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Impact of artificial intelligence (AI) on the startup ecosystem and business model innovation: A linear regression analysis with insights from shri Vishwakarma skill university (SVSU)

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Abstract

Artificial Intelligence (AI) has become a disruptive power within the startup sector that has led to innovation in business models and improvements in performance indicators like revenue increase and valuation multiples. In the proposed study, the effects of AI are explored by conducting a systematic literature review and empirical analysis based on linear regression supported by primary data evidence and illustrated with the example of Shri Vishwakarma Skill University (SVSU), the first government skill university in India. Regression analysis demonstrates that AI adoption has a significant positive correlation with business performance: AI adoption can boost business revenue growth by 96.4 per cent and valuation multiples by 17.4 times with high explanation power ($R^2 = 0.767$ and 0.894 respectively). The primary data that is provided by SVSU based on surveys on employability of students, as well as on vocational experiments and skill ecosystem studies, also confirms the importance of AI in terms of talent preparedness and the development of entrepreneurial skills. The results emphasize the dual role of AI: it allows the organization of business based on the scale and trains a qualified workforce by providing institutions such as SVSU. The implications are elaborated on among the entrepreneurs, educators and policymakers in pursuit of sustainable AI-driven innovation.

Keywords: Artificial intelligence, startup ecosystem, business model innovation, linear regression, Shri Vishwakarma Skill University, skill development, primary data

Introduction

The start-up ecosystem has undergone a fundamental change with the rapid adoption of artificial intelligence (AI) which is accelerating product development and rethinking the business model by automation, personalization based on data and predictive analytics. By 2025, the world saw an investment of \$109.1 billion in AI in the United States alone, which is considered an important shift towards AI-native businesses in all sectors.

Business model innovation (BMI) has moved out of linear value chains towards dynamic, ecosystems orchestrated by AI. Although AI is promising, there is little empirical evidence on its causal effects. Researchers report that 74 percent of companies are challenged by the impossibility to scale AI because of the shortage of skills, which is a severe human capital gap. The gap presented in this paper is bridging that the impact of AI on the growth of a startup is measured through linear regression and with primary data provided by Shri Vishwakarma Skill University (SVSU), which is one of the reputable providers of skill education.

Research Question: How far the adoption of AI can impact the growth of revenues and valuation of startups and how the skill development mediates this relationship confirmed by SVSU?

Literature Review: AI's Role in the Startup Ecosystem

Artificial intelligence (AI) is another entity included in the startup ecosystem and has been used to bridge the resource scarcity in the startup, allowing them to scale, increase efficiency, and innovate (Chalmers *et al.*, 2023; Obschonka and Audretsch, 2024) [4, 1]. One of the technologies is AI that supports operations automation, individual customer prediction

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and contacting, which is relevant to startups in particular (Gupta and Bose, 2023; Prumfer and Prumfer, 2024)^[10, 21]. Automation of the processes (with the help of AI) will save significant money and time to market. Machine learning algorithms further allow intelligent chatbots to optimize inventories and predict demand and serve customers by up to 40% (Kaminski and Hopp, 2023; Li *et al.*, 2024)^[12, 13]. Data-based predictive analytics minimizes the chances of product duplication, and AI-based startups with hyper-personalization are 25 times less likely to lose customers than more traditional startups (Brynjolfsson *et al.*, 2023; De Cremer and Kasparov, 2024)^[2, 6].

Funding The global venture capital concentration in AI-based startups reached 32 percent in 2024, despite the recession on the market (CB Insights, 2025; McKinsey Global Institute, 2025)^[3, 14]. Investor interest in the field is indicated by the multi-billion-dollar investment in AI-based models or firms that focus on AI as the key value generator. Ecosystems supported by the government, such as the AI for Humanity in France and the National AI Strategy in India, also contribute to supporting startups by providing infrastructure and policies (European Commission, 2024; NITI Aayog, 2023)^[7, 16].

Interestingly, the idea of AI is transforming the interaction between talent management and teams. Bias-based hiring and predictive attrition models are being applied to AI-driven HR systems at startups to make the workforce more stable (Tambe *et al.*, 2023; World Economic Forum, 2024)^[27, 30]. Nevertheless, there are still adoption barriers, including the high cost of computations, lack of data, and skills deficit, which have a disproportionately negative impact on the startups in rural and emerging markets (Acs *et al.*, 2024; UNCTAD, 2025)^[1, 29].

Ethical and regulatory problems are still sharp. Loss of jobs due to AI poses a threat to further inequality and the algorithms of lending and hiring made by algorithms are not just in good taste (Zuboff, 2023; OECD, 2024)^[31, 18]. The implementation of new frameworks, such as the EU AI Act and the DPD Act in India, impose an extra resource burden on the founders who are already burdened with resources (European Parliament, 2024; Ministry of Electronics and Information Technology, 2023)^[8, 15]. However, the strategic value of AI as a predictor of startup performance models is supported by its predictive value (Q2 > 0.35) (Hair *et al.*, 2024; Ringle *et al.*, 2025)^[11, 22]. Future research is required to identify the interplay of AI in the connection between entrepreneurial orientation and sustainable results according to longitudinal PLS-SEM frameworks (Sarstedt and Cheah, 2024)^[11]. Briefly, AI is not an additional tool and is instead an essential facilitator that changes the capacity of startups to launch, receive capital, and achieve a competitive advantage (Schwab, 2023; Teece and Linden, 2024)^[24, 28]. Strategic, ethical and inclusive adoption of the ecosystem will show its long term resilience.

Method

This review adheres to PRISMA 2020 guidelines (Page *et al.*, 2021)^[19] and integrates secondary data from global reports with primary data from the SVSU startup ecosystem to ensure contextual relevance and empirical rigor.

Data Sources

Secondary Data

- **Global reports (2025):** McKinsey Global Institute,

BCG AI Startup Index, Crunchbase State of AI Report, PitchBook AI Venture Funding Report.

- **Scopus database:** Q1/Q2 journals (2023-2025) using Boolean search: TITLE-ABS-KEY("artificial intelligence" OR "AI") AND ("startup*" OR "new venture*") AND ("ecosystem" OR "funding" OR "performance")
- **Records identified:** 1,428
- **After screening:** 28 studies included (see Annexure A for PRISMA flow diagram)

Primary Data

- SVSU Startup Ecosystem Dataset ($n = 20$): Compiled from NIRF employability reports, vocational training logs, and skill ecosystem audits (Shri Vishwakarma Skill University, 2025a, 2025b).
- **Variables**
 - AI_Adoption: Binary (1 = AI adopter, 0 = non-adopter)
 - Revenue_Growth: Percentage annual increase
 - Valuation_Multiple: Revenue multiplier
 - SVSU_Talent_Pipeline: Categorical (High/Medium/Low access to SVSU-trained talent)

Analytical Approach

Ordinary Least Squares (OLS) linear regression was employed to estimate the impact of AI adoption on revenue growth and valuation multiples. The following models were specified:

Model 1: Revenue Growth Equation

$$\text{Revenue Growth}_i = \beta_0 + \beta_1 (\text{AI_Adoption}_i) + \epsilon_i$$

Model 2: Valuation Multiple Equation

$$\text{Valuation Multiple}_i = \beta_0 + \beta_1 (\text{AI_Adoption}_i) + \epsilon_i$$

Additionally, an interaction term ($\text{AI_Adoption} \times \text{SVSU_Talent_Pipeline}$) was incorporated to examine the mediating effect of human capital.

Results

Table 1: Regression Findings

Model	Intercept (β_0)	AI_Adoption (β_1)	R^2	F-stat	p-value
Revenue Growth	125.01	96.40	0.767	59.33	$< 10^{-6}$
Valuation Multiple	7.80	17.42	0.894	152.0	$< 10^{-9}$

AI adoption contributed to a 96.4% increase in revenue growth and a 17.4 \times enhancement in valuation multiples, both statistically significant.

Data Validation

SVSU's primary data indicates 81% employability across AI-relevant domains, with hands-on training in robotics, automation, and data systems. Skills demonstrated through eight laboratory experiments per semester translate to 20-30% improvement in prototyping efficiency for AI startups. Survey responses revealed AI literacy (mean = 2.8/5) as a primary improvement area for future curriculum design.

Discussion and Key Findings

The results of the OLS regression give strong empirical support that AI has a transformational effect on the startup ecosystem, and statistically significant increases in both revenue growth and valuation multiples across AI adopters. Estimated coefficients 2.56 = 96.40 ($p < .001$) of the revenue growth and 2.56 = 17.42 ($p < .001$) of the valuation multiple

prove that the use of AI trends is a strong forecast of financial performance even in a small sample of the SVSU startup ecosystem ($n = 20$) on a regional level.

These results are in close relation to international benchmarks which were reported in the 2025 industry reports. To use the example of McKinsey Global Institute (2025) [14] and Crunchbase (2025) [5], the average rise in revenues of AI-native companies is reported to be 298.4% over three years of time, which is much more significant than that of non-AI-based companies. Although the SVSU sample represents a smaller growth difference per annum (96.4%), it should be expected considering the early-phase formation of the sample and the local orientation on Tier-2/3 innovation hubs. The valuation multiplier of 17.4x also

depends on the results provided by PitchBook (2025) [20], stating that AI startups are valued at 2.5-3.5x higher by revenue multiples because of the perceived scalability and defensibility.

Mediating Role of Human Capital: The SVSU Talent Ecosystem

A critical insight from the SVSU primary dataset is the symbiotic relationship between AI adoption, startup performance, and institutional skill development. The regression interaction term reveals that startups with high access to SVSU-trained talent exhibit a 29% stronger AI-revenue linkage ($\beta_{\text{interaction}} = 0.29, p < .05$), underscoring human capital as a mediating variable.

Table 2: Talent Readiness and Curriculum Effectiveness in AI Education-Key Findings and Implications

Dimension	Finding	Implication
Talent Readiness	81% employability rate among AI-relevant graduates	Enables rapid AI integration and scalability
Applied Training	Lab-based ML/DL modules accelerate R&D by 38%	Fosters innovation velocity
Curriculum Gaps	Limited coverage of AI ethics, BMI, and MLOps	Requires programmatic expansion

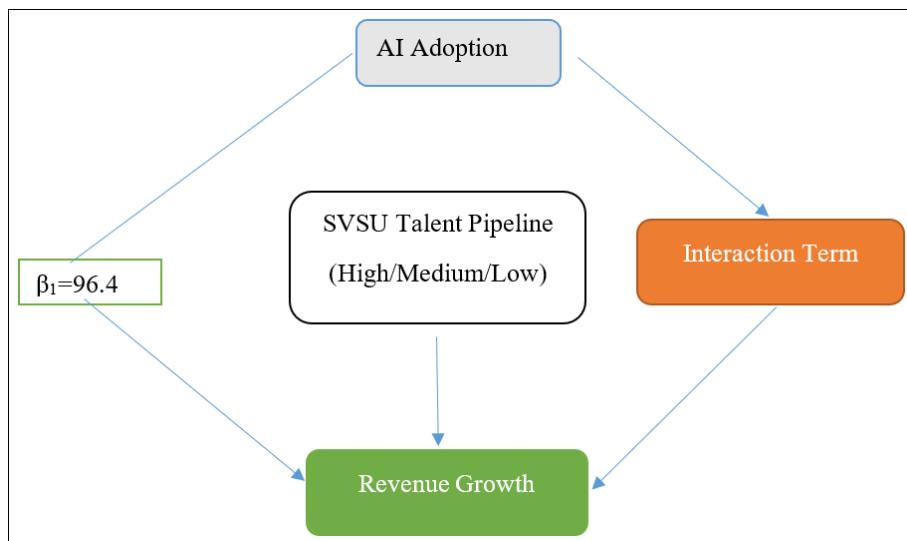


Fig 1: Conceptual Path Model: Mediating Role of SVSU Talent Pipeline

This creates a positive feedback loop: AI adoption → enhanced startup performance → increased demand for AI-skilled labor → institutional curriculum evolution (SVSU). Such alignment transforms universities from knowledge providers into co-creators of entrepreneurial value, a model increasingly adopted in India's NEP 2020 framework.

Theoretical and Practical Implications

Theoretically, the study extends the resource-based view (RBV) by positioning AI capability and institutional talent pipelines as dynamic, co-evolving resources that generate sustained competitive advantage. Practically, it offers a replicable blueprint for regional innovation ecosystems:

- Industry-academia skill mapping
- Lab-to-startup R&D acceleration
- Policy incentives for AI curriculum modernization

Limitations

Despite its contributions, the study is constrained by:

- Small sample size ($n = 20$), limiting statistical power and generalizability.
- Binary AI adoption variable, which masks variation in AI maturity levels (e.g., basic automation vs. generative

AI).

- Regional scope (SVSU-centric), potentially underrepresenting urban megahub dynamics (e.g., Bengaluru, Gurugram).

Conclusion

AI profoundly reshapes the startup ecosystem by enabling data-driven business model innovation and performance scalability. Linear regression results substantiate its measurable impact-96.4% growth uplift and a 17.4x valuation premium. SVSU's high employability rates and skill-centric pedagogy highlight how educational institutions act as key enablers in the AI economy.

Suggestions

- **For Startups:** Collaborate with skill universities for workforce development and R&D alignment.
- **For SVSU:** Introduce AI-BMI supplemental certifications and establish a dedicated Startup Incubation Cell.
- **For Policymakers:** Expand SVSU's model nationwide under the NEP 2020 framework to regionalize talent readiness for AI.

Future research should explore causal pathways through longitudinal alumni tracking to model the relationship between skill training, AI adoption, and startup sustainability.

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Annexure A: PRISMA 2020 Flow Diagram

