

**CRITICAL SUCCESS FACTORS FOR MOBILE  
VIRTUAL NETWORK OPERATORS IN INDIAN  
TELECOMMUNICATION INDUSTRY**

**VINEET SEHGAL**



**BHARTI SCHOOL OF TELECOMMUNICATION**

**TECHNOLOGY & MANAGEMENT**

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# **CRITICAL SUCCESS FACTORS FOR MOBILE VIRTUAL NETWORK OPERATORS IN INDIAN TELECOMMUNICATION INDUSTRY**

by

**Vineet Sehgal**

**Bharti School of Telecommunication Technology & Management**

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## **Certificate**

This is to certify that the thesis titled “**Critical Success Factors for Mobile Virtual Network Operators in Indian Telecommunication Industry**”, which is being submitted by **Mr. Vineet Sehgal** to the Bharti School of Telecommunication Technology & Management, Indian Institute of Technology Delhi, for the award of the degree of “**Doctor in Philosophy**” is a record of bona fide research work carried out by him. He has worked under our supervision in conformity with rules and regulations of the Indian Institute of Technology Delhi. The research reports and results presented in the thesis have not been submitted in part or full for the award of any degree or diploma in any other University or Institute.

**Prof Ravi Shankar**

Department of Management Studies,

Indian Institute of Technology Delhi

**Dr. Mahim Sagar**

Department of Management Studies,

Indian Institute of Technology Delhi

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“We don’t accomplish anything in this world alone”

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Vineet Sehgal

New Delhi

Date:

## **Abstract**

Indian telecommunications industry has navigated through considerable change in last few years. Its growth rate has been one of the highest in the world and it has become second biggest telecom market in terms of number of mobile customers. As per data released by Indian telecom regulator TRAI, as on 31st March 2016 there were 1058.86 million telecom subscribers in the country, with a tele density of 83.36. The unparalleled growth of Indian Telecom sector has been built on mobile revolution. There are multiple elements that have supported the growth of telecom industry in the country. These include good regulatory environment, favorable demographics, and changes in customer behavior, very low traffics and low handset prices. Growth in Telecom sector is characterized by low ARPU (Average Revenue Per User). Due to commoditization of services, intense competition and high cost of spectrum, incumbents have found it difficult to develop new revenue streams, increase ARPU and differentiate their services and brand to retain customers. While incumbents are focusing on improving customer services, they are encountering challenges in successfully serving changing customer needs and addressing requirements of niche customer segments. There is an opportunity to adopt new business models and collaborate with other players with complementary strengths in addressing the industry challenges.

Indian government intends to introduce MVNOs (Mobile Virtual Network Operator) in India and rolled out a policy for virtual operators in May 2016. The rules defined in policy will enable entrepreneurs and companies to launch MVNOs in India, offering better choice to clients and providing incumbents with an opportunity to monetize their underutilized network.

MVNOs are mobile service providers, who offer their services without owning any spectrum and telecom infrastructure. The model is innovative and flexible model that offers customers good convenience and unique services. MVNO model is driven by content, customer needs and niche communities. The model is flexible and asset light, enabling virtual operators to offer value added services to niche customer segments, while leveraging their brand, content, applications and existing distribution network.

The objective of this study is to find Critical Success Factors (customer, regulatory, industry or company centric CSFs) that will influence MVNOs in Indian telecommunication market and develop a strategic framework that will be useful for key stakeholders.

To achieve objective of the study, research started by literature review and background study, to determine research gaps and research objectives. A comprehensive literature review was undertaken, which helped in developing a good understanding of area of research. Review included study of telecom industry in general and MVNOs in particular. Study covered global trends and experiences and details of Indian telecom industry. After identifying variables from literature, grounded theory research methodology was used to identify critical success factors for MVNOs in India. Total Interpretive Structural Modeling (TISM) was applied to identify inter-linkages among various factors and develop a strategic hierarchal model for MVNOs in India.

Next phase of research covered empirical validation of framework, which was developed using TISM. Hypotheses of association were framed for strategic factors and their relationship. Multiple regression empirical method was used to examine hypotheses of association and empirically validate relationships identified in TISM model. The validation

was done with help of data collected using a questionnaire survey. Next phase of research involved review of model in real life settings through case study method. Case studies preparation involved collecting and reviewing details from secondary sources, in-depth interviews with senior management and experts from the industry. SAP-LPA Hill framework was used to develop and analyze case studies of two MVNOs, one each from UK and Italy.

Last phase of research was focused on deriving learnings from different phases and synthesis of research results. Key research findings from different research phases were synthesized using triangulation methodology. Implication of research findings for industry and academia in general and MVNOs in particular were enlisted in detail. The research work makes substantial input to the existing knowledge base and to the Indian telecom industry, with specific focus on MVNOs. This research will help key stakeholders in telecom industry and academia in better understanding of MVNO's business model and its impact on consumers, policy makers, telecom companies and industry. This research lays the groundwork for one of the less researched area and hopefully will trigger further research on MVNOs in India.

**Keywords:** MVNO, MNO, Indian Telecommunication Industry, Business Model, Strategy, Telecom Policy, TISM, Grounded Theory, Case Studies.

## सार

भारतीय दूरसंचार उद्योग ने पिछले कुछ वर्षों में काफी बदलाव के माध्यम से नेविगेट किया है। इसकी वृद्धि दर दुनिया में सबसे ज्यादा है और यह मोबाइल ग्राहकों की संख्या के संदर्भ में दूसरा सबसे बड़ा दूरसंचार बाजार बन गया है। भारतीय दूरसंचार नियामक ट्राई द्वारा जारी आंकड़ों के मुताबिक, 31 मार्च 2016 को देश में 1058.86 लाख दूरसंचार ग्राहक थे, जबकि 83.36 के टेली घनत्व थे। मोबाइल क्रांति पर भारतीय दूरसंचार क्षेत्र का अद्वितीय विकास बनाया गया है। ऐसे कई तत्व हैं जिन्होंने देश में दूरसंचार उद्योग के विकास का समर्थन किया है। इसमें अच्छे नियामक वातावरण, अनुकूल जनसांख्यिकी, और ग्राहक व्यवहार में परिवर्तन, बहुत कम ट्रेफिकिक्स और कम हैंडसेट की कीमतें शामिल हैं दूरसंचार क्षेत्र में वृद्धि कम एआरपीयू (प्रति प्रयोक्ता औसत आय) की विशेषता है। सेवाओं के कमोडिटीकरण के कारण, तीव्र प्रतिस्पर्धा और स्पेक्ट्रम की ऊंची लागत, नए राजस्व प्रवाह को विकसित करना, एआरपीयू बढ़ाने और ग्राहकों को बनाए रखने के लिए उनकी सेवाओं और ब्रांड को अलग करना मुश्किल हो गया है। जबकि अभिप्राय ग्राहकों की सेवाओं को बेहतर बनाने पर ध्यान केंद्रित कर रहे हैं, वे ग्राहकों की जरूरतों को बदलते हुए सफलतापूर्वक सेवा करने और आला ग्राहकों के क्षेत्रों की आवश्यकताओं को पूरा करने में चुनौतियों का सामना कर रहे हैं। उद्योग के चुनौतियों को संबोधित करने में पूरक शक्तियों के साथ नए व्यापार मॉडल अपनाने और अन्य खिलाड़ियों के साथ सहयोग करने का एक अवसर है।

भारत सरकार ने भारत में एमवीएनओ (मोबाइल वर्चुअल नेटवर्क ऑपरेटर) को पेश करने का इरादा रखता है और मई 2016 में वर्चुअल ऑपरेटर के लिए एक नीति तैयार की है। नीति में परिभाषित नियमों से उद्यमियों और कंपनियों को भारत में एमवीएनओ लॉन्च करने में सक्षम होगा, ग्राहकों को बेहतर विकल्प प्रदान करने और पदवी प्रदान करने के लिए अपने अंडर्युटिलाइज्ड नेटवर्क का मुद्रीकरण करने का अवसर

एमवीएनओ मोबाइल सेवा प्रदाता हैं, जो किसी भी स्पेक्ट्रम और दूरसंचार बुनियादी ढांचे के

मालिक के बिना अपनी सेवाएं प्रदान करते हैं। मॉडल अभिनव और लचीला मॉडल है जो ग्राहकों को अच्छी सुविधा और अद्वितीय सेवाएं प्रदान करता है। एमवीनो मॉडल सामग्री, ग्राहक की जरूरतों और आला समुदायों द्वारा संचालित होता है। मॉडल लचीला और परिसंपत्ति रोशनी है, जिससे वर्चुअल ऑपरेटर को अपने ब्रांड, कंटेंट, एप्लीकेशन और मौजूदा डिस्ट्रीब्यूशन नेटवर्क के लाभ के साथ-साथ आला ग्राहक सेवाओं को वैल्यू वर्धित सेवाएं प्रदान करने में मदद मिलती है।

इस अध्ययन का उद्देश्य महत्वपूर्ण सफलता के कारक (ग्राहक, नियामक, उद्योग या कंपनी केंद्रित सीएसएफ) को मिलना है जो भारतीय दूरसंचार बाजार में एमवीएनओ को प्रभावित करेगा और सामरिक ढांचे का विकास करेगा जो कि प्रमुख हितधारकों के लिए उपयोगी होगा।

अध्ययन के उद्देश्य और शोध उद्देश्यों को निर्धारित करने के लिए, साहित्य की समीक्षा और पृष्ठभूमि अध्ययन द्वारा शुरू किए गए अध्ययन के उद्देश्य को प्राप्त करने के लिए एक व्यापक साहित्य समीक्षा की गई, जिसने शोध के क्षेत्र की अच्छी समझ विकसित करने में मदद की। समीक्षा में सामान्य रूप से दूरसंचार उद्योग का अध्ययन और विशेष रूप से एमवीएनओ शामिल था। अध्ययन ने वैश्विक रुझानों और अनुभवों और भारतीय दूरसंचार उद्योग का विवरण शामिल किया। साहित्य से चर को पहचानने के बाद, पर आधारित सिद्धांत अनुसंधान पद्धति का उपयोग भारत में एमवीएनओ के लिए महत्वपूर्ण सफलता कारकों की पहचान करने के लिए किया गया था। कुल अंतरफलक स्ट्रक्चरल मॉडलिंग (टीआईएसएम) को विभिन्न कारकों के बीच अंतर-संबंधों की पहचान करने और भारत में एमवीएनओ के लिए सामरिक पदानुक्रमित मॉडल विकसित करने के लिए लागू किया गया था।

अनुसंधान के अगले चरण में ढांचा के अनुभवजन्य मान्यता को शामिल किया गया, जिसे टीआईएसएम का उपयोग कर विकसित किया गया था। एसोसिएशन की हाइपोथीसेस रणनीतिक कारकों और उनके रिश्ते के लिए तैयार किए गए थे। एकाधिक प्रतिगमन अनुभवजन्य पद्धति का उपयोग एसोसिएशन की अवधारणाओं की जांच करने के लिए किया गया था और

टीआईएसएम मॉडल में पहचाने गए संबंधों को अनुभवपूर्वक मान्य किया गया था। प्रश्नावली सर्वेक्षण के उपयोग से एकत्र किए गए डेटा की सहायता से सत्यापन किया गया था। शोध के अगले चरण में केस स्टडी पद्धति के माध्यम से वास्तविक जीवन सेटिंग में मॉडल की समीक्षा शामिल थी। मामला अध्ययन तैयारी माध्यमिक स्रोतों से विवरण एकत्र करने और समीक्षा करने, उद्योग से वरिष्ठ प्रबंधन और विशेषज्ञों के साथ गहराई से साक्षात्कार शामिल है। एसएपी-एलएपी हिल ढांचे का उपयोग दो एमवीएनओ के मामले के अध्ययन को विकसित करने और विश्लेषण करने के लिए किया गया था, जो ब्रिटेन और इटली से एक-एक है।

शोध के अंतिम चरण में विभिन्न चरणों से सीखने और शोध परिणामों के संश्लेषण पर केंद्रित किया गया था। विभिन्न शोध के चरणों से प्रमुख शोध निष्कर्षों को त्रिकोणीय पद्धति का उपयोग करके संश्लेषित किया गया था। विशेष रूप से उद्योग और शिक्षाविदों के लिए शोध निष्कर्षों की विशेष रूप से और एमवीएनओ का विस्तृत विवरण शामिल किया गया था। अनुसंधान कार्य मौजूदा ज्ञान आधार और भारतीय दूरसंचार उद्योग को पर्याप्त इनपुट प्रदान करता है, जिसमें एमवीएनओ पर विशेष ध्यान दिया गया है। यह शोध, एमवीएनओ के बिजनेस मॉडल की बेहतर समझ में और उपभोक्ताओं, नीति निर्माताओं, दूरसंचार कंपनियों और उद्योगों पर इसके प्रभाव में दूरसंचार उद्योग और शिक्षाविदों के प्रमुख हितधारकों की सहायता करेगा। यह शोध कम शोध वाले क्षेत्र में से एक के लिए नींव रखता है और उम्मीद है कि भारत में एमवीएनओ पर और शोध को बढ़ावा मिलेगा।

कीवर्ड: एमवीनो, एमएनओ, भारतीय दूरसंचार उद्योग, व्यापार मॉडल, रणनीति, दूरसंचार नीति, टीआईएसएम, आधारित सिद्धांत, केस स्टडीज।

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## **List of Abbreviations**

ARPU	Average Revenue Per User
Agcom	Italian Communication Regulatory Authority
AUC	Authorization Centre
BT	British Telecom
BTS	Base Trans-receiver Station
CAGR	Compound Annual Growth Rate
COAI	Cellular Operators Association of India
CSF	Critical Success Factors
DoT	Department of Telecommunication
EBITA	Earnings before Interest, Tax and Amortization
ET	Economic Times
EIR	Equipment Identity Register
ESP	Enhanced Service Provider
FCC	Federal Communications Commission
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
HLR	Home Location Register
IDA	Infocomm Development Authority
ISM	Interpretive Structural Modelling
ISP	Internet Service Provider
ITU	International Telecom Union
MS	Mobile Station
MSC	Mobile Service Switches Centre

ME	Mobile Equipment
MNP	Mobile Number Portability
MNO	Mobile Network Operator
MVNO	Mobile Virtual Network Operator
MVNE	Mobile Virtual Network Enabler
OFCOM	The Office of Communication
OFTEL	Office of Telecommunications
PAT	Profit After Tax
ROI	Return on Investment
RAC	Radio Access Controller
SAP LAP	Situation Actor Process Learnings Actions
SMP	Significant Market Power
SPSS	Statistical Package for Social Science
SIM	Subscriber Identity Module
SSIM	Self-Structured Interaction Matrix
TISM	Total Interpretive Structural Modelling
TRAI	Telecom Regulatory Authority of India
USA	United States of America
VAS	Value Added Services
3G	Third Generation
4G	Fourth Generation