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A STUDY ON TECHNOLOGY ADOPTION AMONG WORKING WOMEN IN MANUFACTURING SECTOR

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Abstract

Manufacturing, the production of goods using labor, machines, and technological processes, has undergone significant transformations throughout history. Initially, manufacturing was characterized by skilled artisans working alongside unskilled or semi-skilled laborers. However, the modern era has brought rapid changes to the global economy, profoundly impacting women's roles in the workforce. Globalization and technological advancements have shifted the focus towards high-skilled, technology-intensive production, rendering traditional low-skill, labor-intensive occupations in sectors like agriculture and textiles less prominent. Despite these changes, manufacturing continues to evolve, driven by innovations, strategic business approaches, and cutting-edge techniques. This evolution has been shaped by pivotal moments in history, with three women – Madame C.J. Walker, Rosie the Riveter, and Stephanie Kwolek – playing pivotal roles in advancing manufacturing. Their lasting impact continues to inspire women to join the manufacturing industry today

Keywords: Technology, Adoption, Women, Manufacturing

Introduction

In the modern era, technology has become a cornerstone for innovation, efficiency, and competitiveness across industries, including manufacturing. The integration of advanced technologies, such as automation, robotics, and digital systems, has transformed traditional manufacturing processes, requiring workers to adapt to new tools and workflows. Working women in manufacturing face unique opportunities and challenges in adopting and utilizing these technologies effectively. Despite the growing emphasis on

gender diversity and inclusion in the workplace, women often encounter barriers that hinder their ability to embrace technological advancements. These barriers include limited access to training, cultural biases, and the underrepresentation of women in technical roles. Conversely, technology adoption provides a pathway for working women to enhance their skills, increase productivity, and achieve career growth. This study aims to explore the factors influencing technology adoption among working women in the manufacturing sector. The manufacturing industry has undergone significant transformations throughout history, with pivotal moments shaping its current state. Notably, three women – Madame C.J. Walker, Rosie the Riveter, and Stephanie Kwolek – have played a crucial role in advancing manufacturing and continue to inspire women to join the industry today. A recent study by Lashitew (2023) found that technology adoption is influenced by demand conditions, supply conditions, and managerial attributes. Demand conditions refer to factors that influence the attractiveness of digital technologies, resulting from information capabilities and human resources. Supply conditions relate to the availability of Information and Communication Technology (ICT) and digital solutions, such as basic infrastructure and internet-based services. Managerial attributes, including gender influence, attitudes, risk tolerance, and adaptability, also play a significant role in determining technology adoption decisions in entrepreneurial contexts.

Methodology

Objectives of the study

- To study the Socio-Economic status of the respondents.
- To analyze the technology adoption among working women in the manufacturing sector.

The Sampling Procedure

The present study was carried out in Renigunta Mandal, Tirupati District, Andhra Pradesh. The sampling unit for the research among working women in manufacturing sector at Wingtech Mobile Communications India Pvt. Ltd., IT Park, Renigunta Mandal, Tirupati District, Andhra Pradesh. in the age group of below 25 years to above 45 years. A total of 100 samples from working women in the manufacturing sector were selected for this study using simple random sampling method. The investigator was familiar with the local language, making it easy to build rapport with the respondents.

Results and Discussion

Table No.1: Percentage Distribution of the Respondent's by Age

Age group	No. of Respondents	Percentage
Below 25 yrs	56	56.0
25- 30 yrs	44	44.0
35- 45Yrs Above	-	-
Total	100	100

The table shows that the majority of respondents (56%) are below 25 years of age, indicating that a significant portion of the workforce is quite young. Two-fifths of the respondents (44%) are in the age group of 25-30 years, suggesting that young adults also form a substantial part of the workforce. There are no respondents in the age group of 35-45 years or above, implying that the workforce in this sector is predominantly young, with very few or no older employees.

Table No. 2: Percentage of Distribution of The Respondents According to Their Educational Level.

Educational status of Respondents	No. of Respondents	Percentage
Illiterate	-	-
Primary Education	-	-
Secondary Education	-	-
Intermediate	16	16.0
Degree	72	72.0
Post-Graduation	12	12.0
Total	100	100

The data reveals that the majority (72%) of respondents had completed their undergraduate studies. More than one-tenth (16%) of respondents possessed an intermediate qualification, while a smaller proportion (12%) had completed their postgraduate studies.

Table No. 3: Percentage Distribution of the Respondent's by Marital Status

Marital Status of respondents	No. of Respondents	Percentage
Married	8	8.0
Unmarried	92	92.0
Divorced	-	-
Widow	-	-
Total	100	100

The above table shows that the majority (92%) of respondents were unmarried, while another 8%) of respondents were married.

Table No. 4: Percentage distribution of the respondents by Occupational Status

Occupational status	No. of Respondents	Percentage
Operators	70	70.0
Quality	25	25.0
Key operators	5	5.0
Total	100	100

The table indicates that the majority (70.0%) of the respondents were working as operators in the mobile manufacturing sector, while one-fourth (25.0%) worked in the quality department. The mobile manufacturing sector classified a small percentage (5.0%) of the respondents as key operators.

Table No. 5: Percentage Distribution of the Respondent's by Annual income

Monthly income	No. of Respondents	Percentage
Less than 25000/-	88	88.0
More than 25000/- Rs and less than 50000/-	12	12.0
More than 500001/- and less than 75000/-	-	-
Total	100	100

It was observed from the data majority (88.0%) of the respondents' income level was less than 25000/-, followed by one-fourth (12.0%) of the respondent's income level was more than 25000/- Rs and less than 50000/-.

Table 6: Percentage distribution of respondents by work experience

Work Experience	No. of Respondents	Percentage
Below 5 yrs	96	96.0
5 to 10 yrs	4	4.0
Total	100	100

According to the table, the vast majority (96%) of respondents have less than 5 years of work experience in the company. Only a small percentage (4%) of respondents have between 5 and 10 years of work experience with the company.

Table 7: Percentage distribution of respondents by place of residence."

Place of residence	No. of Respondents	Percentage
Rural	64	64.0
Urban	32	32.0
Semi- Urban	4	4.0
Total	100	100

According to the table evidence, more than two-thirds (64%) of the respondents lived in rural areas, while slightly over one-third (32%) lived in urban areas. Only a small percentage (4%) of the respondents lived in semi-urban areas.

Table No. 8: Percentage distribution of the respondents by their office timings.

Office timing	No. of Respondents	Percentage
Morning shift	32	32.0
Night Shift	20	20.0
No specific timing	48	48.0
Total	100	100

The table indicates that More than two fifths (48.0%) of the respondents indicated that there are no specific office timings for the workplace due to employees' preferences. This suggests that a significant portion of the workforce either has flexible work hours or operates under a system where the timing of work is not strictly defined. This flexibility could cater to varying personal schedules or preferences among employees. This flexibility can be advantageous for accommodating diverse employee needs, such as commuting preferences, family obligations, or personal productivity peaks.

One third (32.0%) of the respondents stated that they have morning shift duties. This indicates that a substantial portion of the workforce starts work earlier in the day, typically adhering to more traditional working hours that begin in the morning. Morning shifts are common in many industries and are often aligned with standard business hours.

One fifth (20.0%) of the respondents reported having night shift duties. This signifies that a notable segment of the workforce works during nighttime hours, which could involve tasks or responsibilities that require 24-hour coverage or operations extending beyond typical daytime hours. Night shifts are prevalent in industries such as healthcare, hospitality, manufacturing, and customer support.

Table No. 9: The Percentage Distribution of Respondents Based on The Distance of Their Workplace from Their Home.

workplace from your home	No. of Respondents	Percentage
About 1 Km	28	28.0
2-4 km	20	20.0
5-6 km	4	4.0
More than 6 kms.	48	48.0
Total	100	100

The table shows More than two fifths (48.0%) of the respondents have their workplace located more than 6 kilometers away from their home. This indicates that a significant portion of the workforce has a commute distance that requires longer travel times, potentially impacting daily routines and transportation choices. Nearly one third (28.0%) of the respondents have their workplace located within 1 kilometer from their home. This suggests that a considerable number of respondents have the convenience of a short commute, which could contribute to reduced travel time and easier access to their workplace. One fifth (20.0%) of the respondents have their workplace located between 2 to 4 kilometers away from their home. This range indicates a moderate commute distance, which is still manageable but longer compared to those with workplaces closer to home.

A minor proportion (4.0%) of the respondents have their workplace located between 5 to 6 kilometers away from their home. This signifies a relatively short but slightly longer commute distance compared to those within 1 kilometer.

Table No. 10: The Percentage Distribution of Respondents Based on Their Mode of Transport

workplace from your home	No. of Respondents	Percentage
Walking	14	14.0
Own vehicle	20	20.0
Local bus	8	8.0
Office bus	54	54.0
Total	100	100

The table shows that the majority half of the respondents (54%) use the office bus, indicating that this is the most common mode of transport. This suggests that many workplaces provide transportation services, which can be convenient and cost-effective for employees. This choice could be influenced by factors such as cost-effectiveness, accessibility of bus routes, and possibly environmental considerations. One fifth (20.0%) of the respondents use their own vehicles (e.g., car, motorcycle) as their mode of transport to get to the office. This indicates that a substantial number of respondents prefer the convenience and flexibility that comes with using their own vehicle for commuting. Reasons for this choice could include control over travel time, route flexibility, and possibly comfort during travel.

Less than one fifth (14.0%) of the respondents walk as their mode of transport to the office. This represents a smaller proportion of respondents who either live close enough to their workplace to walk comfortably or choose walking as a preferred mode of commuting for health, environmental, or personal reasons. Walking as a mode of transport indicates proximity to the workplace and a preference for physical activity as part of the daily commute.

Table No. 11: Percentage Distribution of The Respondents by Their Job Satisfaction.

Satisfied with the present job	No. of Respondents	Percentage
Yes	75	75.0
No	25	30.0
Total	100	100

The table indicates that more than three fourths (75.0%) of the respondents are satisfied with their present job. This high percentage suggests that a significant majority of the respondents find their job satisfactory, which could be attributed to factors such as convenient timing and a good work environment. Convenient timing might imply flexible working hours or schedules that suit the employees' needs, while a good work environment likely includes factors like supportive colleagues, positive organizational culture, and conducive physical surroundings. One fifth (25.0%) of the respondents are not satisfied with their present

job. This indicates that a notable minority of respondent's express dissatisfaction with their job. Reasons for dissatisfaction could vary and might include factors such as job role dissatisfaction, lack of growth opportunities, inadequate compensation, poor work-life balance, or issues with management.

Table No. 12: The Percentage Distribution of Respondents Based On 'If Yes, Why Are They Satisfied with The Job.

If yes, why	No. of Respondents	Percentage
Good salary	50	66.0
Good administration	5	7.0
Pleasant atmosphere	5	7.0
Convenient hours	15	20.0
Suited to qualifications and interest	-	-
Total	75	100

The table shows that majority (66.0%) of the respondents attribute their satisfaction with the job to receiving a good salary. This suggests that a significant motivation for job satisfaction among these respondents is financial compensation. A good salary is often a crucial factor in overall job satisfaction as it reflects fair compensation for skills, responsibilities, and contributions. one tenth (20.0%) of the respondents cite convenient working hours as a reason for their job satisfaction. This indicates that a smaller proportion of respondent's value flexible or manageable working hours that contribute positively to their satisfaction. Flexible working arrangements can enhance work-life balance and productivity.

A very small proportion (7.0%) of respondents attribute their job satisfaction to good administration and a pleasant atmosphere in the workplace. This suggests that a minority find satisfaction in the quality of management practices and the overall positive environment at work. A supportive and positive workplace culture can foster employee engagement and satisfaction.

Table No. 13: Percentage Distribution of The Respondents by Reasons for Dissatisfaction.

If yes, why	No. of Respondents	Percentage
Insufficient salary	20	66.0
Poor administration	-	-
Unfriendly atmosphere	-	-
Inconvenient hours	5	17.0
Unsuited to qualifications and interest	5	17.0
Total	30	100

The table shows that majority (66.0%) of the respondents are dissatisfied with their job due to receiving an insufficient salary. This suggests that a notable minority of respondents feel that their compensation does not adequately reflect their skills, experience, or the responsibilities they undertake in their roles. Less than one fifth (17.0%) of the respondents are dissatisfied with their job Inconvenient hours and Unsuited to qualifications and interest.

Table No. 14: The Percentage Distribution of Respondents Based on The Type of Work Allotted to Them.

Type of work allotted	No. of Respondents	Percentage
Skilled/	92	92.0
Unskilled	8	8.0
Total	100	100

The table indicates that an overwhelming proportion (92.0%) of the respondents are allotted skilled work. This suggests that the majority of respondents are engaged in roles or tasks that require specialized knowledge, expertise, or training. Skilled work typically involves professions or positions where specific skills, qualifications, or experience are necessary to perform the job effectively. A very small proportion (8.0%) of respondents are allotted unskilled work. This indicates that only a minority of respondents are engaged in tasks that do not require specialized training or qualifications. Unskilled work may involve roles that are more routine, manual, or straightforward in nature, and typically require minimal training or experience to perform. Positions categorized as unskilled work might include basic assembly line tasks, general labor, or simple administrative duties that do not demand advanced skills or extensive training.

Table no: 15 Percentage Distribution of The Respondents by The Type of Product They Manufacture.

Product manufacture	No. of Respondents	Percentage
Mobile	72	72.0
Electrical equipment	8	8.0
Basic metals	20	20.0
Total	100	100

The table indicates that the majority of respondents (72%) are involved in the manufacturing of mobile products. This indicates a strong focus on the mobile industry, which could be due to high demand and rapid technological advancements in this sector. One fifth, 0% of respondents are engaged in the manufacturing of basic metals. This suggests a significant portion of the workforce is involved in industries related to metal production, which is essential for various applications, including construction, automotive, and machinery.

A very small proportion, specifically 8% of respondents manufacture electrical equipment. This indicates a smaller but notable segment of the workforce is dedicated to producing electrical components and devices, which are crucial for numerous industries. The focus on mobile manufacturing could reflect global trends in technology and consumer electronics, while the involvement in basic metals and electrical equipment suggests foundational industries supporting broader economic activities.

Table No. 16: Percentage Distribution of The Respondents by Reasons Why Their Company Engages in Technological Innovation.

Type of work allotted	No. of Respondents	Percentage
To attract more customers	95	95.0
To fight competitions	-	-
To improve product performance	-	-
To increase company's performance	5	5.0
Total	100	100

The table indicates that majority, 95.0% of the respondents, indicated that their company engages in technological innovation primarily to attract more customers through mobile products. This suggests that

companies recognize the importance of mobile technology in reaching and engaging with a broader customer base. Mobile products such as apps, mobile-friendly websites, and digital platforms enable companies to enhance customer experience, offer convenience, and stay competitive in a mobile-centric market.

A small proportion, specifically 5.0% of the respondents, stated that their company engages in technological innovation to increase company performance. This could include initiatives aimed at enhancing operational efficiency, reducing costs, optimizing supply chain management, improving product quality, or streamlining internal processes through technology-driven solutions. While less emphasized compared to customer-focused innovations, improving company performance remains crucial for achieving long-term sustainability and profitability.

Major findings of the study

- Majority (72%) of respondents had completed their undergraduate studies.
- Majority (92%) of respondents were unmarried, while another 8%) of respondents were married.
- The majority (70.0%) of the respondents were working as operators in the mobile manufacturing sector,
- Majority (88.0%) of the respondents' income level was less than 25000/-,
- Majority (96%) of respondents have less than 5 years of work experience in the company.
- More than two-thirds (64%) of the respondents lived in rural areas,
- More than two fifths (48.0%) of the respondents indicated that there are no specific office timings for the workplace due to employees' preferences.
- More than two fifths (48.0%) of the respondents have their workplace located more than 6 kilometers away from their home.
- Majority half of the respondents (54%) use the office bus, indicating that this is the most common mode of transport.
- More than three fourths (75.0%) of the respondents are satisfied with their present job.
- That majority (66.0%) of the respondents attribute their satisfaction with the job to receiving a good salary.
- Majority (66.0%) of the respondents are dissatisfied with their job due to receiving an insufficient salary.
- An overwhelming proportion (92.0%) of the respondents are allotted skilled work.
- The majority of respondents (72%) are involved in the manufacturing of mobile products.
- Majority, 95.0% of the respondents, indicated that their company engages in technological innovation primarily to attract more customers through mobile products.

Conclusion

India's manufacturing sector is seeing a rise in female participation, with women making up 19.7% of the workforce in 2019-20. Historically, women's involvement ranged between 10-20%, but their skills in areas such as attention to detail and consistent performance are now highly valued, particularly in the Electronics Manufacturing Services (EMS) sector. States like Tamil Nadu, Karnataka, Uttar Pradesh, and Maharashtra are leading this shift, with increased investment in EMS facilities and a preference for hiring local women. To further enhance women's participation, companies are investing in health, safety, and training programs. Reforms in labor laws, flexible working hours, and accommodations are essential to support this trend and foster gender equality in the industry. Addressing these challenges and implementing supportive policies will help leverage women's skills, driving continued growth and innovation in manufacturing.

Recommendations of the Study

Introduce specialized training programs and certifications to improve employees' technical skills and proficiency in advanced technologies. Implement flexible working hours and hybrid work models to accommodate employees' caregiving responsibilities and personal needs. Review salary structures, offer competitive wages, performance-based incentives, and comprehensive benefits to enhance job satisfaction. Expand office bus services or provide travel allowances to assist employees traveling from distant locations. Address salary-related dissatisfaction by introducing feedback mechanisms, career advancement opportunities, and employee engagement programs. Focus on continuous learning and training to keep employees updated with technological advancements and maintain a competitive workforce. Establish rural training centers and community recruitment drives to develop local talent and strengthen rural employment opportunities. Promote employee participation in idea-generation programs and workshops to boost creativity and workplace engagement. Implement clear policies on work timings to improve efficiency and provide clarity to employees. Enhance skills related to mobile product manufacturing, such as supply chain optimization and market research training

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