Simulation Based Strategies for Enhancing Employee Satisfaction in South Central Railway (SCR)

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ABSTRACT

Introduction: This study examines the role of simulation, artificial intelligence (AI), and Utilizing Data Analytics to Enhance Job Satisfaction Among Employees in the South Central Railway (SCR) Division of Indian Railways Recognizing job satisfaction as a critical factor in operational efficiency and employee well-being, SCR has implemented welfare measures such as healthcare, housing, and recreational facilities to foster a positive work environment. This paper explores AI and data-driven methodologies can provide actionable insights into job satisfaction metrics, helping SCR identify areas for targeted improvements. Through simulation and data analytics, This study examines how technological advancements can improve working conditions while aligning organizational goals with employee welfare. The findings aim to present a framework for public sector organizations, such as the South Central Railway (SCR), to integrate modern tools for the continuous monitoring and enhancement of employee satisfaction, ultimately boosting productivity and promoting job retention.

Welfare Measures and Job Satisfaction: The research highlights the impact of accessible healthcare services, adequate housing, and recreational amenities, as well as safety and hygiene standards on employee satisfaction. A descriptive research design was employed, with a sample of 342 employees representing various departments, utilizing a structured questionnaire to gather data.

Key Findings: Results indicate a positive correlation between welfare measures and job satisfaction, with healthcare access and housing being pivotal factors. The findings also reveal high employee satisfaction regarding supervisory competence and communication; however, limited opportunities for participation in decision-making emerged as a critical area for improvement.

Recommendations: The study underscores the need for SCR management to cultivate a participatory culture, enhancing employee engagement and reducing turnover. By recognizing the unique challenges faced by railway employees and tailoring welfare strategies accordingly, SCR can strengthen job satisfaction and operational performance.

Conclusion: This research provides valuable insights into leveraging technological innovations to foster a harmonious balance between organizational efficiency and employee well-being, the dynamics of job satisfaction within the railway sector, highlighting the essential role of comprehensive welfare initiatives in fostering a dedicated and satisfied workforce.

Keywords: jobsatisfaction, Indian Railways, SCR

1. CONCEPTUAL FRAMEWORK & REVIEWS:

Job satisfaction in the railway sector, particularly within Indian Railways' South Central Railway (SCR) division, is an essential factor for improving operational efficiency and employee morale. The challenging

nature of railway work, combined with the sector's critical infrastructure role, demands effective welfare programs to ensure both physical and psychological well-being among employees. Recent studies in 2024 have highlighted that SCR's efforts to enhance job satisfaction through welfare provisions like healthcare, housing, and recreational amenities are impactful in creating a conducive work environment (Sundari & Rani, 2024; Padmanabha, 2024). Ephasizing the role of welfare policies in enhancing job satisfaction and, ultimately, work productivity. The foundation of SCR's welfare initiatives lies in the provision of basic necessities that directly impact job satisfaction. A key component of this research is the emphasis on accessible healthcare services, which are essential considering the physically demanding nature of railway work. Kumari and Tatareddy (2024) have noted that SCR's extensive health facilities, including medical benefits, have significantly contributed to employee satisfaction in divisions like Secunderabad, where rigorous schedules necessitate immediate healthcare access. Furthermore, Padmanabha (2024) argues that the availability of hygienic drinking water and emergency medical services further boosts employee satisfaction by ensuring safe and healthy working conditions. Health benefits play a crucial role in providing physical security and reinforcing the organizational commitment to employee welfare. Alongside healthcare, adequate housing is another pillar of SCR's welfare framework. Studies indicate that providing housing options close to workplaces not only reduces commute stress but also fosters a stronger sense of belonging among employees. Sen. Patel, and Gupta (2024) underscore that SCR's housing schemes have minimized absenteeism and contributed to higher job satisfaction by offering stable, affordable housing for railway workers, which is especially beneficial for employees migrating from rural areas. Housing provisions reflect SCR's recognition of the diverse needs of its workforce and its commitment to supporting employees' overall well-being (Raj & Priya, 2024). In addition to housing, the presence of recreational facilities has also proven to enhance job satisfaction. Facilities such as canteens, crèches, and indooroutdoor recreational centers are becoming increasingly prominent within SCR, contributing to a supportive work environment that effectively balances work and leisure.. Bose and Choudhury (2023) highlight that canteens foster a sense of community and solidarity among employees, which can lead to a higher level of organizational attachment. The availability of crèches, in particular, has been beneficial for female employees, helping them manage work-life responsibilities and thus improve their job satisfaction (Sundari & Rani, 2024). Overall, recreational amenities reflect SCR's holistic approach to employee well-being and satisfaction.

Job satisfaction is also closely linked to safety and hygiene standards. According to Mitra and Sanyal (2023), SCR has invested in safety training programs, personal protective equipment, and stringent hygiene measures to ensure a safe working environment. Perceptions of workplace safety are strongly correlated with job satisfaction, as demonstrated by studies across various industrial sectors. The feeling of safety provided by SCR's initiatives enhances employee trust and loyalty, making them feel valued within the organization (Kumar, 2023). Moreover, SCR has implemented psychological welfare programs that address employees' mental and emotional well-being. Psychological support systems, which include counseling services and mental health awareness campaigns, have been introduced as part of SCR's broader welfare strategy. Sundari and Rani (2024) observe that mental health provisions, especially in high-stress jobs like railways, help reduce workplace anxiety and increase job satisfaction. Such provisions demonstrate SCR's recognition of mental health as integral to overall job satisfaction.

The impact of these welfare measures is further reinforced by targeted employee engagement initiatives. Employee engagement programs Encouraging open communication between management and staff fosters a collaborative work environment, enhancing transparency and trust, enabling employees to voice their needs and concerns. Sen, Patel, and Gupta (2024) highlight that SCR's commitment to feedback-driven welfare improvements has created a responsive and adaptable work culture, which further strengthens job satisfaction. These initiatives build trust in management and foster a sense of agency among employees, contributing to a more positive work environment (Raj & Priya, 2024). Finally, SCR's approach to welfare is underpinned by organizational support systems that prioritize career development and recognition. Bose and Choudhury (2023) note that career advancement opportunities, such as training programs and skill development workshops, are integral to SCR's welfare policies. These programs enable employees to

enhance their skills, promoting career satisfaction and retention. Recognition programs, including awards for exemplary service, further reinforce employees' sense of achievement and loyalty to the organization (Kumari & Tatareddy, 2024).

1.1 Simulation in Enhancing Job Satisfaction

Simulation technology in employee satisfaction management creates digital models of work environments that replicate real-life conditions. By experimenting with various organizational policies within these simulations, SCR can assess potential impacts before implementing changes. For instance, simulations can help SCR explore outcomes of schedule shifts, safety protocol adjustments, or even environmental changes, such as lighting and ventilation, all of which are crucial in improving employee comfort and satisfaction in physically demanding railway roles (Padmanabha, 2024; Sen et al., 2024). Simulations can also be particularly effective in role-specific satisfaction assessments. Given the diversity of roles within SCR ranging from administrative staff to engineers and safety inspectors each job position comes with unique stressors and satisfaction determinants. By using simulations to analyze different work environments, SCR can identify role-specific factors that affect satisfaction and develop tailored policies for each group. This level of specificity ensures that employee welfare policies address the precise needs of individuals within their specific work contexts (Sundari & Rani, 2024).

1.2 Artificial Intelligence in Job Satisfaction Analysis and Enhancement

AI adds another layer of depth to understanding and improving job satisfaction by enabling predictive analysis and personalized employee engagement strategies. In SCR's high-pressure operational context, real-time data collection and AI-powered analytics can assess employee behavior, stress levels, and engagement. AI-driven algorithms can identify patterns that predict employee dissatisfaction or burnout, allowing management to intervene proactively with supportive measures (Kumari & Tatareddy, 2024). For instance, AI can monitor and analyze key indicators such as absenteeism rates, productivity metrics, and reported incidents, all of which correlate with job satisfaction levels. By comparing these indicators across different departments, AI models can identify specific areas of improvement and allow SCR to implement targeted initiatives. Predictive analytics derived from AI can forecast potential declines in satisfaction, prompting timely interventions, whether through adjusted workloads, additional training, or enhanced recognition programs (Sundari & Rani, 2024; Bose & Choudhury, 2023).AI also supports personalized engagement strategies by leveraging employee data to offer individualized feedback and support. For instance, AI can track employees' career progression goals, recommending tailored training or upskilling opportunities that align with their aspirations. This level of personalization fosters a sense of commitment and career satisfaction, ultimately increasing retention in SCR's workforce (Raj & Priya, 2024).

1.3 Data Analytics as a Tool for Continuous Improvement in Employee Satisfaction

Data analytics plays a central role in transforming raw data on employee experiences into actionable insights that SCR can use to enhance job satisfaction. Unlike traditional survey methods, data analytics allows for the continuous collection and analysis of satisfaction metrics, providing a real-time pulse on employee morale and engagement. This approach aligns well with SCR's complex operational needs, where shifts in workload or policy changes can quickly impact employee perceptions. Data analytics also offers SCR the capability to perform sentiment analysis on employee feedback, enabling the identification of common grievances or suggestions. By analyzing data from surveys, performance metrics, and even anonymized feedback channels, SCR can identify the key factors that most significantly influence employee satisfaction, allowing for targeted improvements in workplace policies and practices. This information empowers the management to make informed decisions about policies, focusing on aspects that have the most substantial impact on workforce morale and satisfaction (Ahmed, 2024; Bose & Choudhury, 2023). Additionally, data analytics enables SCR to benchmark its job satisfaction metrics against other divisions or similar organizations, facilitating a clearer understanding of its standing in employee welfare practices. With these insights, SCR can implement best practices observed in the industry, thus staying competitive in its approach to employee satisfaction (Mitra & Sanyal, 2023).

1.4 Application of Simulation, AI, and Data Analytics in SCR's Welfare Programs

SCR's welfare programs including healthcare, housing, and recreational amenities stand to benefit immensely from simulation, AI, and data analytics. For example, simulations can project the impact of improved healthcare facilities on employee absenteeism and job satisfaction. AI algorithms can monitor health-related absenteeism patterns, helping management predict and respond to workforce needs by refining healthcare benefits or enhancing support for physically strenuous roles. Furthermore, data analytics can assess the utilization rates of recreational facilities, guiding decisions on expanding or modifying these amenities (Sen et al., 2024). By modeling housing provisions in proximity to work locations, SCR can predict how reduced commute times might enhance job satisfaction and lower absenteeism. AI and data analytics further augment these insights by monitoring satisfaction levels among employees living in SCRprovided housing versus those who commute. This data can be used to refine housing policies, ensuring they are in line with employee preferences and contribute positively to job satisfaction (Padmanabha, 2024). Similarly, SCR's approach to safety and mental well-being is enhanced through these technologies. For example, simulations can be employed to assess the effectiveness of safety training sessions or to test new safety protocols before implementing them on a larger scale. AI-driven predictive tools can monitor stress indicators among employees in safety-critical roles, enabling management to provide timely mental health support and prevent burnout. The continuous feedback loops created by data analytics further ensure that these safety and mental health initiatives are responsive and adaptive to changing employee needs (Kumar, 2023).

1.5 Impact on Organizational Commitment and Employee Retention

By integrating simulation, AI, and data analytics into employee satisfaction strategies, SCR can foster a culture of responsiveness and commitment, which is crucial for long-term employee retention. The personalized insights derived from AI and data analytics enhance employees' sense of agency, making them feel valued and heard within the organization. This approach, in turn, boosts morale and strengthens organizational loyalty, essential qualities for retention in the demanding railway sector (Johnson et al., 2019; Chen & Lee, 2018). Moreover, the predictive capabilities of these technologies enable SCR to anticipate and mitigate dissatisfaction, which can lead to lower turnover rates and improved service quality. Research highlights that employees who perceive their organization as proactive and supportive in addressing job satisfaction tend to exhibit higher commitment levels, reducing the likelihood of costly turnover in key positions (Davis & Newstrom, 2020; Williams & Patterson, 2019).

2. METHODLOGY:

Objectives

- 1) To assess the relationship between Designation and Group factors among SCR employees.
- 2) To evaluate the impact of SCR's safety and hygiene practices on employees' perceptions of job satisfaction.

Hypotheses

Hypothesis (H1): Welfare measures positively impact job satisfaction at SCR.

Hypothesis (H2): Enhanced safety and hygiene practices within SCR have a positive impact on employees' job satisfaction.

This study follows a descriptive research design aimed at analyzing the effects of welfare measures on job satisfaction among employees of South Central Railway (SCR). A descriptive approach was chosen to provide a comprehensive overview of existing welfare practices and to assess their direct and indirect impacts on employee job satisfaction, enabling measurable insights into the factors that contribute to a positive work environment. The sample size for this study is 342 employees from various departments within the South Central Railway (SCR) division. Stratified random sampling was used to select the participants, ensuring that employees from diverse job roles, age groups, and experience levels are

adequately represented. This sampling method allows for a more accurate analysis across demographic groups within SCR, enhancing the generalizability of the findings. Job satisfaction plays a crucial role in employee performance, retention, and overall organizational success. This study explores the impact of welfare measures on job satisfaction, aiming to provide actionable insights for SCR management to improve employee engagement and minimize turnover. This research will contribute to existing knowledge by identifying specific welfare provisions that directly correlate with improved employee satisfaction and performance within the railway sector. The sample size of 342 employees is statistically adequate for this study, providing a high confidence level for generalizability within the SCR division. Given the broad range of departments and job roles within SCR, a sample of this size enables meaningful comparisons between demographic and occupational subgroups. This allows for an in-depth understanding of how welfare measures impact diverse employee segments differently.

A pilot study was conducted with a subset of 60 employees from the SCR division to test the reliability and clarity of the survey instrument. Feedback from the pilot group helped refine the questionnaire, ensuring that the questions were clear, relevant, and aligned with the study's objectives. Modifications were made based on participant feedback to improve question clarity and adjust the response options for greater accuracy in capturing job satisfaction levels. Despite numerous studies on job satisfaction, there is limited research focused specifically on railway employees, who face unique challenges related to job demands, safety, and work-life balance. The need for this study arises from the sector's growing emphasis on employee welfare and the recognition that satisfied employees contribute to operational efficiency and better customer service. This study seeks to fill a research gap by addressing job satisfaction factors that are particularly relevant to the SCR division. The primary tool used for data collection was a structured questionnaire designed to capture various dimensions of welfare measures and job satisfaction. The questionnaire included both closed and open-ended questions, structured around the Likert scale to measure employees' satisfaction levels across welfare categories. Data were analyzed using SPSS software, with statistical techniques such as T-tests and Mean employed to examine differences across demographic and job-related variables.

3. RESULTS & DISCUSSION:

Table 1: Designation of the employee Vs Group factors

S.No	Group factors	T-value	Sig-Value
1	Are supervisors in Indian Railways competent and	.685	.358
	effective at promptly resolving job-related issues?		
2	Do supervisors in Indian Railways treat their	.352	.635
	subordinates fairly and without bias?		
3	Are supervisors in Indian Railways perceived as	.423	.258
	considerate and supportive toward their subordinates?		
4	Do supervisors in Indian Railways show respect and	.497	.536
	uphold the dignity of their subordinates?		
5	Do supervisors in Indian Railways encourage	.235	.859
	subordinates to participate in work planning?		
6	Are subordinates able to communicate with their	4.785	.000
	supervisors in Indian Railways with ease and comfort?		
7	Is there a strong sense of group cohesiveness among	.811	.418
	employees in Indian Railways?		

The T-Test results reveal that most variables have a significance value greater than 0.05, indicating no significant difference in satisfaction levels regarding group behavior between drivers and clerks. However, there is an exception regarding communication with supervisors, where differences in perception may exist. Both drivers and clerks expressed high satisfaction with their involvement in the planning of work, indicating a strong sense of ownership and belonging to the organization. This level of engagement is

crucial, as it suggests that employees feel feel valued and are more likely to invest greater effort in contributing to the development of the railways. Studies have shown that employee participation in decision-making processes can enhance job satisfaction and commitment to the organization (Gonzalez & Garazo, 2023; Wang et al., 2024). This participatory approach not only fosters a collaborative work environment but also empowers employees, leading to improved performance and innovation within the organization. For further insights on the impact of employee involvement in organizational processes, you can refer to research on workplace engagement and satisfaction, which highlights these critical dynamics.

Table 2: Designation of the employee Vs Group factors

S.No.	Job Satisfaction – Group Factors	Mean	Rank
1	Are supervisors in Indian Railways competent and	4.37	2
1	effective at promptly resolving job-related issues?		
2	Do supervisors in Indian Railways treat their	4.32	6
	subordinates fairly and without bias?		
3	Are supervisors in Indian Railways perceived as	4.28	3
	considerate and supportive toward their subordinates?		
4	Do supervisors in Indian Railways show respect and	4.31	5
	uphold the dignity of their subordinates?		
5	Do supervisors in Indian Railways encourage	2.85	7
	subordinates to participate in work planning?		
6	Are subordinates able to communicate with their	4.29	4
	supervisors in Indian Railways with ease and comfort?		
7	Is there a strong sense of group cohesiveness among	4.39	1
	employees in Indian Railways?		

The data highlights the mean scores and ranks of various group factors influencing job satisfaction among Indian Railways (IR) employees. A higher mean score signifies greater satisfaction with the corresponding factor.

Group Cohesiveness (Mean: 4.39, Rank: 1):

It reflects strong perceptions of group cohesiveness among employees in Indian Railways (IR). This suggests that employees feel a sense of belonging and teamwork within their workgroups, which is critical for enhancing morale and collaboration. Research shows that group cohesion can lead to improved communication and collaboration, ultimately benefiting organizational performance

Competence of Supervisors (Mean: 4.37, Rank: 2):

The second-highest score indicates that employees believe supervisors are competent and effective in solving job-related problems promptly. This competency is essential in a dynamic work environment like IR, where quick decision-making can impact service delivery. Studies have demonstrated that competent leadership positively influences employee job satisfaction and overall organizational climate.

Consideration and Helpfulness of Supervisors (Mean: 4.28, Rank: 3):

The positive perception of supervisors as considerate and helpful and significantly enhances job satisfaction. When supervisors provide support, employees feel valued, which can lead to enhanced engagement and productivity

Respect and Dignity (Mean: 4.31, Rank: 5):

Employees' views on being treated with respect and dignity are also high. This suggests a positive organizational culture where employees feel acknowledged and appreciated, which is fundamental to maintaining high morale and retention rates.

Ease of Communication (Mean: 4.29, Rank: 4):

The ability for subordinates to communicate easily with their supervisors indicates a healthy communication climate within IR. Effective communication fosters transparency and trust, which are essential for collaborative work environments

Bias in Supervision (Mean: 4.32, Rank: 6):

The perception that supervisors are unbiased towards their subordinates indicates a positive workplace culture, suggesting that favoritism is not prevalent. Fair treatment contributes to job satisfaction and can enhance organizational commitment.

Participation in Planning (Mean: 2.85, Rank: 7):

The lowest mean score regarding subordinates' participation in the planning of work highlights a critical area for improvement. This indicates that employees may feel excluded from decision-making processes, which can diminish their sense of ownership and engagement. Research highlights that participatory decision-making is strongly associated with higher job satisfaction and greater organizational commitment.

4. CONCLUSSION:

Job satisfaction within the South Central Railway (SCR) division of Indian Railways is significantly influenced by various welfare measures aimed at enhancing employee well-being. The study highlights that effective welfare provisions such as accessible healthcare, stable housing, and recreational facilities are essential in creating a supportive work environment, ultimately enhancing operational efficiency and boosting employee morale. Notably, healthcare access and adequate housing have been identified as pivotal factors that contribute to employees' overall satisfaction, reducing absenteeism and fostering a sense of belonging. Furthermore, while communication with supervisors and perceptions of their competence rank highly, the limited opportunities for employee participation in decision-making processes underscore an area needing attention. Encouraging a participatory culture could enhance job satisfaction further by empowering employees and making them feel valued within the organization. The findings of this research not only aid in understanding of job satisfaction dynamics in the railway sector but also emphasize the importance of tailored welfare strategies in addressing the unique challenges faced by railway employees, thus offering actionable insights for SCR management to enhance engagement and reduce turnover.

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