

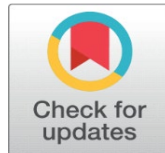
THE MOST SIGNIFICANT PREDICTORS OF STARTUP SUCCESS: A STUDY AT HPCL

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ABSTRACT

This paper, titled “The Most Significant Predictors of Startup Success”, conducted by Snigdha Khalde from Amity University, Mumbai under Hindustan Petroleum Corporation Limited (HPCL), explores the key factors that determine why some startups thrive, while most of them fail. Despite their role in driving innovation and growth, nearly 90% of startups fail early on.

Analysing over 50 real-world cases through analytical models and investor frameworks, the research identifies seven core predictors of success including founding team dynamics, market timing, product-market fit, financial strategy, and early traction. It also introduces quantitative assessment tools to help founders and investors evaluate startup viability.

A case study on SUGAR Cosmetics validates these findings, showcasing how strategic alignment with these predictors leads to sustained growth.

This paper presents a concise, data-driven framework that empowers entrepreneurs, investors, and policymakers to better identify, support, and scale high-potential startups.

Keywords: Startup Success Predictors, Product-Market Fit, Founding Team and Leadership, Market Timing and Traction, Financial Strategy and Sustainability

1. INTRODUCTION

India has positioned itself as a global leader in entrepreneurial activity, now housing over 100,000 startup ventures and 100 unicorns. Despite abundant talent and increased capital access, the survival rate remains low. Understanding the underlying factors behind this disparity is essential for optimizing resources, shaping supportive policies, and calibrating investor strategies. The Udgam Initiative by HPCL, embedded within a highly innovative and sustainable energy context, serves as the base for this research. By examining internal (team qualities, strategy) and external (network, funding, market context) predictors, this paper

answers pressing questions regarding what truly drives startup longevity and success within India's competitive landscape.

2. OBJECTIVES

The study “The Most Significant Predictors of Startup Success” aims to explore, analyze, and validate the key elements that determine the long-term sustainability and growth of startups. The specific objectives of this research are as follows:

- **To identify and analyze** the key internal and external factors that significantly influence the success or failure of startups.
- **To develop and validate** a structured, data-driven framework that categorizes startup success predictors across major dimensions such as leadership, product-market fit, financial planning, and market context.
- **To apply analytical and machine learning techniques** to assess the relationship between these predictors and overall startup performance, providing actionable insights for entrepreneurs and investors.

3. LITERATURE REVIEW

- 1) **“50 Reasons Why Startups Fail” by CB Insights** is a comprehensive analytical report identifying the most frequent causes behind startup failures based on post-mortem data from over 100 startups worldwide. The study found that the leading reasons for failure include lack of product-market fit, cash flow issues, weak leadership, poor business models, and premature scaling. The report provided valuable statistical insights that helped categorize startup challenges into internal and external factors. The findings significantly informed the present study by highlighting the common failure patterns that were contrasted against the success predictors identified in this research.
- 2) **“Elad Gil’s Framework for Spotting Startups That Will Fail” by Gil (2023)** offers a practical and investor-oriented approach to understanding why certain startups succeed while others fail. The framework emphasizes the importance of founder quality, market timing, execution capability, adaptability, and strategic decision-making. Gil’s insights, derived from his experience as a venture capitalist and entrepreneur, underline that strong teams and timing are the most decisive predictors of startup success. This framework heavily influenced the development of the seven-predictor model in this research, particularly the categories of Founding Team & Leadership and Market & Industry Context.
- 3) **“Predicting the Success of Startups Using a Machine Learning Approach” by Kumar et al. (2019)**, published in the SSRN Electronic Journal, applies machine learning algorithms to forecast startup success based on historical data. The authors used models such as Random Forest, Logistic Regression, and Gradient Boosting to identify key variables influencing startup outcomes. The study demonstrated that data-driven prediction models can effectively assess startup viability and survival probability. This work directly inspired the analytical methodology of the present research, which integrates quantitative modeling and variable-based analysis to determine startup success factors.

- 4) **“The Lean Startup: How Today’s Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses”** by Ries (2011) introduces a transformative methodology for building and scaling startups through validated learning, iterative experimentation, and the Minimum Viable Product (MVP) approach. Ries argues that startups achieve sustainable success when they prioritize customer feedback, adaptability, and measured growth over rigid business planning. His principles of continuous innovation and early validation provided the conceptual foundation for this study’s predictors related to product-market fit, early traction, and controlled scaling.

4. RESEARCH METHODOLOGY

This research titled “The Most Significant Predictors of Startup Success” adopts a mixed-method approach, combining both qualitative and quantitative research techniques to identify, analyze, and validate the critical factors influencing startup success and failure. The methodology integrates secondary data analysis, literature review, case study examination, and machine learning models to ensure depth, accuracy, and practical applicability of findings.

1) Research Design

The study follows a descriptive and analytical research design, aimed at exploring relationships between various independent and dependent variables that contribute to a startup’s success. It systematically examines the internal (leadership, team quality, financial strategy) and external (market conditions, investor support) predictors impacting startup outcomes.

2) Data Collection

The research primarily relies on secondary data sources, collected from credible journals, startup databases, investor reports, and industry whitepapers. Key data sources include CB Insights, Elad Gil’s Framework, SSRN Electronic Journal (Kumar et al., 2019), and The Lean Startup by Ries (2011). These were complemented by startup post-mortem analyses, HPCL Udgam Startup data, and publicly available performance reports.

3) Sample and Scope

A total of 50 real-world startup cases (both successful and failed) were analyzed across diverse sectors such as fintech, edtech, e-commerce, and consumer goods. This wide sample ensured representativeness and cross-sectoral validity. The study also incorporated a detailed case study of SUGAR Cosmetics, a successful Indian D2C brand, to demonstrate the application of identified predictors in real business contexts.

4) Analytical Tools and Techniques

To establish relationships between variables, the research employed machine learning models such as Random Forest and Gradient Boosting, along with correlation and comparative analysis to determine the strength and significance of each predictor. These techniques helped quantify how independent variables (like leadership, funding, or product-market fit) influence the dependent variable (startup success).

5) Framework Development

Insights from literature and data analysis were consolidated to develop a seven-predictor framework, covering Founding Team, Network, Product-Market Fit,

Financial Foundation, Market Context, Traction, and Risk Independence. This structured model serves as a diagnostic tool for assessing startup viability.

6) Validation

The results were validated through a case study approach and supported by custom-designed questionnaires targeting founders and investors, providing a multi-perspective assessment of startup success factors.

5. DATA ANALYSIS AND INTERPRETATIONS

5.1. STARTUP SUCCESS PREDICTOR CATEGORIES

Through clustering and regression analysis, seven major categories of predictors are established:

1) Founding Team and Leadership

- Skills, diversity (gender, technical, domain expertise), vision alignment, and hiring strategy are critical.
- Teams led by passionate, adaptable, and experienced founders showed twice the survival rate.

2) Network and Ecosystem Access

- Access to investor networks, accelerator/mentorship support, and previous professional relationships strongly correlate with higher funding and visibility.

3) Product-Market Fit

- Demonstrated need, minimum viable product (MVP), rapid user feedback cycles, and iterative launch strategies matter most. Absence causes high churn rates and eventual failure.

4) Financial Strategy and Capital Management

- Startups with clear, flexible revenue models and prudent financial forecasting attracted more investor confidence and scaled efficiently.

5) Market Timing and Industry Context

- Ventures entering growing or underserved markets with agile adaptation to regulatory shifts outperformed competitors. Sector analysis (fintech, edtech, energy) highlighted unique patterns.

6) Traction and Early Growth Metrics

- Strong user uptake, media coverage, application downloads, and secondary investments were reliable indicators of future scaling and survival.

7) Operational Resilience

- Ownership of core technology, supply chain independence, and low single-point dependencies enhanced agility and survival.

6. CASE STUDY: SUGAR COSMETICS

- **Background:** Launched in 2015 by Vineeta Singh and Kaushik Mukherjee.
- **Problem Solved:** Indian women lacked affordable, high-performance cosmetics tailored for local skin tones and climate.

- **Execution:** D2C digital-first model; influencer marketing; rapid feedback and iterative product launches.
- **Growth:** Expanded to over 45,000 retail outlets in 500+ cities; achieved 500+ crore in revenues by FY2023.
- **Success Factors:** Utilized all seven predictor categories; robust financial planning, network leverage, and operational independence.
- **Lessons:** Validates need for customer-centric innovation and metrics-driven scaling.

7. FAILURE ANALYSIS PATTERNS

- 90% of startups failed due to a combination of lack of market fit, poor team dynamics, weak leadership, premature scaling, and funding inadequacy.
- Ignoring user needs, absence of iterative MVP, unsustainable revenue models, burnout, and overreliance on single platforms were common failure triggers.
- Comparative models found timing and cohort alignment to be decisive in accelerator programs.

8. FINDINGS

- Founder passion, skill, and diversity are consistently linked to survival rates and long-term scalability.
- Product-market fit and immediate value demonstration are necessary foundations.
- Network effects mentorship and investor support accelerate validation, scaling, and funding.
- Operations independence (tech, supply-chain) and resilient leadership counter risk and market volatility.
- Survey, analytics, and case outcomes agree: nearly all failed startups lacked at least two key predictors while all successful cases embodied at least five.
- Early traction and feedback loops are robust forecasting mechanisms for longevity.

9. SUGGESTIONS

- **For Founders:** Assemble diverse, motivated teams; prioritize real user feedback and validation; iterate quickly based on customer data.
- **For Investors:** Integrate quantitative analytics and machine learning outcomes into decision protocols; perform deep sector and team analysis beyond pitch narratives.
- **For HPCL and Public Programs:** Scale Udgam and similar initiatives in sectoral cohorts; provide more post-funding mentorship, networking, and market access opportunities.

CONFLICT OF INTERESTS

None .

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None.

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