Emperor International Journal of Management

ISSN: 2583-1267 **Mayas Publication®** **www.mayas.info**

Volume-VI **Issue-IV** **April 2026**

A Study on Impact of Artificial Intelligence on Employee Work-Life Balance in the Metal Manufacturing Sector, Tiruvallur District

M. Madhan

II Year MBA Student, of Management Studies,
School of Management,
Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology,
Avadi, Tamil Nadu 600062

Dr. P. Tamilselvan

Assistant Professor,
Department of Management Studies,
Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology,
Avadi, Tamil Nadu 600062.

Abstract

In the modern industrial world is fast-paced and changing at rates not experienced previously. The introduction of A I in the Manufacturing sector is shifting the way we manage in workplace. The main purpose of this study is to examine the alternative uses and effects of integrating AI into the improved work-life balance for employees through automation of routine tasks, improved scheduling of personnel, and data-informed decision-making in HR management. AI based tools including predictive analytics, virtual assistants, and intelligent monitoring systems are allowing organizational actors to decrease employee stress, improve productivity of employees, and promote flexible work arrangements while working in organizational contexts that previously emphasized rigid unyielding manufacturing efforts. The research paper seeks to assess how AI applications can facilitate a more effective approach to time, well-being, and feelings of satisfaction in jobs through examining the manner of applications of AI. The research study will also monitor operational challenges of addressing ethical considerations, displacement of human jobs through automation, and digital upskilling. Data for the study will utilize recent literature and case examination of manufacturing

organizations that have adopted AI based HR and operation systems. The conclusion of the study affirms the paths of work-life balance through AI intersection are best managed through harmonizing the human-centered management practices with technological approach.

Keywords: Employee Work-Life Balance, Artificial Intelligence adoption, Employee Well-being, and Time Management.

I. INTRODUCTION

Background of the Study

Artificial Intelligence (AI) is becoming a leading force across industries, including more traditionally conservative sectors such as manufacturing. In introduction of automation, predictive analytics, and intelligent systems, AI is enhancing efficiency and having an impact on the quality of one's work-life balance, or the balance of work responsibilities with self- wellness. In many manufacturing contexts, employees can experience challenges associated with long working hours, repetitive nature and high-speed deadlines.

AI infrastructures, like smart scheduling, optimized workload and predictive maintenance, will assist in eliminating some of this workload demand through artificial intelligence technologies that reduce work, downtime, and allow employees to work in a more relaxed manner. In addition, the people will have the capability to change to other more interesting and skill-based work when the AI automates the dull and time-consuming work.

The AI will have the capability to offer the managers the data that will help in the planning of the staff, thus enabling the people to dedicate their time and energy more productively to increase the productivity while feeling happier about their jobs. Overall, through automation of repetitious tasks and predictive and analytical support for decision making, employees are empowered to make more efficient use of their time and energy. Therefore, AI is a positive addition for creating a more balanced workplace environment, as well as more advance model of work.

Problem Statement

The manufacturing industry generally requires employees to work in conditions that are not conducive such as long working hours, repetition, high production goals, and high working pressure. These can lead to stress, exhaustion, and inability to have a proper balance of work and life. The failure of employees to balance work and life properly can impact negatively on their overall welfare, job satisfaction and productivity which could also influence the overall organizational performance. The recent past has seen the manufacturing industry experience an

immense development in the application of technology and thus has contributed to the integration of the Artificial Intelligence (AI) in organizational management. The concept of AI means intelligent scheduling, advanced maintenance, and other related mechanisms, which can help to ameliorate the working conditions, and the employees will be able to properly plan their working hours.

Objectives of the Study

Primary objective

- To determine the role of Artificial Intelligence (AI) in employee work-life balance in the metal manufacturing industry in Tiruvallur District.

Secondary objectives

- To analyze how Artificial Intelligence affects employee workload and stress.
- To study the role of time management in improving employee work-life balance.
- To examine the challenges of using Artificial Intelligence in manufacturing companies.
- To identify the benefits of Artificial Intelligence adoption in improving employee productivity and workplace efficiency.

Significance of the research

Manufacturing companies are the sphere where AI technologies are increasingly being implemented and will be able to enhance the efficiency and productivity of operations. Though the technological and economic advantages of AI are the concern of different organizations, it is also necessary to comprehend the effects it has on workers, particularly, their balance of work and life. To summarize, the study is pertinent since it aims at exploring how Artificial Intelligence technologies affect the employee population, risking in particular the workload among the employees, their work stress levels and work-life balance in the manufacturing sector. The research also, the research would help in determining different factors which contribute to the implementation of AI, thus availing managers with the relevant information to employ AI technology in their organizations.

Review of Literature

- **Shazia Begum et al. (2025)** and they were examining the possibilities of AI reducing stress in workplaces and enhancing the work-life balance in

India. The study found that AI technologies help automate tasks improve time management and enhance employee being.

- **Atmaja et al. (2025)** examined the connection between the adoption of AI and a balanced work-life among employees in Indonesia, and demonstrated that the adaptation to AI tools would increase efficiency, reduce stress.
- **Rozman et al. (2023**) deep into the question of whether AI is capable of cutting down on the number of tasks that employees have to complete and boost company performance, concluding that an AI-sensitive culture, leadership, and training greatly decrease the perceived labor burden.
- **Malik et al. (2021)** examined the impact of AI on employees in the industry 4.0 organizations and found that AI implementation enhances flexibility, autonomy, and creativity, as well as job performance.
- **Raghuram et al. (2019).** Organizations continue to influence the balance between work and life as affected by AI. The importance of the manager support, communication, and culture was demonstrated by Wall (1998)

Research Gaps

Although previous studies have evaluated the potential effects of Artificial Intelligence (AI) on employee wellness, technostress, job burnout, and productivity in a variety of industries, there are any sound empirical studies that directly link the adoption of AI to work-life balances. However, the utilization of AI has been also recognized by research studies (Begum et al., 2025; Atmaja et al., 2025; Rozman et al., 2023; Malik et al., 2021) as a factor to help reduce the number of repetitive pieces of work, increase efficiency, and make the work process more engaging to the employees.

Research Methodology

Research design

The present study adopts a descriptive and analytical research design. Descriptive research is used to describe the characteristics of employees in the manufacturing sector and their work-life balance conditions. Analytical research is used to examine the relationship between Artificial Intelligence (AI) adoption, Employee well-being, stress levels, and work-life balance. A quantitative research approach is followed to collect measurable and reliable data from respondents. The study is empirical in nature as it is based on primary data collected directly from employees working in the manufacturing sector.

Sample Size and Sampling Technique

The sample size consists of 128 respondents taken in metal manufacturing organizations. The study uses data collected directly from respondents through a structured questionnaire. The respondents were selected to capture their experiences and perceptions regarding the impact of AI, on employee work-life balance employee being and stress levels. The study employs a sampling technique, which is a type of non-probability sampling method.

Data Collection Methods

The study uses primary data as the main source of information. Primary data were collected using the questionnaire of employees employed in manufacturing organizations. The questionnaire was aimed at collecting data about the perception of the employees concerning the effects of Artificial Intelligence (AI) on their stress state, productivity, employee well-being, and work-life balance. The questionnaire was comprised of close ended statements assessed by a Likert scale, which allowed participants to specify the extent to which they agreed or disagreed with the questions based on issues concerning the adoption of AI and work-life balance. Of the 128 respondents interested in the survey, the responses obtained were utilized in the study to carry out further statistical analysis.

Tools Used for Analysis

1. **Descriptive Statistics:**
   Descriptive analysis is used to summarize the collected data in a simple and clear way. It uses measures such as percentages, averages, and charts to present the responses of the participants. This helps in understanding the variables of the study, including Artificial Intelligence adoption, employee well-being, time management, and employee work-life balance.
2. **Correlation Analysis:**
   Correlation analysis will be used to assist in reviewing the extent of the relationship between the independent variables of Artificial Intelligence (AI) adoption, Employee Well-being and Time Management and the Employee Work-Life Balance dependent variable. Correlation analyses will enable the investigators to establish the level of positive (or) negative associations of such independent variables on the work-life balance among the employees in the manufacturing industry.
3. **Regression Analysis:**
   The regression analysis will be applied to investigate the effect of the independent variables on the dependent variable. In the current research, it is beneficial to comprehend the impact of such aspects as the adoption of

Artificial Intelligence, stress reduction, employee welfare, and time management on employee work-life balance.

4. **ANOVA**

   Anova is used to find whether there are any significant differences in employee's opinions about work-life balance based on factors such as age, work experience, or job role. It helps to compare the responses of different groups of employees.

Data Analysis and Interpretation

The data collected from 128 employees in the manufacturing sector was analyzed using Descriptive analysis, correlation, regression, and ANOVA tests.

Table 1

Gender of Respondents

S.No	Particulars	Frequency	Percentage
1	Male	80	62
2	Female	47	37
3	Prefer not to say	1	1
	Total	**128**	**100**

Interpretation

Based on the data table, approximately 62 percent of the respondents were males, 37 percent were female and the rest, 1 percent preferred not to state their gender. That is, most of the members of this research are male.

Table 2

Organization use Artificial Intelligence (AI) technologies in work processes

S.No	Particulars	Frequency	Percentage
1	Yes	64	50
2	No	20	16
3	Planning to implement AI	30	23
4	Not Sure	14	11
	Total	**128**	**100**

Interpretation

The table shows that 50% of the respondents stated that their organization uses (AI) technologies in work processes. About 23% reported that their organizations are planning to implement AI. Meanwhile, 16% indicated that

AI is not used in their organization and 11% of the respondents were not sure about the use of AI in their workplace.

Table 3
Correlation Analysis

		AI_Adoption	EWB	TM	EWLB
AI_Adoption	Pearson Correlation	1	.513**	.459**	.432**
	Sig. (2-tailed)		.000	.000	.000
	N	128	128	128	128
EWB	Pearson Correlation	.513**	1	.459**	.585**
	Sig. (2-tailed)	.000		.000	.000
	N	128	128	128	128
TM	Pearson Correlation	.459**	.459**	1	.629**
	Sig. (2-tailed)	.000	.000		.000
	N	128	128	128	128
EWLB	Pearson Correlation	.432**	.585**	.629**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	128	128	128	128

Interpretation

It is indicated that employee work-life balance correlates positively with AI adoption, employee well-being, and time management. The strong relations are between time management and employee well-being, and moderately between AI adoption. The p-value of 0.000 shows that the relationships are statistically significant.

Table 4
Regression Analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.713[a]	.508	.496	1.59408

a. Predictors: (Constant), TM, EWB, AI_Adoption

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	325.781	3	108.594	42.735	.000[b]
2	Residual	315.094	124	2.541		
3	Total	640.875	127			

Dependent Variable: EWLB

Predictors: (Constant), TM, EWB, AI_Adoption

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.290	1.092		3.013	.003		
	AI_Adoption	.036	.065	.043	.561	.576	.673	1.486
	EWB	.354	.076	.359	4.686	.000	.674	1.484
	TM	.406	.068	.444	5.993	.000	.722	1.386

Dependent Variable: EWLB

Interpretation

The regression analysis is telling us that the combined effect of AI introduction, employee wellness, and time management explain approximately 50.8% of work-life balance differences in employees (R 2 = 0.508). The ANOVA indicates the model is significant (F, 42.735, p, 0.000). It also happens that employee well-being and time management are the giants that support improved work-life balance.

Table 5

One Way Anova Analysis

One Way Anova

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	412.384	22	18.745	8.614	.000
Within Groups	228.491	105	2.176		
Total	640.875	127			

Interpretation

The ANOVA findings and found out that there exists a genuine difference in work-life balance among the groups. The p-value is 0.000, which is significantly less than 0.05 and therefore the differences are statistically significant. It implies

that the factors we considered in the research actually make a significant difference to work-life balance of employees.

Results and Discussion

The research results indicate that the balance in work and life in factories can be achieved with the help of AI utilization, attention to the well-being of the employees, and time management. In the analysis, it states that work-life balance is positively and significantly related to the three. The connection between time management and employee well-being is stronger compared to AI that is more moderate.

As shown in the regression results, the variation in employee work-life balance characteristics (through AI adoption) combined with employee well-being and time management can explain nearly half of its variation (around 50.8 percent). Using common words, when factories work wisely with AI, keep employees' content and healthy, and assist them in balancing their work and life, they will be able to make work-life balance noticeably.

Comparison with Previous Studies

The results of this research basically agree well with what has been published in the past. According to Shazia Begum and colleagues (2025), AI may reduce monotony and even increase the well-being of staff, which will lead to more healthful work life. Atmaja et al. (2025) also introduce the idea that it also increases work efficiency and reduces employee stress. Similarly, the findings of Rozman and the team (2023) revealed that AI systems assist in workload reduction, and in performance, in general. All this evidence supports the idea that the implementation of AI can help the workers cope better with their tasks. Thus, the implementation of AI in the daily activities of the companies can help the companies improve the quality of life for their workers.

Practical Implications

The results of this research provide some quite useful conclusions to the companies that operate within the manufacturing industry. In principle, companies can improve the work-life balance of their workers by implementing Artificial Intelligence software that replaces monotonous tasks and drives efficiency to the limit. Artificial intelligence can assist people in better time management and reduce the overall workload, as well. The actual lesson learned is that organizations must also be interested in enhancing employee welfare and providing adequate training to enable employees to adjust to AI and indeed gain with it.

Findings

The major findings of the study are:

- The adoption of Artificial Intelligence has a positive impact on the work-life balance of employees in the manufacturing industry.
- The well-being of employees is an important aspect of improving the work-life balance of employees. The relationship between time management and the work-life balance of employees is high.
- The correlation analysis shows that work-life balance is positively correlated with AI adoption, employee well-being, and time management.
- Results of regression indicate that the combination of AI adoption, employee well-being, and time management are suitable to explain localized variance in employee work-life balance, which is approximately 50.8 percent.
- The influence of employee well-being and time management on worker work-life balance is substantially higher than the influence of AI adoption among the variables.
- A positive result of the study states that the manufacturing sector can improve the work-life balance with the successful implementation of AI technologies as well as with the increase of employee well-being and time management.

Suggestions / Recommendations / Future Recommendations

- In principle, manufacturing businesses must get their hands on AI to automate and enable their teams to perform their work more efficiently.
- They are also expected to attempt to make the work environment happier by establishing a relaxed working environment and reducing the stress levels for the entire crew.
- Planning and scheduling with AI could be used to allow workers to use their time more effectively, thus being really productive without getting burnt.
- Training of personnel on how to deal with AI in the workplace is essential so that all staff members can understand how to use AI without panic.
- The companies should also develop strategies that will ensure there is a healthy work-life balance despite the ubiquitous nature of AI.
- Future studies need to consider other issues such as job satisfaction, company culture, and employee engagement to understand their implications on the work-life balance of the people.

II. CONCLUSION

This paper examined the impact of Artificial Intelligence (AI) on work-life balance among employees in the manufacturing industry. Through the evidence we discovered, it appears that AI adoption, employee welfare, and time management are all positively correlated to work-life balance. They also demonstrate that proper application of AI can ensure workload reduction, improved workflow, and allow employees to balance professional and personal lives. In general, the study highlights that AI in combination with employee-oriented management principles can create a more balanced and healthy working environment.

Scope for Future Research:

Further research may also investigate other variables such as job satisfaction, organizational culture, and employee engagement to know more about them and their impact on work life balance as well. There is also the possibility of researchers looking at various industries or increasing sample sizes in order to gain broader information. Moreover, the long-term effects of AI adoption on overall employee welfare and general organizational performance should also be studied.

III. REFERENCES

1. Begum, S., Khan, R., & Ahmed, M. (2025). The role of artificial intelligence in reducing workplace stress and improving work-life balance among employees. *Journal of Management and Technology Studies*, 12(2), 45–58.
2. Atmaja, A., Pratama, R., & Wijaya, S. (2025). Artificial intelligence adoption and its impact on employee work-life balance in modern organizations. *International Journal of Business and Management Research*, 10(1), 77–89.
3. Rozman, M., Tominc, P., & Pušnik, M. (2023). Artificial intelligence, employee workload, and organizational performance in a VUCA environment. *Sustainability*, 15(3), 2154.
4. Malik, A., Budhwar, P., Patel, C., & Srikanth, N. (2021). May the bots be with you! Delivering HR cost-effectiveness and individualised employee experiences in an AI-enabled workplace. *The International Journal of Human Resource Management*, 32(3), 1–29.
5. Davenport, T. H., & Ronanki, R. (2018). Artificial intelligence for the real world. *Harvard Business Review*, 96(1), 108–116.
6. Brynjolfsson, E., & McAfee, A. (2017). *Machine, Platform, Crowd: Harnessing Our Digital Future*. W. W. Norton & Company.
7. Parker, S. K., & Wall, T. D. (1998). *Job and Work Design: Organizing Work to Promote Well-Being and Effectiveness*. Sage Publications.

8. Raghuram, S., Hill, N. S., Gibbs, J. L., & Maruping, L. M. (2019). Virtual work: Bridging research clusters. *Academy of Management Annals*, 13(1), 308–341.
9. Tarafdar, M., Cooper, C. L., & Stich, J. F. (2019). The technostress trifecta: Techno eustress, techno distress, and design. *Information Systems Journal*, 29(1), 6–42.
10. Jarrahi, M. H. (2018). Artificial intelligence and the future of work: Human-AI collaboration in organizational decision-making. *Business Horizons*, 61(4), 577–586.
11. Sharma, A., & Goyal, R. (2020). Artificial intelligence adoption in organizations: Implications for employee performance and work-life balance. *International Journal of Advanced Research in Management*, 11(3), 45–52.
12. Solomon, M. R. (2018). *Consumer Behavior: Buying, Having, and Being* (12th ed.). Pearson Education.