International Journal of Applied Mathematics

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

CREATIVITY AND INNOVATION IN ORGANIZATIONS: A STUDY OF THE IMPACT OF AI

Mashail Saleh Ibrahim Alsalamah

Department of Management Information System and Production Management, College of Business & Economic, Qassim University, Saudi Arabia

Email: mslamh@qu.ed.sa

Abstract

Artificial intelligence (AI) has embedded itself more than ever in contemporary organizations as a tool to facilitate visionary problem-solving, idea generation, and the subsequent conversion of ideas into innovative solutions. Creativity, the formulation of unique and applicable ideas, and innovation capability (IC), the generation and implementation of novelty in an organization, are pivotal to generating a sustainable competitive advantage in uncertain markets. This research compares traditional innovation practices with AI-supported practices and examines the effects of AI adoption (AIA) on organizational creativity (OC) and IC from individual and team levels. Data were collected from 457 workers in Saudi Arabia across manufacturing, IT, and service organizations through structured questionnaires and performance appraisal measures. The researchers used hierarchical linear modeling (HLM) and partial least squares structural equation modeling (PLS-SEM) to conceptualize the relationship between AIA, creative output and innovation performance. To evaluate AI applications based on characteristics such as collaborative engagement (CE) and technical adaptation (TA) related to ideation, prototyping, and process optimization. The reliability and validity of the findings were ensured through Cronbach's alpha, composite reliability (CR), and confirmatory factor analysis (CFA). Regression analysis assessed the predictive power of AIA on creativity and innovation, and correlation analysis clarified the relationships among AIA, creativity and innovation. The adoption of AI increases OC significantly ($\beta = 0.34$) and its capacity for innovation ($\beta = 0.28$). Creativity mediates innovation ($\beta = 0.42$) while CE partially mediates, and TA mitigates these benefits in OC level. The findings demonstrated that AI is better than traditional methods, identify the best organizational designs for AI-led innovation, and provide actionable guidelines for managers on how to approach the alignment of technological capacity and organizational routines to sustain innovation acceptance.

Keywords: Organizational Creativity, Innovation Capacity, Idea Generation, AI Adoption, Collaborative Engagement, Organizational Structures.

1. INTRODUCTION

Artificial intelligence has become a very disruptive force in today's workplace, changing how businesses gather, choose, and provide value. Data analytics, customer service, process automation, and strategic decision-making are a few of the many domains in which it can be used [1]. Recognizing how AI influences organizational creativity and innovative capacity, and

Received: August 02 2025

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

not just operational efficiency, is emerging significantly. Innovation capacity is the ability to develop information into products, services, or processes that reinforce competitive advantage.

Organizational creativity is the ability to come up with new and useful ideas in organizations [2]. Organizations are now able to analyze enormous sets of data, identify patterns, and predict trends much faster and more accurately than it was previously feasible with human work through AI. Using NLP and cognitive computing, it has become easier to work with unstructured data, revealed hidden ideas, and presented new solutions [3]. Solutions empowered by AI may enhance rather than supplant creative human invention by delivering inventive marketing campaign concepts, creating several design options, or shortening product development cycles. In these scenarios, AI provides a role and joins as a partner to enhance employees´ creativity or bring new options to the table, all leading to new possibilities of creation [4].

The way organizations innovate is gaining recognition as a source of competitive advantage. Organizations which can create a portfolio of innovations can create market-specific products, quickly react to changes in the market, and presume a culture of risk and experimentation. Organizations of the future will utilize AI to provide an appropriate condition in organizational risk and experimentation by offloading routine tasks normally done by individuals to AI systems, freeing humans to think and focus on higher order, complex thinking jobs [5].

The systems powered by AI can also replicate the input of the market, capture the needs of underserved clients, and provide insight into how the innovation can be designed, all of which contribute to the shift of creative ideas to a profitable one. The technologies support a cyclic process through which human creativity and computer intelligence have the option to co-operate [6]. Innovation capacity refers to the capability of an organization to turn innovative ideas into something that can be used into practical applications. This includes business opportunities, process improvements, and technology-driven innovation. AI improves decision-making, mitigates uncertainty, and facilitates resource allocation (in essence, it improves all good things for creativity) [7].

At a deeper level, AI enhances the level of support delivered across functions, bridging various data sets, facilitating information sharing, and knowledge dissemination, and bringing people together around evidence-informed decision-making, all of which are essential to sustain modernization over the long term. AI has many more innovative and advanced benefits, however the use of AI in administrative processes comes with its own set of challenges [8]. Overreliance on algorithmic prejudice, computational decision-making, an outright repression of the human intuition may all produce an impact on the innovative mentality and creative thinking of employees. Thus, regarding business culture, the competences of the employees, their strategy alignment, the consequence of AI requires a more thorough knowledge of technology capabilities to completely grasp its implications [9]. Before ensuring the implementation of AI is successful, businesses can go through a comprehensive analysis to ensure that it underpins sustainable innovation and promotes human creativity. Due to the studies that are underway regarding the potential impact that AI may have on the organization

Received: August 02 2025

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

in terms of its capacity to be creative and innovative, the field of research is significant, topical, and deserves more attention.

Organizations can more clearly comprehend the tactical worth of artificial intelligence as leverage of productivity and more through the emotional consideration of the artificial intelligence methods in relation to development enactment, problem solving and idea development [10]. The focus on creativity as well as innovation underlines the importance of including AI with human intelligence to develop an organizational environment that is more creative, flexible, and resistant.

1.1. Research Objective and Contributions

The research will address the question of how AI impacts creativity on the organization level and the research will determine how AI enhances the ability to generate innovation so that the business can achieve better results. The key contribution of the research is listed as follows.

- The process of adopting AI aids OC and IC with practical outcomes that enable organizations to develop novel ideas and successfully implement them.
- Once again, creativity mediates invention, and both technical adaptation, and teamwork strengthen the relationship between the adoption of AI innovation and outcomes.
- AI offers unique advantages over traditional approaches to developing ideas, making things, and systematic improvement, speeding up product development and organizational efficiency.
- Providing practically valuable recommendations for managers to harness the capabilities of AI with their organization's processes to sustain a culture to support long-term innovation performance.

The structured framework of the research is as follows below. Section 1 discusses the significant background of the research. Section 2 presents previous studies of AI- powered innovations. Section 3 outlines the development of hypotheses. Section 4 delineates research design, data collection, questionnaire information and statistical analysis. Section 5 shows the experimental findings of AI on organizational creativity and innovation capability. Section 6 presents the discussion of the research. Section 7 presents the conclusions and future directions of the research.

2. RELATED WORKS

The research investigates the impact of knowledge sharing facilitated by AI on creativity in organizations. The authors employed the bootstrap method and multi-level regression to evaluate the associations established from 189 surveys [11]. The results showed that, overall, AI had a significantly positive effect on knowledge sharing and innovation. Information sharing acted as a mediator, while internal collaboration acted as a positive moderator. The limitations of the research included the cross-sectional research design, small sample size, and self-reported data. This research explored the impact of value creation, proprietary information,

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

and organizational creativity on the big data performance of AI-oriented organizations. An analysis of data from 500 AI-oriented organizations located in a technology park was obtained through in-person interviews and analyzed using SmartPLS 4.0.8.4[12]. Findings indicated positive impacts of all three factors on organizational performance. Findings possess limitations, as they are only derived from organizations found in Istanbul, and results may not be fully transferable across other contexts.

The research examined the effect of AI technology on innovation management, specifically supporting ideation, accelerating prototyping, and facilitating collaborative efforts to capitalize on OC and competitive advantage. The research found that AI enhanced the efficiency of innovation, facilitated collaboration across functional areas, and reduced innovation cycle time. [13]. However, since AI technologies are rapidly advancing, the findings can shift quickly and were context dependent and based on non-aggregate use of limited organizational data. The research also investigated KS and AI in relation to organizational effectiveness. The situations under which AI and KS increase productivity and efficiency were investigated using a fuzzy set-theoretic technique [14]. The research showed that while NY works better when paired with KS, AI alone is insufficient. Its failure to take into consideration factors like finances and the declared corporate a culture that could affect results is one of its drawbacks.

By enhancing resource efficiency and data-driven decision-making, this research investigated how artificial intelligence (AI) may support circular business model innovation (CBMI) in industrial production [15]. The results also highlight dynamic abilities that, through value discovery, realization, and optimization, support the production of long-term and economic value. The limitations of the present research include a small sample size, context-specific results, and the dynamic nature of AI technology. An investigation focuses on how companies use AI in research and development, specifically examining whether AI facilitates or automates employment and whether it encourages exploratory rather than exploitative innovation [16]. A full coding of 956 news stories from around the world in 2020 indicated that automated AI is used less often (11%) than it is to help exploratory R&D (64%) and to make work easier for people (55%). A drawback of depending solely on the news industry is that it could spread bias and overlook internal business operations.

The research examined how AI can facilitate and generate new ideas and entities. It uses a conceptual model to consider traditional innovation processes, in addition to using perspectives like: technological push, industry pull, and the innovation funnel [17]. The research provides evidence that AI can influence both the end results of creativity and also the early stages of ideation. The key challenges are any system can become unusable over time from lack of data validation and the ongoing emergence of artificial intelligence. The research also examined the impact of AI-ensured decision making in relation to entrepreneurship and organizational policy development. It synthesized a review of the literature and a model that attributes human and AI decision making as theoretical. The AI Model demonstrated a way AI can improve decisions more accurately, notably, more in relation to creativity, and pace of decision making, and include stakeholders and industry standards to make decisions even better [18]. The results

Received: August 02 2025

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

suggest that AI can improve learning goals, value creation, service extension, and competitiveness with respect to the overall organization's goals; however, it was primarily theoretical as evidence was limited considering variability in industries and suggesting further evidence was also limited based on practicality and universal implementation.

Researchers investigated the potential advantages of using Transformer-based language models to support teams of people working on new product development (NPD) in generating new ideas. The researchpromotes human-AI collaboration by deliberately using an AI-augmented dual diamond framework in activities such as idea generation, sentiment analysis, and text compression [19]. Ultimately, the findings suggest these models helped with generating ideas by increasing the breadth of problems and solutions, and improving innovation performance. Some of the challenges with AI were the technology could never substitute human ingenuity, that the outputs could reveal bias, and that it required careful embedding in existing NPD processes. The research explored the role of AI in supply chain performance and resilience (SCP, SCRes), in situations of uncertainty [20]. Through the utilization of survey data from 279 organizations from multiple countries and industries, SEM demonstrated that while AI improves supply chain resilience (SCRes) for long-term performance, it also improves SCP for short term performance by digesting information. However, limitations to the researchrelated to its cross-sectional nature and possible respondent bias, highlight the need in future research for longitudinal studies of long-term outcomes.

2.1. Research Gap

The capability of AI to enhance organizational performance, creativity, and innovation has been extensively studied; however, many of these studies rely on conceptual frameworks, cross-sectional designs, or small or context-specific samples [11–13]. The cumulative effects of AI implementation, collaboration, and team accountability at both individual and collective levels have been inadequately examined [19]. Consequently, extensive, cross-sectoral, and longitudinal research is necessary to understand the enduring impacts of AI on the organization innovation and creativity [20]. AIA substantially increases an organization's potential to be creative and come up with new ideas, and creativity is what leads to new ideas. TA and CE make these effects stronger, stressing how AI helps OC.

3. HYPOTHESIS DEVELOPMENT

In the hypothesis structure, the relationship among AIA [11], IC, and OC is conceptualized. Table 1 and Figure 1 provide specifics on how AI-powered processes could improve the genesis of ideas, the creation of prototypes, and the implementation of new ideas. The model also incorporates the mediating effects of CE, as well as the moderating effects of TA. The model may classify the evaluation of experimental methods, and offer insight into the mechanisms of how AI affects innovation outcomes.

Table 1: Hypotheses, Pathways, and Definitions Regarding AI's Influence on Organizations Creativity and Innovation Capacity

Received: August 02 2025

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

Hypothesis	Path	Definition / Explanation
H1: AI Adaption (AIA) → Organizational Creativity (OC)	AIA positively influences OC.	Using AI approaches makes the ideas that people and groups come up with more unique, diverse, and useful.
H2: AI Adaption (AIA → Innovation Capacity (IC)	AIA positively impacts organizational IC.	Organizations that use AI can better implement and sell ideas, which makes it easier to turn innovative ideas into real developments.
H3: Organizational Creativity (OC) → Innovation Capacity (IC)	OC positively affects IC.	Contends that elevated creativity within individuals and teams (original and practical concepts) results in enhanced innovative outcomes.
H4: Collaborative Engagement (CE)(Mediator) → AI Adoption(AIA) → Innovation Capacity (IC)	CE mediates the relationship between AIA and IC.	AIA makes teams work together better and get more involved, which makes the organization better able to put new ideas into action.
H5: Technological Adaptability (TA) → (Moderates) AI Adoption(AIA) → Innovation Capacity (IC)	TA moderates the effect of AIA on creativity and IC.	This idea posits that organizations more adept at adapting to new technologies would experience more effects from AI adoption on the presentation of innovation and modernity compared to those that are less adaptable.

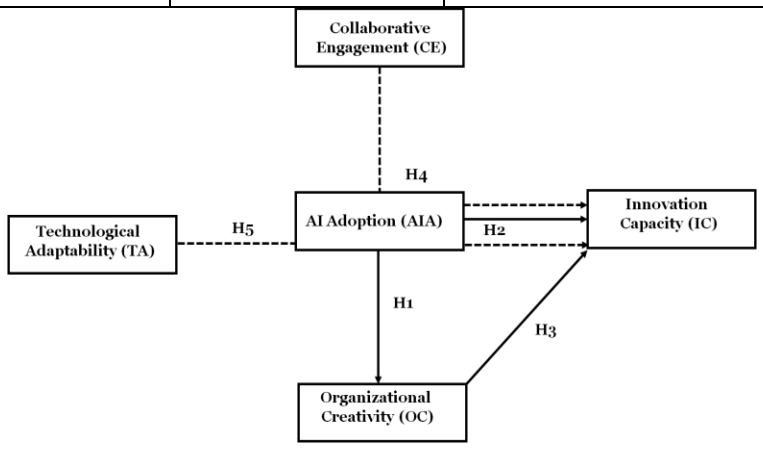

Figure 1: Hypothesis Conceptual Framework

4. METHODOLOGY

The research adopted a quantitative approach comprised of performance assessment tools and standardized instruments. A total of 457 professionals employed across the industrial, service,

Received: August 02 2025

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

and IT fields including Saudi Arabian participants completed the information used for the research as illustrated in Figure 2. To examine the relationships among AIA, innovation performance, and creativity, the research used HLM, and PLS-SEM. Validity and reliability were determined using CFA, CR, and regression and correlation analysis. The authors examined AI applications in terms of ideation, prototyping, and optimized processes, where TA and collaboration were identified as key elements.

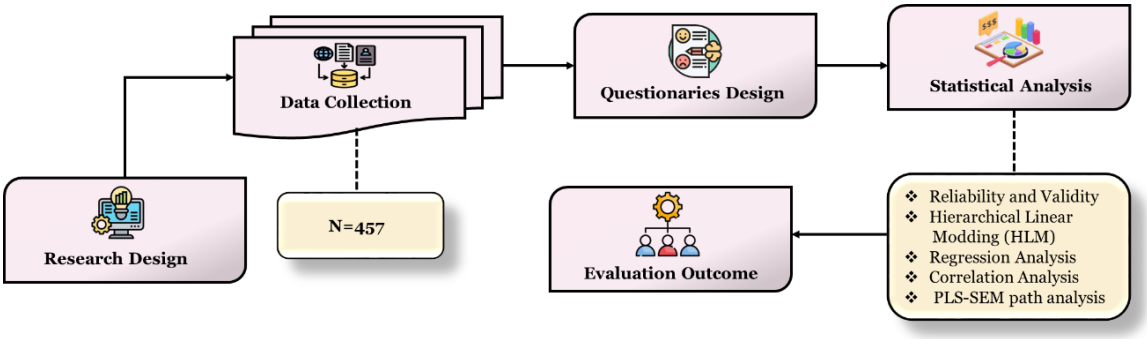

Figure 2: Framework of methodological overview

The research employed a quantitative cross-sectional approach utilizing structured surveys and presentation metrics to investigate the impact of AI on structural innovation and intellectual capital. 447 professionals in the information technology, industrial, and service sectors located in Saudi Arabia provided input on AI adoption, and how it affected creative and innovative outputs. The AIA, creative outputs, and innovation performance were analyzed through HLM and PLS-SEM. Instruments included Cronbach's alpha, CR, and CFA to assure the results were reliable and valid. The methodology allowed for a comparison of AI-enabled innovation with traditional innovation approaches at both the individual and organizational level.

4.1. Participants Details

Data was collected from 457 participants across different organizational contexts and AIA levels in three industries (service, IT, and industrial). Random sampling with stratification was used as a recruiting method, reducing selection bias and increasing the representation of the population by classifying individuals by industry and work status using data from Saudi Arabia. Participants only qualified for this research if they had worked for at least two years and had engaged in innovation-induced opportunity experience (i.e., inspiration, optimizing processes, and AI-enhanced opportunities). This ensured that participants had the appropriate vantage points regarding creative process and organizational innovation. It also generated representative and rigorous results that were appropriate for understanding what AI means for creativity and innovation in educational settings.

4.2. Research Instrument

Table 2 presents an organized questionnaire focusing on the effectiveness of AI use to boost an organization’s internal communication. For each of the variables, specifically, CE, OC, AIA, IC, and TA, there are two specific questions. By gaining opinions on AI use, enhancing

Received: August 02 2025

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

ideas, collaboration among individuals and teams, and the results of innovation on an individual level or team level, these questions can provide quantitative data for research exploration.

Table 2: Questionnaire on AI Impact, Creativity, and Innovation Capacity

Variables	Question 1	Question 2
AIA	Has your company started using AI tools to come up with new ideas?	How frequently do you solve problems or innovate at work using AI tools?
OC	Do AI tools help you generate more diverse ideas?	Have AI tools improved the quality of ideas produced by your team?
IC	Has AI sped up the process of making prototypes at your company?	Has AI made it easier to carry out new projects or processes?
CE	Has AI improved collaboration among team members during innovation tasks?	Do AI tools encourage cross-functional or team-wide idea sharing?
TA	Are you okay with studying and employing new AI tools at work?	Does your company offer help and training for using AI technologies?

4.3. Statistical Analysis

An analysis of the effects of AI on creativity and creative output was conducted using the Statistical Package for Social Sciences (SPSS) version 27.0. The ratings and variables were checked and their reliability was measured using Cronbach's Alpha, CR, and CFA. PLS-SEM was used to bootstrap for significance and take into account moderating, direct, and indirect relationships. HLM took regression, correlation analysis, and impacts at the individual and team levels into account.

4.3.1. Reliability and Validity Test

Ensures that the measuring instruments consistently and accurately measure factors such as AIA, OC, and IC. Accurate and consistent measurements provide people with more confidence in the study's outcomes.

Cronbach's Alpha provides an assessment of reliability for item internal consistency on surveys and to make sure that closely related questions measure the same construct. Composite Reliability assesses how well individual items help to measure the same construct and is concerned with validity in factor loadings- executions of reliability refer back to Cronbach's alpha. CFA is used to establish whether survey items accurately represent latent constructs.

4.3.2. Hierarchical Linear Modeling (HLM)

Examines data that is layered (people on teams) and looks at how AI interacts with imagination and creativity on many levels. Separates contributions made by individuals from those made

Received: August 02 2025

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

by teams. Discusses how AI changes the output from innovation at both personal and organization levels.

- Accounts for nested structure of professionals within teams or departments.
- Separates within-team variance from between-team variance.
- Measures how individual AI usage and team-level AI adoption affect creative outputs.

4.3.3. Regression Analysis

Regression analysis refers to a statistical approach that explores the relationship between a single dependent variable (DV) (outcome) and one or more independent variables (IV) (predictor). It explores how strong the relationships are, if they are significant, and the direction of the relationships, so researchers can make predictions and understand what the meaning is of the predictor or predictors.

- Make a guess about how a change in AIA will affect creativity and the ability to come up with new ideas.
- Simple regression (with one predictor) and multiple regression (with more than one predictor).
- Coefficients (β), significance (p-values), and model fit (R^2) indicate how well predictors explain the outcome.

4.3.4. Correlation Analysis

Correlation analysis allows for the evaluation of the strength and direction of the relationship among two continuous variables (e.g. AI adoption and organizational innovation). It indicates the extent to which the variables vary together, but is not indicative of causation.

- Pearson correlation for linear relationships; Spearman for non-normal data.
- Positive correlation → variables increase together; negative → one increases while the other decreases.
- Helps find early connections for more studies.

4.3.5. PLS-SEM

This research investigates the complicated relationship between latent attributes, like AIA, innovation, collaboration, and business. It also looks closely at hypotheses relating to mediation and moderation effects, and illustrates precisely how AIA empowers an organization to create rigorously documented novel and innovative ideas.

- Tests direct effects (AI → creativity, AI → innovation).
- Assesses mediating effects (e.g., collaborative engagement between AI and innovation).
- Assesses moderating effects, such as technical adaptability affecting AI impact.

Received: August 02 2025

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

- Uses bootstrapping to determine significance and confidence intervals.

5. RESULT

Studies have shown that AI plays a major role in improving a firm's creative capacity and new idea generation capability, both directly and indirectly. AI had a positive effect on new product and process innovation. Creativity is essential to produce new ideas from AI. Collaboration engagement (CE) and the scientific agility of the firm has also affected the relationship between AI and innovation data. Overall, the results showed that not only did it present the importance of thinking about technology, collaboration and flexibility of the firm to better maximize the results from creativity, it also confirmed that AI, CE, and creativity acted as overlapping levels of significance towards organizational innovation, through regression and correlation analysis.

5.1. Demographic Characteristics

Table 3 lists the participants' ages, genders, industries, levels of education, AI experience, as well as personal and professional details. There are the same number of males and women in the sample, which suggests that the balance of sexes is very even. The people who took part in the research were from a wide range of ages and levels of education, from college students to professionals or those with PhDs. This means that they are usually quite smart. There are a lot of different fields covered by the respondents, but the business, information technology, and services industries are the most common. The people in the sample had varying levels of AI understanding, from very little to very high. Most of them indicate they utilize AI at work every day. The experience of participants with AI is depicted in Figure 3.

Table 3: Profile of Respondents Across Sectors and Experience Levels

Characteristics	Categories	Frequency (n)	Percentage (%)
Gender	Male	238	52.1
	Female	205	44.8
	Other / Prefer not say	14	3.1
Age Group	21–30	172	37.6
	31–40	154	33.7
	41–50	91	19.9
	51 and above	40	8.8
Educational Level	Bachelor’s Degree	243	53.2
	Master’s Degree	168	36.7
	Doctoral / Professional	46	10.1
Industry Sector	Manufacturing	152	33.3

Received: August 02 2025

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

	Information Technology	178	38.9
	Service Sector	127	27.8
Experience with AI	None	58	12.7
	Basic	176	38.5
	Intermediate	163	35.7
	Advanced	60	13.1
Years of Work Experience	Less than 2 years	74	16.2
	2–5 years	146	31.9
	6–10 years	142	31.1
	More than 10 years	95	20.8
Frequency of AI Use	Daily	132	28.9
	Weekly	183	40.0
	Monthly	92	20.2
	Rarely	50	10.9

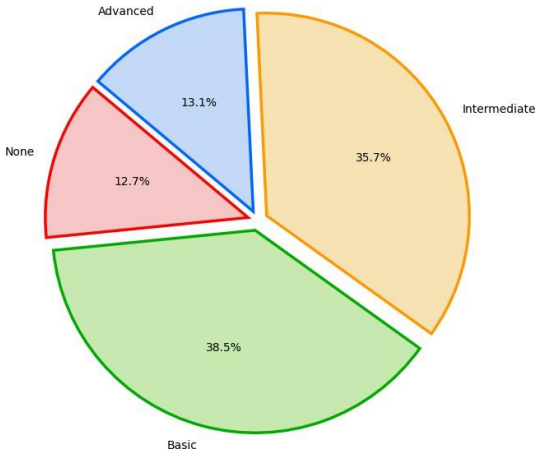

Figure 3: Visualization of Experience with AI Outcomes

5.2. Reliability and Validity

Table 4 shows the validity and reliability measures for the parts of the researchthat measure AIA, OC, IC, CE, and TA. All structures represent good internal consistency with Cronbach's alpha scores ranging from 0.85 to 0.89. Figure 4 shows how much the survey's item subordinated measures the intended variables. With CR values of 0.89 to 0.92, are further supporting the consistency and strength of the model estimating the factor loadings for the survey items.

Received: August 02 2025

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

The AVE values, which range from 0.61 to 0.65, show that sufficient convergent validity was achieved, which indicates the items within constructs explained over 60% of the variance. Together, these numbers indicate the validity and reliability of the measurement approach in evaluating respondent's views about AIA, its effect on OC and IC, the significance of collaboration and the need for TA in the corporate context.

Table 4: Reliability and Validity Metrics for All Constructs Measuring Factors

Construct	Items	Cronbach's α	CR	AVE
AIA	AIA1–AIA5	0.89	0.91	0.65
OC	OC1–OC4	0.87	0.90	0.62
IC	IC1–IC5	0.88	0.92	0.64
CE	CE1–CE4	0.85	0.89	0.61
TA	TA1–TA4	0.86	0.90	0.63

Table 5 presents the survey item's factor loadings for five constructs: AIA, OC, IC, CE, and TA. Factor loadings indicate how strongly each question represents the latent variable it is measuring. Overall, factor loadings provide evidence of solid construct validity with all loads for variables exceeding 0.78, or higher. Each of the five AIA items (AIA1 to AIA5) adequately reflected respondents' views of the usage of ai with factor loadings that ranged from 0.78 to 0.84.

In addition, the loadings for the parameters related to organizational creativity and innovative capacity are > 0.79, which suggests that creative output and innovation implementation are constantly easier to monitor. Technological adaptation and collaboration both have a high loading (0.78–0.84), which provides support for the measure of AI Technology adaptability and teamwork. This evidence suggests the measurement model is statistically valid and appropriate for further structural research.

Table 5: Factor Loadings of Survey Items for AI Adoption, Creativity, Innovation, Collaboration, and Adaptability

Construct	Item	Loading
AIA	AIA1	0.78
	AIA2	0.82
	AIA3	0.80
	AIA4	0.84
	AIA5	0.79
OC	OC1	0.81

Received: August 02 2025

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

	OC2	0.85
	OC3	0.80
	OC4	0.83
IC	IC1	0.82
	IC2	0.79
	IC3	0.85
	IC4	0.81
	IC5	0.83
CE	CE1	0.78
	CE2	0.81
	CE3	0.79
	CE4	0.82
TA	TA1	0.80
	TA2	0.83
	TA3	0.81
	TA4	0.84

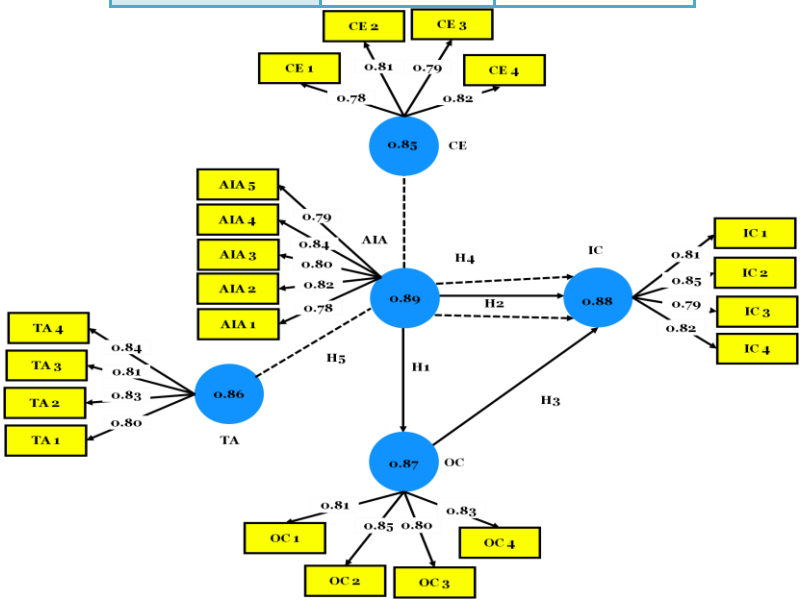

Figure 4: Measurement Model's Visual Representation

5.3. Hierarchical Linear Modeling (HLM)

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

Table 6 presents a summary of how AIA supports creativity, invention, and collaboration at the individual and team level. There was a significant ($p < 0.001$) enhancement from AIA to OC ($\beta = 0.34$, $t = 6.80$) and IC ($\beta = 0.28$, $t = 4.67$) at the individual level, which means individuals appear to be better positioned to inspire creativity and innovative ideas with AI technologies. OC leads to an effect on innovation capacity ($\beta = 0.42$, $t = 8.40$); creativity was one of the most clear connections between AI use and innovation outcomes. At the team level, AIA emerged as a positive predictor of CE ($\beta = 0.36$, $t = 5.14$), suggesting AIA effectively supports well-coordinated decision-making at the front lines of implementing AI. CE, in turn, positively predicted creativity potential as an outcome of AIA ($\beta = 0.30$, $t = 5.00$). Ultimately, AIA becomes an essential process that supports innovation unsupervised via creativity and team functionality. All associations producing a p-values < 0.001.

Table 6: HLM Results for Individual and Team Levels

Path	Level	β	SE	t-value	p-value
H1: AIA → OC	Individual	0.34	0.05	6.80	<0.001
H2: AIA → IC	Individual	0.28	0.06	4.67	<0.001
H3: OC → IC	Individual	0.42	0.05	8.40	<0.001
H4: CE→ (Mediator) AIA→ IC	Team	0.36	0.07	5.14	<0.001
H5: TA → (Moderates) AIA→ IC	Team	0.30	0.06	5.00	<0.001

5.4. Regression Analysis

The impact of AIA, OC, CE, and TA IV on dependent IC is seen in regression Table 7 and Figure 5. Higher levels of AIA, creativity, cooperation, and flexibility improve innovation performance, according to all predictors, which have notable positive impacts. OC ($\beta = 0.42$) had the greatest influence, according to the standardized coefficients (β), followed by AIA ($\beta = 0.28$), CE ($\beta = 0.15$), and TA ($\beta = 0.12$). This model is statistically significant ($F = 85.4$, $p < 0.0$), and technology, creativity, and cooperation together explain 56% of the variation in IC ($R^2 = 0.56$).

Table 7: Regression Results for Predictors of Innovation Capacity

Variables	β	SE	t-value	p-value
AIA	0.28	0.05	5.60	<0.001
OC	0.42	0.06	7.00	<0.001
CE	0.15	0.04	3.75	0.002
TA	0.12	0.03	4.00	0.001

Received: August 02 2025

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

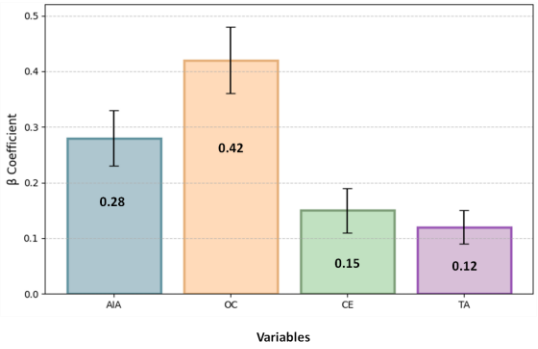

Figure 5: Visualization of Coefficient and SE Values Outcomes

5.5. Correlation Analysis

Table 8 and Figure 6 show the Pearson correlation coefficients among TA, IC, OC, AIA, and CE; each variable is positively related, indicating that greater use of AI is associated with greater potential for creativity (r = 0.65) and innovation (r = 0.65). Creativity and innovation also are moderately, positively correlated with TA and CE, further demonstrating their facilitative role for OM-OC in AI-enabled OC. The correlation analysis has provided first insights into how each variable is related and can serve to inform future statistical modelling, be it regression or hierarchical linear modelling or SEM. Overall, the data provides evidence that innovative performance, collaboration, and TA are all interrelated.

Table 8: Correlation Matrix of AI Adoption, Creativity, Innovation, and Supporting Factors

Variables	AIA	OC	IC	CE	TA
AIA	1	0.65	0.61	0.52	0.57
OC	0.65	1	0.70	0.58	0.55
IC	0.61	0.70	1	0.60	0.59
CE	0.52	0.58	0.60	1	0.62
TA	0.57	0.55	0.59	0.62	1

Received: August 02 2025

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

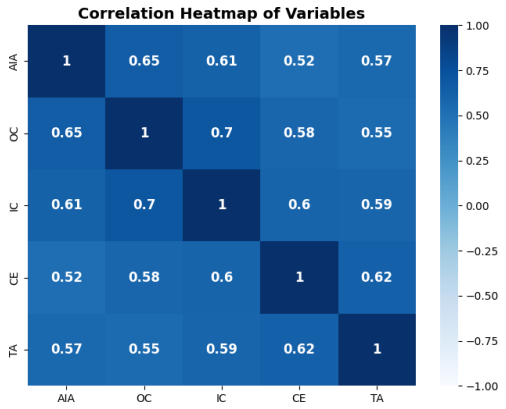

Figure 6: Visualization of Correlation Matrix Using Variables

5.6. Pathway analysis using PLS-SEM

Table 9 and Figure 7 present the results of five hypotheses evaluating the influence of AIA on OC and IC in enterprises. H1 shows that AIA has a strong and positive impact on OC ($\beta = 0.34$, $p < 0.001$) and that AI technologies improve the creative process. According to H2 ($\beta = 0.28$, $p < 0.001$), using AI directly increases one's ability for creativity. H3 emphasizes the significance of creativity as a way of attaining innovation by demonstrating that OC considerably enhances IC ($\beta = 0.42$, $p < 0.001$).

H4 shows an incomplete mediation effect, meaning that some of the link between AIA and creative talent can be explained by CE ($\beta = 0.11$, $p = 0.001$). This implies that AIA collaboration and information sharing are two factors that foster creativity. There is statistical support for each theory, and H5 significantly alters the correlation between innovation results and AIA ($\beta = 0.09$, $p = 0.014$), indicating that TA promotes.

Table 9: PLS-SEM Path Coefficients and Hypothesis Testing

Hypothesis	Path	β	t-value	p-value	Supported?
H1	**AIA → OC**	0.34	6.80	<0.001	Yes
H2	**AIA → IC**	0.28	4.67	<0.001	Yes
H3	**OC → IC**	0.42	8.40	<0.001	Yes
H4	**CE→(Mediator) AIA→ IC**	0.11 (mediation)	3.20	0.001	Partial Mediation
H5	**TA → (Moderates) AIA→ IC**	0.09 (moderation)	2.45	0.014	Yes

Received: August 02 2025

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

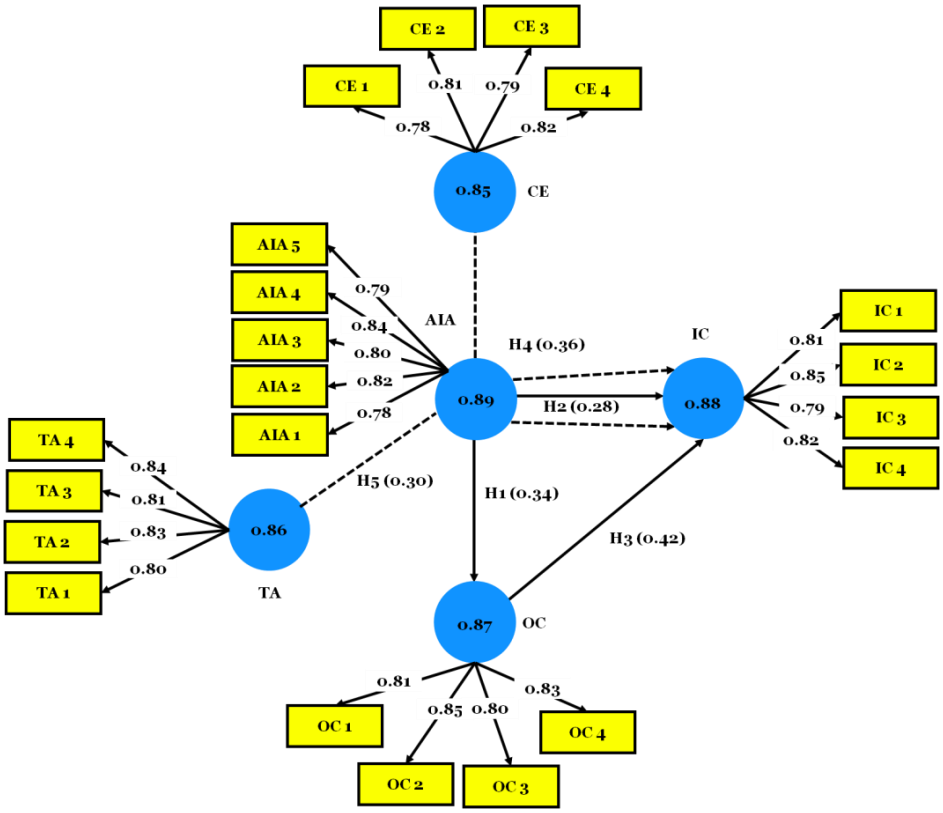

Figure 7: Result of the Estimation of the Hypothesis's Pathway

6. DISCUSSION

The studies had some methodological issues. First, the initial research had a sample of 500 AI companies, but was limited to one geographic region, rendering it not useful for other geographical areas [12]. The second research was fuzzy set theoretic but the model lacked significant contextual factors that might have also affected the outcomes, such as, market conditions and organizational culture [14]. The third research was theoretical and did not actually conduct an empirical study, which, will not capture how quickly AI technology is developing and renders the use of AI technology less useful [17]. The current research mitigated some of the methodological limitations of the previous studies because while it uses the empirical methods of HLM and PLS-SEM, and a multi-sector sampled sample of 457 users, also them consider TA and CE implementation as contextual factors. These enhancements to the methodological frameworks increased the contribution and generalizability of the results. The findings revealed AI had a positive significant effect on organizational creativity ($\beta = 0.34$) and innovation capabilities ($\beta = 0.28$), while organizational creativity has a strong positive effect on development efforts ($\beta = 0.42$). The research successfully identified both team and individual effects with a sample from 457 respondents across production, IT and service sectors through HLM and PLS-SEM data analysis. Cooperation acts as a weak enhancer supporting creativity ($\beta = 0.09$), while TA moderates AI's supportive effect on creativity. As noted previously, tests of validity and reliability confirm that findings are accurate. The results demonstrate that AI has does not support organizations to develop as creative and innovative

Received: August 02 2025

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

as an approach which can be supplemented with adaptability and teamwork. Overall, it offers managers valuable insights on implementing technology in ways which can sustain creative performance.

6. CONCLUSION

Studies indicate that utilizing AI makes innovation straightforward and seamless for organizations in direct and indirect ways. Creativity is necessary for firms to generate innovative outcomes by adopting AI. Also, creativity contributes to mediation. TA relates to the need for new flexible organizational models and development for talent, which supports the connection within AIA and innovation. In conclusion, the research shows that artificial intelligence can improve people's idea development and idea improvement, and their approach could alter how people work. AIA boosts creativity ($\beta = 0.34$) and invention ($\beta = 0.28$), and creativity leads to innovation ($\beta = 0.42$). CE ($\beta = 0.11$) weakens the connection from AI to creativity a little while TA ($\beta = 0.09$) strengthens the connection to creativity. Positive connections suggest that AI, creativity, and teamwork all lead to the invention being better. Thus, organizations can be more successful than their competitors by utilizing AI in conjunction with flexibility and teamwork in constantly changing markets. To obtain the best results from innovation, managers need to use AI appropriately, in addition to creating environments that also foster the power of innovation or progress with socialization. The generalizability of the research may be limited by the focus on the industrial, IT, and service industries. Future research could expand to cross-cultural contexts, the long-term implications of AI, and additional moderators or mediators that may result in creativity in different organizations.

REFERENCES

1. Chen, Z., Liu, X., Hogan, W., Shenkman, E. and Bian, J., 2021. Applications of artificial intelligence in drug development using real-world data. *Drug discovery today*, *26*(5), pp.1256-1264. https://doi.org/10.1016/j.drudis.2020.12.013
2. Ahmad, Z., 2025. Unlocking AI capabilities: exploring strategic fit, innovation ambidexterity and digital entrepreneurial intent in driving digital transformation. *Journal of Management Development*, *44*(2), pp.194-218. https://doi.org/10.1108/JMD-05-2024-0171
3. Diab, B. and El Hajj, M., 2024. Ethics in the age of artificial intelligence: unveiling challenges and opportunities in business culture. *Cogent Business & Management*, *11*(1), p.2408440. https://doi.org/10.1080/23311975.2024.2408440
4. Malik, A., De Silva, M.T., Budhwar, P. and Srikanth, N.R., 2021. Elevating talents' experience through innovative artificial intelligence-mediated knowledge sharing: Evidence from an IT-multinational enterprise. *Journal of International Management*, *27*(4), p.100871. https://doi.org/10.1016/j.intman.2021.100871
5. AL-khatib, A.W. and Ramayah, T., 2025. Artificial intelligence-based dynamic capabilities and circular supply chain: Analyzing the potential indirect effect of frugal

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

innovation in retailing firms. *Business Strategy and the Environment*, *34*(1), pp.830-848. https://doi.org/10.1002/bse.4018

6. Huang, M.H. and Rust, R.T., 2021. A strategic framework for artificial intelligence in marketing. *Journal of the academy of marketing science*, *49*(1), pp.30-50. https://doi.org/10.1007/s11747-020-00749-9
7. Jácome de Moura Jr, P., dos Santos Junior, C.D., Porto-Bellini, C.G. and Dias Junior, J.J.L., 2024. The over-concentration of innovation and firm-specific knowledge in the artificial intelligence industry. *Journal of the Knowledge Economy*, *15*(4), pp.20547-20577. https://doi.org/10.1007/s13132-024-01974-1
8. Wang, S., Huang, X., Xia, M. and Shi, X., 2024. Does artificial intelligence promote firms' innovation efficiency: Evidence from the robot application. *Journal of the Knowledge Economy*, *15*(4), pp.16373-16394. https://doi.org/10.1007/s13132-023-01707-w
9. Mannuru, N.R., Shahriar, S., Teel, Z.A., Wang, T., Lund, B.D., Tijani, S., Pohboon, C.O., Agbaji, D., Alhassan, J., Galley, J. and Kousari, R., 2025. Artificial intelligence in developing countries: The impact of generative artificial intelligence (AI) technologies for development. *Information development*, *41*(3), pp.1036-1054. https://doi.org/10.1177/02666669231200628
10. FossoWamba, S., Queiroz, M.M., Pappas, I.O. and Sullivan, Y., 2024. Artificial intelligence capability and firm performance: a sustainable development perspective by the mediating role of data-driven culture. *Information Systems Frontiers*, *26*(6), pp.2189-2203. https://doi.org/10.1007/s10796-023-10460-z
11. Li, N., Yan, Y., Yang, Y. and Gu, A., 2022. Artificial intelligence capability and organizational creativity: The role of knowledge sharing and organizational cohesion. *Frontiers in psychology*, *13*, p.845277. https://doi.org/10.3389/fpsyg.2022.845277
12. Pinarbasi, F., SonmezCakir, F., GünerGültekin, D., Yazici, M. and Adiguzel, Z., 2024. Examination of the effects of value creation, intellectual property and organizational creativity on artificial intelligence focused enterprises. *Business Process Management Journal*, *30*(1), pp.317-337. https://doi.org/10.1108/BPMJ-07-2023-0551
13. Mirzani, Y., 2024. Artificial intelligence and innovation management: Transformative forces shaping organizational creativity. *EPRA International Journal of Multidisciplinary Research (IJMR)*, pp.511-518. https://doi.org/10.36713/epra16272
14. Olan, F., Arakpogun, E.O., Suklan, J., Nakpodia, F., Damij, N. and Jayawickrama, U., 2022. Artificial intelligence and knowledge sharing: Contributing factors to organizational performance. *Journal of Business Research*, *145*, pp.605-615. https://doi.org/10.1016/j.jbusres.2022.03.008
15. Sjödin, D., Parida, V. and Kohtamäki, M., 2023. Artificial intelligence enabling circular business model innovation in digital servitization: Conceptualizing dynamic capabilities, AI capacities, business models and effects. *Technological Forecasting and Social Change*, *197*, p.122903. https://doi.org/10.1016/j.techfore.2023.122903

Received: August 02 2025

Volume 38 No. 9s , 2025

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

16. Johnson, P.C., Laurell, C., Ots, M. and Sandström, C., 2022. Digital innovation and the effects of artificial intelligence on firms' research and development–automation or augmentation, exploration or exploitation?. *Technological Forecasting and Social Change*, *179*, p.121636. https://doi.org/10.1016/j.techfore.2022.121636
17. Brem, A., Giones, F. and Werle, M., 2021. The AI digital revolution in innovation: A conceptual framework of artificial intelligence technologies for the management of innovation. *IEEE Transactions on Engineering Management*, *70*(2), pp.770-776. https://doi.org/10.1109/TEM.2021.3109983
18. Rajagopal, N.K., Qureshi, N.I., Durga, S., Ramirez Asis, E.H., Huerta Soto, R.M., Gupta, S.K. and Deepak, S., 2022. Future of business culture: An artificial intelligence-driven digital framework for organization decision-making process. *Complexity*, *2022*(1), p.7796507. https://doi.org/10.1155/2022/7796507
19. Bouschery, S.G., Blazevic, V. and Piller, F.T., 2023. Augmenting human innovation teams with artificial intelligence: Exploring transformer-based language models. *Journal of product innovation management*, *40*(2), pp.139-153. 10.1111/jpim.12656
20. Belhadi, A., Mani, V., Kamble, S.S., Khan, S.A.R. and Verma, S., 2024. Artificial intelligence-driven innovation for enhancing supply chain resilience and performance under the effect of supply chain dynamism: an empirical investigation. *Annals of operations research*, *333*(2), pp.627-652. https://doi.org/10.1007/s10479-021-03956-x

Received: August 02 2025