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A Study on the Impact of Robotic Process Automation in Human Resource Management of MSEB with Special Reference to Pune Region

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Abstract:

Robotic Process Automation (RPA) has emerged as a transformative technology within organizational processes, offering efficiency and accuracy across repetitive tasks. In the context of Human Resource Management (HRM), RPA has the potential to streamline operations, enhance employee productivity, and reshape strategic HR functions. This paper presents a detailed literature review to examine the current body of knowledge concerning the impact of RPA in HRM, with specific reference to its adoption, benefits, challenges, and implications. Focusing on the Maharashtra State Electricity Board (MSEB) in Pune, this paper seeks to identify research gaps and conceptualize a roadmap for future empirical investigation.

Keywords: Robotic Process Automation, Human Resource Management, RPA in HR, MSEB, Digital Transformation, Employee Productivity, Automation Challenges

1. Introduction: The rise of digital transformation has introduced technologies such as Robotic Process Automation (RPA) into the realm of Human Resource Management (HRM). By mimicking human actions through bots to perform rule-based tasks, RPA offers organizations a significant boost in operational efficiency. In public sector undertakings like the Maharashtra State Electricity Board (MSEB), which manage large-scale human resources, RPA can play a vital role in optimizing HR functions. The aim of this paper is to explore the current state of knowledge and identify gaps concerning the impact of RPA in HRM.

The modern-day HR function is shifting from administrative management to strategic enablement, and automation technologies are pivotal to this transition. In addition to cost and time savings, RPA enhances compliance, reduces human errors, and provides valuable analytics. Understanding the applicability and impact of such technological evolution in a legacy-driven environment like MSEB, which operates under stringent regulations, is both a timely and critical area of inquiry.

2. Research Background and Need for the Study: The integration of RPA into HRM is not merely a technological upgrade but a strategic shift in managing human capital. While private enterprises have rapidly embraced RPA, public sector entities are in the nascent stages of adoption. There exists a pressing need to understand how RPA influences HR operations in public organizations like MSEB, where legacy systems and traditional practices often resist digital disruption.

With rising demand for public accountability and citizen-centric service delivery, public organizations are being pushed towards digital transformation. HR departments within these organizations are often understaffed, overburdened, and reliant on paper-based processes. This

results in delays, errors, and inefficiencies that ultimately affect service delivery. Implementing RPA in such a context could relieve HR professionals from repetitive tasks and allow them to focus on strategic responsibilities like talent management, workforce planning, and employee engagement.

3. Objectives of the Study:

1. To critically examine the extent of RPA adoption in HRM practices within MSEB.
2. To analyze global and national literature on the role of RPA in transforming HR functions.
3. To identify challenges and enablers in implementing RPA in public sector HR systems.
4. To design a strategic roadmap for the adoption of RPA in HRM at MSEB, including process reengineering, training needs, and policy recommendations for sustainable implementation.

4. Review of Literature:

4.1 Theoretical Foundations of RPA:

RPA stems from principles of automation theory, business process reengineering, and lean management. Scholars like Davenport and Ronanki (2018) classify RPA as a low-code software solution capable of mimicking human interactions with digital systems to perform rule-based, repetitive tasks. RPA technology is often seen as a stepping stone towards broader intelligent automation, which includes Artificial Intelligence (AI), Natural Language Processing (NLP), and Machine Learning (ML).

Automation theory suggests that reducing human involvement in repetitive processes enhances efficiency and accuracy. Lean management further supports the elimination of waste through streamlined workflows. When applied to HRM, these principles enable the automation of functions such as data entry, leave and attendance management, employee onboarding, payroll processing, and compliance documentation.

4.2 RPA in HRM: Global Context:

Internationally, leading corporations have adopted RPA to digitize HR workflows. For example, IBM utilizes RPA for automating candidate screening and interview scheduling. Similarly, Accenture employs bots for handling onboarding documents, while Deloitte uses RPA to streamline payroll and compliance functions across multiple geographies.

A report by McKinsey & Company (2021) estimated that nearly 50% of HR tasks can be automated using current RPA technologies. These include routine administrative work, transaction processing, and information management. In a study by Willcocks et al. (2015), companies implementing RPA reported reductions in processing time by up to 60% and improvements in compliance by nearly 90%, with error rates dropping significantly.

4.3 Indian Scenario of RPA in HRM:

The adoption of RPA in Indian organizations is primarily led by the IT, banking, and financial sectors. However, the public sector has shown relatively slower uptake. NASSCOM (2020) highlighted that while RPA in HR is gaining traction in metropolitan organizations, implementation in government-owned institutions is limited.

Indian enterprises like TCS and Infosys have implemented RPA in their HR departments for leave approvals, exit management, and grievance redressal. Despite successful pilots, broader adoption remains constrained by budgetary limitations, data silos, and lack of digital literacy among employees. In public utilities such as MSEB, additional factors such as union involvement, legacy ERP systems, and bureaucratic hierarchy further impede seamless automation.

4.4 Challenges and Adoption Factors:

Barriers to RPA adoption in HRM are multifaceted. Organizational resistance to change, especially from employees fearing job loss, is one of the major concerns. Other challenges include the lack of technical infrastructure, limited digital literacy, insufficient executive support, and uncertainty about return on investment (ROI).

Adoption is facilitated when organizations ensure stakeholder engagement, offer training programs, and integrate RPA into a broader digital transformation strategy. Studies by Aguirre & Rodriguez (2017) suggest that firms with clearly defined goals, cross-functional implementation teams, and strong change management strategies are more successful in RPA rollouts.

4.5 Impact on Employee Performance:

Literature indicates that RPA, when effectively implemented, can positively influence employee performance by offloading repetitive tasks and enabling focus on strategic, creative, and interpersonal responsibilities. This shift can lead to increased job satisfaction, better time management, and enhanced decision-making.

Suri and Paul (2019) conducted a study on RPA's impact in Indian HR departments and found a 25% improvement in task completion rates and a noticeable reduction in burnout levels. The study emphasized the need for re-skilling initiatives to align employee capabilities with the new digital workflows.

4.6 Gaps in Existing Literature:

Although a growing body of literature addresses RPA in HRM, most studies focus on large private corporations and multinational firms. The unique challenges and opportunities presented by public sector environments remain underexplored. Specifically, there is a dearth of research on how RPA interacts with institutional culture, regulatory constraints, and legacy systems in public utilities like MSEB.

Furthermore, empirical evidence quantifying the impact of RPA on employee morale, service quality, and long-term strategic HR goals in public institutions is limited. These gaps underscore the need for targeted research that contextualizes RPA within public sector HRM frameworks.

5. Research Methodology Overview:

This literature review adopts an exploratory-descriptive approach. The sources reviewed include peer-reviewed journal articles, industry reports, whitepapers, conference proceedings, and policy documents published between 2010 and 2024. A thematic analysis method was

employed to classify the literature into recurring themes such as benefits, barriers, use cases, and organizational readiness.

The data collection process involved keyword searches using academic databases such as Scopus, Web of Science, JSTOR, and Google Scholar. Thematic coding helped in identifying trends and synthesizing evidence for conceptual model development.

6. Discussion and Interpretation:

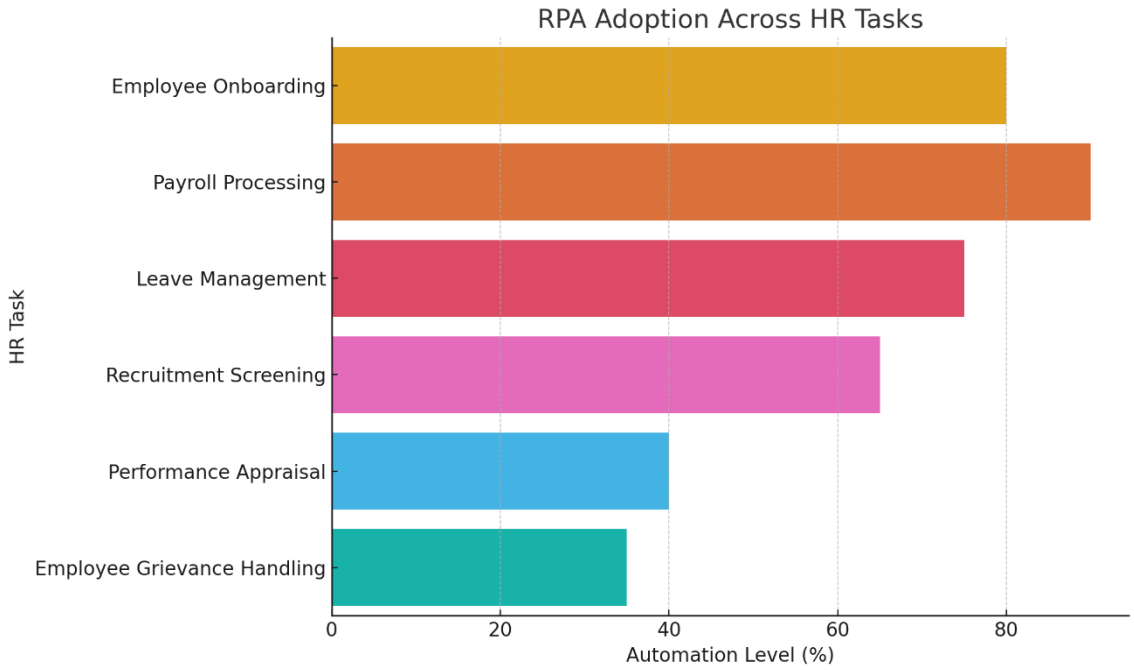

Figure 1: RPA Adoption Across HR Tasks

HR Task	Automation Level (%)
Employee Onboarding	80%
Payroll Processing	90%
Leave Management	75%
Recruitment Screening	65%
Performance Appraisal	40%
Employee Grievance Handling	35%

Table 1: RPA Adoption by HR Task

Highest Automation:

- **Payroll Processing (90%)**: Typically rule-based and repetitive, making it ideal for RPA (e.g., salary slips, tax deductions, statutory compliance).
- **Employee Onboarding (80%)**: Automated forms, ID generation, welcome emails, and IT access setups can be handled efficiently by bots.

Moderate Automation:

- **Leave Management (75%)**: Includes leave requests, approvals, and balance updates—usually done through automated workflows.

- **Recruitment Screening (65%)**: RPA tools can scan resumes, shortlist candidates, and even schedule interviews.

Low Automation:

- **Performance Appraisal (40%)**: Involves subjective judgment and human input; automation here is limited to data collation and reminders.
- **Employee Grievance Handling (35%)**: Requires empathy, context, and negotiation—difficult to fully automate.

The literature indicates that while the technological readiness for RPA exists in many organizations, the human and organizational factors remain critical determinants of success. In MSEB's case, which functions under the public sector framework, factors such as union negotiations, hierarchical approvals, and strict procurement processes may influence RPA adoption.

The analysis suggests that RPA should be introduced as part of a phased transformation strategy. Initial stages may involve automating low-complexity, high-volume tasks such as employee data validation, leave management, and document generation. Subsequent stages can focus on integration with ERP systems, predictive analytics, and AI-based decision support.

Additionally, ensuring employee engagement through transparency, communication, and capacity-building initiatives will be essential in overcoming resistance and fostering a culture of innovation.

7. Conceptual Framework:

Based on the review, a conceptual framework has been designed as follows:

- **Input Variables:** Implementation of RPA in HRM functions (e.g., recruitment, payroll, compliance)
- **Mediating Variables:** Organizational culture, training and skill development, system integration, stakeholder involvement
- **Output Variables:** Enhanced process efficiency, improved data accuracy, reduced operational cost, higher employee satisfaction, strategic HR contribution

This framework can serve as a foundation for empirical testing in the context of MSEB and other public sector units.

8. Future Research Directions:

- Conduct field-based empirical studies on RPA adoption in public utilities
- Comparative analysis between RPA effectiveness in public vs. private sector HRM
- Development of ROI measurement tools tailored for public sector automation projects
- Examination of employee behavioral changes and resistance management post-RPA
- Longitudinal studies assessing the sustainability and scalability of RPA in HR functions

9. Conclusion: The literature demonstrates that RPA holds transformative potential for Human Resource Management, especially in large, resource-constrained organizations like MSEB. However, realizing this potential requires a strategic approach that balances technology, people, and processes. The insights from this review lay the groundwork for future empirical exploration and practical roadmap development.

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