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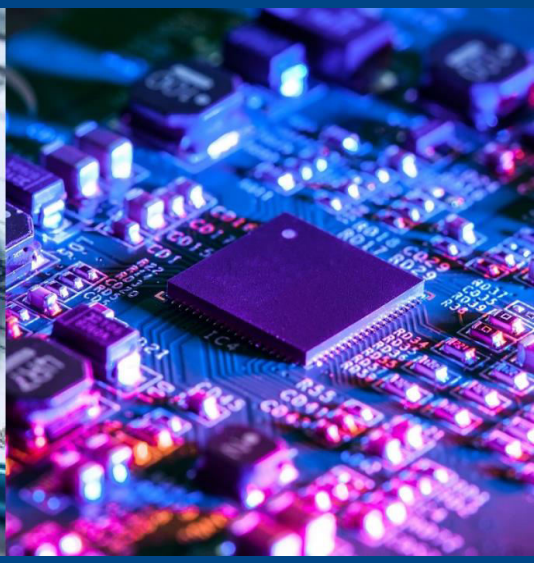

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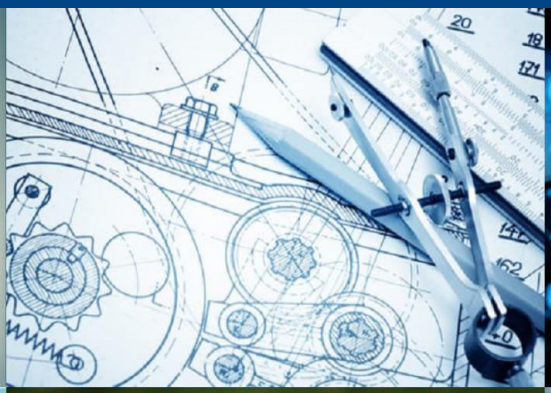

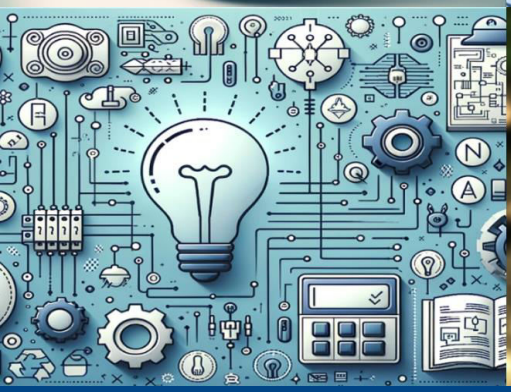

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The Role of Artificial Intelligence and Business Analytics in Financial Decision-Making of Startups

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ABSTRACT: This research focuses on understanding the application of Artificial Intelligence and Business Analytics in the financial decision making of startups and small firms. With the current development of new technology, businesses are relying more on AI based tools for accurate forecasts, reduced risk and enhanced financial planning and budgeting. Although the awareness about AI in businesses is rising, there are only a few studies that assess the actual implementation of AI and BA in startups. A descriptive research design is adopted and primary data were obtained from 104 respondents comprising prospective entrepreneurs, owner and finance expert of start-ups via a structured questionnaire. The data was analyzed using descriptive statistics and reliability analysis and it was established that the measure was reliable with Cronbach's Alpha value as 0.837. From the data it was concluded that 89.5% of the respondents are aware of the tools in AI and 69.2% are currently using AI or analytic tool in their work place. Most commonly adopted AI and analytics tools by respondents: Predictive Analytics, Financial Forecasting, Automated Accounting, AI based Risk Analysis, Data Visualization Dashboards. Key financial decisions affected by the AI tools are budgeting, investment plans, risk assessment, fraud detection and cash flows management. The paper concludes that even though AI provides a lot of opportunities for the financial management of startups, its implementation is constrained by costs, availability of knowledgeable staff, concerns over privacy of information and technological challenges.

KEYWORDS: Artificial Intelligence, Business Analytics, Financial Decision-Making, Startups, Predictive Analytics, Cronbach's Alpha, Risk Management, Financial Forecasting

I. INTRODUCTION

Today data represents the most crucial asset driving the success of an organization. The growing adoption of AI and BA has tremendously transformed how organizations deal with data and leverage it in order to make business decisions. Financial decision making that includes decisions about budgeting, planning for new investments, risk management, and cash flow management is the area that has been affected the most by the recent changes.

Business decision making, generally, had been a reactive process based on the experience of managers and was driven by manual calculations and excel spread sheets analysis. Startups and evolving organizations encounter a new dimension where decisions have to be made immediately under uncertain, and volatile situations and with lack of adequate resources and financial expertise. These factors create the demand of smart tool capable of delivering timely data based information and forecast with predictive capability.

Statement of the Problem:

The traditional methods of making financial decisions are slow, passive, based on hindsight and past judgment. Businesses find it difficult to accurately predict future trends, demands, and financial risks. The huge amounts of business data remain to be untapped because of poor data quality and poor analysis systems. Decision-makers do not have real time information to support budgeting, investment and strategic planning.

II. REVIEW OF LITERATURE

AI in the context of financial management has also been a pertinent issue in academic circles of recent times. In a quick look at literature it is evident that there are opportunities as well as constraints in applying AI to financial management.

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Schmitt (2020) discussed the contribution of AI to business analytics and emphasized the ability of machine learning applications in financial services, stating that AI is able to assist in predictive algorithms that can better credit risk modelling, fraud detection and optimal investment portfolios, setting the initial grounds on how AI and better financial performance were connected.

Prasanth et al. (2023) conducted an analysis of the contribution of AI in decision-making in business where they deduced that companies using AI based analytical decision-making techniques recorded a 30–40% improvement in decision accuracy. It was explained that this jump from descriptive analytics to prescriptive analytics was a competitive edge.

Oluoha et al. (2022) presented research on enhanced data analytics for optimization of business decisions and concluded that the application of data visualization and predictive modeling decreased latency time during financial planning process greatly. Their results showed that data visualization and predictive modeling could integrate and make sense of real time streams of data.

Roundy (2022) research into the adoption of AI and algorithmic decision-making by entrepreneurial ecosystems concluded that AI adoption in startup firms was in its infancy but rapidly emerging and showed that startup firms utilizing AI for financial decisions recorded higher survivability and higher growth in scale.

Celestin & Vanitha (2018) researches into AI supported entrepreneurship tool for startups and reported on the application of automation in the accounting and financial reports processes where entrepreneur bandwidth is reserved for higher tasks. The result showed that the usage of an accounting automation software reduced errors up to 70%.

Gaps Identified in Existing Literature

Most research looks at decision-making in general rather than financial decisions in particular.
Very few studies examine the adoption of AI within startups and SMEs.
Limited integration of AI and Business Analytics as a combined construct.
Negligible work done in practical financial decision-making areas (e.g. Budgets, cash flows, investment decisions).
Evidence regarding actual rates of adoption and metrics of success in the Indian business environment are rare.

Objectives of the study:

1. To examine the role of AI and Business Analytics in the financial decision-making of startup.
2. To assess the extent to which AI tools can assist in enhancing forecasting precision, budgeting and risk mitigation.
3. To investigate the level of awareness and the degree of adoption of AI tools among the respondents.
4. To highlight the main challenges encountered while implementing AI and analytics into the financial operations.

III. RESEARCH METHODOLOGY

Research Design

This research has been approached using a descriptive research design because we want to thoroughly describe the nature of the involvement and influence of AI and Business Analytics in financial decision- making processes. This type of research design is used when you aim to describe the characteristics of a phenomenon and recognize the patterns or correlations between the variables.

Target Population

The sample population were entrepreneurs, start-up owners, small business owners and financial managers who have been implementing or intending to use AI in their businesses. Business or financial qualified respondents were chosen as participants to ensure quality and relevance of replies.

Sample Size

Overall, a total of 102 useful responses were gathered and examined in this survey. Therefore, there was a broad variety of respondent demographics represented, the reliability of this scale with such a range could be established statistically as well as be sufficient for reliability analysis of this scale. The age ranges, income levels, and industries were also quite spread out for respondents included in this study.

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Sampling Technique

Convenience sampling was used as the main sampling method. Data was collected using online modes such as Google Forms which provided an easier way of collecting data as it was accessible from any geographical location.

Data Collection

Primary data was collected using a structured questionnaire that included twenty-two items on demographics, AI awareness, usage of tools, period of use of tools, Likert scale items on perception (Q5-Q10), influence of profitability, difficulties/problems and future intentions (qualitative open-ended items). Secondary data was obtained from various published research articles, academic journals, and industry reports from 2018-2026.

Data Analysis and Interpretation

Demographic Profile of Respondents

Table 1: Gender Distribution of Respondents

Gender	Frequency	Percentage (%)
Male	76	73.8%
Female	27	26.2%
Total	103	100.0%

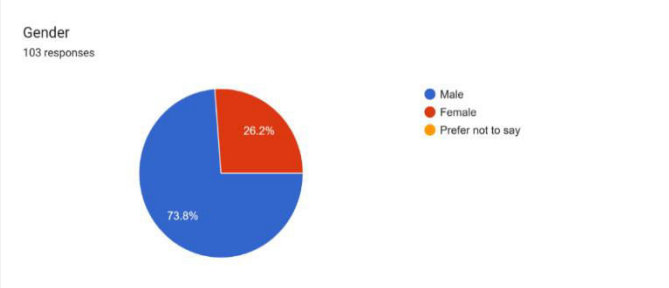

Table 2: Age Distribution of Respondents

The sample consisted mainly of male respondents (73.8%). This is consistent with the gender structure of the entrepreneurship and the startup sector in the investigated area. The proportion of women respondents was 26.2%, which is an emerging number representing increasing involvement of female in the technology-focused business environment.

Age Group	Frequency	Percentage (%)
15–25 years	70	67.3%
25–35 years	15	14.4%
35–45 years	3	1.9%
45–55 years	14	13.5%
More 55 years	2	2.9%
Not specified than	0	0.0%
Total	104	100.0%

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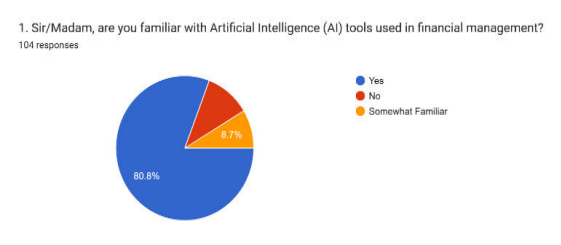
A significant majority of respondents (67.3%) belong to the 15–25 years age group, reflecting the youthful demographic of aspiring entrepreneurs and startup owners..

AI Awareness and Adoption

Table 3: Awareness of AI Tools in Financial Management

Awareness Level	Frequency	Percentage (%)
Yes – Fully Familiar	84	80.8%
Somewhat Familiar	9	8.7%
No	11	10.5%
Total	104	100.0%

As for the level of acquaintance with AI tools used for financial management, as many as 80.8% of respondents replied that they "are very familiar with", 8.7% are "partially familiar with", and 10.5% "are unfamiliar with".



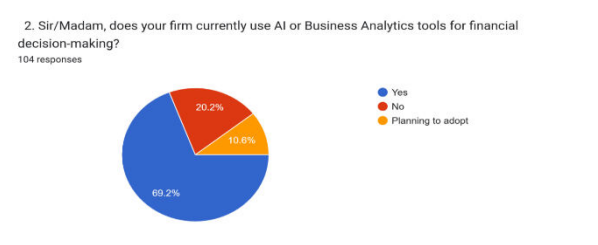
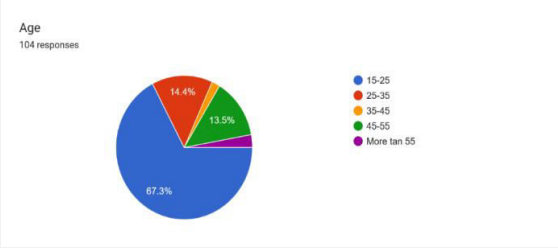


Table 4: Current AI/Business Analytics Tool Usage

Usage Status	Frequency	Percentage (%)
Currently Using	72	69.2%
Not Using	21	20.2%
Planning to Adopt	11	10.6%
Total	104	100.0%

AI/Business analytics is already being used in 69.2% of the respondent's firms, and another 10.6% plan to do so in the coming year. The usage and adoption of AI tools within the startup world is very high with a combined percentage of 79.8%.



AI Tools and Duration of Use

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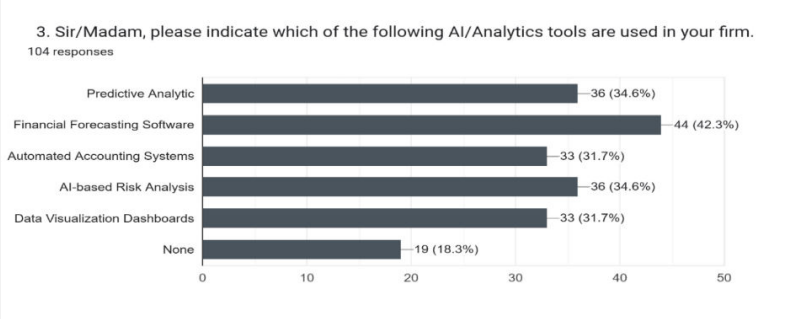
Table 5: Types of AI/Analytics Tools Used

Tool Type	Approximate Usage (%)
Predictive Analytics	34.6%
Financial Forecasting Software	42.3%
Automated Accounting Systems	31.7%
AI-based Risk Analysis	34.6%
Data Visualization Dashboards	31.7%
None	18.3%

Tools used more often are Financial Forecasting Software and Predictive Analytics. That tells the financial future predictions' accuracy is most important. AI based Risk Analysis and Automated Accounting were applied a lot too.



Impact on Profitability

Table 6: AI's Impact on Overall Profitability

Profitability Impact	Frequency	Percentage (%)
Improved Significantly	21	20.2%
Improved Moderately	38	36.5%
Improved Slightly	34	32.7%
No Noticeable Change	9	8.7%
Decreased Profitability	2	1.9%
Total	104	100.0%

A combined 89.4% indicate that there has been some improvement in profitability due to the integration of an AI tool, which clearly backs the proposed hypothesis. Only 1.9% claim a reduction in profitability, this could be a consequence of poor implementation or initial investment.

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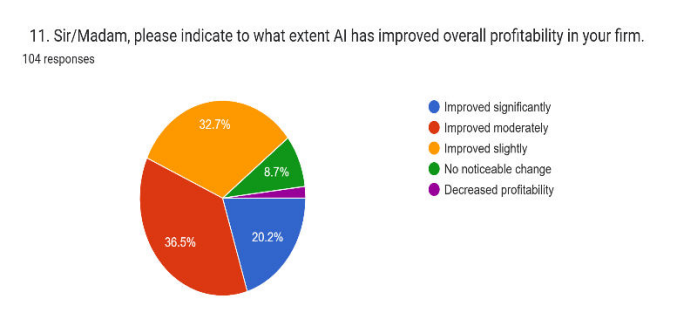

Table 7: Case Processing Summary (Reliability Analysis)

	N	%
Valid	104	100.0
Excluded	0	0.0
Total	104	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Analysis

For the Likert-scale measurement instrument (Questions 5 to 10), to check the reliability of this internal consistency Cronbach's Alpha was run using IBM SPSS Statistics Version 23. The 6 items measure how agreeably the respondent thinks AI is effective with strategic adoption, forecasting accuracy, cash flow management, decision-making speed, budget and cost management, and risk minimization.

Table 8: Reliability Statistics — Cronbach's Alpha

Cronbach's Alpha	N of Items
0.837	6

The Cronbach's Alpha value of 0.837 (rounded from 0.8366) confirms excellent internal consistency of the six-item scale, exceeding the widely accepted threshold of 0.70 (Nunnally, 1978). This validates the reliability of the measurement instrument and confirms that the items coherently measure the latent construct of AI's perceived impact on financial decision-making. The analysis was conducted on all 104 valid cases with no exclusions, further strengthening the robustness of the findings.

Findings

- It validates a strong internal reliability for the measurement scale used, with a Cronbach's Alpha of 0.837 (N=104) that is above the commonly accepted threshold of 0.70.
- Respondents (80.8%) exhibit a high familiarity with the use of AI tools within financial management, denoting a good market-level awareness.
- In terms of usage, 69.2% of firms already employ either AI or Business Analytics tools, and an additional 10.6% are planning on doing so.
- The AI tools being used the most widely include: Financial Forecasting Software (42.3%), Predictive Analytics (34.6%), AI-based Risk Analysis (34.6%), Automated Accounting Systems (31.7%), and Data Visualization Dashboards (31.7%).
- Improvement of profitability is observed by 89.4% of the respondents after having implemented AI, and a significant improvement by 20.2% of respondents.

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- The main fields influenced by AI in the decision-making process are budgeting/forecasting, investment planning, risk evaluation, fraud detection, and cash-flow management.
- Concerns about data privacy (56.9%), lack of skilled employees (53.9%), technical complexity (54.9%) and high implementation cost (51.0%) have been cited as the main hindrances in the adoption of AI.
- There is a clear intention of increasing the use of AI, with 88.3% of respondents stating their plan to raise or slightly raise their level of investment on this matter within the following three years.
- Qualitative results have indeed shown a strong change from manual/spreadsheets driven and reactive accounting methods toward automated/data driven proactive ones.
- The adoption of AI at the respondent organization (Dr. D Y Patil College of Arts, Commerce and Science and DPGU) is put into effect for real-time financial modeling and scenario analysis.

IV. CONCLUSION

Through a detailed systematic review of the implementation of Artificial Intelligence and Business Analytics for financial decision-making within startups and SMEs, this study has built a compelling case to promote the utilization of AI for financial operations. It is apparent from the respondents that a significant majority found AI solutions as a positive element which has resulted in an increased forecasting accuracy, better risk management and improved profitability of the startups/SMEs.

Cronbach's Alpha reliability coefficient of 0.837 assures us about the validity of the measure used, thereby increasing our confidence in the quantitative outcomes of this research. The 6-item Likert scale used in the study effectively measures the attitude of the respondents toward strategic use of AI which is also well depicted in Table1 where a number of variables covering the reasoning behind the adoption, impact of AI for forecasting and cash flow management, time-saving of decision-making, budget preparation, risk reduction etc are found to be positive. From this study, it has been clear that the traditional style of financial operations is moving from intuition-based and retrospectively based methods to the use of real time, predictive and automated tools to help with financial decision-making. Tools such as predictive analytics and financial forecasting software are already an integral part of everyday financial tasks for a majority of the respondents' organizations. Despite all these benefits, many challenges stand in the way of complete AI integration such as risks in data privacy and security, lack of professionals skilled in AI technologies, initial costs and complexity. There is a need to implement targeted policies and provide more affordable AI tools and training so as to popularize AI among startups.

Thus, it can be said that AI and Business Analytics are no longer just innovative tools but a strategic necessity for the startups if they intend to stay competitive in a data driven economy. It is suggested that the future research include broader sample from different countries and cultures, analysis across different sectors, longitudinal study to determine the long-term effects of the adoption of AI in financial management.

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