

DEVELOPING MULTISTAKEHOLDER ENGAGEMENT MODELS: SELECT STUDIES USING DATA SCIENCE ALGORITHMS

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**DEPARTMENT OF MANAGEMENT STUDIES
INDIAN INSTITUTE OF TECHNOLOGY DELHI
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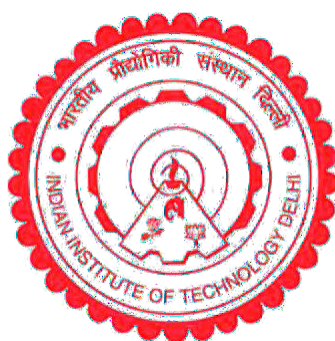
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Submitted

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

to the



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DEDICATION

I dedicate this entire work to my elder brother, Anurag, and sister-in-law, Shobhna, who are more than parents to me, and I couldn't have reached here without their selfless support, and to my dear wife, Priti and son, Aavyukt for bringing all the joy on this rollercoaster of ups and downs.

CERTIFICATE

This is to certify that the thesis titled **Developing Multistakeholder Engagement Models: Select Studies Using Data Science Algorithms**, submitted by **Anuj Batta**, to the Indian Institute of Technology Delhi for the award of the degree of **Doctor of Philosophy** is a bonafide record of the research work done by him under my supervision. The contents of this thesis, in full or in parts, have not been submitted to any other Institute or University for the award of any degree or diploma. Material wherever borrowed has been duly acknowledged.

Professor Dr. Arpan Kumar Kar
Professor,
Department of Management Studies
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the findings of this research at least bring some positive changes in our livelihood.

Anuj Batta

ABSTRACT

The primary objective of a business organization is to maximize profits and generate value for its shareholders. Stakeholders play a very important role in any organization for its operations and growth. Every stakeholder group like customers, investors, employees, suppliers etc. have their own significant influence on the process in which an organization operates towards meeting its objectives. There can be various lenses through which the impact of stakeholders can be studied and measured with different perspectives to see how it correlates with the overall performance of the organization. Stakeholder engagement is one of the most important elements in this context. Literature indicates that there is a profound role of stakeholder engagement behavior in value co-creation. The selective studies in this thesis, very carefully focus on three types of major stakeholders, with one important behavioral aspect each, to complete the holistic view of the value chain. For exploring this domain, three related studies have been undertaken. Firstly, query resolution mechanism and channel reliance were studied for customer engagement and churn. Secondly, engagement behavior of the third-party sellers who sell on ecommerce marketplaces has been explored using a cross-platform analysis to see the impact on their ratings and attrition through disengagement. Lastly, employee disengagement and attrition due to technostress with digital transformation has been explored. Theories used for framing the theoretical foundation were ‘Exit, Voice, and Loyalty theory’, ‘Justice Theory’, and ‘Person-Environment Fit Theory’. These studies use variety of data, both structured and unstructured, based on primary and secondary data collection, and in collaboration with two companies along with data from ecommerce platform, Amazon, and social media platform, Twitter. For data analysis, descriptive analytics, natural language processing, machine learning models, path analysis, and statistical tests were used. The three stakeholders chosen for this research are critical for any

organization. The models and analysis used in the studies doesn't only test the hypothesis but also provide predictive models to use them as leading KPIs and proactive decision making. The implications of the research can be applied in various sectors of corporate. Information technology companies can reduce employee attrition caused by technostress. Ecommerce companies can drive the sellers on their platforms to be more engaging that results into better ratings, lesser seller churn and in-turn more profits. Ecommerce start-ups can focus on the right channels and better methodology to improve customer retention which is the most important measure for their success. This study also contributes to different research streams such as cross platform study to see the impact of sellers' efforts through social media on profitability for ecommerce companies, employee attrition linked with the new ecosystem of work from home in India, and how channel selection, discounts offered, and issue resolution drives customers behaviour in ecommerce setup. The theoretical contributions and implications of the thesis have been highlighted along with limitation and future work.

KEYWORDS: Stakeholder disengagement, cross platform study, Social media, ecommerce, employee attrition, customer retention, seller churn, machine learning models, predictive models

सारांश

एक व्यावसायिक संगठन का प्राथमिक उद्देश्य लाभ को अधिकतम करना और अपने शेयरधारकों के लिए मूल्य उत्पन्न करना है। किसी भी संगठन के संचालन और विकास के लिए हितधारक बहुत महत्वपूर्ण भूमिका निभाते हैं। प्रत्येक हितधारक समूह जैसे ग्राहक, निवेशक, कर्मचारी, आपूर्तिकर्ता आदि का उस प्रक्रिया पर अपना महत्वपूर्ण प्रभाव होता है जिसमें कोई संगठन अपने उद्देश्यों को पूरा करने की दिशा में काम करता है। ऐसे विभिन्न लेंस हो सकते हैं जिनके माध्यम से हितधारकों के प्रभाव का अध्ययन किया जा सकता है और विभिन्न दृष्टिकोणों से मापा जा सकता है कि यह संगठन के समग्र प्रदर्शन के साथ कैसे संबंधित है। इस संदर्भ में हितधारक जुड़ाव सबसे महत्वपूर्ण तत्वों में से एक है। साहित्य इंगित करता है कि मूल्य सह-निर्माण में हितधारक जुड़ाव व्यवहार की गहरी भूमिका है। इस थीसिस में चयनात्मक अध्ययन, मूल्य श्रृंखला के समग्र दृष्टिकोण को पूरा करने के लिए, प्रत्येक के एक महत्वपूर्ण व्यावहारिक पहलू के साथ, तीन प्रकार के प्रमुख हितधारकों पर बहुत सावधानी से ध्यान केंद्रित करते हैं। इस डोमेन की खोज के लिए, तीन संबंधित अध्ययन किए गए हैं। सबसे पहले, ग्राहक जुड़ाव और मंथन के लिए क्वेरी समाधान तंत्र और चैनल निर्भरता का अध्ययन किया गया। दूसरे, ई-कॉमर्स मार्केटप्लेस पर सामान बेचने वाले तीसरे पक्ष के विक्रेताओं के जुड़ाव व्यवहार का एक क्रॉस-प्लेटफॉर्म विश्लेषण का उपयोग करके पता लगाया गया है ताकि उनकी रेटिंग और विघटन के माध्यम से गिरावट पर प्रभाव देखा जा सके। अंत में, डिजिटल परिवर्तन के साथ तकनीकी तनाव के कारण कर्मचारियों के विघटन और नौकरी छोड़ने का पता लगाया गया है। सैद्धांतिक आधार तैयार करने के लिए उपयोग किए जाने वाले सिद्धांत 'निकास, आवाज और वफादारी सिद्धांत', 'न्याय सिद्धांत' और 'व्यक्ति-पर्यावरण फिट सिद्धांत' थे। ये अध्ययन प्राथमिक और द्वितीयक डेटा संग्रह के आधार पर, और ईकॉमर्स प्लेटफॉर्म, अमेज़ॅन और सोशल मीडिया प्लेटफॉर्म, ट्विटर के डेटा के साथ दो कंपनियों के सहयोग से, संरचित और असंरचित दोनों प्रकार के डेटा का उपयोग करते हैं। डेटा विश्लेषण के लिए, वर्णनात्मक विश्लेषण, प्राकृतिक भाषा प्रसंस्करण, मशीन लर्निंग मॉडल, पथ विश्लेषण और सांख्यिकीय परीक्षणों का उपयोग किया गया। इस शोध के लिए चुने गए तीन हितधारक किसी भी संगठन के लिए महत्वपूर्ण हैं। अध्ययन में उपयोग किए गए मॉडल और विश्लेषण न केवल

परिकल्पना का परीक्षण करते हैं बल्कि उन्हें अग्रणी KPI और सक्रिय निर्णय लेने के रूप में उपयोग करने के लिए पूर्वानुमानित मॉडल भी प्रदान करते हैं। शोध के निहितार्थों को कॉर्पोरेट के विभिन्न क्षेत्रों में लागू किया जा सकता है। सूचना प्रौद्योगिकी कंपनियां टेक्नोस्ट्रेस के कारण होने वाली कर्मचारियों की छंटनी को कम कर सकती हैं। ईकॉमर्स कंपनियां अपने प्लेटफॉर्म पर विक्रेताओं को अधिक आकर्षक बना सकती हैं, जिसके परिणामस्वरूप बेहतर रेटिंग, कम विक्रेता मंथन और बदले में अधिक मुनाफा होता है। ईकॉमर्स स्टार्ट-अप ग्राहक प्रतिधारण में सुधार के लिए सही चैनलों और बेहतर कार्यप्रणाली पर ध्यान केंद्रित कर सकते हैं जो उनकी सफलता के लिए सबसे महत्वपूर्ण उपाय है। यह अध्ययन विभिन्न अनुसंधान धाराओं में भी योगदान देता है जैसे कि ईकॉमर्स कंपनियों की लाभप्रदता पर सोशल मीडिया के माध्यम से विक्रेताओं के प्रयासों के प्रभाव को देखने के लिए क्रॉस प्लेटफॉर्म अध्ययन, भारत में घर से काम के नए पारिस्थितिकी तंत्र से जुड़े कर्मचारियों की छंटनी, और चैनल चयन, छूट कैसे की पेशकश की जाती है, और समस्या समाधान ईकॉमर्स सेटअप में ग्राहकों के व्यवहार को संचालित करता है। थीसिस के सैद्धांतिक योगदान और निहितार्थों पर सीमा और भविष्य के काम के साथ प्रकाश डाला गया है।

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ABBREVIATIONS

AI – Artificial Intelligence

API – Application Programming Interface

AUC – Area under the ROC curve

B2C – Business to Customer

BFSI – Banking, financial services and insurance

CART – Classification and Regression Tree

CEO – Chief Executive Officer

CMO – Chief Marketing Officer

CRM – Customer Relationship Management

CRTSA - Customer Retention Through Support Attributes

CSV – Comma Separated Values

e-WOM – electronic Word of Mouth

EBSCOhost – Elton B. Stephens Company

EDA – Exploratory Data Analysis

ERP – Enterprise Resource Planning

EVL – Exit, Voice, and Loyalty

HR – Human Resources

ICT – Information and Communication Technology

IS – Information Systems

IT – Information technology

ITeS – Information Technology Enabled Services

JSON – JavaScript Object Notation

KPI – Key Performance Indicator

MAW-1997 – Mirchell and Woods 1997 theory

MNC – Multinational Corporation

NASCAR – National Association for Stock Car Auto Racing

NLP – Natural Language Processing

P-E fit – Person Environment Fit

P-J fit – Person Job Fit

PIIT – Personal Innovativeness in Information Technology

PLS – Partial Least Square

ROC – Receiver Operating Characteristic Curve

SQL – Structured Query Language

TF-IDF – Term Frequency Inverse Document Frequency

TISA – Technology-Induced State Anxiety

URL – Universal Resource Locator