise concerns about the permanence and difficulty of acquiring necessary skills. Emphasizing sustainability, this assessment ensures successful implementation and adaptation to change (Schlegel & Kraus, 2023).

Performance reviews and HR analytics should be stored in a common repository for AI algorithms to enhance applicant selection. SHRM must analyze which elements to automate with RPA, ensuring alignment with strategic plans. Emphasizing sustainability, this approach streamlines operations and improves efficiency (Pradhan & Saxena, 2023).

With the favorable influence of AI on HRM operations, there is still a large gap between the required pace of sourcing, screening, interviewing, and selection. HR managers know their employees and their relationships in ways that Artificial Intelligence programming does not (Vashisht et al., 2021). Saxena et al. (2021) study that industry 5.0 will undoubtedly bring new levels of efficiency and personalization to the workplace. Modern HRM will certainly lead the organization to new heights and beyond. The concerns raised may be explored further through conversation, study, and testing.

In Human Resource Management (HRM), sustainability transcends environmental concerns to encompass social and organizational sustainability. As businesses adapt to diverse, remote, and hybrid workforces, RPA emerges as a sustainable enabler of workforce efficiency and agility. By automating repetitive tasks—such as payroll processing, recruitment screenings, and benefits administration—RPA minimizes resource consumption, cuts costs, and reduces organizational waste. RPA fosters social sustainability by freeing HR teams to focus on building inclusive, well-being-centered workplace cultures while improving data accuracy for better talent management and reduced turnover. It supports long-term organizational sustainability by optimizing processes, enhancing scalability, and enabling eco-friendly, paperless operations. As sustainability pressures mount, RPA will drive greener, socially.

2.3. Robotic Process Automation in Banking, Financial Services and Insurance Sector

The financial sector's robotic process automation market was valued at \$340.95 million in 2020 and is expected to grow by 30% between 2021 and 2030, reaching \$4,883.41 million (Sonik et al., 2024). Financial institutions use robotic process automation (RPA) for a variety of labor-intensive and time-consuming tasks, including information retrieval, credit card, mortgage, and ongoing services. RPA's advancement is quickly reducing the need for a large workforce for these procedures. The implementation of Robotic Process Automation (RPA) can enhance process efficiency, reduce loan operating time, and give the bank more analyst capacity for customer service by evaluating automated results and assessing complex loans that were previously unmanageable (Shidaganti et al., 2023).

Credit scoring, underwriting, and risk management techniques have all been transformed by RPA. Loan approval procedures have been accelerated by predictive analytics and automated underwriting systems, and risk assessment models use AI to make well-informed conclusions based on a variety of data sets. Robotic Process Automation (RPA) has reduced operational costs and reduced errors in everyday jobs by automating processes (Periasamy et al., 2024).

Computer program applications known as robotic process automation (RPA) bots are used in the business world to provide corporate client service. RPA application processes operate like a well-oiled machine, providing clients with a constantly updated helpdesk resource. RPA is a sage worker in and of itself. Instead of managing employees, RPA is used to handle customer assistance, much like HR information systems. Keeping track of every customer takes a lot of time during business hours. RPA handles visa expiration notifications, investment maturity date notifications, and electronic signature tracking for clients (Narasimhan, 2023).

Predictive and prescriptive analytics play a significant role in the stock market and the insurance industry (Ravi & Kamaruddin, 2017). Automating BSFI's operations will change the industry, but it will also serve as a renovation to keep up with modern, technologically advanced society (Gulhane &

Gulhane, 2019). An appropriate tool should be picked after the process selection. The top three RPA tools are Automation Anywhere, UiPath, and BluePrism. It is important in insurance and banking businesses since it supports front and back-office automation (Khan, 2020). Centralization of operations and faster turnarounds in areas like loan processing or selling financial goods have been implemented by Axis Bank, ICICI Banks, HDFC Banks, and other financial institutions (Shenoy & Aithal, 2020). A few recommended practices should be followed for RPA installations to have these good benefits for banks (Carmo, 2020). Indian private banking businesses are urged to acquire crucial life qualities such as tolerance, endurance, resilience, tenacity, and persistence (Lioliou, 2020). The banks may use RPA for data entry, which will reduce employees' workload and help improve overall operational efficiency, which will help them increase their Return on Investments and maintain their position in a highly competitive environment (Menon & Aslekar, 2021). Digital transformation and new business models with E Collaborations between conventional banks and businesses and Fintech are the future of any global economy (Bhasin & Gulati, 2021). Last but not least, the future of robotics in banking is bright. Banks will have fewer clients and employees in a few years but stronger relationships. Robots can help people operate more efficiently by storing data and collaborating. AI's impact on the Indian BFSI industry represents a paradigm shift, where cutting-edge technologies and financial acumen combine to change how services and operations are conducted. Routine and rule-based jobs are automated by AI-driven bots, which lowers operating expenses and minimises data inaccuracies. AI-powered robo-advisors offer automatic, customized investing recommendations according to each user's risk tolerance and financial objectives and activities related to processing and compliance (Periasamy et al., 2024).

The worldwide development gap is expected to widen in the years when AI drives some regions of the world and others are based on human capital (Beerbaum, 2021). Controversies about the automation of administrative jobs will need to be addressed in future research and development (Lindgren, Toll, & Melin, 2021). An expert team of change management, innovation, or technology professionals might explore what technologies best match a business and how this affects the organization's dynamics. Finally, organizations should constantly take advantage of opportunities to learn about technologies, software, systems, and personal development to minimize or alleviate technological gaps (Scholte Lubberink, 2021). Recent research and studies have explored the possibility of robotic systems taking the place of human employees and workers in some industries. Future academic studies might examine the efficacy and significance of HRM functions in the banking industry's digital transformation path (Latif, Mahmood, & Ali, 2020). RPA is a novel technology that has not been fully researched.

RPA has been used in HR departments worldwide, resulting in a 40 per cent reduction in time and increased staff productivity (Al Balushi & Goel, 2019). The research focuses on several use cases of RPA usability, acceptance, and adoption of RPA in the BFSI domain under HRM.

The BFSI industry's global operations have historically consumed significant resources and impacted the environment. Financial institutions face pressure to reduce their footprint, particularly in paper-heavy documentation and energy-intensive data centers. Sustainability can be achieved through RPA by automating processes, reducing paperwork, and lowering energy usage, thereby cutting carbon emissions and aligning with global standards.

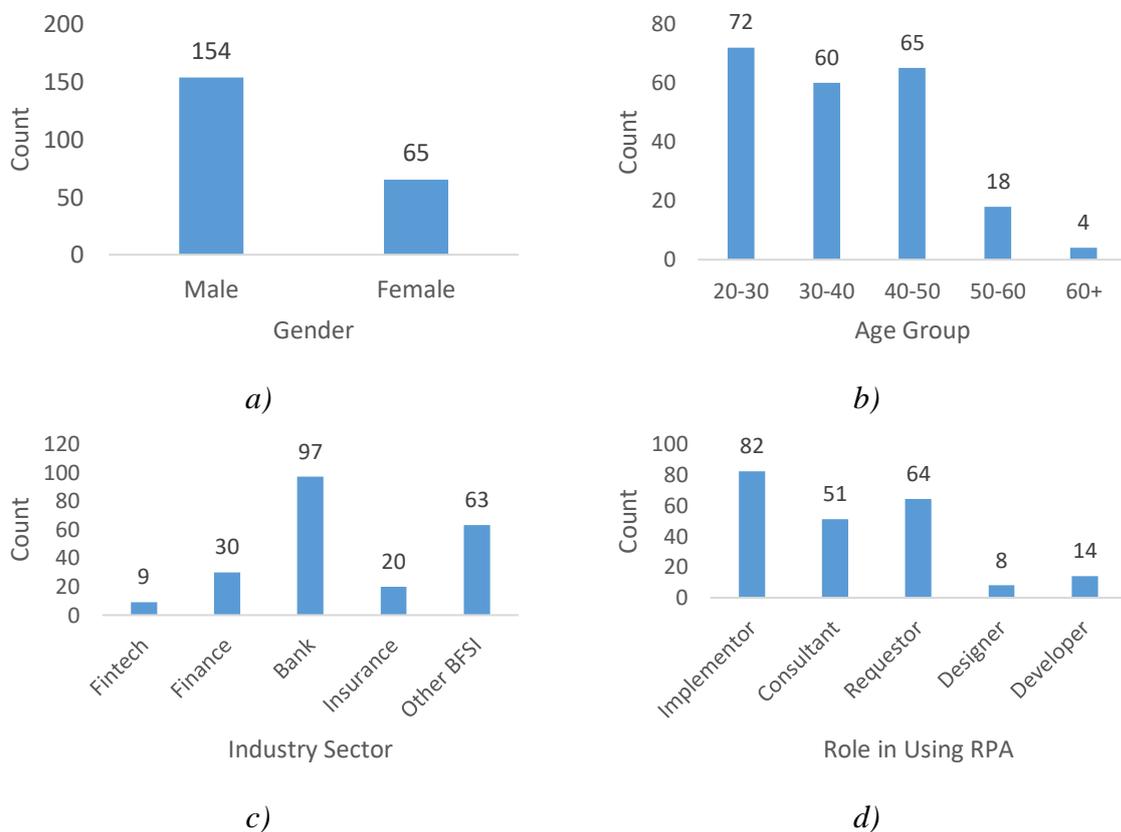
By 2025, as regulatory bodies demand greater corporate responsibility, RPA will be vital in meeting sustainability targets while maintaining efficiency. Automation will help banks and insurance companies reduce waste, optimize resource management, and enhance energy efficiency. RPA's ability to streamline compliance processes will ensure institutions meet environmental and regulatory requirements without additional human resources. Balancing operational efficiency with sustainability will be crucial in the future competitive landscape.

3. Methodology

3.1. Data

The data was collected using questionnaires distributed among current BFSI employees in India. Primary data feedback from 219 employees in government and private BFSI HRM departments is collected and analyzed. A quantitative survey is carried by creating a questionnaire using Likert five point scaling system (Vaske et al., 2017) to learn the challenges and impact of RPA in HRM use cases. The demographic and Industry Profile of the respondents are shown in Figure 1-3. It can be observed that regarding gender profile, maximum respondents were males (~70%) and females constituted about 30% of the sample (Figure 1a). Regarding age group, maximum respondents were between age group 20-30 to 40-50, indicating that respondents were young-middle aged (figure 1b). Maximum respondents belonged to banking (~44%) and other BFSI (~29%) (Figure 1c). Most of the RPA users were implementers, consultants and requestor. The maximum were from implementer (~37%) and requestor (~29%) category.

Figure 1. Demographic/Industry Profile of respondents



Source: Researcher's Computation.

3.2. Variables Construction

The average values of the responses were used to compute the variables related to RPA development, RPA acceptance, RPA efficiency, HRM efficiency improvement. Table 1 shows the inclusion of variables in the said constructs.

Table 1. Variables Used under Study

Construct	Variable	Code	Type			
RPA Adoption	RPA Development and Implementation	RPADEV	Independent			
RPA Implementation						
RPA Training						
RPA Development Automation						
RPA Development Optimization						
RPA Acceptance	RPA Acceptance	RPAACC	Mediator			
RPA Efficiency in Employee Hiring	RPA Efficiency in HRM	RPAEFF	Mediator			
RPA Efficiency in Employee Management						
RPA Efficiency in Employee Learning						
RPA Efficiency in Talent Management						
RPA Efficiency in HRM Laws and Policies						
RPA Efficiency in Organization Compliance						
RPA Efficiency in Exit Management						
RPA Efficiency in Shared Service Model						
BFSI Sector				Sector	SEC	Moderator
RPA Efficiency in Leadership				HRM Efficiency Improvement	HRMEFF	Dependent
RPA Efficiency in Employee Benefits						

Source: Researcher's Compilation.

3.3. Theoretical Model and Hypotheses Development

The present study aims to understand the impact of RPA development & implementation (RPADEV) on overall HRM efficiency (HRMEFF), through mediation of RPA development and implementation (RPADEV), RPA efficiency in HRM (RPAEFF) and BFSI specific sector (SEC). The hypothesis developed in the present study shall be based on some existing empirical models such as Technology-Organization-Environment (TOE) Framework (Tornatzky et al., 1990), Task-Technology Fit (TFF) Theory (Goodhue & Thompson, 1995) and the most famous Unified Theory of Acceptance and Use of Technology (UTAUT) Model (Venkatesh et al., 2003). **RPA Acceptance** and **RPA in HRM efficiency** denotes the technological factor, **RPA development and implementation** denotes the organizational factor, and **sector** influences the environmental factor. The impact on HRM Efficiency based on TOE model is assessed using the following hypotheses:

H_{1a} : RPADEV has a significant positive impact on RPAEFF

H_{1b} : RPADEV has a significant positive impact on RPAACC

H_{2a} : SEC significantly moderates the relationship between RPAEFF and RPADEV

H_{2b} : SEC significantly moderates the relationship between RPAACC and RPADEV

H_{3a} : RPAEFF has a significant positive impact on HRMEFF

H_{3b} : RPAACC has a significant positive impact on HRMEFF

The Task-Technology Fit (TFF) model states that technology adoption improves HRM efficiency.

The following hypotheses along with H_{3a} and H_{3b} is necessary to be tested:

H_{4a} : SEC significantly moderates the relationship between RPAEFF and HRMEFF

H_{4b} : SEC significantly moderates the relationship between RPAACC and HRMEFF

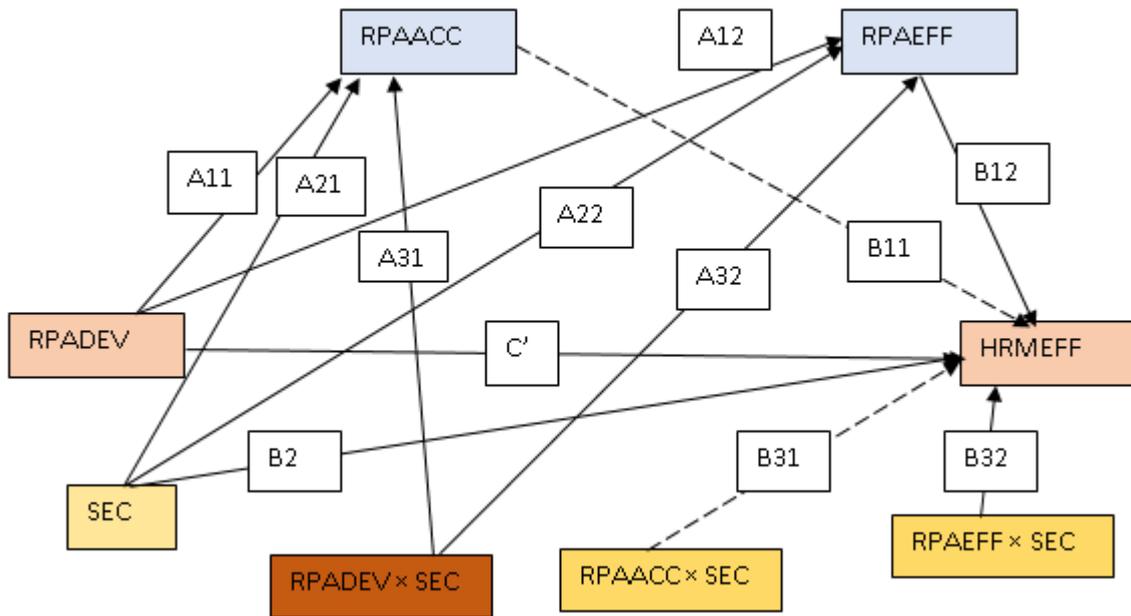
The Unified Theory of Acceptance and Use of Technology (UTAUT) model states that the efficiency is not improved by mere acceptance, rather use and adoption of technology improves the efficiency of the concern. Hence, following UTAUT model, the following hypotheses is developed:

H_{5a} : RPAEFF significantly moderates the relationship between RPADEV and HRMEFF

H_{5b} : RPAACC does not significantly moderates the relationship between RPADEV and HRMEFF

Hypothesis 5a states that RPA in HRM improves the HRM efficiency, whereas mere acceptance does not play a direct role in improving HRM efficiency. The theoretical model is represented by figure 2. The dashed lines represent proposed insignificant relationships as supported by UTUAT model.

Figure 2. Theoretical Model



Source: Researcher’s Compilation Adopting Hayes (2013).

3.4. Empirical Model

The empirical model for testing the mediating effects is modelled by (1) and (2). Model (3) shows the full impact of RPAEFF and RPAACC on the HRMEFF by the moderating effect of SEC.

$$RPAEFF = \beta_0 + \beta_1 RPADDEV + \beta_2 SEC + \beta_3 (RPADDEV \times SEC) + \varepsilon \quad (1)$$

$$RPAACC = \beta_0 + \beta_1 RPADDEV + \beta_2 SEC + \beta_3 (RPADDEV \times SEC) + \varepsilon \quad (2)$$

$$HRMEFF = \beta_0 + \beta_1 RPADDEV + \beta_2 RPAEFF + \beta_3 RPAACC + \beta_4 SEC + \beta_5 (RPAEFF \times SEC) + \beta_6 (RPAACC \times SEC) + \varepsilon \quad (3)$$

4. Data Analysis, Findings and Discussion

The present study finds a direct and significant relationship between HRMEFF and RPADDEV ($\beta=0.422, p<0.001$), as per table 4. This indicates that robotic process automation significantly improves HRM efficiency. The mediator models had an R-squared value of 0.815 for RPAEFF and 0.762 for RPAACC. From table 2, it is evident that RPADDEV is a significant predictor for RPAACC ($\beta=0.960, p<0.001$) and RPAEFF ($\beta=0.915, p<0.001$).

The Table 3 shows the model summary of the overall model. About 82.6% of the variation in HRM Efficiency was explained using the total model. The RPADDEV ($\beta=0.422, p<0.001$) and RPAEFF ($\beta=0.708, p<0.001$) were significantly related with HRMEFF (table 4). Table 5 shows that RPAEFF

is significantly influenced by sectors as the bootstrapped confidence limits does not contain zero for the sectors Bank, Finance and other BFSI(Hayes, 2017). Figure 3 shows the empirical model.

Table 1. Model Summary for RPA Efficiency and RPA Acceptance

Mediator	R	R ²	MSE	F	df1	df2	p
RPAEFF	0.903	0.815	0.175	315.522	3	215	0.000
RPACC	0.873	0.762	0.271	229.618	3	215	0.000

Source: Researcher's Computation.

Table 2. Coefficients for Mediators

Predictor	Mediator	β	SE	t	p	LLCI	ULCI
Constant	RPAEFF	0.403	0.221	1.826	0.069	-0.032	0.838
RPADDEV	RPAEFF	0.915	0.056	16.46	0.000	0.805	1.025
SEC	RPAEFF	-0.066	0.068	-0.964	0.336	-0.200	0.069
RPADDEV × SEC	RPAEFF	0.005	0.018	0.280	0.780	-0.030	0.041
Constant	RPAACC	0.164	0.275	0.597	0.551	-0.378	0.706
RPADDEV	RPAACC	0.960	0.069	13.878	0.000	0.824	1.097
SEC	RPAACC	-0.083	0.085	-0.978	0.329	-0.250	0.084
RPADDEV × SEC	RPAACC	0.012	0.022	0.542	0.588	-0.032	0.056

Source: Researcher's Computation.

Table 3. Model Summary for RPA Efficiency and RPA Acceptance

Outcome	R	R ²	MSE	F	df1	df2	p
HRMEFF	0.909	0.826	0.178	167.235	6	212	0.000

Source: Researcher's Computation.

Table 4. Model for HRM Efficiency

Predictor	β	SE	t	p	LLCI	ULCI
Constant	0.020	0.221	0.088	0.930	-0.417	0.456
RPADDEV	0.422	0.087	4.840	0.000	0.250	0.595
RPAEFF	0.708	0.117	6.036	0.000	0.477	0.939
RPAACC	-0.132	0.093	-1.417	0.158	-0.316	0.052
SEC	0.038	0.065	0.585	0.559	-0.091	0.167
RPAEFF × SEC	-0.023	0.028	-0.813	0.417	-0.078	0.032
RPAACC × SEC	0.017	0.025	0.680	0.497	-0.033	0.067

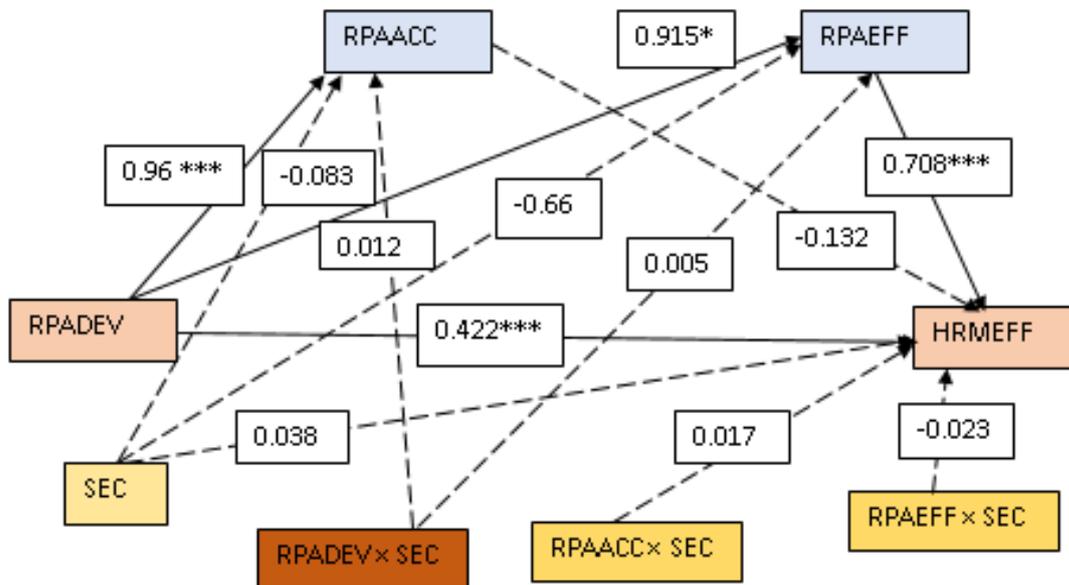
Source: Researcher's Computation.

Table 5. Conditional Indirect Effects of RPA Development and Implementation on HRM Efficiency

Mediator	Sector	Effect	BootSE	BootLLCI	BootULCI
RPAEFF	1	0.630	0.132	0.374	0.889
RPAEFF	2	0.613	0.108	0.401	0.826
RPAEFF	5	0.559	0.103	0.365	0.777
RPAACC	1	-0.112	0.097	-0.298	0.092
RPAACC	2	-0.096	0.078	-0.248	0.064
RPAACC	5	-0.047	0.111	-0.267	0.163

Source: Researcher's Computation.

Figure 3. Model Coefficients



Note: ‘***’ Significant at 0.01 level, ‘**’ Significant at 0.05 level, ‘*’ Significant at 0.1 level, ‘’ Not Significant. Dotted lines represent insignificant relationship.

Source: Researcher’s Preparation.

5. Conclusion and Recommendations

The main aim of the study was to understand the determinants of relationship between robotic process automation and human resource management within the BFSI sector in India. The study found that RPA development and implementation significantly improves HRM efficiency in Indian BFSI sector. The study concluded that RPA efficiency in HRM significantly mediate the relationship between RPA implementation and HRM efficiency. The sector specific factors indicate that sectors play a moderation role between RPA efficiency in HRM and HRM efficiency, which reinforce the importance of sectorial influences. The findings validate the theoretical foundations laid by Tornatzky et al. (1990), Goodhue and Thompson (1995) and Venkatesh et al. (2003). The study concludes that RPA adoption improves HRM efficiency primarily through its implementation, i.e., efficiency in employee hiring, training and management, along with HRM laws and practice, rather than mere adoption.

5.1. Policy Recommendations

The present study lays down the following policy recommendations to the BFSI sector in improving the efficiency of Human Resource Managers:

- 1) Investing in RPA training and development,
- 2) Sector specific customization,
- 3) RPA driven decision making,
- 4) Regulatory framework for RPA in HRM,
- 5) Improving collaboration between IT and HR teams.

5.2. Future Scope of the Study

Although the findings are significant, the present study was limited to the Indian BFSI sector and was based on self-reported survey responses. The study captures the impact of RPA at a specific point of time, which fails to capture the long-term effect. The macroeconomic trends and other technological advances were also not analyzed in the present study. Therefore, to overcome these limitations, future studies may explore the impact of RPA on HRM efficiency across various industries beyond BFSI, conducting longitudinal studies to capture the time varying effects. AI-driven decision making can also be integrated with RPA to improve the decision-making process in HRM. While the present study depends upon HR personnel, employee perspective can also be implemented to check the impact of RPA on their work experience, job roles and overall satisfaction in the organization.

References

1. Al Balushi, M., & Goel, N. (2019). The Development of Robotic Process Automation (RPA) For the Efficiency of Back Office Operations at Bank Muscat. *Journal of Student Research*.
2. Albastaki, Y. A. (2021). When Technology Meets Finance: A Review Approach to FinTech. *Innovative Strategies for Implementing FinTech in Banking*, 1-21.
3. Anagnoste, S. (2018). Robotic Automation Process–The operating system for the digital enterprise. *Proceedings of the International Conference on Business Excellence*, 54-69.
4. Avliotis, A. (2019). Business process management and robotic process automation: early deployment of a combined approach. *University of Macedonia, Thessaloniki*.
5. Beerbaum, D. (2021). Artificial Intelligence Ethics Taxonomy-Robotic Process Automation (RPA) as business case. *Special Issue 'Artificial Intelligence& Ethics' European Scientific Journal*.
6. Bhasin, N. K., & Gulati, K. (2021). A Study of the Readiness of Indian Banks to Absorb COVID-19s Impact Through New Emerging Technologies and Strategies for Competitive Advantage. *E-Collaboration Technologies and Strategies for Competitive Advantage Amid Challenging Times, IGI Global*, 50-75.
7. Brown, J. D. (2002). The Cronbach alpha reliability estimate. *JALT Testing & Evaluation SIG Newsletter*, 6.
8. Carmo, G. P. (2020). Robotic process automation: impact and best practices in portuguese banks. *Doctoral dissertation*.
9. Dax, S., Wewerka, J., & Reichert, M. (2020). A User Acceptance Model for Robotic Process Automation. *IEEE 24th International Enterprise Distributed Object Computing Conference (EDOC)*, 97-106.
10. Deloitte. (2022, June 21). *The Robots are ready. Are you?* Retrieved from Deloitte.com: <https://www2.deloitte.com/cn/en/pages/strategy-operations/articles/the-robots-are-ready.html>
11. Dinno, A., & Dinno, M. A. (2017). Package 'dunn.test'. *CRAN Repos*, 1-7.
12. Fernandez, D., & Aman, A. (2021). The influence of robotic process automation (Rpa) towards employee acceptance. *International Journal of Recent Technology and Engineering*, 295-299.
13. Figueiredo, A. S., & Pinto, L. H. (2020). Robotizing shared service centres: key challenges and outcomes. *Journal of Service Theory and Practice*.
14. Flechsig, C., Anslinger, F., & Lasch, R. (2022). Robotic Process Automation in purchasing and supply management: A multiple case study on potentials, barriers, and implementation. *Journal of Purchasing and Supply Management*, 100718.
15. Gharia, R., Narang, R., & Karnik, M. P. (2020). IMPACT OF COVID 19 LOCK DOWN ON THE EMPLOYEES' WELL-BEING: A STUDY WITH REFERENCE TO PROFESSIONALS. *PalArch's Journal of Archaeology of Egypt/Egyptology*, 2458-2472.
16. Goodhue, D. L., & Thompson, R. L. (1995). Task-Technology Fit and Individual Performance. *MIS Quarterly*, 19(2), 213. <https://doi.org/10.2307/249689>

17. Gulhane, V., & Gulhane, P. S. (2019). BFSI Sector: In the version of 21st Century. *Symbiosis Institute of Management Studies Academic Conference*.
18. Gupta, P., Fernandes, S. F., & Jain, M. (2018). Automation in recruitment: a new frontier. *Journal of Information Technology Teaching Cases*, 118-125.
19. Hafner, A. W. (1998). *Descriptive statistical techniques for librarians*. Chicago: ALA Editions, American Library Association.
20. Handa, A. (2021). Future of Work in BFSI organizations. Transformational Leadership in Banking: Challenges of Governance. *Leadership and HR in a Digital and Disruptive World*, 55.
21. Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (2nd ed.). Guilford Publications.
22. Herm, L., Janiesch, C., Helm, A., Imgrund, F., Hofmann, A., & Winkelmann, A. (2023). A framework for implementing robotic process automation projects. *Information Systems and e-Business Management*, 1-35.
23. Hirwe, S., Kashyap, A., & Patle, B. (2023). Review on Involvement of AI, RPA and IoT in Human Resource Management.
24. Hofmann, P., Samp, C., & Urbach, N. (2020). Robotic process automation. *Electronic Markets*, 99-106.
25. Javor, N. (2020). Combating Money Laundering with Digital Technologies. *University of Zagreb. Faculty of Economics and Business*.
26. Joo, B. K., & Lee, I. (2017). Workplace happiness: work engagement, career satisfaction, and subjective well-being. In Evidence-based HRM: A global forum for empirical scholarship. *Emerald Publishing Limited*.
27. Kaya, C. T., Türkyılmaz, M., & Birol, B. (2019). Impact of RPA technologies on accounting systems. *Muhasebe ve Finansman Dergisi*, 82.
28. Khan, S. (2020). COMPARATIVE ANALYSIS OF RPA TOOLS-UIPATH, AUTOMATION ANYWHERE AND BLUEPRISM. *International Journal of Computer Science and Mobile Applications*.
29. Kosonen, L., & Lappi, O. E. (2020). Impacts, benefits, and implementation of RPA and its effect on outsourced work. *LUT School of Engineering Science*.
30. Kunduru, A. (2023). Cloud BPM Application (Appian) Robotic Process Automation Capabilities. *Asian Journal of Research in Computer Science*, 267-280.
31. Latif, K. A., Mahmood, N. H., & Ali, N. R. (2020). Exploring sustainable human resource management change in the context of digital banking. *Journal of Environmental Treatment Techniques*, 779-786.
32. Leblebici, D. (2012). Impact of workplace quality on employee's productivity: case study of a bank in Turkey. *Journal of Business Economics and Finance*, 38-49.
33. Lindgren, I., Toll, D., & Melin, U. (2021). Automation as a Driver of Digital Transformation in Local Government: Exploring Stakeholder Views on an Automation Initiative in a Swedish Municipality. *DG. O2021: The 22nd Annual International Conference on Digital Government Research*, 463-472.
34. Lioliou, K. (2020). The impact of the Center of Excellence governance on the definition of RPA KPIs. An exploratory case-study of the Dutch banking sector. *Turku School of Economics*.
35. McKight, P. E., & Najab, J. (2010). Kruskal-wallis test. *The corsini encyclopedia of psychology*, 1-1.
36. Mélypataki, G., & Riczu, Z. J. (2020). LABOUR LAW AND EMPLOYMENT POLICY IMPLICATIONS OF DIGITIZING WORK AND INTRODUCING ROBOTICS. *HANTOS PERIODIKA*, 61.

37. Menon , V., & Aslekar, A. (2021). A Study to Identify the Possibilities of Implementing Robotic Process Automation for the Processing of Loans in Banks. *REVISTA GEINTEC-GESTAO INOVACAO E TECNOLOGIAS*, 5486-5500.
38. Mer, A., & Virdi, A. S. (2022). Artificial intelligence disruption on the brink of revolutionizing HR and marketing functions. *Impact of Artificial Intelligence on Organizational Transformation*, 1-19.
39. Mohamed, S. A., Mahmoud, M. A., & Mahdi, M. N. (2022). Improving Efficiency and Effectiveness of Robotic Process Automation in Human Resource Management. *Sustainability*, 3920.
40. Mookerjee, J. (2021). A Review of the Robotic Process Automation's Impact as a Disruptive Innovation in Accounting and Audit. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, 3675-3682.
41. Mookerjee, J., & Rao, O. R. S. (2021a). A Review of the Impact of Disruptive Innovations on Markets and Business Performance of Players. *International Journal of Grid and Distributed Computing*, 14(1), 605-630.
42. Mookerjee, J., & Rao, O. R. S. (2021b). A Review of the Robotic Process Automation's Impact as a Disruptive Innovation in Accounting and Audit. *Turkish Journal of Computer and Mathematics Education*, 12(2), 3675-3682.
43. Murinde, V., Rizopoulos, E., & Zachariadis, M. (2022). The impact of the FinTech revolution on the future of banking: Opportunities and risks. *International Review of Financial Analysis*, 102103.
44. Napierala, M. A. (2012). What is the Bonferroni correction? *Aaos Now*, 40-41.
45. Narasimhan,, G. (2023). Implication of RPA on Financial Services: A Novel Human Resources Information System. *Strategic Human Resource Management in the Hospitality Industry: A Digitalized Economic Paradigm*, 116-139.
46. Nedumaran,, C., Sundar,, S., Kumar,, S., Kumar,, R., & Rajan,, R. (2023). An Intelligent Agent to Automate HR Process. *World Conference on Communication & Computing (WCONF)* (pp. 1-8). Raipur, India: IEEE.
47. Patrício et al. (2023). Literature review of decision models for the sustainable implementation of Robotic Process Automation. *Procedia Computer Science*, 870-878.
48. Peeters, M. C., & Plomp, J. (2022). For Better or for Worse: The Impact of Workplace Automation on Work Characteristics and Employee Well-Being. In *Digital Transformation. IntechOpen*.
49. Poornima, K. M., & Chitra, S. (2020). THE CHANGING LANDSCAPE OF FIN-TECH IN THE DIGITAL ERA. *PalArch's Journal of Archaeology of Egypt/Egyptology*, 2650-2658.
50. Pradhan,, I., & Saxena,, P. (2023). AI-SHRM: REVOLUTIONIZING HRM IN THE FOURTH INDUSTRIAL REVOLUTION. *Journal of Data Acquisition and Processing*,, 38((2)), 4314-4322.
51. Rajkhowa, B., & Joshi, S. (2020). INTELLIGENT AUTOMATION-USSES, BENEFITS, AND IMPACT. *PalArch's Journal of Archaeology of Egypt/Egyptology*, 4610-4619.
52. Rao, O. R., & Mookerjee , J. (2021). A Review of the Impact of Disruptive Innovations on Markets and Business Performance of Players. *International Journal of Grid and Distributed Computing*, 605-630.
53. Ravi, V., & Kamaruddin, S. (2017). Big data analytics enabled smart financial services: opportunities and challenges. *International Conference on Big Data Analytics, Springer, Cham*, 15-39.
54. Samarasinghe, K. R., & Medis, A. (2020). Artificial Intelligence based Strategic Human Resource Management (AISHRM) for Industry 4.0. *Global Journal of Management And Business Research*.

55. Saukkonen, J., & et. al. . (2019). AI, RPA, ML and Other Emerging Technologies: Anticipating Adoption in the HRM Field. *ECIAIR 2019 European Conference on the Impact of Artificial Intelligence and Robotics* (p. 287). *Academic Conferences and publishing limited*.
56. Saxena, A., & et. al. (2021). Emergence of Futuristic HRM in Perspective of Human-Cobot's Collaborative Functionality. *International Journal of Engineering and Advanced Technology (IJEAT)*.
57. Schlegel,, D., & Kraus,, P. (2023). Skills and competencies for digital transformation—a critical analysis in the context of robotic process automation. *International Journal of Organizational Analysis*, , 804-822.
58. Schmid, F., & Schmidt, R. (2007). Multivariate extensions of Spearman's rho and related statistics. *Statistics & probability letters*, 407-416.
59. Scholte Lubberink, D. L. (2021). A Multiple-Case Study on the Future of Roles and Competencies: Purchasing, Logistics, Marketing, and HRM. *Bachelor's thesis, University of Twente*.
60. Sebel, M. (2020). Robotic Process Automation (RPA) & Human Resources. *UiPath*.
61. Shah, N., Michael, F., & Chalu, H. (2020). The Influence of Electronic Human Resource Management Use and Organizational Success: A global conceptualization. *Global Journal of Management and Business Studies*, 9-28.
62. Shenoy, V., & Aithal, P. S. (2020). Post-Pandemic Entry Level Indian Private Banking Jobs. *National Conference 'Mangema' December 2020 at www.srinivasuniversity.edu.in*.
63. Shidaganti,, G., Khandelwal,, L., Gupta, K., & Vaswani, H. (2023). Challenges in Banking and Solving Them Using RPA. *Confluence of Artificial Intelligence and Robotic Process Automation*, 133-156.
64. Sliż, P., & Brennenstuhl, M. (2020). Service processes architecture identification at the financial and accounting shared services centre. *Zeszyty Naukowe. Organizacja i Zarządzanie/Politechnika Śląska*.
65. Stanley, D. S., & Aggarwal, V. (2019). Impact of disruptive technology on human resource management practices. *International Journal of Business Continuity and Risk Management*, 350-361.
66. Taşdoğan, M. E. (2021). Implementation of Robotic Process Automation (RPA): a qualitative case study into the way organizational actors give and make sense of the implementation process. *Master's thesis, University of Twente*.
67. The lab. (2021, November 5). *Robotics in banking with 4 RPA use case examples*. Retrieved from The Lab Consulting: <https://thelabconsulting.com/robotics-in-banking-with-4-rpa-use-case-examples/>
68. Tornatzky, L. G., Fleischer, M., & Chakrabarti, A. K. (1990). *The processes of technological innovation*. Free Press.
69. Trivedi, A., & Pillai, L. (2020). HR: DIGITAL TRANSFORMATION 2020. *Advances and Applications in Mathematical Sciences*.
70. Vashisht, A., Dharwal, M., & Sharma, A. (2021). CHANGING TRENDS IN BUSINESS MANAGEMENT: IMPLICATIONS IN THE POST COVID ERA. *INSPIRA Jaipur, India*.
71. Vaske, J. J., Beaman, J., & Sponarski, C. C. (2017). Rethinking internal consistency in Cronbach's alpha. *Leisure sciences*, 163-173.
72. Venigandla et al. (2024). Empowering Smart Cities with AI and RPA: Strategies for Intelligent Urban Management and Sustainable Development. *Valley International Journal Digital Library*, 1117-1125.
73. Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478.

74. Vijayabaskar, R. (2021). Impact Of Emotional Labor On Emotional Exhaustion Of Bank Tellers In Private Banking Sector. *gladnetwork.in*, 1-19.
75. Vishnu, S., Agochiya, V., & Palkar, R. (2017). Data-centered dependencies and opportunities for robotics process automation in banking. *Journal of Financial Transformation*, 68-76.
76. Watai, C. L. (2021). Digitalization in accounting: impacts of Robotic Process Automation in accounting with a particular outlook on the Accountant's role. *Doctoral dissertation*.
77. Weisstein, E. W. (2006). *Correlation coefficient*. Retrieved from mathworld.com: <https://mathworld.wolfram.com>
78. Wesarat, P. O., Sharif, M. Y., & Abdul Majid, A. H. (2014). A conceptual framework of happiness at the workplace. *Asian Social Science*, 78-88.
79. Wewerka, J., & Reichert, M. (2023). Robotic process automation-a systematic mapping study and classification framework. *Enterprise Information Systems*, 17(2).
80. Wewerka, J., & Reichert, M. (2021). Robotic Process Automation in the Automotive Industry- Lessons Learned from an Exploratory Case Study. *RCIS*, 3-19.
81. Willcocks, L., Lacity, M., & Craig, A. (2017). Robotic process automation: strategic transformation lever for global business services? *Journal of Information Technology Teaching Cases*, 17-28.