

ORIGINAL ARTICLE



# Artificial intelligence adoption and sustainable financial decision-making among MSMEs: An empirical study of Cuttack city

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## ABSTRACT

In recent times, Artificial Intelligence (AI) is increasingly influencing financial decision-making and sustainability measures in business organizations. The current study explores the impact of AI adoption on sustainable financial decision-making in Micro Small and Medium Enterprises (MSMEs) of Cuttack City. The study is based on both primary and secondary data obtained from 200 owners of MSMEs using a structured questionnaire survey. The study employed descriptive and analytical research designs, while statistical techniques including percentage analysis, mean score, Pearson correlation and linear regression were used for data analysis. The findings indicate a significant positive relationship between AI adoption and sustainable financial decision-making. AI-enabled instruments facilitate better financial forecasting, resource allocation and environmental considerations in financial investments. The study concludes that AI adoption significantly improves sustainable financial decision-making among MSMEs and provides useful implications for policymakers, financial institutions, and MSME owners.

## KEY WORDS

Artificial intelligence; AI adoption; Sustainable financial decision-making; Sustainability

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## Introduction

### Background of the study

AI has emerged as a transformative technology that is significantly influencing business operations, financial management, and strategic decision-making across industries. AI refers to computer-based systems capable of performing tasks such as learning, reasoning, prediction, and problem-solving that traditionally require human intelligence [1]. In the present business environment, organizations are increasingly adopting AI-driven technologies to improve forecasting accuracy, automate financial operations, reduce risks, and enhance operational efficiency. At the same time, sustainable financial decision-making has become an important concern for businesses, as it emphasizes profitability along with environmental and social responsibility. Sustainable financial practices encourage firms to invest in environmentally responsible activities such as efficient resource utilization, green investments, and long-term sustainable growth [2]. Consequently, the integration of AI with sustainable financial practices has gained considerable attention among MSMEs in recent years.

MSMEs form the backbone of developing countries like India, playing a vital role in employment generation and economic growth [3]. Integration of AI with sustainable decision making significantly improves the performance of MSMEs by enhancing forecasting accuracy through machine learning and analytics tools such as IBM Watson, Google Cloud AI and Microsoft Azure AI [4]. Furthermore, AI provides predictive analytics for sustainability through tools like SAS Analytics, Tableau, and Power BI. It also reduces operational costs via automation software including UiPath, Automation Anywhere, Zoho Books, QuickBooks, and SAP ERP and optimizes resource allocation through platforms like Oracle NetSuite and Microsoft Dynamics 365. Additionally, blockchain platforms such as Ethereum and Hyperledger are used to ensure transparency and sustainable finance tracking [5]. Ultimately,

these tools assist MSME owners in identifying opportunities and making smarter financial decisions that are both profitable and environmentally responsible.

Though AI is becoming more and more important in driving corporate sustainability in Cuttack city, a key economic centre, faces significant hurdles in implementing AI based tools such as lack of adequate financial resources and technological awareness, limited predictive analytics capabilities and difficulty in accessing reliable financial information [6]. These challenges can adversely affect the MSMEs of Cuttack city.

### Statement of the problem

MSMEs should make both profitable and environmentally friendly financial decisions; however, due to unawareness, poor technical understanding, lack of financial resources, and high costs involved, MSMEs have not adopted AI solutions in Cuttack city [4,6]. Further, there is very little research on how AI affects sustainable financial decisions made by MSMEs [5]. This research therefore seeks to empirically assess how the level of AI adoption structurally influences the independent framework of sustainable financial decision-making among MSME owners in Cuttack city.

### Significance of the study

- To identify inexpensive AI solutions for MSMEs operating in Cuttack City.
- To establish how AI adoption makes organizations environmentally sustainable.
- To identify ways through which ESG factors can be made profitable through AI.
- To identify inexpensive AI solutions which will lower cost of operations.
- To offer insights that will be useful to business people.

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### Objectives of the study

- To find out the levels of AI adoption within MSMEs.
- To analyze the impact of AI adoption on sustainable financial decision-making among MSMEs.

### Scope of the study

The research aims to explore the influence of AI techniques like predictive analytics, cloud accounting, and blockchain on sustainable financial decision-making within MSMEs in Cuttack city. Data for the analysis were collected from 200 MSME owners in Cuttack city through a structured questionnaire using convenience sampling.

### Hypothesis of the study

**H0:** AI adoption has no significant impact on sustainable financial decision-making among MSMEs in Cuttack City.

**H1:** AI adoption has a significant positive impact on sustainable financial decision-making among MSMEs in Cuttack City.

### Limitations of the study

- The research is confined to the area of MSMEs operating in Cuttack city.
- The sample consists of only 200 MSMEs.
- Results would be based on the opinions of respondents who could exhibit some degree of bias.

### Review of Literature

#### Empirical studies on AI and financial decision-making

According to Chhavi, the diffusion of AI in Indian corporate finance showed that technological adoption was predominantly concentrated in big and capital-intensive organizations, thus small-scale industries were not adequately digitized [7]. Nevertheless, where implemented, it enhanced forecast precision and made decisions faster, thereby indicating that availability of data is an important prerequisite of effective technology adoption.

In terms of small enterprises, Jamal et al. posited that although there were advantages of AI systems from an operational point of view, adoption in developing nations was hampered because of structural limitations, mainly associated with high expenses and lack of local specialists [6]. This operational constraint is further supported by Mishra, who, in his analysis of Indian MSMEs, found that although there was optimal use of automation tools for accounting and cloud-based financial modules for managing daily cash flow operations, small firms did not leverage the same in their sustainability planning processes due to poor strategic thinking [4]. This observation, in turn, is further validated by Chandrasekar and Subash in relation to regional operational constraints, while Kant pointed out the importance of tech readiness in strategic technology use among small firms [8,9].

By emphasizing advanced algorithms, Choudhari et al. established that implementation of machine learning models such as Random Forest and Long Short-Term Memory (LSTM) networks greatly helps in decreasing credit risk and facilitating capital flows to the disadvantaged MSMEs, hence improving financial inclusiveness [5]. In addition, by Scaria and Sengottaiyan, it was verified that predictive analysis improves short term cash management in small firms, but this was limited to considerations of profitability measures only [10].

As far as the issue of sustainability is concerned, Kekeocha et al. found out that the use of predictive analytics in developing countries helps in achieving operational sustainability and resource sustainability, which indicates that training in such technologies may lead to the emergence of green technologies [11]. Vijayakumar and Harish stressed the point that small businesses are unable to fill the sustainability gap on their own; without special state incentives and structures, no tech-resilience model can be available for MSMEs [12]. Lastly, Kettiramalingam et al. explored the issue of the speed of financial decision making in tech clusters in cities, pointing out that while artificial intelligence resolves the problem of delay in data processing, it gives rise to new security issues [13].

### Theoretical framework

This study uses two simple ideas: the Technology Acceptance Model (TAM) and the Resource-Based View (RBV).

According to TAM, an individual will only opt for a technological innovation provided that it offers convenience and usefulness [7]. Thus, if the MSME owner perceives the AI system as too complicated or useless concerning finance-related operations, he or she would not waste their time on it. On the contrary, if such a system has time-saving, error-reduction, or investment facilitation benefits, chances are it would be adopted [10].

RBV also adds an extra dimension to this. According to RBV, firms will be able to outdo their competitors if they possess certain valuable resources, which their competitors do not possess [14]. The use of AI tools such as predictive analytics or automated accounting, if effectively done, becomes the resource that gives one firm an upper hand. Through this lens, specialized AI systems serve as the distinct operational resource (Independent Variable) that enables and drives the firm's capacity to make eco-friendly, sustainable financial allocations (Dependent Variable) [3].

Combining the two concepts together helps us look at both human (motivation of the owner) and organizational (growth through use of AI) perspectives at the same time. This is what our research intends to address in Cuttack City.

### Research gap

Several earlier studies have pointed out that implementing artificial intelligence would enhance the financial performance and decisions of MSMEs [4,5,7]. However, a critical gap exists in current literature: most studies merge technology adoption and general financial outcomes into a single construct without isolating their distinct relationship. Furthermore, empirical research using primary data to specifically measure the structural impact of AI adoption on separate sustainable financial choice frameworks remains scarce, particularly within the MSME ecosystem of Cuttack city.

### Research Methodology

#### Research design

The current study was carried out following a descriptive and analytical research design in order to investigate the influence of AI adoption on sustainable financial decision-making in the case of MSME owners in Cuttack city.

### Nature of data

- **Primary Data:** Data collected through a structured questionnaire for MSME owners.
- **Secondary Data:** Data collected from journals, research papers, reports, and other sources available online.

### Sampling design

- **Population:** MSME owners in Cuttack city
- **Sample Size:** 200 respondents
- **Sampling Technique:** convenience sampling

### Data collection methods

The primary data was gathered through the use of a structured questionnaire that had questions formulated in a closed format according to the 5-point Likert scale, where 1 represented strongly disagree and 5 represented strongly agree. This was done to gather data related to AI implementation and sustainable financial decision-making. A preliminary survey conducted among ten MSME owners yielded a Cronbach's alpha of 0.85, indicating good reliability [15].

### Variables of the study

- Independent Variable: AI Adoption
- Dependent Variable: Sustainable Financial Decision-Making

This study seeks to evaluate how artificial intelligence adoption impacts sustainable financial decision-making among MSME owners in Cuttack city.

### Tools and techniques of analysis

The collected data were analyzed using Microsoft Excel. In order to properly test the empirical relationship between the two constructs, the data analysis was done starting from the computation of descriptive statistics all the way to the development of inferential models. The first step was to calculate the value of the Pearson Product-Moment Correlation Coefficient  $\rho$ , which tests the strength and direction of the linear relationship between the variables of interest: AIA and SFD. The second step was to conduct an OLS Linear Regression Analysis of the effects of the independent variable (X) AIA on Y (SFD), which is determined by the formula:

$$Y_{SFD} = \beta_0 + \beta_1 X_{AIA} + \epsilon$$

Where  $\beta_0$  (Beta zero) represents the constant intercept,  $\beta_1$  (Beta one) is the unstandardized regression coefficient, and  $\epsilon$  (Epsilon) represents the stochastic error term.

### Study period

The research was carried out from January 2026 to March 2026.

### Data Analysis and Interpretation

This chapter describes the analysis and interpretation of the data obtained from the MSME entrepreneurs in Cuttack city. Percentage analysis, mean score, and Pearson correlation analysis, and linear regression analysis have been used to analyze the data to establish the influence of AI usage on sustainable financial decision-making (Table 1 and Table 2).

**Table 1.** Demographic profile of respondents (Percentage analysis).

| Particulars               | Category      | No. of respondents | Percentage (%) |
|---------------------------|---------------|--------------------|----------------|
| Gender                    | Male          | 120                | 60%            |
|                           | Female        | 80                 | 40%            |
| Age                       | Below 30      | 42                 | 21%            |
|                           | 30-40         | 86                 | 43%            |
|                           | Above 40      | 72                 | 36%            |
| Educational Qualification | Undergraduate | 52                 | 26%            |
|                           | Postgraduate  | 92                 | 46%            |
|                           | Others        | 56                 | 28%            |
| Type of MSME Business     | Manufacturing | 58                 | 29%            |
|                           | Service       | 86                 | 43%            |
|                           | Trading       | 56                 | 28%            |

**Interpretation:** From the table, it can be seen that most of the respondents are males (60%) and aged between 30-40 years (43%). The majority of the respondents are postgraduates (46%), reflecting that respondents possess good educational qualifications. Amongst the types of business, the highest number of respondents are from the services sector (43%) followed by manufacturing and trading.

**Table 2.** Descriptive statistics.

| Statements                                                         | N   | Mean | Std. deviation |
|--------------------------------------------------------------------|-----|------|----------------|
| AI helps in making environmentally responsible financial decisions | 200 | 4.28 | 0.64           |
| AI supports efficient use of financial resources                   | 200 | 4.22 | 0.67           |
| AI improves investment in eco-friendly initiatives                 | 200 | 4.18 | 0.69           |
| AI reduces financial risks related to sustainability               | 200 | 4.35 | 0.61           |
| AI enhances long-term sustainable financial planning               | 200 | 4.30 | 0.63           |

**Interpretation:** From the descriptive statistics, it can be seen that the means of all the variables are more than 4, which suggests a high degree of agreement. The maximum value of mean ( $M = 4.35$ ,  $SD = 0.61$ ) is associated with reduction of financial risks. Low values of standard deviation further validate the findings. In this way, it can be inferred that AI implementation has a positive impact on sustainable financial decision-making among MSMEs.

### Hypothesis testing

**H0:** AI adoption has no significant impact on sustainable financial decision-making among MSMEs in Cuttack City

**H1:** AI adoption has a significant positive impact on sustainable financial decision-making among MSMEs in Cuttack City.

### Correlation analysis

To observe whether a statistically viable relationship exists between the independent construct (AI Adoption) and the dependent construct (Sustainable Financial Decision-Making), a Pearson correlation matrix was constructed (Table 3-6).

**Table 3.** Pearson correlation matrix.

| Constructs                           | AI adoption (AIA) | Sustainable financial Decisions (SFD) |
|--------------------------------------|-------------------|---------------------------------------|
| AI Adoption                          | 1.000             |                                       |
| Sustainable Financial Decision (SFD) | 0.732**           | 1.000                                 |

\*Correlation is significant at the 0.01 level (2-tailed); N = 200.

**Interpretation:** The correlation matrix reveals a strong, statistically significant positive linear relationship between AI adoption and sustainable financial decision-making ( $r = 0.732$ ,  $p < 0.001$ ). This establishes that higher frequencies of digital tech utilization strongly move alongside enhanced sustainability choices.

### Regression analysis

To test the predictive impact of AI adoption on sustainable financial decision-making and formally address the null hypothesis ( $H_0$ ), an OLS regression model was computed (Table 4).

**Table 4.** OLS regression model summary

| Model | R     | R square | Adjusted R square |
|-------|-------|----------|-------------------|
| 1     | 0.732 | 0.536    | 0.534             |

**Table 5.** ANOVA summary.

| Model      | Sum of squares | df  | Mean square | F      | Sig.p value |
|------------|----------------|-----|-------------|--------|-------------|
| Regression | 27.624         | 1   | 27.624      | 228.75 | 0.0000      |
| Residual   | 24.000         | 198 | 0.121       |        |             |
| Total      | 51.624         | 199 |             |        |             |

**Table 6.** Coefficients matrix.

| Predictor variable     | Unstandardized $\beta$ | Std. error | Standardized $\beta$ | t-value | Sig. p-value |
|------------------------|------------------------|------------|----------------------|---------|--------------|
| (Constant / Intercept) | 1.38                   | 0.214      | —                    | 6.458   | 0.000        |
| AI Adoption (AIA)      | 0.718                  | 0.047      | 0.732                | 15.125  | 0.000        |

**Model Statistics:**  $R = 0.732$ ;  $R^2 = 0.536$ ; Adjusted  $R^2 = 0.534$ ;  $F = 228.75$  ( $p < 0.001$ ).

**Interpretation:** The model summary reveals an  $R^2$  value of 0.536, indicating that 53.6% of the variation in sustainable financial decision-making among MSMEs is explained by AI adoption. The adjusted  $R^2$  value of 0.534 further confirms that the regression model provides a good fit to the data. The overall regression model is statistically significant, as indicated by the F-value of 228.750 ( $p < 0.001$ ), demonstrating that AI adoption has a significant influence on sustainable financial decision-making.

The coefficient analysis shows that the unstandardized regression coefficient ( $\beta$ ) for AI Adoption is 0.718 ( $t = 15.125$ ,  $p = 0.000$ ). Since the p-value is less than the significance level of 0.05, the null hypothesis ( $H_0$ ) is rejected, and the alternative hypothesis ( $H_1$ ) is accepted. This confirms that AI adoption has a significant positive impact on sustainable financial decision-making among MSMEs in Cuttack City. The regression coefficient further indicates that a one-unit increase in AI adoption is associated with an increase of 0.718 units in the sustainable financial decision-making score, holding other factors constant.

### Findings

The survey results obtained from the 200 owners of MSMEs in Cuttack City have revealed that the use of AI has witnessed an immense increase among manufacturers, service organizations, and traders. The majority of the respondents were of the opinion that AI helps in making financial decisions

sustainably through financial forecasting, proper allocation of resources, reduction of financial risks, and making environmentally sustainable investments [7,10]. Also, the respondents were of the view that AI increases operational efficiency and financial sustainability through data-driven decisions.

Further analysis empirically shows that there exists a strong positive relationship between AI adoption and sustainable financial decision making ( $r = 0.732$ ,  $p < 0.001$ ). Regression analysis shows that AI adoption is a significant determinant of sustainable financial decision making since 53.6% of the total variance is explained by it ( $R^2 = 0.536$ ). The regression equation was found to be highly significant ( $F = 228.750$ ,  $p < 0.001$ ) but the positive regression coefficient ( $\beta = 0.718$ ,  $t = 15.125$ ,  $p < 0.001$ ) shows that increased levels of AI adoption significantly improve sustainable financial decision making of MSMEs. Consequently, the null hypothesis was rejected while the alternative hypothesis was accepted. The results are in

accordance with the TAM and RBV, which argue that the proper adoption of AI technologies improves organizational capabilities and enhances sustainable financial performance [3].

This demographic pattern also shows that 46% of the respondents were postgraduates, signifying a reasonably high education status of MSME owners. This kind of educational experience could have helped them gain higher knowledge about AI-enabled finance technology. This would have made it easier for them to implement such technology in their business practices [4]. All in all, from the results obtained above, it is clear that adoption of AI is vital in order to help MSMEs make sustainable financial decisions.

### Recommendations

The application of AI technology is highly recommended to be considered in order to enhance the effectiveness of financial planning and ensure the sustainable development of businesses. The increasing level of awareness and understanding regarding the role of AI technologies will lead to more effective and informed decisions regarding business finances. In this regard, governmental institutions and other financial organizations need to organize training and awareness programs in order to provide entrepreneurs with all necessary knowledge concerning AI-based solutions.

Furthermore, technology providers should pay attention to developing relatively inexpensive solutions based on AI technologies that will be accessible for entrepreneurs running small businesses. Moreover, supportive government policies, incentives, and institutions are to be developed in order to stimulate the wide usage of AI technologies. Additionally, MSMEs need to implement AI technologies in conjunction with sustainable business models related to the effective management of various resources and environmental responsibility in investments.

### Scope for Future Research

However, despite providing some useful insights into the application of AI among MSMEs in Cuttack city, some research questions remain unanswered and need further investigation.

For starters, future research can widen its scope by studying the differences between cities such as Cuttack and another one, namely Bhubaneswar. It is interesting whether being located in a traditional or IT-saturated environment affects the decision of an MSME owner to apply AI in business management.

Furthermore, future research may monitor the development of the 200 surveyed MSMEs over a period of five years to assess whether AI adoption contributes to long-term sustainable financial decision-making and business sustainability.

Finally, a detailed analysis of different artificial intelligence tools is also needed. To illustrate, the researcher may investigate whether using cloud accounting or blockchain can help an MSME become more sustainable.

### Conclusion

The research underlines the increasing relevance of AI technology in assisting MSMEs of Cuttack city to make sustainable decisions in their financial operations. Since firms are now operating in an environment characterized by competition, the ability to make financial decisions in a manner

that is sustainable has become very important. In this context, the role of AI becomes apparent as it can help in making informed financial decisions and managing resources in a responsible way.

Despite the existence of issues including lack of awareness and financial and technical difficulties in the use of AI technology by MSMEs, its advantages should not be ignored. The empirical evidence confirms that AI adoption depth functions as a distinct, statistically significant predictor that positively drives sustainable financial decision-making frameworks. This measured relationship provides an opportunity for business enterprises to systematically enhance their long-term sustainability while contributing to broader ecological objectives. Thus, creation of an enabling environment for businesses to adopt new technologies may be an important step towards ensuring their sustainability.

### Disclosure Statement

No potential conflict of interest was reported by the author.

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