

# **STRATEGIC INNOVATION IN NEW VENTURES: A MULTI-METHOD STUDY**

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**DEPARTMENT OF MANAGEMENT STUDIES  
INDIAN INSTITUTE OF TECHNOLOGY DELHI  
JANUARY 2023**



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# **STRATEGIC INNOVATION IN NEW VENTURES: A MULTI-METHOD STUDY**

*by*

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**DEPARTMENT OF MANAGEMENT STUDIES**

*submitted*

*in fulfilment of the requirements of the degree of Doctor of Philosophy*

to the



**INDIAN INSTITUTE OF TECHNOLOGY DELHI**

**JANUARY 2023**



## **Dedication**

*Dedicated to Parents*



## **Certificate**

This is to certify that the thesis entitled “**Strategic Innovation in New Ventures: A Multi-method Study**” submitted by Mr. K Dinesh to the Indian Institute of Technology Delhi, for the award of the degree of “**Doctor of Philosophy**” in the Department of Management Studies, is a record of bonafide research work carried out by him. He has worked under my guidance and supervision and has fulfilled the requirements for the submission of this thesis, which to our knowledge has reached the requisite standard. The models and research findings presented in this thesis have not been submitted elsewhere for the award of any degree.

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## **Acknowledgements**

Foremost, I would like to express my sincere gratitude to my supervisor Prof. Sushil, IIT Delhi for the continuous support of my PhD study. I am highly indebted to him for his constant motivation, patience, enthusiasm, and immense knowledge, which helped me to complete this study.

I am grateful to Prof. Sanjay Dhir, IIT Delhi, for his guidance and motivation throughout the study. Besides my supervisor, I would also like to thank the members of my Student Research Committee (SRC): Prof. Kanika T. Bhal, Prof. Sanjay Dhir, and Dr. Manoj K. Sharma for their valuable comments which enhanced the study. I am also thankful to Prof. Kirankumar S. Momaya, IIT Bombay, for his mentorship.

I am thankful to Dr. Jeevaraj S., Assistant Professor, ABV-IIITM Gwalior, for guiding me through the basics of fuzzy set theory. I am also thankful to Dr. M. Berlin and Dr. Vijayakumar Kathirvel, NIT Arunachal Pradesh for their constant support and motivation. I would also like to mention my sincere gratitude to Mr. Naresh Kumar, Teacher, Kendriya Vidyalaya No.2, DMW Patiala, who always inspired and motivated me to pursue higher studies.

I would like to thank my colleagues in the Strategy and Competitiveness Lab, particularly Rishabh Rajan, Kamakshi, and Abhilasha for their support. I am also indebted to my friends, Dinesh, Kashish, Ajit, Kasi, Sagar, and Shubham for their support. I am also thankful to Dr. Nivedhitha S., PhD, IIT Guwahati for her constant support and encouragement.

Finally, I would like to acknowledge with gratitude, the support and love of my family – my parents, K Kalaiarasi and M Kamala Kannan, and my brother, K Vijesh.

**K Dinesh**



## **Abstract**

This dissertation investigates how strategic innovation is related to entrepreneurship. Though innovation and entrepreneurship are highly related and bound to each other, innovation as a process is still complex in new ventures. The process is complicated in new ventures because of limited resources, lack of experience and risk-taking abilities. Past research has shown that strategic innovation is often prevalent in the context of established firms rather than new ventures. Paradoxically, leading entrepreneurs in the world have shown strong strategic innovation intent despite limited resources and other mentioned constraints. Currently, the knowledge base in this area is incomplete and fragmented. It lacks a coherent structure that would allow entrepreneurial organisations to achieve competitive advantage through strategic innovation. Therefore, this thesis embeds strategic innovation in entrepreneurship from all perspectives, including entrepreneurial behaviour, innovative business functions, and firm performance.

Initially, a brief introduction to the context of this thesis is given, followed by a comprehensive literature review on strategic innovation, entrepreneurship, and relevant theories. Drawing from published literature, this dissertation identifies factors of strategic innovation in the context of entrepreneurship. The strategic innovation factors are cross-compared in different case organisations concerning the roles and functions. With the available case facts on strategic innovation factors, it is observed that the primary functions pertaining to each factor are similar in different entrepreneurial organisations. With the identified factors, it is attempted to conceptualise the interplay of factors in an entrepreneurial organisational setup. The thesis presents a hierarchical model illustrating the interrelationships between the factors. Further, in the conceptualisation phase, the model is simplified and transformed into a multilevel mediation model to demonstrate hypothesised relationships between strategic innovation factors and firm performance.

The hierarchical model conceptualised through argumentation-based Total Interpretive Structural Modelling (TISM) is used as a base for predictive modelling. For this predictive modelling purpose, the thesis proposes and illustrates a novel methodology which incorporates fuzzy-set theory in the existing TISM method. The conceptualised TISM model for strategic innovation in new ventures is simulated using the proposed method to develop scenarios of the integrated innovation system in new ventures.

A secondary data-based study in the context of innovation and entrepreneurship is presented. The model is tested with datasets representing Indian and Global entrepreneurship. The comparison-based examination outlined the differences in the scenario of strategic innovation in India and at the Global level. The results are further utilised for fuzzy logic-based simulation, where a holistic scenario is developed, illustrating various possible interplay of factors.

The thesis also presents a primary data-based study inclusive of factor analysis and empirical testing of models. Following factor analysis, both the hierarchical and the multilevel mediation models developed in the conceptualisation phase are empirically tested using primary data. It is observed that the hierarchical model representing the integrated system of strategic innovation is conceptually more valid.

An attempt has been made to study the dynamic behaviour of strategic innovation systems in an entrepreneurial organisation. A system dynamics-based case study is performed to capture the dynamics and actual reflections of strategic innovation in a case organisation.

Summing up, the last section of the thesis provides a conclusive understanding of strategic innovation in new ventures with a summary of major findings, strategic recommendations, significant research contributions, and direction for future research.

## सार

यह शोध प्रबंध इस बात की पड़ताल करता है कि रणनीतिक नवाचार उद्यमिता से कैसे संबंधित है। यद्यपि नवप्रवर्तन और उद्यमशीलता अत्यधिक संबंधित हैं और एक-दूसरे से बंधे हुए हैं, एक प्रक्रिया के रूप में नवोन्मेष नए उद्यमों में अभी भी जटिल है। सीमित संसाधनों, अनुभव की कमी और जोखिम लेने की क्षमता के कारण नए उद्यमों में प्रक्रिया जटिल होती है। पिछले शोधों से पता चला है कि रणनीतिक नवाचार अक्सर नए उद्यमों के बजाय स्थापित फर्मों के संदर्भ में प्रचलित होता है। विरोधाभासी रूप से, दुनिया के प्रमुख उद्यमियों ने सीमित संसाधनों और अन्य उल्लिखित बाधाओं के बावजूद मजबूत रणनीतिक नवाचार का इरादा दिखाया है। वर्तमान में, इस क्षेत्र में ज्ञान का आधार अधूरा और खंडित है। इसमें एक सुसंगत संरचना का अभाव है जो उद्यमी संगठनों को रणनीतिक नवाचार के माध्यम से प्रतिस्पर्धात्मक लाभ प्राप्त करने की अनुमति देगा। इसलिए, यह थीसिस उद्यमशीलता व्यवहार, अभिनव व्यावसायिक कार्यों और फर्म प्रदर्शन सहित सभी दृष्टिकोणों से उद्यमिता में रणनीतिक नवाचार को एम्बेड करती है।

प्रारंभ में, इस थीसिस के संदर्भ में एक संक्षिप्त परिचय दिया गया है, इसके बाद रणनीतिक नवाचार, उद्यमशीलता और प्रासंगिक सिद्धांतों पर व्यापक साहित्य समीक्षा की गई है। प्रकाशित साहित्य से आकर्षित, यह शोध प्रबंध उद्यमिता के संदर्भ में रणनीतिक नवाचार के कारकों की पहचान करता है। भूमिकाओं और कार्यों से संबंधित विभिन्न मामलों के संगठनों में रणनीतिक नवाचार कारकों की तुलना की जाती है। रणनीतिक नवाचार कारकों पर उपलब्ध मामले के तथ्यों के साथ, यह देखा गया है कि प्रत्येक कारक से संबंधित प्राथमिक कार्य विभिन्न उद्यमशील संगठनों में समान हैं। पहचाने गए कारकों के साथ, एक उद्यमी संगठनात्मक सेटअप में कारकों के परस्पर क्रिया को अवधारणा बनाने का प्रयास किया गया है। थीसिस एक पदानुक्रमित मॉडल प्रस्तुत करता है जो कारकों के बीच अंतर्संबंधों को दर्शाता है। इसके अलावा, वैचारिक चरण में, मॉडल को सरल बनाया गया है और रणनीतिक नवाचार कारकों और फर्म के

प्रदर्शन के बीच परिकल्पित संबंधों को प्रदर्शित करने के लिए एक बहुस्तरीय मध्यस्थता मॉडल में बदल दिया गया है।

तर्क-आधारित टोटल इंटरप्रिटिव स्ट्रक्चरल मॉडलिंग (TISM) के माध्यम से परिकल्पित श्रेणीबद्ध मॉडल का उपयोग भविष्यवाणी मॉडलिंग के लिए आधार के रूप में किया जाता है। इस भविष्यवाणी मॉडलिंग उद्देश्य के लिए, थीसिस एक उपन्यास पद्धति का प्रस्ताव और चित्रण करती है जो मौजूदा टीआईएसएम पद्धति में फ़ज़ी-सेट सिद्धांत को शामिल करती है। नए उद्यमों में रणनीतिक नवाचार के लिए संकल्पित टीआईएसएम मॉडल को नए उद्यमों में एकीकृत नवाचार प्रणाली के परिदृश्यों को विकसित करने के लिए प्रस्तावित पद्धति का उपयोग करके सिमुलेटेड किया गया है।

नवाचार और उद्यमिता के संदर्भ में एक द्वितीयक डेटा-आधारित अध्ययन प्रस्तुत किया गया है। मॉडल का परीक्षण भारतीय और वैश्विक उद्यमिता का प्रतिनिधित्व करने वाले डेटासेट के साथ किया जाता है। तुलना-आधारित परीक्षा ने भारत और वैश्विक स्तर पर रणनीतिक नवाचार के परिदृश्य में अंतर को रेखांकित किया। फ़ज़ी लॉजिक-आधारित सिमुलेशन के लिए परिणामों का आगे उपयोग किया जाता है, जहां एक समग्र परिदृश्य विकसित किया जाता है, जो कारकों के विभिन्न संभावित परस्पर क्रिया को दर्शाता है।

थीसिस कारक विश्लेषण और मॉडलों के अनुभवजन्य परीक्षण सहित एक प्राथमिक डेटा-आधारित अध्ययन भी प्रस्तुत करती है। कारक विश्लेषण के बाद, अवधारणात्मक चरण में विकसित पदानुक्रमित और बहुस्तरीय मध्यस्थता मॉडल दोनों का प्राथमिक डेटा का उपयोग करके अनुभवजन्य रूप से परीक्षण किया जाता है। यह देखा गया है कि रणनीतिक नवाचार की एकीकृत प्रणाली का प्रतिनिधित्व करने वाला पदानुक्रमित मॉडल वैचारिक रूप से अधिक मान्य है।

एक उद्यमी संगठन में रणनीतिक नवाचार प्रणालियों के गतिशील व्यवहार का अध्ययन करने का प्रयास किया गया है। एक केस संगठन में रणनीतिक नवाचार की गतिशीलता और वास्तविक प्रतिबिंबों को पकड़ने के लिए एक सिस्टम डायनेमिक्स-आधारित केस स्टडी की जाती है।

संक्षेप में, थीसिस का अंतिम खंड प्रमुख निष्कर्षों, रणनीतिक सिफारिशों, महत्वपूर्ण अनुसंधान योगदानों और भविष्य के अनुसंधान के लिए दिशा के सारांश के साथ नए उपक्रमों में रणनीतिक नवाचार की एक निर्णायक समझ प्रदान करता है।



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## **Nomenclature**

AIM	Atal Innovation Mission
AVE	Average Variance Extracted
CEO	Chief Executive Officer
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CLD	Causal Loop Diagram
COVID-19	Corona Virus Disease of 2019
CR	Construct Reliability
DPIIT	Department for Promotion of Industry and Internal Trade
EFA	Exploratory Factor Analysis
GDP	Gross Domestic Product
GEM APS	Global Entrepreneurship Monitor Adult Population Survey
GEM	Global Entrepreneurship Monitor
GFI	Goodness of Fit Index
HRM	Human Resource Management
IBM	International Business Machines Corporation
ICT	Information and Communication Technology
IoT	Internet of Things
ISM	Interpretive Structural Modelling
IT	Information Technology

KMO	Kaiser-Meyer-Olkin
PLS-SEM	Partial Least Squares-Structural Equation Modelling
R&D	Research & Development
RMSEA	Root Mean Square Error of Approximation
SaaS	Software as a Service
SEM	Structural Equation Modelling
SPSS	Statistical Package for Social Sciences
SRMR	Standardized Root Mean Square Residual
TISM	Total Interpretive Structural Modelling
TISM-P	Total Interpretive Structural Modelling with Polarity
TQM	Total Quality Management