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Augmenting Innovation: Artificial Intelligence Among Women Entrepreneurs

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Abstract

Artificial intelligence is the most powerful tool in this decade that augments innovation in all areas of business. It promotes entrepreneurship through automating several processes like demand forecasting, automated bookkeeping, personalized customer experience, innovative marketing strategies, product design, etc. AI has been adopted by women entrepreneurs, especially after the COVID-19 pandemic. It helps them improve their sales and reduce their efforts. Still, they are confronting a lot of constraints on AI implementation, like the huge cost of installation, a lack of digital skills, a lack of sufficient resources, etc. (Aiswarya and Sangeetha, 2022). The present study aims to understand the perceptions of women entrepreneurs towards the adoption of AI in their businesses. Data was collected through a structured questionnaire and was conveniently collected from a sample of 250 women entrepreneurs from five different districts in Kerala, India, registered under the District Industries Centre (DIC). Cronbach's alpha test was conducted to test the reliability of the questionnaire. A three-point and five-point Rensis Likert scale was used for measuring the perception of women entrepreneurs towards AI. Statistical analyses are conducted using weighted averages, measures of dispersion, one-way ANOVA, chi-square tests, and factor analysis. SEM Association between women entrepreneurs' awareness towards artificial intelligence and its tools, usage of AI in their business, nature of benefits realized (positive impact of AI on their business), and nature of challenges faced by them while implementing AI.

Keywords: Artificial Intelligence, women entrepreneurs, technology, digital skills, innovation.

1 Introduction

The number of women pursuing entrepreneurial careers has risen, which is positive. Though traditionally dominated by men, the landscape of entrepreneurship is changing as more women take the risk of starting their own companies and assuming leadership roles (Franzke, et al., 2022). Numerous causes, such as evolving social views, easier access to resources and education, and the recognition of women's distinct viewpoints and abilities in the entrepreneurial ecosystem, are responsible for this change (Maura McAdam, Richard T. Harrison and Claire M. Leitch, 2018; Majumder, 2023). Women are starting companies in a wide range of sectors, including healthcare, fashion, technology, and finance. Future generations are inspired by women entrepreneurs who break down boundaries and show how diversity can improve the commercial landscape. AI is a versatile technology that helps us combine data, analyze it, and apply insights to make better decisions.

It involves robots that make decisions requiring human competence and react to stimuli in a way commensurate with human responses. Technological breakthroughs, digital transformation, and data-driven decision-making are driving a healthy upswing in the Indian market for artificial intelligence (AI) and machine learning (ML). A wide range of industries, including manufacturing, banking, healthcare, e-commerce, and agriculture, are aware of the revolutionary potential of AI and ML (Boukherouaa, et al., 2021). AI-powered analytics are used by businesses to gain actionable insights that improve consumer experiences through tailored suggestions, streamline supply chains, and even advance medical diagnoses.

Indian companies are catching up quickly when it comes to AI use. An environment with favourable regulations has been established for the expanding usage of AI by the Indian government through its Digital India project. Data centres and the intelligence underlying the data collected will allow industry and the government to make efficient algorithm-based decisions as India rapidly adopts digital technology. This translates into more chances for the nation to use AI. AI is being used by Indian businesses to innovate new goods and services, improve the consumer experience, and revolutionize their industries. Small and medium-sized businesses (SMEs) in India are realizing that artificial intelligence (AI) may improve operations, spur innovation, and provide them with a competitive advantage. The adoption of AI by women entrepreneurs needs to be studied. Disappointingly, only 22% of AI roles are filled by women in India, a country with the second-largest AI workforce and one of the biggest gender gaps in the field.

Artificial intelligence (AI) solutions can help small business owners increase productivity, automate repetitive processes, and gain insightful knowledge about market trends and client behaviour (Haleem, 2022). The availability of AI tools and their limitless potential to transform society present ideal circumstances for female entrepreneurs to seize the initiative and build the AI-driven businesses of the future. Artificial intelligence (AI) provides strong instruments that can boost the inventiveness, efficiency, and production of female entrepreneurs. AI can help remove obstacles that prevent women from participating fully in the economy. For example, it can assist women find new or better jobs and make sure that female entrepreneurs can access emerging markets and financial inclusion (Roy, 2022). Specifically, AI-powered content production offers revolutionary ways to improve brand marketing. Some studies evaluated the relationship between an entrepreneurial mindset and the ability to analyze large data with artificial intelligence under the moderating influence of environmental dynamism (Dubey et al., 2020; Lévesque et al., 2022; Ramesh, 2021).

The present study aims to understand the perceptions of women entrepreneurs towards the adoption of AI in their businesses. Though the concept evolved and was used over the years by several companies, whether it reached the small businesses owned by women entrepreneurs needs to be studied. The study analyzes the awareness level of AI applications among female entrepreneurs and how far they have adopted them in their businesses. It also examines the constraints they confronted in implementing AI in their business.

2   Review of Literature

Guglielmo and Pellegrini (2023) consider the critical use of AI within all Industry 4.0 technological paradigms, such as smart factories, the Internet of Things (IoT), augmented reality (AR), and blockchain. It aims to investigate the impact of AI on entrepreneurship as an enabler for entrepreneurs. All pertinent papers establishing links between artificial intelligence and entrepreneurship were examined through a methodical assessment of the literature. The "AI-enabled entrepreneurial process" is the framework that the cluster interpretation adheres to. This study demonstrates that artificial intelligence (AI) has significant ramifications for entrepreneurship. Specifically, AI benefits entrepreneurs in four ways: through opportunities, decision-making, performance, education, and research. The examination of 139 peer-reviewed publications (Perifanis, and Kitsios, 2023) has highlighted the performance benefits, success criteria, and challenges associated with using AI, according to the literature. To build AI skills and incorporate them into business and IT plans to boost multiple business value streams. Only by carefully embracing and putting these new, cutting-edge technologies into practice will organizations thrive in the digital transformation alignment of the modern day. This review aims to address the issue of resource orchestration and governance in this dynamic environment, which is still relatively complex despite the revolutionary potential advantages that AI capabilities may promote. It is also early in the research process regarding the strategic implementation of AI in organizations, so this review will help present and future organizations effectively enhance various business value outcomes. Another author (Shepherd and Majchrzak, 2022) outlined the basics of artificial intelligence (AI) and considered some of the longer-term, more general societal effects of AI. They suggest that entrepreneurship and AI together can create a powerful tool. To investigate the potential of this super tool for AI entrepreneurship and ideally steer its application toward beneficial processes and results, academics can study the intersection of AI and entrepreneurship. A more interaction-based perspective of (potential) entrepreneurial opportunities, a more activities-based micro-foundation approach to entrepreneurial action, a more cognitively hot perspective of entrepreneurial decision-making and action, and a more compassionate and prosocial role of entrepreneurial action are the four emerging areas for entrepreneurship research that they concentrate on. They address implications for the shadow side of entrepreneurship while concentrating on certain subjects related to entrepreneurship that stand to gain from AI's augmentation potential. In their study, Chalmers, et al. (2021) investigate how artificial intelligence (AI) can affect the processes, approaches, and outcomes of new business endeavours, as well as how this technology might both supplement and replace the labour-intensive process of creating, presenting, and executing ideas. They look at how these modifications will affect the way entrepreneurial efforts are organized because they call for new operating procedures. While artificial intelligence (AI) has promise for fostering entrepreneurship, it is not without limitations. Their research program emphasizes the negative impacts of artificial intelligence on society and the economy, with a particular focus

on established small enterprises that may face disintermediation in an AI-driven economy. Chae and Goh (2020) have directed their attention towards how digital technologies are impacting and contributing to the realm of entrepreneurship. This study used a learning machine in conjunction with data from Crunchbase and the Twitter API to address the question, "Who are digital entrepreneurs?" This study shows that digital entrepreneurs in the artificial intelligence and data analytics (AIDA) space are more likely to be men, active, and connected online than non-digital entrepreneurs. Furthermore, they tend to be more extroverted, less industrious, and friendly than other non-digital entrepreneurs. Investors, lawmakers, current and potential digital entrepreneurs, and educators will all benefit from their research's increased understanding of digital entrepreneurs.

Darwish et al. (2020) reviewed the advancements in AI-related applications over the years, ignoring the potential for using and using these systems in the future for business owners. In this regard, the current study effort offers numerous facets and real-world applications for AI systems. It was made clear that for those systems to be practically usable, they will require an extremely complex control mechanism that regulates the responses of the AI-related systems. the research is based on the effects of artificial intelligence (AI) on user entrepreneurs, as well as the variables that encourage user entrepreneurship and the process itself, along with its traits and future directions (Li et al., 2022). Furthermore, this paper organizes the logic of the shift in user entrepreneurship in the AI era. This investigation yields four results. First, AI helps entrepreneurs by gathering vast amounts of user data and using intelligent analysis to derive the best possible business decisions and judgments. Second, business owners may employ AI systems to ascertain user desire (e.g., more precise and significant product flaws) and to comprehend users' prospective demands. Third, AI helps business owners acquire solid user data for their products, including both elite and common customers, for a larger market. Fourth, AI restructures the three-stage user entrepreneurial process-product element deconstruction, product verification matching, and innovative product commercialization-replacing the original intergenerational product replacement model with intermittent and periodic characteristics for entrepreneurial activities. In the Indian context, research explores the efforts of Indian women entrepreneurs to keep their businesses afloat in the face of the COVID-19 emergency in 2021-2022 (Bhatnagar and Yadav, 2023). This study focuses on the efforts made by women in Rajasthan, specifically highlighting how artificial intelligence (AI) helps them to survive. In addition to adding to the body of data by examining women-claimed micro and small companies (MSEs) and their use of AI through social media during COVID-19, it looks at how Indian women entrepreneurs used social media to stay in business throughout the epidemic. A survey was distributed to a sample of one hundred female entrepreneurs who run their enterprises using social media platforms. Using an anti-tactical strategy to handle survey data from 100 respondents, the researchers discovered that the pandemic essentially impacts women entrepreneurs, particularly those who manage MSMEs. Due to reduced discounts, hampered supply chains, and the trouble of paying credit portions, women's compensation has decreased. Even though female entrepreneurs are particularly vulnerable to financial shocks, the majority require assistance from the public or private sectors. This assessment highlights the role artificial intelligence (AI) can play in providing virtual entertainment to save women's businesses. Web-based entertainment has gained notoriety for assisting women in marketing their enterprises, attracting new customers, and retaining existing ones. Strong developments combined with enticing offerings like restrictions, a range of services, and promotion have helped women business owners minimize their losses. It is implied that in times of crisis, female entrepreneurs adopt creative strategies to maintain the viability of their enterprises. Another study elicits a range of contradictory reactions, oblique arguments, and viewpoints regarding the viability of entrepreneurship in Bangalore City utilizing conventional methods of decision-making and artificial intelligence (Shiyal et al., 2019). Fifty replies make up the sample size for this study. To learn how entrepreneurs view traditional versus artificial intelligence, structured questionnaires have been given to them along with in-person interviews. Additionally, the relationship between traditional and artificial intelligence has been examined, as well as how it influences entrepreneurial decisions. The findings showed that there is a statistically significant difference between how men and women entrepreneurs are perceived based on personality and compatibility tests.

2.1 Research Gap

Previous studies help to understand the concept of artificial intelligence among entrepreneurs in-depth as they are based on extensive literature (Giuggioli and Pellegrini (2023); Perifanis and Kitsios (2023)). They are not based on survey data. The present study aims to analyze the perceptions of women entrepreneurs regarding the adoption of AI in their businesses. Many female entrepreneurs started adopting AI during the COVID-19 pandemic. The digital literacy of women entrepreneurs improved a lot during the COVID-19 pandemic. This leads to the adoption of AI. However, it was found that AI is largely adopted by huge companies, especially multinational companies. Still, the concept of AI is unreached in the hands of women entrepreneurs in small businesses. Most of the studies (Shepherd and Ann Majchrzak, 2022) outline the basics of artificial intelligence (AI) and consider some of the longer-term, more general societal effects of AI. Some studies (Bhatnagar and Yadav, 2023) mainly focused on the use of AI through social media during COVID-19. These studies did not measure the knowledge and usage of AI tools by women entrepreneurs. The study (Darwish et al., 2020) reviewed advancements in AI-related applications over the years, and another one (Li et al., 2022) investigates variables that encourage user entrepreneurship and the process itself, along with its traits. These studies analyze the impact of AI on entrepreneurship (Bhadauria et al., 2022; Hisrich and Soltanifar, 2021). Research (Chae and Goh, 2020) also focused on the concept of digital entrepreneurs and their usage of AI. The present study primarily analyzes the awareness level of women entrepreneurs about the concept of AI and its tools. It also analyzes how far they are adopting it and the problems they faced while adopting

it in their business.

2.2 Objectives and Hypothesis of the study

The first objective is to investigate the awareness level of artificial intelligence among women entrepreneurs. The second objective is to examine the use of artificial intelligence by women entrepreneurs. The last objective is to analyze the obstacles to using artificial intelligence confronted by women entrepreneurs. The hypotheses of the study include:

H1: Women entrepreneurs' level of awareness of various areas of AI application differs according to their age.
H2: Women entrepreneurs' level of awareness of various AI tools differs according to their educational qualifications.
H3: There exists an association between women entrepreneurs' level of awareness of AI applications and their usage in their businesses.
H4: There exists an association between women entrepreneurs' level of awareness of AI tools and their usage in their businesses.
H5: There exists an association between AI tool usage by women entrepreneurs and their perception of its positive impact on their businesses.
H6: There exists an association between AI tool usage by women entrepreneurs and the nature of challenges faced by them in its implementation.

3 Research Methodology

The present study aims to examine the perceptions of women entrepreneurs about AI. Data was conveniently collected from a sample of 250 women entrepreneurs from five different districts in Kerala, India, registered under the District Industries Centre (DIC). A sample of 50 women entrepreneurs each from five districts in Kerala was conveniently taken. The districts taken for the study include Palakkad, Thiruvananthapuram, Thrissur, Kannur, and Kozhikode. As it is difficult to obtain the total number of women entrepreneurs registered under DIC, a convenient sampling method is adopted. A systematic questionnaire created with Google Forms was used to gather data. It covers aspects such as the demographic profile for four items, the degree of familiarity with different AI tools for six items, the application of AI in business for seven items, and the difficulties in putting AI into practice for seven items. Cronbach's alpha test was conducted to test the reliability of the questionnaire. Cronbach's alpha score is 0.714126, which shows the questionnaire is reliable. A five-point Likert scale was used as it accurately measured the different degrees of perception of women entrepreneurs on AI (Joshi et al., 2015). Statistical analyses are conducted using weighted averages, measures of dispersion, one-way ANOVA, chi-square tests, and factor analysis. SEM Association between women entrepreneurs' awareness towards artificial intelligence and its tools, usage of AI in their business, nature of benefits realized (positive impact of AI on their business), and nature of challenges faced by them while implementing AI.

4 Data analysis and Interpretation

Table 1: Demographic Profile of Women Entrepreneurs

S. No.	Demographic Profile	No of Respondents	Percentage
	Age		
1.	Less than 25 Years	40	16.00
2.	26-40 Years	132	52.80
3.	41-55 Years	52	20.80
4.	Above 56 Years	26	10.40
	Total	250	100
	Marital Status		
1.	Married	171	68.40
2.	Unmarried	79	31.60
	Total	250	100
	Educational Qualifications		
1.	High School	79	31.60
2.	Under Graduation	105	42.00
3.	Post Graduation and Above	53	21.20
4.	Others	13	5.20
	Total	250	100
	Work Experience		
1.	Below 2 Years	120	48.00
2.	2-5 Years	78	31.20
3.	Above 5 Years	52	20.80
	Total	250	100

Source: Primary data.

Table 1 shows the demographic profile of the respondents. 52.80% of the respondents are between the ages of 26 and 40. 20.80% of the respondents are between the age groups of 41 and 55 years old. 16% of the respondents are below the age of 25 years, and the remaining 10.40% of respondents are above the age group of 56 years. 68.40% of respondents are married, and 31.60% are unmarried. 42% of respondents are undergraduates, 31.60% have high school qualifications, 21.20% have post-graduation and above qualifications, 5.20% have other educational qualifications like diplomas, and 48% of the respondents have less than 2 years of work experience as entrepreneurs. 31.20% have 2 to 5 years of work experience. 20.80% of respondents have 5 years of work experience.

Table 2: Measure of Dispersion and One-Way ANOVA
Test Age of Women Entrepreneurs Vs Level of Awareness on Various Areas of AI Application

Variables	Less than 25 Years		26-40 Years		41-55 Years		Above 56 Years		F Value	Sig
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Hiring and Recruitment	2.350	0.483	2.500	0.510	1.750	0.437	2.114	0.946	7.468	.000
Market Prediction	2.000	0.816	1.705	0.789	2.250	0.837	1.500	0.510	8.318	.000
Customer Analysis	1.675	0.474	1.591	0.800	2.000	1.020	1.500	0.505	2.939	.034
Billing and Invoice	1.000	0.000	1.689	0.783	1.250	0.437	1.500	0.510	15.063	.000
Targeted Marketing	2.025	0.832	2.402	0.799	2.000	0.714	1.500	0.510	12.072	.000
Quality Control and Assurance				0.837	2.189	0.607	2.025	0.832	24.627	.000
Financial Forecasting	2.350	0.949	2.295	0.651	2.000	0.714	2.000	1.020	12.983	.032

Source: Primary Data
Level of Significance: 5 percent
H1: Women entrepreneurs' level of awareness on Various Areas of AI Applications differs according to their age.
The computed ANOVA test values of 7.468, 8.318, 2.939, 15.063, 12.072, 24.627, and 12.983 were found to be within the significance level of five per cent. Henceforth, the hypothesis framed is accepted, and it has been concluded that women entrepreneurs' level of awareness in various areas of AI application differs according to their age.

Table 3: Measure of Dispersion and One-Way ANOVA Test Educational Qualifications of Women Entrepreneurs Vs Level of Awareness on Various AI Tools

Variables	High School		Under Graduation		Post Graduation and Above		Others		F Value	Sig
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
ChatGPT	1.329	0.473	1.886	0.788	2.226	0.847	1.736	0.788	24.198	.000
Grammarly	2.013	0.824	2.114	0.609	1.755	0.830	2.000	0.728	12.943	.034
Click up	2.506	0.503	2.238	0.838	2.509	0.869	2.368	0.745	13.791	.011
Jasper AI	2.329	0.473	2.248	0.830	2.755	0.434	2.368	0.665	9.400	.000
Chat spot	2.329	0.473	2.114	0.788	2.264	0.836	2.260	0.717	6.738	.000
Dall. E 2	2.177	0.902	2.752	0.434	2.019	0.720	2.428	0.748	21.712	.000

Source: Primary Data
Level of Significance: 5 percent

H2: Women entrepreneurs' level of awareness of various AI tools differs according to their educational qualifications.
The computed ANOVA test values of 24.198, 12.943, 13.791, 9.400, 6.738, and 21.712 were found to be within the significance level of five per cent. Henceforth, the hypothesis framed is accepted, and it has been concluded that women entrepreneurs' level of awareness of various AI tools differs according to their educational qualifications.
Source: Primary Data

Table 4: MUsage of AI in Business

AI Usage	Highly Used	Used	Moderately Used	Lowly Used	Not Used	Sum	Mean	Rank
Social Media	120 (48.00)	65 (26.00)	13 (5.20)	26 (10.40)	26 (10.40)	977	3.91	2
Chat GPT/ Chatbots	39 (15.60)	53 (21.20)	52 (20.80)	66 (26.40)	40 (16.00)	735	2.94	3
Automated Bookkeeping	26 (10.40)	91 (36.40)	13 (5.20)	80 (32.00)	40 (16.00)	733	2.93	4
Decision Support System	0 (0.00)	52 (20.80)	26 (10.40)	92 (36.80)	80 (32.00)	550	2.20	6
Virtual Assistants	66 (26.40)	52 (20.80)	40 (16.00)	66 (26.40)	26 (10.40)	816	3.26	1
Designing Products	41 (16.40)	65 (26.00)	27 (10.80)	65 (26.00)	52 (20.80)	728	2.91	5
Prediction of Demand	0 (0.00)	39 (15.60)	13 (5.20)	132 (52.80)	66 (26.40)	525	2.10	7

Table 4 shows the usage of AI in business by respondents. Most of the respondents use virtual assistants for conducting business. They also actively use social media to sell products. They also adopt chat GPT/chatbots and automated bookkeeping in their enterprise. Only a small number of respondents are adopting AI for product design and demand prediction.

Table 5: Challenges of Implementing AI for Business

Challenges	Major Issue	One of the Issues	Moderate Issue	Not a Issue	No Relevance	Sum	Mean	Rank
Lack of Training	92 (36.80)	67 (26.80)	13 (5.20)	52 (20.80)	26 (10.40)	897	3.59	4
Employee Resistance	78 (31.20)	93 (37.20)	26 (10.40)	40 (16.00)	13 (5.20)	933	3.73	3
Ethical Concerns	80 (32.00)	65 (26.00)	39 (15.60)	40 (16.00)	26 (10.40)	883	3.53	5
High Installation Cost	119 (47.60)	78 (31.20)	13 (5.20)	26 (10.40)	14 (5.60)	1012	4.05	2
Quick Changing Rules and Regulations	53 (21.20)	52 (20.80)	65 (26.00)	40 (16.00)	40 (16.00)	788	3.15	7
Lack of Infrastructure	118 (47.20)	80 (32.00)	13 (5.20)	26 (10.40)	13 (5.20)	1014	4.06	1
Low-Quality Data	79 (31.60)	53 (21.20)	53 (21.20)	39 (15.60)	26 (10.40)	870	3.48	6

Source: Primary Data

SEM Association between women entrepreneurs' awareness towards artificial intelligence and its tools, usage of AI in their business, nature of benefits realized (positive impact of AI on their business), and nature of challenges faced by them while implementing AI.

H3: There exists an association between women entrepreneurs' level of awareness of AI applications and their usage in their businesses.

H4: There exists an association between women entrepreneurs' level of awareness of AI tools and their usage in their businesses.

H5: There exists an association between AI tool usage by women entrepreneurs and their perception of its positive impact on their businesses.

H6: There exists an association between AI tool usage by women entrepreneurs and the nature of challenges faced by

them in its implementation.

Exhibit: 1
Confirmatory Factor Analysis: Association Between Women Entrepreneurs Opinion on Artificial Intelligence
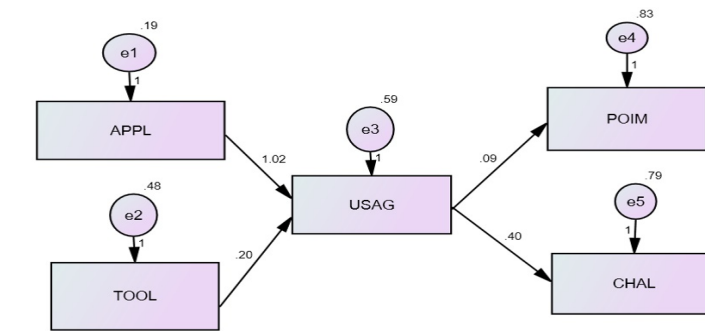
Source: Primary Data

Level of Significance: 5 per cent
Minimisation: .016
Miscellaneous: .301
Bootstrap : .000
Total : .317

The CFA results are presented in Table 8 and Exhibit 1. The fit indices indicate that the measure has a good fit over-all. Based on these measurements, the result of the study shows that the proposed model has a good data fit: χ^2 (CMIN) = 16.023 (p =.004), GFI =.972, AGFI =.931, TLI =.929, CFI =.998, NFI =.941, PNFI =.961, PCFI =.939, RFI =.969, IFI =.901, RMSEA =.003, indicative of a good fit. Although not all the values to the right of the observed variables represent standardized factor loadings (β), they are represented in the following table: 7.

Table 7: Confirmatory Factor Analysis: Path Analysis Structure Maximum Likelihood–Regression Weightage

Path			Unstandardised Estimates	Standardised Estimates	S.E	C.R	P Value	Relationship
USAG	<—	APPL	1.025	.495	.112	9.127	.000	Significant
USAG	<—	TOOL	.199	.155	.070	2.858	.004	Significant
POIM	<—	USAG	.093	.092	.064	1.454	.046	Significant
CHAL	<—	USAG	.405	.377	.063	6.425	.000	Significant

Source: Primary Data
Level of Significance: 5 per cent

The association between AI application and usage of AI in business (USAG vs. APPL) (β =.495, p =.000) is positively correlated and found to be significant. Similarly, the association between AI tools and usage of AI in business (USAG vs. TOOL) (β =.155, p =.004) is positively correlated and found to be significant. The association between the usage of AI in business and the positive impact of AI in business (APOIM vs. USAG) (β =.092, p =.046) is positively correlated and found to be significant. The association between the usage of AI in business and the challenges of implementing AI in business: CHAL vs. USAG (β =.377, p =.000) is positively correlated and found to be significant. Henceforth, the hypothesis is accepted, and it has been concluded that there exists an association between (i) women entrepreneurs' level of awareness of AI applications and their usage by them in their businesses; (ii) women entrepreneurs' level of awareness of AI tools and their usage by them in their businesses; (iii) AI tool usage by women entrepreneurs and their perception of its positive impact on their businesses; and (iv) AI tool usage by women entrepreneurs and the nature of challenges faced by them in its implementation.

5   Results and Discussion

The study examines the awareness level of artificial intelligence among women entrepreneurs and the usage of artificial intelligence by women entrepreneurs. Most of the respondents are aware of AI applications in billing and invoices, customer analysis and market prediction, quality control, and assurance. Respondents are least aware of AI applications for hiring and recruitment, targeted marketing, and financial forecasting. They are only aware of basic AI applications. ANOVA test

Table 6: Confirmatory Factor Analysis: Chi-Square Result and Goodness of Fit Indices of The Proposed Model

Validity of the Constructs			
Constructs	**CR**	**AVE**	**MSV**
AI Application (APPL)	0.836	0.610	0.160
AI Tools (TOOL)	0.832	0.561	0.432
Usage of AI Business (USAG)	0.819	0.600	0.414
Positive of AI in Business (POIM)	0.850	0.619	0.294
Challenges of Implementing AI for Business (CHAL)	0.837	0.545	0.262
Fit Indices	**Obtained Value**	**Accepted Thresholds Levels**	**Acceptable Value**
χ2 (CMIN)	16.023	NA	NA
DF	6	NA	NA
P	.004	NA	NA
Scaled χ2/df	2.671	<0.05	<0.05
Goodness of Fit Index (GFI)	.972	Value Greater than 0.95	0-1
Adjusted Goodness of Fit Index (AGFI)	.931	Value Greater than 0.95	0-1
Tucker-Lewis Index (TLI)	.929	Value Greater than 0.95	0-1
Comparative Fit Index (CFI)	.998	Value Greater than 0.95	0-1
Normed Fit Index (NFI)	.941	Value Greater than 0.95	0-1
Parsimonious Normed Fit Index (PNFI)	.961	0=Poor Fit, 1=Good Fit	0-1
Parsimonious Comparative Fit Index (PCFI)	.939	0=Poor Fit, 1=Good Fit	0-1
Relative Fit Index (RFI)	.969	0=Poor Fit, 1=Good Fit	0-1
Incremental Fit Index (IFI)	.901	0=Poor Fit, 1=Good Fit	0-1
Root Mean Square Approximation Method (RMSEA)	.003	The range between 0.05-0.08	.05 or less would indicate a close fit of the model

results show that women entrepreneurs' level of awareness of various areas of AI application differ according to their age. It has been determined that women entrepreneurs' level of awareness of various areas of AI application differs according to their demographic status through one-way ANOVA. Computed ANOVA results show that women entrepreneurs' level of awareness of various AI tools differs according to their experience. Most of the respondents use virtual assistants for conducting business. They also actively use social media to sell products. They also adopt chat GPT/chatbots and automated bookkeeping in their enterprise. Only a small number of respondents are adopting AI for product design and demand prediction. Innovation and product development are the main impacts of AI in business. Then, personalized customer service and optimized marketing and advertising are the major benefits of AI. It also helps in risk management and fraud prevention. It also automates operational efficiency. The least beneficial benefits of AI are decision-making, supply chain management, and logistics as decision-making requires human intervention. SEM Association between women entrepreneurs' awareness towards artificial intelligence and its tools, usage of AI in their business, nature of benefits realized (positive impact of AI on their business), and nature of challenges faced by them while implementing AI. There is an association between women entrepreneurs' level of awareness of AI applications and their usage by them in their businesses, women entrepreneurs' level of awareness of AI tools and their usage by them in their businesses, AI tool usage by women entrepreneurs' perceptions of its positive impact on their businesses, and AI tool usage by women entrepreneurs' nature of challenges faced by them in its implementation.

6 Conclusion and Recommendation

The study evaluates the awareness level of AI among women entrepreneurs and its usage among them. AI is an innovative concept and inevitable to survive in the heavy competition from multinational companies. It's time to study AI, its applications, and its benefits in business. Many female entrepreneurs started adopting AI during the COVID-19 pandemic. The digital literacy of women entrepreneurs improved a lot during the COVID-19 pandemic. This leads to the adoption of AI. Still, its awareness level is very low among women entrepreneurs. Many of them have not heard of the concept and are still following conventional methods of business. The adoption of AI improves their business and helps them sell their products and services across the world. The study concludes that the level of awareness of AI among women entrepreneurs is very low in various areas of business. The positive side is that most of them are using AI for billing and invoices, and they are adopting virtual assistants and Chat GPT. The use of social media for marketing and sales by women entrepreneurs can also be seen as a change. High installation costs and a lack of infrastructure are the main hindrances they confront while adopting AI in business. These can be reduced to some extent with the support of the government and financial institutions.

a. Practical implications

The concept of AI is gaining importance these days. AI has been adopted by different groups of people in almost all areas. AI is widely adopted in the business field, too. Multinational companies have been adopting AI in the past few years. The study examines the adoption of AI by women entrepreneurs in Kerala. AI augments innovation in business. The study helps to understand the awareness level of AI among women entrepreneurs in various areas of business. The study creates awareness among women entrepreneurs regarding the concept of AI and its benefits. Many women entrepreneurs are adopting basic AI tools in their businesses for communication, idea generation, networking, etc. This is a positive sign, and the study also informs businesswomen about the necessity of learning about advanced AI tools. The study in-depth analyzes the obstacles faced by them in the adoption of AI in business. Government and financial institutions need to aid in developing infrastructure facilities for AI implementation. More awareness campaigns need to be conducted by different agencies, like district industry centres, about AI and its tools and benefits. Capacity-building programs need to be conducted to train them in the application of AI tools. Women entrepreneurs need to be enhanced with knowledge and skills for implementing AI in their businesses.

b. Limitations and future scope of the study The study is limited to a sample size of 250 and restricted to only five districts in Kerala. The present study only focused on the awareness level and usage of AI tools by women entrepreneurs. It did not measure the effectiveness of AI tools in business or the requirements of women entrepreneurs for their implementation in business. It is also not focused on determining the skills necessary for AI adoption in business. Future studies can be conducted among rural and urban women entrepreneurs separately to understand the level of AI application by women entrepreneurs in both areas. AI usage among small and medium enterprises can also be studied in the future. The present study focused on AI applications in whole business by women. Future studies can be widened by focusing on AI applications in different departments like finance, marketing, etc. Only the usage of basic AI tools has been measured in the study. More advanced AI tools are now available, and their usage can be measured in further studies.

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