

## **Digital Capability, Artificial Intelligence Adoption and Entrepreneurial Orientation as Drivers of Sustainable Livelihoods among Traditional Wooden Artisan Enterprises: An Integrated Dynamic Capability Perspective**

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**Abstract:** The traditional wooden craft enterprises play a role in preserving cultural heritage, improving rural livelihoods, and contributing to economic development. However, they are challenged with factors like shifts in consumer preferences, lack of digital skills, narrow access to markets, and technological disruption. The integrated effect of advanced artificial intelligence and digital technologies on the sustainable livelihoods of traditional Wooden Artisan Enterprises is not well understood, despite the new opportunities they provide in terms of competitiveness, innovation, and sustainability in the long-term. To understand these relationships, the study will use the lenses of Dynamic Capability Theory (DCT) and Sustainable Livelihood Framework (SLF) to create an integrated conceptual framework that illuminates the relationship between strengthening digital capability and AI adoption, and how these relationships positively influence the economic resilience, market expansion, innovation performance and sustainability of livelihoods. A questionnaire-based survey was carried out to gather data and test the hypotheses in 230 TWA enterprises of Andhra Pradesh, India, using partial Least Squares Structural Equation Modelling (PLS-SEM). The results suggest that digital competence has a significant impact on the adoption of AI and entrepreneurial orientation. These variables, in turn, partially mediate the relationship between digital capability and sustainable livelihoods. The study is a contribution to the literature, as it combines recent digital technologies with the Sustainable Livelihoods approach in the context of traditional craft enterprises, and provides practical insights for policy makers, artisans cooperatives and entrepreneurship development agencies interested in promoting digital inclusion, sustainable rural development and growth based on heritage.

**Keywords:** Digital Capability, Artificial Intelligence, Adoption, Entrepreneurial Orientation, Sustainable Livelihoods, Dynamic Capability Theory, Wooden Artisans Enterprises, Traditional Handicrafts, PLS-SEM.

### **Introduction**

MSMEs are contributing to economic development, job creation, and improvement in the livelihood of the rural population to a great extent. The MSME ecosystem in India plays a pivotal role in safeguarding cultural heritage and empowering millions of artisans' families. The wooden handicrafts of artisans in Kondapalli, Etikoppaka and Bobbili Cluster, Andhra Pradesh are renowned all over the world for their art and craft. While they are a vital and important part of the

culture and economy, they also have a range of problems such as limited access to markets, dependence on intermediaries, poor digital infrastructure, poor digital literacy and increasing competition from mass produced goods. These limitations put them in a disadvantageous position and endanger artisans' livelihoods.

The competition has changed for MSMEs with digital technologies. Digital platforms, online sales, digital payment systems, social media and Artificial Intelligence (AI) offer businesses new ways of streamlining operations, improving customer interactions, increasing reach, and building sustainable competitive edges. The success of these technologies and their effective use, however, relies not just on their availability but also on the ability of an organization to adopt, integrate, and effectively use them.

DCT is the proper theory to explain how organizations sense, seize and reconfigure their capabilities over time, in the face of changes in the market (Teece, 2007; Teece et al., 1997). In this context, Digital Capability helps businesses to recognize and embrace digital opportunities, AI Adoption enhances intelligent decision-making and business efficiency, and Entrepreneurial Orientation strengthens innovation, proactiveness and risk-taking ability. When taken together, these organizational skills are expected to enhance competitiveness of enterprises and contribute towards sustainable livelihood outcomes.

Few studies, however, have considered these constructs together with the framework of Dynamic Capability Theory to study the traditional wooden artisan MSMEs in the digital era. Existing research has largely been on manufacturing companies, technology-based companies, or the handicraft sector in general, and in the latter case there is little empirical evidence on wooden artisan companies. Besides, the intermediary link between Digital Capability and Sustainable Livelihoods through Artificial Intelligence Adoption and Entrepreneurial Orientation has been hardly studied. The lack of this research gap hinders the understanding of how enterprises' digital transformation capabilities boost their competitiveness and can enhance the sustainable livelihoods of heritage-based MSMEs.

Given the above, the present study posits and empirically tests an integrated model to examine the linkages between Digital Capability, Artificial Intelligence Adoption and Entrepreneurial Orientation and Sustainable Livelihoods of the traditional wooden artisans' enterprises in the state of Andhra Pradesh. Survey data collected from traditional wooden artisans MSMEs were analyzed using Partial Least Squares Structural Equation Modelling (PLS-SEM) to examine both direct and indirect relationships among the study constructs.

The novelty of this research lies in the development and validation of an integrated DCT-based model that combines Digital Capability, Artificial Intelligence Adoption, Entrepreneurial Orientation, and Sustainable Livelihoods within the context of traditional wooden artisans MSMEs. This study is different from the studies that have been conducted mainly on manufacturing industries or general MSMEs, as it focuses on the wooden artisan enterprises that operate within a heritage-based cultural context in the state of Andhra Pradesh. The mediation effect of Artificial Intelligence Adoption and Entrepreneurial Orientation in the effect of digital capabilities on livelihood sustainability is also presented, which is novel empirical evidence in

the application of Dynamic Capability Theory in traditional artisan businesses and has implications for policymakers, MSME development agencies and artisan communities.

## Research Objectives

**RO1:** To explore the impact of **Digital Capability** on **Artificial Intelligence Adoption** among traditional wooden artisan enterprises.

**RO2:** To analyze the impact of **Digital Capability** on **Entrepreneurial Orientation** among traditional wooden artisan enterprises.

**RO3:** To analyze the impact of **Artificial Intelligence Adoption** on **Sustainable Livelihoods** among traditional wooden artisan enterprises.

**RO4:** To examine the impact of **Entrepreneurial Orientation** on **Sustainable Livelihoods** among traditional wooden artisan enterprises.

**RO5:** To examine the direct impact of **Digital Capability** on **Sustainable Livelihoods** among traditional wooden artisan enterprises.

**RO6:** To examine the mediating effect of **Artificial Intelligence Adoption** on the relationship between **Digital Capability** and **Sustainable Livelihoods**.

**RO7:** To examine the mediating effect of **Entrepreneurial Orientation** on the relationship between **Digital Capability** and **Sustainable Livelihoods**.

**RO8:** To develop and validate an **integrated Dynamic Capability-based research model** explaining **Sustainable Livelihoods** among traditional wooden artisan enterprises.

## Literature Review

### A. Dynamic Capability Theory

Dynamic Capability Theory (DCT) explains how organizations maintain competitiveness by sensing opportunities, seizing them through effective resource deployment, and reconfiguring organizational capabilities in response to a changing environment (Teece et al., 1997). DCT differs from the Resource-Based View (RBV) by emphasizing the dynamic ability of firms to adapt, renew, and reconfigure their resources in rapidly changing business environments. (Barney, 1991). (Teece, 2007) further developed the concept of dynamic capabilities by identifying the processes of sensing, seizing, and transforming as essential mechanisms for adapting to market shifts and technological change. DCT presents a suitable theoretical framework for the traditional wooden artisan MSMEs to understand the role played by improving their digital capability and entrepreneurship orientation in increasing their competitiveness and sustainable livelihoods by incorporating the tool of AI.

### B. Digital Capability

Digital Capability is an enterprise's capacity to use digital technologies, infrastructure and the Digital skills to enhance business performance and competitiveness. It involves digital literacy, technological readiness, managerial skills, and strategic use of digital tools in organizational processes. Recent research shows that digital capability plays a role in becoming more efficient,

more customer-oriented, more innovative, and more resilient for organizations, especially for MSMEs in the process of digital transformation (Leemann & Kanbach, 2022). Artisanal enterprises increase their market opportunities and decrease the intermediate stage in the chain thanks to digital technologies such as e-commerce platforms, social media marketing, and digital payment systems. Thus, digital capability is considered as one of the core skills to facilitate the uptake of higher order technologies and improve the sustainability of businesses in the future.

### **C. Artificial Intelligence Adoption**

Artificial Intelligence (AI) is the set of computational technologies that can learn, predict, and aid in decision making (Russell & Norvig, 2021). With the rise of cloud-based tools, MSMEs can leverage AI in their customer relationship management, demand forecasting, digital marketing, and operational efficiency. The use of AI is an organizational capability in the sense of the Dynamic Capability approach, which is the ability to convert digital resources into intelligent business processes. While traditional craftsmanship remains vital to such artisan businesses, AI can complement their efforts by improving product promotion, customer engagement, inventory management, and market analysis. Yet there are only limited empirical studies on the use of AI by artisans in heritage-based enterprises, which calls for more research.

### **D. Entrepreneurial Orientation**

Entrepreneurial Orientation (EO) is defined as an organizational orientation that is characterized by innovativeness, proactiveness, and risk-taking (Covin & Slevin, 1989; Miller, 1983). Entrepreneurial orientation firms are more likely to recognize new opportunities, develop new products, and use new technologies. In the DCT, EO becomes enabling frames to reconfigure resources in the organization to maintain competitiveness. Digital capability is expected to be more closely connected with sustainable living outcomes in the handicraft sector especially when digital capability plays a key role in helping the artisans diversify products, enter new markets, adopt digital technologies, and maintain the cultural authenticity of their products, thereby strengthening their entrepreneurial orientation.

### **E. Sustainable Livelihood**

According to the Sustainable Livelihood Framework (SLF), livelihoods are the assets, capabilities and activities required to maintain a livelihood in the face of economic and environmental shocks (R. Chambers and G. R. Conway, 1992). Sustainable livelihoods encompass improved income, employment, opportunities, social wellbeing, and long-term resilience. Recent studies emphasize the importance of digital technologies, innovation and entrepreneurship as key factors in ensuring livelihood sustainability, especially among MSMEs and rural businesses. For traditional wooden artisans, sustainable livelihoods encompass not only higher incomes but also business continuity, cultural preservation, and greater participation in digitally developing markets.

### **F. Digital Transformation in Traditional Wooden Artisan Enterprises**

Digital transformation refers to the strategic integration of digital technologies into business processes to improve value creation, innovation, and organizational competitiveness (Vial, 2019). The traditional artisan community in Andhra Pradesh, such as the Kondapalli, Etikoppaka, and

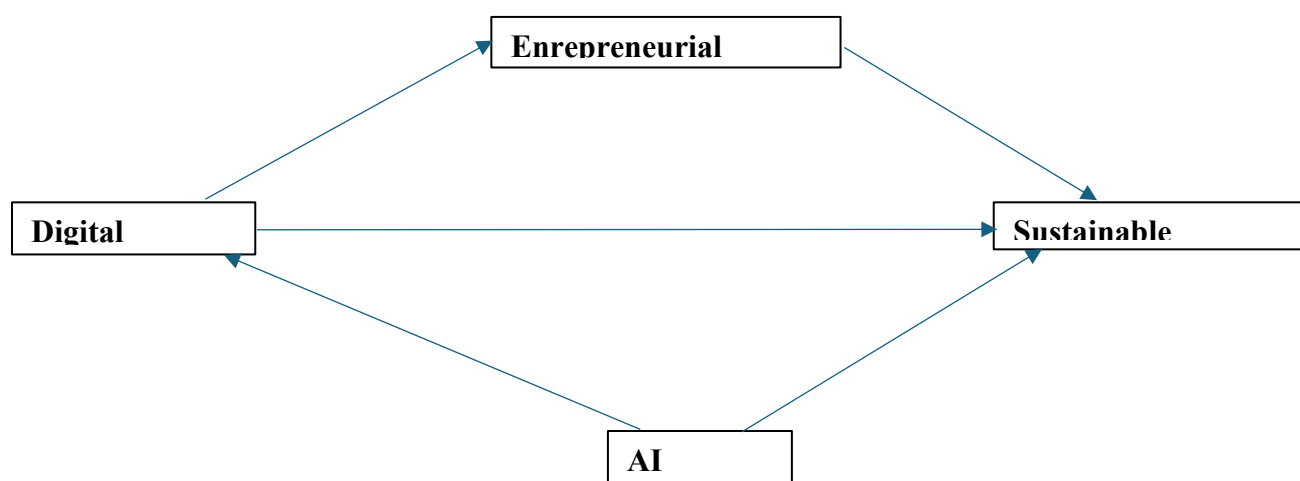
Bobbili clusters, are struggling with issues like access to markets, lack of digital skills, and competition from industrial products. These challenges can be mitigated using digital platforms, e-commerce, social media, and AI-powered tools, which offer avenues for enhanced market penetration, customer engagement, and operational efficiency. However, the existing studies are largely focused on the general handicraft industries, and few studies have examined capability-based digital transformation among traditional wooden artisans in MSMEs.

## Research Gap

Although previous studies have indirectly examined digital capability, AI adoption, entrepreneur orientation, and sustainable livelihoods, limited research has integrated these constructs with a single theoretical framework for traditional wooden artisan MSMEs. Existing research has primarily focused on manufacturing industries, technology-intensive enterprises, and the handicraft sector as a whole, while empirical evidence on traditional wooden artisan enterprises remains limited. Furthermore, the mediating roles of AI adoption and entrepreneurial orientation in the relationship between digital capability and sustainable livelihoods remain underexplored. Accordingly, this study develops and empirically tests a conceptual model to examine how AI adoption and entrepreneurial orientation mediate the relationship between digital capability and sustainable livelihoods among traditional wooden artisan MSMEs in Andhra Pradesh.

H7- Entrepreneurial Orientation mediates the relationship between Digital Capability and Sustainable Livelihoods. The objectives RO1-RO7 are directly related to the hypotheses H1-H7, with the objective RO8 being validated by testing a full PLS-SEM model instead of a single hypothesis.

## CONCEPTUAL FRAMEWORK AND HYPOTHESES



### Variable Classification

The proposed conceptual model classifies digital capability as the independent variable, AI adoption and entrepreneurial orientation as mediating variables, and sustainable livelihoods as the dependent variable, as presented in Table 1.

**Table 1: Classification of Study Variables**

| Variable                         | Role                 |
|----------------------------------|----------------------|
| Digital Capability               | Independent Variable |
| Artificial Intelligence Adoption | Mediator             |
| Entrepreneurial Orientation      | Mediator             |
| Sustainable Livelihoods          | Dependent Variable   |

## Research Hypotheses

### Direct Effects

**H1:** Digital Capability has a significant positive effect on Artificial Intelligence Adoption.

**H2:** Digital Capability has a significant positive effect on Entrepreneurial Orientation.

**H3:** Artificial Intelligence Adoption has a significant positive effect on Sustainable Livelihoods.

**H4:** Entrepreneurial Orientation has a significant positive effect on Sustainable Livelihoods.

**H5:** Digital Capability has a significant positive effect on Sustainable Livelihoods.

### Mediation Effects

**H6:** Artificial Intelligence Adoption mediates the relationship between Digital Capability and Sustainable Livelihoods.

**H7:** Entrepreneurial Orientation mediates the relationship between Digital Capability and Sustainable Livelihoods.

## Research Methodology

### A. Research Design

This study employed a quantitative cross-sectional research design to examine the relationships among digital capability, AI adoption, entrepreneurial orientation, and sustainable livelihoods. This design facilitates the empirical testing of hypothesized relationships using statistical modelling techniques based on Dynamic Capability Theory (DCT) and the Sustainable Livelihood Framework (SLF).

### B. Population and Sampling

The target population comprised traditional wooden artisan enterprises located in the Etikoppaka, Kondapalli, and Bobbili centers. A multi-stage purposive sampling technique was employed because the target population is specialized and geographically dispersed; clusters of artisans and small enterprises were selected, and then Artisans and small enterprises were selected based on their active involvement in the production and marketing of wooden handicrafts. The required sample size for the PLS-SEM is 150 - 300 respondents, depending on the complexity of the model

(Hair et al., 2019) and in this study, at least 200 - 250 responses were sought to ensure statistical validity.

### **C. Data Collection Method**

The primary data were gathered through a structured questionnaire with five sections: Digital Capability, AI Adoption, Entrepreneurial Orientation, Sustainable Livelihoods, and demographic information of respondents. Each of the measures for the measurement items was rated on a five-point Likert scale from 1 = Strongly Disagree to 5 = Strongly Agree. The data were gathered using a combination of field visits, cluster-level interactions, and assisted questionnaire administration to suit the different levels of digital literacy of artisans.

### **D. Measurement of Variables**

Validated reflective scales from previous studies were adapted to the context of traditional wooden artisan enterprises to obtain all constructs. Digital Capability (Digital literacy, Technology usage, Digital integration); AI Adoption (AI applications for marketing, decision-making, sustainable operations); Entrepreneurial Orientation (Innovativeness, Proactiveness, Risk-taking); Sustainable Livelihoods (Income stability, Resilience, Market access, Well-being). Construct validity was achieved by having multiple indicators for each construct.

### **E. Data Analysis Technique**

Partial Least Squares Structural Equation Modelling (PLS-SEM) was performed using SmartPLS software. PLS-SEM was selected because the study is prediction-oriented, incorporates multiple mediating variables, does not require strict exceptions of normality, and is well suited to exploratory research.

### **F. Analytical Procedure**

The data analysis was conducted in two stages. The first stage involved evaluating the measurement model through reliability (Cronbach's alpha, composite reliability), convergent validity (AVE), and discriminant validity (HTMT). The second stage of the analysis involved the evaluation of the structural model, which included path coefficient analysis, bootstrapped significance testing, mediation analysis,  $R^2$  and predictive relevance ( $Q^2$ ), and effect size ( $f^2$ ).

### **G. Ethical considerations and Common Methods Bias Control**

To minimize common methods bias, the anonymity of the respondents was ensured, a simple and clear questionnaire design was employed, Harman's single-factor test was applied in the analysis, and psychological separation of constructs was ensured in the design of the questionnaire. The study obtained informed consent, ensured voluntary participation, protected participants' anonymity, and used the collected data solely for academic purposes.

## **DATA ANALYSIS AND RESULTS**

### **A. Demographic Profile of Respondents**

The demographic profile of the 230 respondents is summarized in Tables II-VI.

**Table II** GENDER DISTRIBUTION OF RESPONDENTS (N=230)

| <b>GENDER</b>     | <b>PERCENTAGE (%)</b> |
|-------------------|-----------------------|
| Male              | 43.5                  |
| Female            | 52.6                  |
| Prefer not to say | 3.9                   |
| Total             | 100.0                 |

There were 52.6% females and 43.5% males; 3.9% did not specify gender. Slightly higher participation of women is indicative of their increased engagements in handcraft production, entrepreneurship and enterprise management in traditional loading artisans MSMEs.

**TABLE III AGE DISTRIBUTION OF RESPONDENTS**

| <b>Age group</b> | <b>Frequency</b> | <b>Percentage (%)</b> |
|------------------|------------------|-----------------------|
| Below 25 years   | 20               | 8.7                   |
| 25 to 34 years   | 61               | 26.5                  |
| 35 to 44 years   | 72               | 31.3                  |
| 45 to 54 years   | 50               | 21.7                  |
| Above 55 years   | 27               | 11.7                  |
| Total            | 230              | 100.0                 |

31.3% of the respondents were in the age bracket 35-44 years, followed by the 25-34 age group (26.5%) and the 45-54 age group (21.7%). The over-55s accounted for 11.7% of the respondents and the under-25s 8.7%, meaning that these terms are predominantly looked after by people in their economically productive years.

**TABLE IV EDUCATIONAL QUALIFICATION OF RESPONDENTS**

| <b>Qualification</b> | <b>Frequency</b> | <b>Percentage (%)</b> |
|----------------------|------------------|-----------------------|
| Primary school       | 60               | 26.1                  |
| Secondary school     | 73               | 31.7                  |
| Graduate             | 64               | 27.8                  |
| Postgraduate         | 21               | 9.1                   |
| Others               | 12               | 5.2                   |
| Total                | 230              | 100.0                 |

The most frequent qualification received was secondary education (31.7%), followed by graduates from primary education (27.8%); 9.1% of respondents had postgraduate qualifications and 5.2% had other backgrounds. This reflects that a large percentage of artisans have the required level of education to be aware of and engaged in entrepreneurial activities with digital technologies.

**TABLE V BUSINESS EXPERIENCE OF RESPONDENTS**

| <b>Business experience</b> | <b>Frequency</b> | <b>Percentage (%)</b> |
|----------------------------|------------------|-----------------------|
| Less than 2 years          | 33               | 14.3                  |
| 2 to 5 years               | 62               | 27.0                  |
| 6 to 10 years              | 65               | 28.3                  |
| 11 to 20 years             | 41               | 17.8                  |

|                    |     |       |
|--------------------|-----|-------|
| More than 20 years | 29  | 12.6  |
| Total              | 230 | 100.0 |

28.3% of the respondents reported 6-10 years of business experience, and 27.0% reported 2-5 years of business experience. Most of the respondents (17.8%) had 11-20 years of experience, with more than 20 years showing the presence of sustainable experience among the enterprise managers, while less than two years accounted for 14.3%.

**TABLE VI ENTERPRISE OWNERSHIP STRUCTURE**

| Enterprise Type | Frequency | Percentage (%) |
|-----------------|-----------|----------------|
| Corporative     | 49        | 21.3           |
| Family run      | 91        | 39.6           |
| Individual      | 77        | 33.5           |
| Others          | 13        | 5.7            |
| Total           | 230       | 100.0          |

The most prevalent ownership arrangement was Family owned (39.6%) followed by the Individual owned Enterprises (33.5 %) and Cooperatives (21.3 %) with 5.7 % of the rest falling under other ownership arrangements. The dominance of family businesses is the result of the traditional fact that wooden handicraft is an inter-generational business sector.

#### **B. Descriptive Statistics DESCRIPTIVE STATISTICS OF THE STUDY VARIABLES**

| Construct                        | Mean  | SD    | Min   | Max   |
|----------------------------------|-------|-------|-------|-------|
| Digital Capability (DC)          | 3.696 | 0.609 | 2.333 | 5.000 |
| AI Adoption (AI)                 | 3.611 | 0.637 | 2.000 | 5.000 |
| Entrepreneurial Orientation (EO) | 3.630 | 0.645 | 2.000 | 5.000 |
| Sustainable Livelihoods (SL)     | 3.589 | 0.606 | 2.286 | 5.000 |

The mean scores were found to be between 3.5892 and 3.696 in the five-point Likert scale, which were at a moderately high level in each construct. The mean ( $M = 3.696$ ,  $SD = 0.645$ ) of Digital Capability was the highest and indicated that the behaviors were generally posted to innovative, proactive, and opportunity-seeking. The mean of the AI adoption is 3.589 ( $SD = 0.606$ ), which represents a moderate score, suggesting that digital transformation has positively impacted livelihood outcomes, but further gains are possible through AI adoption. The standard deviations of 0.606-0.645 suggest that the results are moderately consistent across the sample.

#### **C. Common Method Bias Assessment**

Common method bias (CMB) was evaluated using Harman's single factor test and the full culinary VIF approach since all the variables were measured from the same respondents with the same questionnaire (Kock, 2015; Podsakoff et al., 2003).

**Table VIII** COMMON METHOD BIAS ASSESSMENT SUMMARY

| Method                        | Criterion          | Value       | Decision |
|-------------------------------|--------------------|-------------|----------|
| Harman's single-factor test   | First factor < 50% | 30.17%      | Passed   |
| Full collinearity (inner VIF) | VIF < 3.3          | 1.000-1.304 | Passed   |
| Outer-model VIF               | VIF < 5.0          | 1.323-1.781 | Passed   |

The first unrotated factor explained only 30.17% of total variance, well below the 50% threshold, and all inner-and outer-model VIF values fell within suitable limits. These results confirm that common method bias and multicore do not threaten the validity of the observed relationships among digital capability, AI Adoption, Entrepreneurial Orientation, and Sustainable Livelihoods.

#### **D. Measurement Model Assessment**

Following Hair et al. (Hair et al., 2017), the measurement model was evaluated for indicator reliability, internal consistency, reliability, convergent validity, and discriminant validity for Digital Capability (DC), AI Adoption (AI), Entrepreneurial Orientation (EO), and Sustainable Livelihoods (SL)

**TABLE IX** INDICATOR RELIABILITY (OUTER LOADING RANGES)

| Construct                   | No. Of Items | Loading Range |
|-----------------------------|--------------|---------------|
| Digital capability          | 6            | 0.671–0.760   |
| AI adoption                 | 6            | 0.653–0.766   |
| Entrepreneurial orientation | 6            | 0.716–0.773   |
| Sustainable livelihoods     | 7            | 0.666-0.776   |

Indicator loading ranges from 0.653 to 0.776; although if you fell slightly below the preferred 0.74 threshold, all exceeded the minimum acceptable value of 0.60, and all items were retained given satisfactory construct, reliability and validity.

**TABLE X** RELIABILITY AND CONVERGENT VALIDITY

| Construct                   | Cronbach's | CR    | AVE   |
|-----------------------------|------------|-------|-------|
| Digital capability          | 0.809      | 0.862 | 0.511 |
| AI adoption                 | 0.820      | 0.870 | 0.527 |
| Entrepreneurial orientation | 0.841      | 0.883 | 0.557 |
| Sustainable livelihoods     | 0.836      | 0.876 | 0.504 |

All constructs exceeded the 0.70 threshold for Cronbach's alpha and composite reliability (CR = 0.862–0.883), confirming excellent internal consistency, while AVE values (0.5042–0.557) exceeded 0.50, confirming satisfactory convergent validity.

**TABLE XI** HTMT AND FORNELL-LARCKER DISCRIMINANT VALIDITY

| Constructs | AI          | DC          | EO          | SL (HTMT/F – L diagram). |
|------------|-------------|-------------|-------------|--------------------------|
| AI         | 0.726       |             |             |                          |
| DC         | 0.419/0.341 | 0.715       |             |                          |
| EO         | 0.482/0.399 | 0.458/0.391 | 0.746       |                          |
| SL         | 0.537/0.450 | 0.447/0.378 | 0.699/0.595 | 0.710                    |

All HTMT values (0.419/0.699) fall below the 0.85 threshold, and the Fornell – Larcker diagonal values (square root of AVE, shown in the shaded diagonal) exceeded corresponding construct correlations, jointly confirming discriminant validity among the four constructs.

### E. Collinearity Assessment

Outer-model VIF values ranged from 1.323 to 1.781, and inner-model VIF values ranged from 1.000 to 1.304, both well below the thresholds of 5.0 and 3.3, respectively, confirming the absence of multicollinearity and reinforcing the earlier common-method bias findings.

### F. Structural Model Assessment

Following (Hair et al., 2017), the structural model was assessed through path coefficient and bootstrapping (5000 re-samples),  $R^2$ ,  $F^2$ ,  $Q^2$ , model fit, and mediation analysis.

**TABLE XII** PATH COEFFICIENTS AND HYPOTHESIS TESTING

| H  | Path                | $\beta$ | t     | p      | Decision  |
|----|---------------------|---------|-------|--------|-----------|
| H1 | DC $\rightarrow$ AI | 0.341   | 6.133 | <0.001 | Supported |
| H2 | DC $\rightarrow$ EO | 0.391   | 7.375 | <0.001 | Supported |
| H3 | DC $\rightarrow$ SL | 0.122   | 2.254 | 0.024  | Supported |
| H4 | AI $\rightarrow$ SL | 0.226   | 4.027 | <0.001 | Supported |
| H5 | EO $\rightarrow$ SL | 0.457   | 8.690 | <0.001 | Supported |

All five hypothesized relationships were statistically significant. Digital capability positively influenced AI adoption ( $\beta = 0.341$ ,  $p < 0.001$ ) and entrepreneur orientation ( $\beta = 0.391$ ,  $p < 0.001$ ), indicating that digitally capable Enterprises are more likely to adapt AI enable tech, technologies and exhibit in a way to, proactive behavior. The direct effect of digital capability on sustainable livelihoods was positive, but comparatively weaker ( $\beta = 0.1222$ ,  $p = 0.024$ ), implying a substantial indirect contribution through the mediator. AI adoption significantly improved sustainable livelihoods ( $\beta = 0.226$ ,  $p < 0.001$ ), while entrepreneurial orientation exhibited the strongest influence ( $\beta = 0.457$ ,  $p < 0.001$ ), underscoring innovation and proactive behavior as critical determinants of livelihood enhancement.

**TABLE XIII**  $R^2$ ,  $F^2$  AND  $Q^2$  VALUES

| Construct/ Path | $R^2$ (Adj)   | $F^2$ | $Q^2$ |
|-----------------|---------------|-------|-------|
| AI Adoption     | 0.116 (0.112) | --    | 0.102 |

|                             |               |                |       |
|-----------------------------|---------------|----------------|-------|
| Entrepreneurial Orientation | 0.153 (0.149) | --             | 0.137 |
| Sustainable Livelihoods     | 0.420 (0.412) | --             | 0.129 |
| DC → AI                     | --            | 0.131 (small)  | --    |
| DC → EO                     | --            | 0.180 (medium) | --    |
| DC → SL                     | --            | 0.021 (small)  | --    |
| AI → SL                     | --            | 0.070 (small)  | --    |
| EO → SL                     | --            | 0.276 (medium) | --    |

Digital capability explained 11.6% of the variance in AI adoption and 15.3% in entrepreneurial orientation, relatively weak but acceptable explanatory power for behavioral research – while the full model explained 42.0% of the variance in sustainable livelihoods, indicating moderate explanatory power. Effect sizes (Cohen, 1988) show a medium effect of digital capability on entrepreneurial orientation ( $F^2 = 0.180$ ) and small effect elsewhere, with entrepreneurial orientation showing the strongest contributions to sustainable livelihoods ( $F^2 = 0.276$ ). All  $Q^2$  relevance for endogenous constructs.

**TABLE XIV MODEL FIT INDICES**

| Index      | Value   | Threshold       | Decision   |
|------------|---------|-----------------|------------|
| SRMR       | 0.079   | <0.08           | Good fit   |
| NFI        | 0.833   | >0.80           | Acceptable |
| d_ULS      | 2.012   | Lower is better | Acceptable |
| d_G        | 0.286   | Lower is better | Acceptable |
| Chi-square | 357.737 | Descriptive     | Reported   |

The SRMR (0.079) and NFI (0.833) values met their respective thresholds, indicating that the structural model adequately represents the relationships among the study constructs.

**TABLE XV MEDIATION ANALYSIS**

| Indirect Path         | $\beta$ | t     | p      | Decision    |
|-----------------------|---------|-------|--------|-------------|
| DC → AI → SL          | 0.077   | 3.408 | 0.001  | Significant |
| DC → EO → SL          | 0.179   | 5.551 | <0.001 | Significant |
| Total indirect effect | 0.256   | 6.799 | <0.001 | Significant |

The indirect effect of digital capability on sustainable livelihoods through AI adoption was significant ( $\beta = 0.077$ ,  $p = 0.001$ ), as was the stronger indirect effect through entrepreneurial orientation ( $\beta = 0.179$ ,  $p < 0.001$ ). The total indirect effect ( $\beta = 0.256$ ) exceeded the direct effect ( $\beta = 0.122$ ), and since both direct and indirect parts remain significant, the results confirm partial mediation, with entrepreneurial orientation playing the more substantial mediating role.

The structural model shows digital capability as the exogenous construct influencing AI adoption, entrepreneurial orientation, and sustainable livelihoods, with the two mediators channeling much of its effect towards the endogenous outcome.

Digital capability was the strongest direct influence on sustainable livelihoods ( $\beta = 0.457$ ), followed by AI adoption ( $\beta = 0.226$ ) and entrepreneur orientation ( $\beta = 0.122$ ), signifying its foundational role that fosters digital transformation and livelihood outcomes, which was also significantly shaped by both mediators ( $\beta = 0.341$  and  $0.391$ , respectively).

## DISCUSSION

The results confirmed the proposed concept framework based on DCT. Digital Capability becomes the basic organizational capacity to increase the capacity of enterprises to implement AI and cultivate entrepreneurial orientation, which significantly promotes Sustainable Livelihoods. The model has a moderate explanatory power with  $R^2 = 0.420$  for Sustainable Livelihoods. Moreover, the high level of indirect effects shows that entrepreneurial orientation and AI adoption is a key pathway through which Digital Capability positively impacts livelihood outcomes. The results enhance the literature of the DCT, as it is the first study to test the applicability of the DCT to the case of traditional wooden artisans MSMEs, which has received little empirical attention in the literature. This study differs from the previous studies, which tended to emphasize manufacturing technology intensive sectors, by showing that digital capability also plays an important role in artisan business based on heritage. Findings show that digital capability increases the competitiveness of MSMEs and sustainable livelihoods while not jeopardizing traditional craftsmanship. The results add to the existing body of research on digital transformation, entrepreneurship, and sustainable livelihoods of culturally relevant MSMEs.

## IMPLICATIONS OF THE STUDY

### A. Theoretical Implications

This research continues to apply Dynamic Capability Theory (DCT) to the traditional wooden artisans of MSMEs. While most of the previous studies have been based on the level of manufacturing firms, technology-intensive firms and service-based organizations, the present study shows that DCT is also applicable for the heritage-based enterprises and the activity of artisans, thereby indicating that AI adoption is an important organizational capability that helps enterprises improve their SLR by boosting their EO. Another important theoretical contribution is the development and empirical testing of an integrated conceptual framework that confines these four constructs, instead of working with these four constructs separately. These significant mediating roles of AI Adoption and Entrepreneurial Orientation provide empirical evidence that digital transformation is not enough unless organizations have a robust entrepreneurial orientation and adopt AI technology, it is necessary to obtain sustainable livelihood outcomes. This identification reinforces the existing body of literature that brings together the concepts of digital transformation, entrepreneurship, and sustainable living under the umbrella of the Dynamic Capability Theory.

### B. Practical Implications

The results have some practical implications for the wooden artisans' MSMEs and enterprise managers. Artisans of wood should invest in digital literacy, e-commerce engagement, social media marketing, technological payment, and customer engagement to enhance technological readiness and market access. Therefore, boosting one's digital skills should be a strategic issue.

The positive impact of AI Adoption suggests that user-friendly AI tools can help artisans in areas such as customer engagement, demand planning, inventory management, multilingual communication, and digital marketing – without taking the place of their traditional craftsmanship. Entrepreneurial Orientation was found to be the most significant factor of Sustainable Livelihoods. From the findings it is recommended that artisans should be motivated to innovate, explore new markets, have proactive marketing strategy and take calculated business risks by providing entrepreneurship training and business incubation programmes to them by the policymakers and development agencies. In general, the key to enhancing sustainable livelihoods is investments in digital capacity, technological innovation, the use of AI, and the development of entrepreneurship, as opposed to investments in technology use.

## **CONCLUSION**

The study explored the influence of digital capability on the sustainable livelihood of traditional wooden artisan MSMEs in Andhra Pradesh using the lens of Dynamic Capability Theory (DCT) and applying the concept of entrepreneurial orientation as a mediator. The conceptual model proposed was empirically tested using survey data obtained from 230 traditional wooden artisan enterprises with the help of partial least squares (PLS-SEM). The results showed that Digital capability significantly positively influenced AI Adoption, Entrepreneurial Orientation, and Sustainable Livelihoods. The analysis showed that Entrepreneurial Orientation had the greatest positive impact on Sustainable Livelihoods, followed by AI Adoption, and the digital capability also had a direct effect on Sustainable Livelihoods, albeit with a smaller scale but was statistically significant. The results also demonstrate the partial mediation of the relationship between Digital Capability and Sustainable Livelihoods in both cases, as seen in the presence of a direct link between Digital Capability and Sustainable Livelihoods, with the results most likely being mediated by other organizational abilities, since AI Adoption and Entrepreneurial Orientation were present in both cases. The results indicate that the digital transformation process for wooden artisan traditional businesses is not merely about technology but also about developing their digital competencies and cultivating entrepreneurial attitudes and responsible use of technologies that leverage Artificial Intelligence. The model as proposed here will give the policymakers, development agencies and artisans a holistic idea of the contribution of each individual's capacity to the competitiveness and sustainability of the enterprise, while preserving cultural heritage.

## **CONTRIBUTIONS OF THE STUDY**

### **A. Theoretical Contributions**

This study builds on the existing work of Dynamic Capability Theory and suggests Digital Capability as a baseline capability to enhance AI Adoption and Entrepreneurial Orientation, thereby enhancing the Sustainable Livelihood Framework to comprehend digital transformation in traditional wooden artisans MSMEs.

### **B. Methodological Contributions**

In a methodological aspect, the study constructs a structural model consisting of four latent constructs and seven hypothesized relationships, which are developed and validated by the PLS-

SEM method. The results of the measurement model illustrated reliability, convergent validity, discriminant validity, and predictive relevance, thus ensuring the robustness of the proposed framework and supporting empirical research on the digital transformation and MSME studies.

### **C. Practical Contributions**

The study provides practical implications for artisans, MSME managers, policymakers, and development agencies, and projects that investment in digital capability is not enough unless paired with entrepreneurial capability development and AI adoption. The results inform the design of digital literacy programs, AI training, AI initiatives, entrepreneurship, development, technology and adoption strategies, schemes.

### **Limitations of the study**

The study has some limitations despite the contributions it makes. The study was carried out with 230 traditional wooden artisans MSMEs in Andhra Pradesh, which might not necessarily be representative of other sectors of the artisans or other parts of the country. The cross-sectional design gives a snapshot of the respondents' perception at one time, while longitudinal studies can provide a better insight into how digital and entrepreneurial competencies develop over time. The study was based on self-reported questionnaire data, which could have response bias despite the CMB, and validity testing conducted. It also only included four constructs: Digital Capability, AI Adoption, Entrepreneurial Orientation and Sustainable Livelihoods, rather than other factors like digital innovation capability, organizational learning, government support, market orientation, institutional support and digital ecosystem readiness. Lastly, the study concentrated solely on the wooden artisan business, and the results do not necessarily apply to other groups of handicrafts such as textiles, metal crafts, pottery, or handlooms.

### **FUTURE RESEARCH DIRECTIONS**

Future Studies may replicate the proposed model among other artisan sectors, including handloom, pottery, metal crafts, bamboo crafts, and textile enterprises, to examine the generalizability of the proposed model. The design of longitudinal studies could focus on the change in Digital Capabilities of space AI Adaptation and Entrepreneurial Orientation over time and their influence on long-term enterprise sustainability. Other factors like government support, digital innovation, capability, market orientation, organizational learning, digital ecosystem readiness, financial inclusion and institutional support can also be introduced into the study and can be explored through collaborative research between Indian states and/or developing countries, which can highlight regional differences. Last but not least, future research may explore technologies that are on the horizon, such as Generative Artificial Intelligence, blockchain, the Internet of Things (IoT), Augmented Reality (AR), Virtual Reality (VR) and the digital marketplace in their contribution to promoting artisan entrepreneurship, culture and heritage preservation, export, competitiveness and sustainable livelihoods.

In conclusion, the study reveals that Digital Capability is the fundamental capability of traditional wooden artisans MSMEs, Artificial Intelligence Adoption and Entrepreneurial orientation are

complementary actions to achieve Sustainable Livelihoods from Digital readiness. The main contribution and novelty of the study is the introduction of these constructs within the framework of Dynamic Capability Theory, which will help improve the theoretical understanding and give actionable insights for supporting the digital transformation, competitiveness and sustainable livelihood development of the MSMEs in the heritage and tourism sector.

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