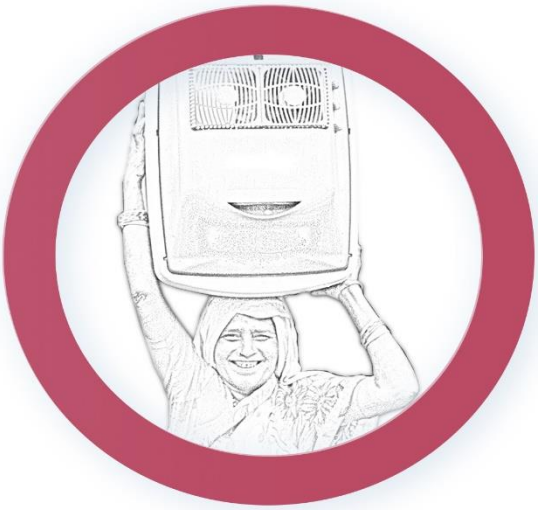
DRIVERS AND BARRIERS OF REVERSE INNOVATION

An exploratory study of factors influencing Reverse Innovation in India

-Sarath Meghna Vipparthi



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SOCIETY PRESSES UPON US ALL THE TIME. THE PROGRESS OF THE LAST HALF CENTURY IS THE PROGRESS OF THE FROG OUT OF HIS WELL.

- R. K. NARAYAN

Drivers and barriers of Reverse Innovation:

An exploratory study of factors influencing Reverse Innovation in India

by

Sarath Meghna Vipparthi

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Executive Summary

The paradigm of innovation approaches has changed over the years. This thesis has been designed to understand one such unconventional innovation approaches called as Reverse Innovation. Reverse Innovation is an innovation approach where the innovation is first launched in an emerging country and then transferred to the developed countries.

The geographical focus of this research is India and the research aims to document innovations of Indian EMNEs that are an example of Reverse Innovation. India's recent developments show that the country is in forefront in terms of disruptive and breakthrough innovations that are further launched in developed countries. As India is moving towards being self-reliant and self-sufficient with a motive to boost its economy, Reverse Innovation can be one of the essential innovation approaches to achieve the same.

The focus of this thesis is from the perspectives of EMNEs (Emerging-market Multinational Enterprises) and the main aim is to find the list of drivers and barriers of RI (Reverse Innovation). For EMNEs in emerging economies to undergo RI and transcend their innovations to developed countries, they struggle in many ways. For example, in terms of funding, technology, operation costs and so on. However, RI approach also brings EMNES, new employment opportunities, inspires firms to produce cutting-edge technologies, FDI spillovers and more. Hence, the motivation is to understand what are the influencing factors of RI, i.e., drivers and barriers for EMNEs undergoing the RI approach. Documenting this will help the business leaders to grasp the concepts of RI and work with a finer comprehension as they advance to different stages in the RI lifecycle. This may in turn galvanise investors' interest to fund and support the innovation, thereby strengthening the stakeholder relationships.

To attain this objective the research has two major parts of data collection. One from literature review and the other from case studies. Before proceeding with data collection, the first step lies in identifying the different stages of RI lifecycle. Then the first set of lists of drivers and barriers are derived from the existing literature studies which are placed in different stages of RI. Later another set of lists of drivers and barriers are derived from three cases studies which are selected in accordance to the designated stages of RI. The case studies comprise of innovations by three Indian EMNEs. They are Tata Group's Tata Nano, Godrej Group's Godrej ChotuKool and the Suzlon Group itself. The cases pertain to both B2B and B2C innovations which cater to different sectors of the society. The case study lists of drivers and barriers are obtained by recording interviews, converting audios to text and in turn the transcribed texts are run on Atlas.ti to form codes. The deliverable of the research is to assemble and analyse both set of lists from literature and case studies.

After the data collection, the analysis has been sectioned into four parts. The first analysis is a cross-case analysis which helps to understand the relative occurrences of factors amongst the case studies. It is an aggregate level analysis to understand the holistic occurrence of factors in all the three case studies. It is seen that Tata Nano has more common drivers to Godrej ChotuKool than with Suzlon. Similarly, Godrej ChotuKool has more common drivers to Suzlon. It could mean that as the innovation proceeds or has the potential to further to next stages of RI, a similarity of factors is found in the innovation which is already in the immediate next stage of RI. Similar trend is also seen for barriers. The second analysis is the comparison of all the three case studies together in different categories where it is seen that there are a greater number of common factors in the earlier stages of RI. In the later stages of RI when the innovation is transferred to the developed country, the factors are more towards the international elements that can affect an innovation's penetration in the country. For example, 'forex transaction'. Further, more fiscal factors can be seen when the innovation moves to developed countries. For example, 'relying on tax-benefits'. Whereas in the initial stages of RI, when the innovation is trying to be widespread in the emerging country itself, technical and business-model related factors are seen profusely over other factors. For example, 'local R&D', 'collaboration with partners', and so on. The third analysis is the case comparison with the literature findings in three stages of RI where the factors are divided according to different categories. It is an adjusted list of all the factors from both literature and case studies. This analysis gives new factors from the case studies which have not been mentioned in the literature before. The final and fourth analysis is the inclusive list of common factors from both literature and case studies. This list includes the factors from literature and the generalizable factors from all the three case studies. There is only one factor that is generalizable from all the three case studies in the drivers and none in the barriers.

The topic of Reverse Innovation is fairly novel and the results obtained from this research cannot be generalised to the entire population. However, the sample size of case studies can be increased to provide more factors and views on the already documented factors. It may increase the reliability of the results. This thesis is an addition to the existing list of drivers and barriers of RI from literature which have not been assimilated in a stage-wise manner of RI lifecycle before. This research adds to literature, the practical relevance and experiences of EMNEs with the help of elaborate case studies in terms of RI. The research deliverable may aid future researchers and managers to understand the pivotal factors for EMNEs that undergo RI approach. It captures an essence of Management of Technology course which is to analyse technologies and new approaches and understand the commercial impact for firms. This research also provides an analysis, review and explanation to new and challenging business contexts by discussing challenges faced by case studies which also adheres to the course structure of Management of Technology.

S. Meghna Vipparthi,
Delft, August 2020

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I am profoundly indebted to the respondents who took time from their busy schedules to participate in my research. All the insights I have received from them have been helpful not just on a research level but on a personal level also. It has given me ways to think creatively about my favourite focus areas of innovations, finance and energy systems. I am also thankful to them for sharing their personal experiences that they have encountered during their work tenure.

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Contents

Abbreviations

B2B- Business-to-business

B2C- Business-to-consumer

BOP- Bottom of the Pyramid

DC- developed country

DMNEs- Developed-country Multinational Enterprises

EE- emerging economy/developing country

EMNEs- Emerging-market Multinational Enterprises

FDA- Food and Drug Administration

GDP- Gross Domestic Product

GHG- Green-house gases

INR- Indian Rupee

IPCL- Indian Petrochemicals Corporation Limited

IRR- Internal Rate of Return

JiT- Just in Time

LCoE- Levelized Cost of Electricity

MW- Megawatts

OEMs- Original Equipment manufacturers

R&D- Research and development

RE- Renewable Energy

RI- Reverse Innovation

UL- UL Safety certification

USD- Unites States dollar

VoC- Voice of Customer

WHO- World Health Organisation

WOM- Word of Mouth

List of figures

List of tables

1

Introduction

1.1 Research Background

Firms worldwide are forced to try new approaches of global innovation due to declining growth in developed markets and increasing opportunities in emerging markets (Lee et al., 2011). The study of Lee et al. (2011), also discusses that innovation approaches have taken various forms, definitions and types, as the global dynamics of innovation changed. Opposed to the traditional innovation approach of innovation traversing from a developed country to developing country, one innovation approach called Reverse Innovation, RI, has been in the forefront since its inception (Ostraszewska and Tylec, 2015; Govindarajan and Ramamurti, 2011; Govindarajan and Euchner, 2012).

Reverse Innovation was coined in 2009 by professors from Dartmouth University, Vijay Govindarajan and Chris Trimble, and General Electric's, Jeffrey R. Immelt. In 2011, Govindarajan and Ramamurti noted that, "Reverse innovation refers to the case where an innovation is adopted first in poor (emerging) economies before 'trickling up' to rich countries" (p. 191). Here, the end goal is when higher-income countries adopt technologies that are first launched in low-resource environments or emerging economies. The research shall use this definition of RI as it stands aligned to motive of understanding RI better in terms of innovations by Emerging-market Multinational Enterprises from an emerging economy until it reaches the developed country. Hence, the definition by Govindarajan and Ramamurti (2011) will serve as the basis of this research.

Two examples of RI from India which comply with the research's base definition of RI approach are explained below. The first example is Bharat Forge, an Indian multinational company, that is associated with automotive industries, power, oil and gas, marine and aerospace industries. It is one of the largest forging firms in the world which is also famous for its maintenance management practice. This maintenance management practice is designed to minimize downtime during machine maintenance plus has an advanced information system for problem predictions. The average downtime is less than 10 percent for all its global platforms (Casestudyinc, 2010). The company eventually secured its presence in various parts of the world such as Sweden, U.S.A. and Germany. Another example is from an Indian healthcare provider that provides economical solutions to undergo a cataract surgery, Aravind Eye Hospitals. Aravind Eye Hospitals performs a cataract surgery for only $30 whereas in western economies it costs about $3000. Their first hospital overseas was established in 2018 in Nigeria by partnering with the Chanrai Group. Aravind Eye Hospitals are currently undertaking projects and collaborating with firms in the west.

Since, the key idea of the RI approach is the final transfer of the innovation and its adoption in developed markets, it means that RI approaches are creating markets not only in developing countries but also in developed countries. Simula et al. (2015), postulate that RI has led to market creation in both developing and developed nations by serving the customers that weren't tapped before. In an interview with Govindarajan, he explains that the focus of RI is to concoct fundamentally different products to meet the needs of people (Govindarajan and Euchner, 2012). Changes in preferences and needs of a customer, hence stand as a precursor to all innovation approaches (Ostraszewska and Tylec, 2015). This is one of the reasons why, since 2009, RI has been seen at the forefront of discussions in terms of new innovation approaches. The picture below is adapted from Hadengue et al. (2017), that supports the former statement which shows the statistics of the rise in research of RI over the years (refer figure 1.1).

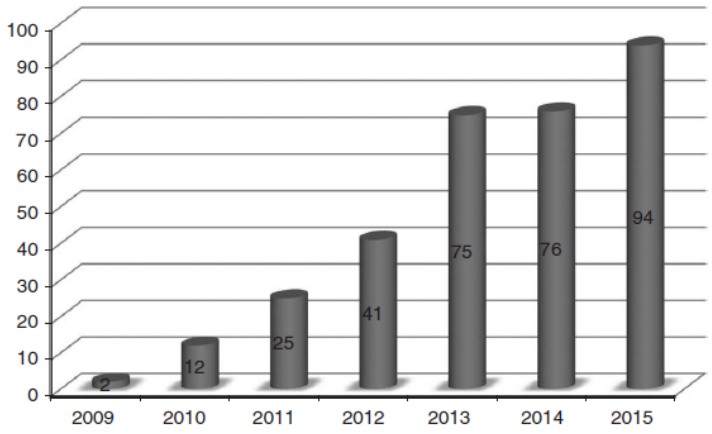

Figure 1.1: Rise in documents addressing RI over years.
Source: Hadengue et al., 2017, pg. 145.

1.2 Knowledge Gap

Govindarajan and Ramamurti (2011), postulated that on the demand side there has been an accelerating growth in emerging economies and simultaneous slowing down in the developed countries. Their study also predicts that in coming years, almost two-thirds of the world GDP is to originate from these emerging economies. Most of the untapped buying power is in the emerging markets of Asia, South Asia, Africa and Latin America (Gwarda, 2016). The severe competitive climate compels firms to evolve, in order to thrive and prosper in emerging markets and hence have become innovation centres (Gwarda, 2016).

Globalization has led to the advent of both opportunities and challenges for firms (Gwarda, 2016). But there are low accounts of why innovations of firms in emerging economies are unsuccessful, struggling or successful using the RI approach (Ostraszewska and Tylec, 2015; Breuer and Upadrasta, 2017; Govindarajan and Euchner, 2012). Seke (2017), gives examples of few DMNEs that have attempted to bring their products in emerging economies. Some of the few DMNEs that have been successful in doing so are Coca-Cola, GE, Harmon, Microsoft, Nestlé, PepsiCo, Procter and Gamble, Renault, and Levi Strauss. In contrast, EMNEs such as Mahindra & Mahindra, Tata Group, etc., have found it difficult to contribute in both developed and developing countries (Seke, 2017). There are cases of firms that have been both successful and unsuccessful by following RI approaches but studies have not elaborately explained their drivers and barriers in developing countries.

For example, von Janda et al. (2018) say that firms which undergo RI should rather refrain from clustering on the basis of geographic advantages. It can challenge the firms to forgo the legacy approaches and in turn discover customer segments with similar need but in different and geographically dispersed market contexts (von Janda et al., 2018). Similarly, only a few research studies have documented information regarding the various barriers in EEs using the RI approach (Breuer and Upadrasta, 2017; Zheng et al., 2016, von Janda et al., 2018). In addition to the barriers, there are not numerous archives that discuss the drivers of RI in EEs (Simula et al., 2015; Govindarajan and Ramamurti, 2011; Govindarajan and Euchner, 2012). For example, some catalysts for RI have been mentioned such as in Goyal and Stefanel (2018), but are restricted greatly to the field of finance and economies.

1.3 Research Objective

Although the innovation paradigm is changing (Govindarajan et al., 2012), studies show that there are lower number of innovations in developing countries in comparison to developed nations. One of the reasons is understood by the study of Hossain et al. (2016), which claims that developed countries have technical advantage with their innovation as they can have easy access to scientific knowledge by having advanced research and development zones at their home market. Whereas in case of emerging economies, studies discuss that there are lesser number of innovations because emerging economies, abbreviated as EEs, or developing countries do not create technological breakthroughs as being done in developed markets (Seke, 2017; Govindarajan and Ramamurti,

2011). Developing countries have to heavily rely on external sources of technology which is a large component of productivity (Zanello et al. (2016). This leads to the research objective which is to gather the main influencing factors; both positive factors i.e., drivers and negative factors, i.e., barriers, of RI in all the stages of RI lifecycle. Doing so will help the researchers and readers understand the ways in which RI can transcend from an emerging economy to a developed country. It will also augment the field of research of innovation approaches that can be implemented by an EMNE.

For a developing country like India, the expandable incomes and disbursing volumes have been higher than before (Seke, 2017). Hence, India is a profitable market for firms to venture into and take advantage of its potential. Seke (2017) also mentions several benefits of RI in the economy such as increase in job opportunities, technology enhancement, affordable goods and so on. It is thus essential to find the drivers and barriers of RI to understand and implement RI which would enable to leverage out of its true potential in developing countries or emerging economies.

Furthermore, even though studies mention few drivers and barriers of RI, there has not been a wholesome list of distinguishing factors in each stage of the RI lifecycle. RI is still a relatively new innovation approach and the challenges within RI are not elaborately explained in the existing literature (Rosenström and Sommer, 2016). Hence, the research attempts to suggest new avenues for future research for EMNEs in emerging economies and readers may use these findings in their RI approaches to get insights on how the influencing factors can unlock opportunities throughout the world. To attain this objective, below are the research questions and sub-research questions to understand the desired outcome of the research.

1.4 Research Question and Sub-Research Questions

Main Research Question- *What are the main drivers and barriers of RI in different stages of RI lifecycle and how do these influencing factors, i.e., drivers and barriers, collectively affect RI approaches?*

Sub-Research Questions:

1. What are the main drivers and barriers listed in the literature of RI? How can these literature drivers and barriers be categorized?

   The first part of the sub-research question is aimed to identify the influencing factors, i.e., both drivers and barriers, from the existing literature. The existing literature studies does have some excerpts of drivers and barriers in brief details. However, the literature does not enlist all the drivers and barriers that are essential to be determined using a RI approach by EMNEs in a single research paper. This question thus identifies main drivers and barriers of RI from the existing theories. The second part of the sub-research question is aimed to

categorize the list in a scientific manner to support the classification of drivers and barriers of RI as a theoretical list.

2. How are the drivers and barriers from case studies classified? How relevant are the drivers and barriers listed from the three cases, to the listed drivers and barriers in the theoretical literature?

   This sub-research question is aimed to analyse the derived list of drivers and barriers from three cases of Indian EMNEs. The list from the cases will be classified and then compared with the list from literature to understand which factors match and which factors are new to the theoretical list. This research question is also aimed to present the lists in different stages of RI lifecycle.

3. How can these drivers and barriers from the cases be integrated in the categorization of the list from the literature?

   This sub-research question is aimed to understand the ways in which the factors from the case studies are listed with the factors from literature. The goal is to create adjusted lists of all the factors from case studies and literature and inclusive lists that has the generalizable factors from all the three case studies along with the factors from literature. This analysis may aim to find the holistic relevant drivers and barriers in terms for an EMNE undergoing RI.

1.5 Project scope

The scope of this research focuses is limited to innovations of three Indian Emerging-market Multinational Enterprises, EMNEs. The thesis will however give a brief understanding of how EMNEs are either in an advantageous position or not as compared to DMNEs while undergoing a RI approach. Beyond this classification is not a scope for the research. The research also includes the challenges faced by the case studies during the innovation lifecycle. It stands different to the barriers. The challenges are the obstacles that the firms have experienced and are documented as learnings in the recommendations section. The barriers however, are the problems firms faced or may face in the future of the innovation. The lists are limited to document the plausible drivers and barriers of RI approach as seen from the case interviews. No other driver or barrier from external sources have been listed in the results of the case study.

1.6 Setting Research Context

In this research we assume that there are two main stages of RI lifecycle (refer figure 1.2). The first stage or step is the 'implementation of the innovation in the developing market'. This is the first and foremost step of RI. In this step, the innovation has been envisioned, launched and implemented in

the developing country. This means that the innovation has been put in place or executed in the developing country. The final step or the end stage is where the same innovation is being 'implemented and adopted in the developed country'. This means that the innovation has been envisioned in developing country, launched in developing country, implemented in both developed and developing countries and is successfully being used by the target customers. There is an intermediate step between the two steps which is dependent on the extent of adoption. This is not considered as a concrete step because it is precursor to the last step, which means that only if the product is adopted completely by the target customer and is running successfully in a developing country only then it can be implemented in a developed country. To be in the adoption stage means innovation is still growing and gaining acceptance by the customers in the developing country. It also means that the innovation is in use and is not discontinued. Thus, to summarise, there are two stages and an intermediate stage in the RI lifecycle. They are named as, first step 'Implementation of innovation in a developing country', intermediate step- 'Innovation adoption in a developing country' and second step- 'Implementation of innovation in the developed country'.

Thus, below is an adaptation of the stages of RI which is also loosely based on RI approaches from existing literature studies (Govindarajan and Ramamurti, 2011; Gwarda, 2016). There could however be different or more stages of RI. Since the research follows the definition by Govindarajan and Ramamurti (2011), the stages are also inspired from the stages mentioned by their study. The chosen three stages of RI in this research is to help researchers or innovators of EMNEs from EEs to be able to implement their innovations in developed countries.

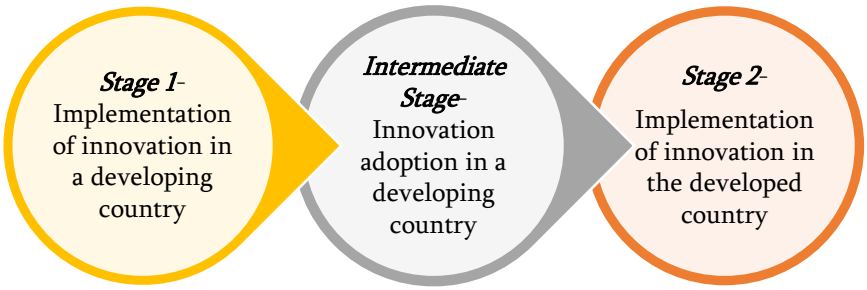

Figure 1.2: Stages of RI lifecycle.
Sources: Own adaptation built from text reference of Govindarajan and Ramamurti, 2011; Gwarda, 2016.

The research uses the term 'EE' which is interchangeably used with 'developing country' means an unsystematic collection of countries that have varying economic sizes and growth rates (Seke, 2017). However, emerging economies do possess some characteristics as of a developed market (Kvint, 2009). Dr. Kvint in 2009, explained emerging economies to be global emerging markets with an increasing rate of middle class with improving standards of lifestyles, social tolerance and increasing cooperation with MNCs. So, until this point, the definition of RI, definition of EE and stages of RI lifecycle used in this research have been mentioned.

Now, to achieve the objective of RI, this research has conducted comparative analysis from three different case studies of Indian firms. According to the stages of RI classification (refer figure 1.2), the three cases are in the three different stages of RI. First case study is of 'Tata Nano', a four-wheeler passenger vehicle which has been envisioned, launched and implemented in the developing country and also attempted to move to developed markets. The second case study is of 'Godrej ChotuKool', a mobile refrigeration unit which has been envisioned, launched, implemented and being used in the developing country. The third and final case study is of Suzlon, a wind turbine manufacturer, which has been envisioned and launched in the developing country, implemented and being used in both developing and developed countries. Alternatively, as per research assumption above, Tata Nano had completed the stage 1 of RI lifecycle i.e., innovation implementation in the developing country, Godrej ChotuKool reached the intermediate stage, i.e., innovation adoption in the developing country and Suzlon has completed the stage 2 of RI, i.e., innovation implemented in developed country. Common to all the cases is that the innovation has been invented and launched in the emerging country which means it has cleared the initial stages of a successful innovation (Mariello, 2007). All three innovations have different market experiences and thus they are interesting comparative studies for the research.

1.7 Thesis Outline and Framework

This research is in the form of a qualitative study where case interviews have been conducted to understand RI in emerging economies by EMNEs. Chapters 1 and 2 have an outline of the research objectives, framework and research approach. Readers even without prior knowledge on Reverse Innovation can understand the research due to the usage of lucid terminology that is also backed by keywords and abbreviations. However, basic understanding of different innovation approaches, management practices and related terminologies can make it easier to follow. Chapter 3 entirely has the literature review as a part of this research to derive a list of drivers and barriers from the existing literature. Chapter 4-5 will be the case studies and the comparative analysis of the results obtained from the case studies and the list obtained from the existing literature. The results will be useful to identify the essential drivers and barriers of Reverse Innovations for EMNEs. The readers can refer to chapter 6 to follow the discussion on results and limitations within the research. This chapter also has recommendations on business perspectives for firms and researchers who are designing models to undergo RI approach. The chapter will also provide the limitations of the research methods. Readers can refer to the entire list of drivers and barriers, different definitions of reverse innovation used, and other information of theoretical literatures at the end of the research in the appendix section. The table for the list of figures used in this research is shared in the earlier sections of the paper. Finally, the language of thesis is very simple to grasp the concepts of Reverse Innovation and more.

Below is a depiction of the research phases to attain the key deliverable of the research in the form of a research framework. It is to understand how data has been collected, segregated after data collection and compiled for an analysis.

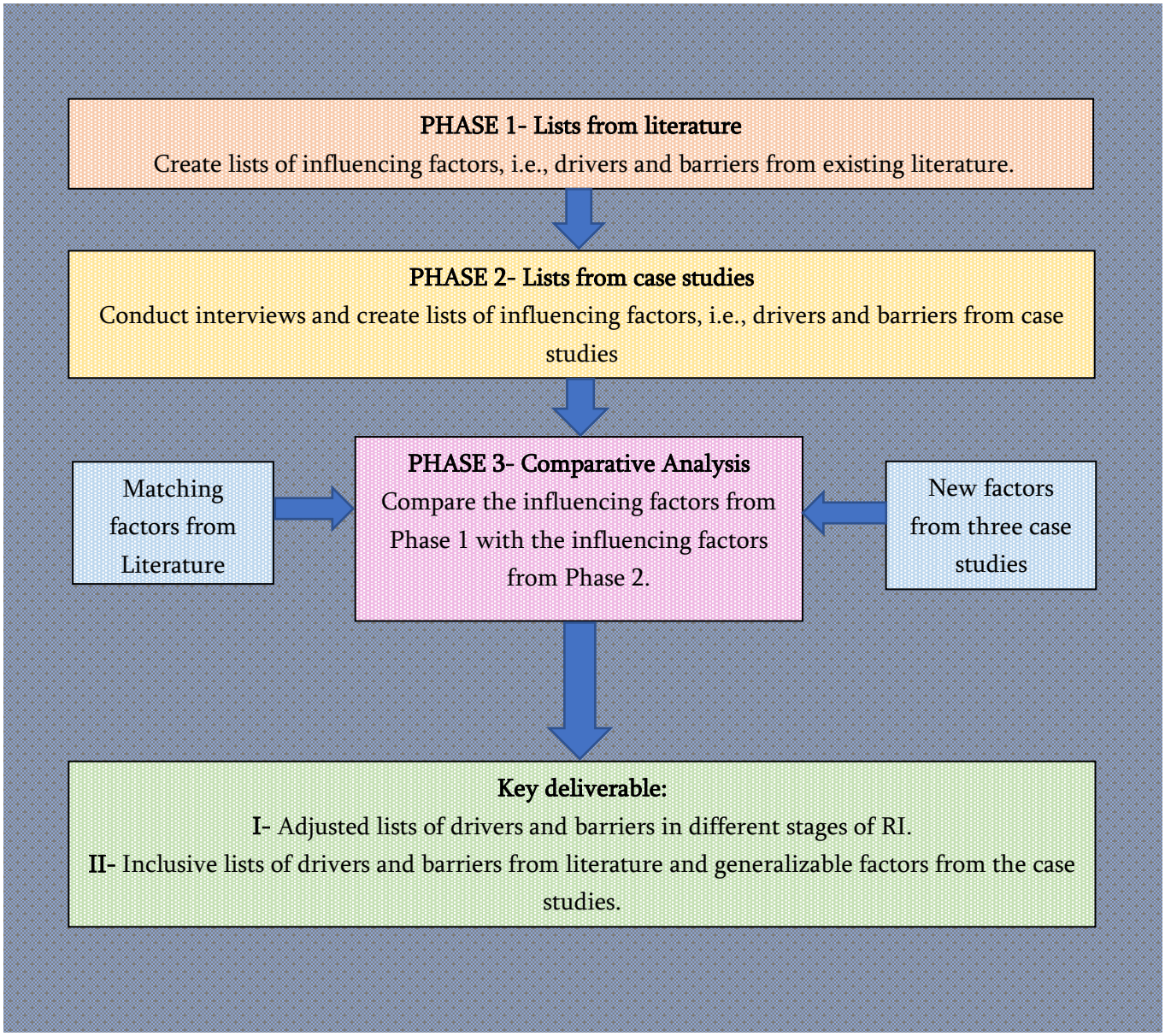

Figure 1.3: Research framework.

1.8 Scientific, Managerial and MOT Relevance

1.8.1 Scientific Relevance

This study can serve as an addition to the existing works on new innovation approaches. This study has not only the drivers and barriers of RI but also other concepts that helps to understand various facets associated with RI. For example, it draws a comparison amongst similar innovation

approaches and how RI is different to them and comparison of advantages between EMNEs and DMNEs while undergoing RI. This topic can provide a comprehensive comparative analysis in the field of reverse innovation as a part of the scientific studies. The study also draws in-depth analyses of different stages of reverse innovation using the three case studies. The study caters to the knowledge gap present in the existing literature.

1.8.2 Managerial Relevance

Technology has always been the driver of an innovation. The economic benefits of any innovation are persuasive but reverse innovation in specific, introduces firms with unique challenges and trials. This makes it important to address the drivers and barriers and manage them in ways where firms can reap the benefits of this relatively new phenomenon of Reverse Innovation. Management for such processes calls for distinctive and innovative methods are seemingly different from those that are already in place. Hence the study attempts to provide a managerial contribution that has the examination of influencing factors of RI to understand the dynamics behind the user needs. Managers can also take insights from the study's findings to mould their business models in a prudent manner in terms of novel RI approach. This research lists factors that will help them to get a stronghold in terms of managing their stakeholders while undergoing RI. This research in Reverse Innovation may also provide valuable information for EMNEs in emerging economies since there are low accounts of how RI can be effectively employed by an EMNE. Such a research on this innovation approach is needed along with more enterprises adopting the approach and learning from their experiences.

1.8.3 Relevance to Management of Technology

Management of Technology courses have played a central role to gauge through the research topic. Not all courses may have impacted or directly contributed to the research but courses such as MOT 1461 Financial Management, E574 Energy Systems (Indiana University, Bloomington) and WM0516TU Turning Technology into Business, had helped to understand various scientific terminologies related to innovations and its practical usage. This helped to easily follow the scientific articles while performing the literature review and to pen down the concepts in this thesis as well. For example, financial concepts, electrical systems' jargons and business concepts of patent holders and firms. However, there are few subjects mentioned below that directly contribute to the topic of RI.

MOT 1435 Technology, Strategy and Entrepreneurship- This course was the foundation course in MOT that had discussed the concepts of Reverse Innovation, Jugaad Innovation and similar other innovation approaches. This research also follows the principles mentioned in the book by Schilling (2017) which was one of the course readings.

MOT 2312 Research Methods- This course explained the entire structure and logical steps involved in different scientific researches. This thesis makes use of the scientific processes plausible in an exploratory research. The research methodology has been inspired from the course reading of Sekaran and Bougie (2016).

2

Research Design

2.1 Research Approach

This research takes the form of an exploratory research. An exploratory research oftentimes uses qualitative methods of the data collection and is a rather flexible research method (Sekaran and Bougie, 2016). It in general relies on informal discussions, interviews with skilled expertise, case studies, questionnaires etc. Here in this research, the topic of RI to find its drivers and barriers, is still being researched and worked upon hence an exploratory research has been the motivation to use for this research. Study validates that when there is not enough theory available to form a theoretical background then exploratory research can be conducted (Sekaran and Bougie, 2016). There are three reasons of motivation as to why the exploratory research is apt for this research which are also coherent to the study of Sekaran and Bougie (2016). Flexibility is one such reason because this nature ensures that researchers can approach the issue creatively to achieve in-depth and insightful information. Second reason is that an exploratory research has the ability to set a foundation for future research in the same topic. An exploratory research can act as a base for researchers and readers who would work with unexplored regions of RI. It can also be impactful for readers who think of refining and redefining their earlier concepts related to RI. Third reason is the unavailability of prior analysis to quantitative research associated with this topic and hence the difficulty to collect data.

Sekaran and Bougie (2016), explain that research body is generally sectioned into two parts; theoretical and empirical. The theoretical part usually includes the literature review of earlier

studies and the empirical part caters to the findings from the research conducted (Sekaran and Bougie, 2016). According to the aforementioned, this research's Chapters 1, 2 and 3, 'introduction' 'research design' and 'literature review', respectively, are entirely theoretical parts of the research. Chapters 4 and 6, 'case studies' and 'discussion and conclusion', respectively, have both empirical and theoretical parts as the research provides theoretical findings as well as empirical outcomes in these three sections. Chapter 5 'comparative analysis' is entirely empirical part of the research. Below (figure 2.1) is the adaptation of the research chapters in terms of theoretical and empirical sections that this research withholds.

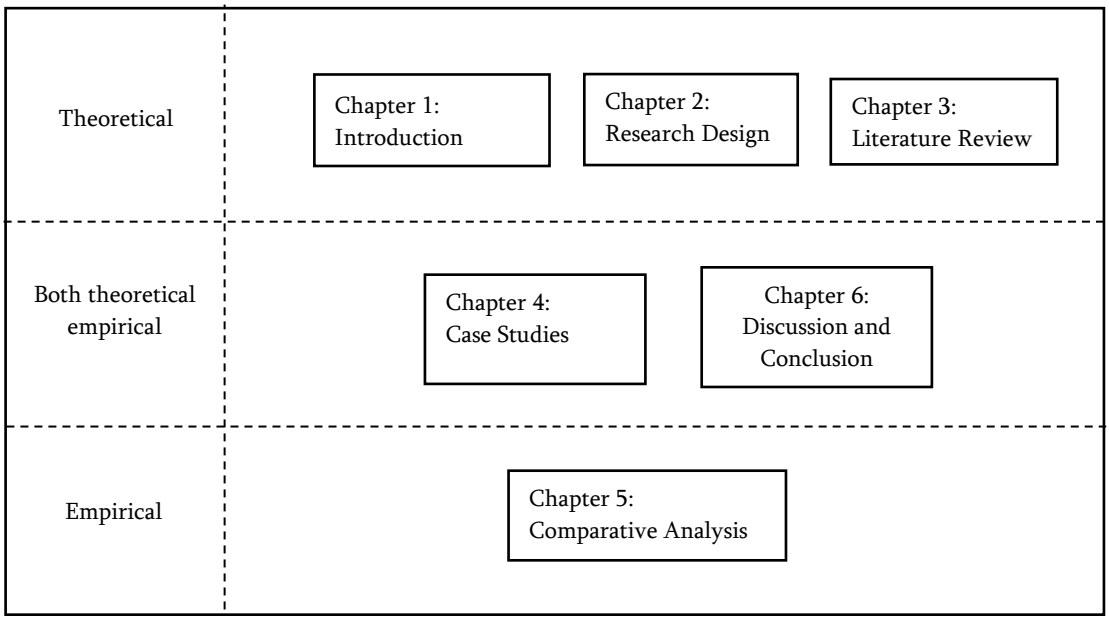

Figure 2.1: Theoretical and empirical parts of the research.
Sources: Own adaptation inspired from Sekaran and Bougie, 2016.

2.2 Research Method and Data Collection

This section discusses the research method and data collection techniques used for the research. The motivation in choosing a particular data collection method is explained alongside the method. As an explorative graduation project, it entails two main sources of data for the research. One, primary data and the other, secondary data. Primary data is data which is collected on a personal basis and usually by the gathered group of people related to the study (Sekaran and Bougie (2016). Interviews and questionnaires are some of the popular methods of primary data collection methods. Sekaran and Bougie's (2016) research mentions the use of interviews to get data directly from respondents. Other sources of primary data can be gathered from, magazines, old reports, or any other archives of relevant and authentic information. Further, authentic social media and blogs can be a good source of information. After the primary data is obtained, secondary data is realized which is the analysis and synthesis of the data obtained from primary data.

Considering the explorative nature of the research, this research relies on qualitative approaches to data gathering which includes, informal discussions and interviews with employers, managers, and other employees in the EMNEs. The primary data from theoretical literature and case studies have been backed by other supporting sources such as websites, newspapers and magazine articles. For example, EMNEs some of the respondents gave additional information to websites, blogs and articles to crosscheck and understand their customer feedbacks. After acquiring the primary data, it was synthesized using software to make an analysis. The analysis from the primate data becomes the secondary data for this research.

There are six logical steps for this research; literature review, scientific categorization, interviews, coding, comparative analysis, and final results, in the research methodology. The chronological order of steps depends on several factors such as the nature of the research question and sub-research questions, objectives of the study, timelines associated with each data collection method, and the type of data obtained within the limited resources. These steps are explained below.

2.2.1 Assembling theoretical drivers and barriers of RI

Research says that literature review is useful to identify and locate the necessary information on a research topic using academic journals, documents and other resources (Rowley and Slack, 2004). For this research, literature review is an integral part because it involves finding a list of drivers and barriers from the theory which is also a part of research objective. The first phase of the research framework is fulfilled by the literature review (refer figure 1.3). The literature review answers the sub-RQ1 of the research.

Literature review on concepts of RI, drivers and barriers of RI and challenges of EMNEs in emerging economies was conducted and then the influencing factors were listed. The search criteria to accomplish the literature review were based on research papers, articles, scientific papers from Scopus, Google Scholar, and Web of Science. The references are listed using Zotero software. The literature search was carried out through citations and abstracts' databases. All the aforementioned sites were useful throughout the research. Initial filters used were "Reverse Innovation", "RI in emerging economies", "Innovation approaches", "Examples of RI". Since the nature of the research is exploratory, a lot of key-phrases were used in conjugation such as "what are the innovation approaches in EMNEs", "drivers and barriers of RI", "challenges faced using the RI approaches", "RI examples in India". These are some search words and key phrases which were helpful throughout whole literature review research.

2.2.2 Categorization of theoretical drivers and barriers of RI

The other part of phase one is after the completion of literature review is the categorization of drivers and barriers, based on the existing scientific studies of RI. The process of categorization of the influencing factors also answers the sub-RQ1. The inspiration to use the categorization is related to the assumed classification of the two stages and the intermediate stage of RI lifecycle in this research. Since, the base definition of RI used in this research has been inspired by Govindarajan

and Ramamurti (2011), it was easy and lucid to also adapt similar classification of three stages of RI, present in their study (refer figure 1.2). Another study by von Zedtwitz et al. (2015), strengthened the resolve of this research's classification of stages. von Zedtwitz et al. (2015) discuss different types of RI and the further classifies as strong or weak RIs. Their study gives examples of the countries alongside the different types of RIs.

Building on the referred concepts of von Zedtwitz et al. (2015) and Govindarajan and Ramamurti (2011), the categorization of drivers and barriers of RI was also based on similar studies. Govindarajan et al. (2012), discusses different gaps such as performance gap, the infrastructure gap, sustainability gap, regulatory gap and preferences gap in RI and can be considered as barriers of RI. Other studies also discuss about the various parameters of RI such as similar approaches of RI, differences between the similar RI approaches, influence of RI in emerging and developed markets, and so on. But they also mention few drivers and barriers experienced by multinational firms in their studies. For example, von Janda et al. (2018), explain few categories such as structure, culture, and resources. The 'structure' drivers entail all the constituents of a firm's organizational structure, the 'culture' drivers entail the conventions and ethics that are applicable in the RI approach, and 'resources' entail the tangible and other intangible assets a firm withholds. Similarly, more factors and reasoning are mentioned in studies of von Zedtwitz et al. (2015), Govindarajan and Euchner (2012), Simula et al. (2015), and Gwarda (2016). So, building on the existing works of RI innovation and upon logical reasoning, there are around eight categories of the drivers and barriers mentioned in this research. These categories are social embeddedness, economic, business-model, technical, resource-constraints, regulatory, political, cultural value. Motivation to create and use these categories will be explained in the later section of drivers and barriers.

2.2.3 Interviews

The second phase of the research framework after the categorization of drivers and barriers is the interview phase (refer figure 1.3). This data collection method answers sub-RQ2. Interviews provide with the opportunity to connect with interviewees who have subject rich data that helps to explore and understand complex issues in their field of expertise. Many ideas which are usually difficult to record in surveys can also be brought to the surface and discussed during interviews. An advantage of interviews is that an immediate response is received from the targeted subject.

Virtual interviews help to contact the related subjects dispersed over various geographic regions where the firms have their offices and units in different parts of the country. It is hence, an efficient way of collecting data when one has specific, both structured or semi-structured questions to ask, needs the responses quickly, and has a sample spread over a wide area. Further, a virtual face-to-face interview helps in understanding reactions of the respondent which gives an idea about the respondent's feeling towards the concept being questioned. Due to the afore-mentioned reasons, face-to-face interviews were conducted over a virtual medium such as on Skype, Google Hangouts, etc. It was because this research required information primarily from India and meeting in person was a difficult option in the given duration. Further, contacting and engaging in person with

managers is even more difficult as they have tight schedules and hence this way of interviewing saves time. It was challenging due to the COVID-19 situation that caused unexpected delays and circumstances in the interview processes. Due to COVID-19, most of the interviewees had to manage their subordinates and other management activities from home because of which it was hard to conduct an interview as soon as they were informed. This delayed the scheduled interview process for over a month but eventually some interviewees showed keen interest in the topic and made the interviews possible. Hence, in the given situation, virtual face-to-face interviews stood out as the most efficient way of communication and data collection methods for this exploratory research of RI.

Interview Questions

The interview questions were semi-structured. Not all the respondents were asked the same questions because each case study is in a different stage of RI and is either a B2B or a B2C company hence, the questioning varied accordingly. Some questions were modified, considering the interviewees preferences to speak on the concept. Below is a concise adaptation of the question concepts (Table 2.2). About 10-15 questions were designed in accordance to the results required from the research output and they fall under the broad spectrum of the question concept mentioned in the table below. In this concept list, additional concepts were asked apart from just drivers, barriers and challenges, to cross validate some factors given in the existing theoretical studies. The motivation to use the question concept are also explained in brief alongside the question concept in the interview.

Question Concept	Case 1 – Nano	Case 2 - ChotuKool	Case 3 - Suzlon	Motivation
Respondent's idea of RI.	✓	✓	✓	Common to all cases.
Drivers and barriers in their innovation. Can it be applied to countries with similar economic situation?	✓	✓	✓	
Do they have country specific business models?	-	-	✓	Only one case has its innovation in other nations.
Biggest challenges and achievements in their journey so far.	✓	✓	✓	Common to all cases.
Did they have competition? If yes, how did they overcome it?	-	✓	✓	Tata Nano is in the first stage of RI and the innovation was discontinued.
Importance of local R&D in EEs.	✓	✓	✓	All cases are EMNEs.
Stakeholder engagement and its delivery.	✓	✓	✓	All cases have vivid and distinguished stakeholders.
Target customer base. Importance of differentiation.	✓	✓	-	Two cases are B2C firms and one case is B2B company.

Critical success factors of the innovation.	✓	✓	✓	Common to all cases.
Importance of marketing.	✓	✓	-	Being a B2B company and a first mover in its business model, they did not undergo any marketing.

Table 2.1: Interview question concept.
✓ : Represents the question concepts asked to the respondent.
- : Represents the question concepts not asked to the respondent.

Interview Protocol

- With the first mail, a 'thesis details and interview document' was sent to the respondents. It consisted of an executive summary, interview protocol and referral documents on RI. The executive summary had a brief introduction to RI, Research Background, Research Objective, Potential gain for organisations and a Research Framework for the interviewee to understand the holistic motive behind the interview.
- Every interview started with an introduction of RI, interview structure and consent to record the call via an audio-recorder.
- Interview questions were sent a week prior to the interview. The interviewees were also notified of the semi-structured nature of the interview. At the end of the interview, the respondents were asked if they had any questions related to RI or the interview.
- The interviewees were also asked for consent in order to record and transcribe the interview before the scheduled interview.

Respondent Selection

Respondents were preferred to be in the management department of all the three firms. However, due to reasons such as unavailability, privacy and security, some respondents had outright disagreed for participation. Finalized respondents hold expertise in either business model analysis and business development, customer experience department, market research, brand management, product development and technology invention. There is diversity in respondents i.e. the interview experts are associated with different departments of the company across the country and worldwide and not just within the headquarters. This varied and experienced skillset of the interviewees is beneficial in understanding RI in the innovation from the grassroot levels. RIA1.1-RIA3.2 is abbreviated for Reverse Innovation Approach and numbered from 1.1 to 3.2. There are codes given to the interviewees, where 1.1-1.2, 2.1-2.2 and 3.1-3.2 are two interviewees from Tata Motors, Godrej and Boyce Mfg. Co. Ltd and Suzlon Group, respectively.

Code	Location	Department	Role	Company
RIA1.1	Jamshedpur, (Headquarters)	Management	Manager Planning, Manager, Assistant Manager (2007-2014)	Tata Motors

RIA1.2	Mumbai, (Headquarters)	Management	Chief Technology Officer and Director of Tata Firms (2015-2019)	Tata Motors
RIA2.1	Texas, USA	Inventor	Principal Scientist (2008-2020)	Researcher (Thermoelectric chip of ChotuKool)
RIA2.2	Mumbai, (Headquarters)	Innovation Strategy, Project Management	Deputy Manager (2013-2016)	Godrej and Boyce Mfg. Co. Ltd
RIA3.1	Pune (Headquarters) and Germany	Management	Technical Head, Senior Manager, Manager, (2011-2018)	Suzlon Group
RIA3.2	Pune, (Headquarters)	Management	Chief Commercial Officer (2018- Present)	Suzlon Group

Table 2.2: Interviewees for the research.

2.2.4 Coding drivers and barriers of RI from case studies

The other part of the second phase is fulfilled by coding. This part answers sub-RQ2 of the research. Coding of non-numerical data can be complex or simple depending the type of information (Sekaran and Bougie, 2016). A type of coding for qualitative research is where the needful data is sectioned into smaller parts and assigned a name to it (Creswell, 2009).

The process of coding qualitative data has been inspired from Creswell's (2009) study. Firstly, the interviews were audio-recorded and converted to text by Sonix software. This transcribing process of converting audio interviews to text was done to assign codes that can be compared with the theoretical data. The transcripts obtained were from the audio interviews of six respondents and amongst them when there was disturbance in the audio, the audio itself was coded for quotations on Atlas.ti. The coding was compiled on Atlas.ti software after the interviews.

Atlas.ti has many features to use for an exploratory data set and one of the important features is the ability to form quotations. Quotations are nothing but the coding of a particular segment of text, audio or video. The software offers three basic ways to form quotations. They are open coding, where any code name is given to the selected quotation, in-vivo coding, where the quotation itself becomes the code, and list-coding, assigning codes from existing code lists. All the three coding techniques were used at some point in the research. However, depending on the data received, the research made more use of open coding and list coding.

2.2.5 Comparative Analysis of lists from literature with lists from case studies

The third and final phase as mentioned is to compare the results of the new factors and existing factors from literature. This part answers sub-RQ2 of the research. The codes were obtained from the interviews and now are listed with all the existing factors from the literature. A comparative

analysis here analyses in depth all the factors mentioned in literature and the factors that are new from this research. The list which is obtained from the interviews and is maintained in three sections, each section specific to the aforementioned stages of RI (refer figure 1.2).

2.2.6 Adjusted Lists and Inclusive Lists

This is the key deliverable of the research. It answers sub-RQ3 of the research. The deliverables from this research can stand as the foundation for future management models in this line of research. The results that are analysed are cross-checked from the related literature. The final analysis is lined together to form the conclusion of the research. The conclusion may help to draw recommendations from comparison of the three cases as a result of the research. This section may also help the management to refer from this study to understand influencing factors in the field of RI.

3

Literature Review

3.1 Early notions of Reverse Innovation

During the early 2000s, studies were conducted on various similar approaches related to RI after inception of the concept. Prahalad (2004), explains one such concept called trickle-up approach. Trickle-up approach is when innovation moves from the bottom to the top of the pyramid. While trickle-up innovation is necessarily required to meet the needs at the bottom of the pyramid, RI is rather to meet new or different needs that are more suitable to developing or emerging markets, regardless of income levels (Hadengue et al., 2017). An interview of Govindarajan by Euchner (2012), also discussed RI in terms of an economic pyramid saying that RI is not only about the bottom of the pyramid rather the entire population outside the top 10% of the economic pyramid. Another attempt to examine the concept was made by the study of Burger-Helmchen et al. (2013), where they described RI as another way to contest the dominant technology-push innovation model put forward by Schumpeter in 2003. Another term became very famous during the early 2000s, glocalization (Govindarajan et al., 2009; Hadengue et al., 2017). Glocalization is the combined name for the global strategy used by DMNEs, i.e., both globalization and localization. Studies show that RI and glocalization may have some correlation but there is a significant difference in the nationwide responses of these two approaches in terms of competition in mass markets within emerging economies which may overpower the degree of adoption of an innovation from one market to another (Govindarajan and Ramamurti, 2011; Seke 2017). As an attempt to differentiate amongst these concepts, one of the thorough works conducted by Zeschky, Winterhalter and

Gassmann, (2014), who define RI as one of the innovation approaches that reduces the complexity, cost of a good and cost of production, which is brought into developed markets after it is launched in emerging markets.

To summarize the brief notions related to RI, a table summarizing the existing studies with some details, such as definition of RI used, barriers/drivers, method/approach, context (developed/emerging) and other relevant information, has been attached at the section Appendix A.

3.2 Importance of Reverse Innovation

Globalization has created struggles for all firms alike and in different levels (Govindarajan and Euchner, 2012). The book by Govindarajan, Trimble and Nooyi, (2012), argues that firms cannot succeed only by innovating in emerging markets but also have to master the attempt to bring the innovation to the developed countries. von Janda et al. (2018), describe that RI approaches are beneficial in two ways. One, customer-centric innovations have the ability to enter untapped markets. Second, these innovations can also appeal to the developed markets where traditional approaches have not made a mark. Now, mostly DMNEs assume that only developed countries accept technological innovations (Simula et al., 2015). In 2004, Prahalad had mentioned some reasons for reluctance by DMNEs to innovate in emerging markets. Few reasons are, cost structures, affordability of financially challenged customers and lack of acumen to use services in EE markets. Research claims that innovation and different business models can help to make a stance in this emerging market and not simply scale the degraded versions (Zeschky, Winterhalter and Gassmann, 2014).

EMNEs have a stronger understanding of local customer needs, cost-effective product design and better distribution channels than DMNEs (Govindarajan and Ramamurti, 2011). This shows that EMNEs have a competitive advantage in their home market i.e., an emerging market, over the DMNEs. DMNEs struggle a lot with understanding the local needs and even face difficulty in gaining their trust (Govindarajan and Ramamurti, 2011). So EMNEs can thus make swift decisions by understanding local preferences and even involve in their day-today activities to maintain the trust of the customers. Another point is that even though DMNEs have technical advantage with their innovation, EMNEs have an advantage in terms of costs, such as operating costs and labour costs (Govindarajan and Ramamurti, 2011). Lack of knowledge for technical innovations may also prevent the customers from adapting these high-end products by DMNEs (Zanello et al., 2016). It comes in conjunction with financial constraints and hence this financial and technical complication may motivate manufacturers to innovate at cheaper and affordable ranges.

Govindarajan and Ramamurti (2011), classify different stages of RI and they explain the relative advantage of EMNEs in each stage. 'Winning in key emerging markets', 'winning in other emerging markets' and 'winning in developed-country markets' are the stages presented in the study of

Govindarajan and Ramamurti (2011). These stages are different mainly in the second stage of this research which is 'innovation adoption in a developing country'. The classification used in this research is slightly different from Govindarajan and Ramamurti (2011) where it discusses the relative advantage of DMNEs over EMNEs in the stages of RI. Whereas this research focuses in understanding the relative advantage between EMNEs and DMNEs. The results show that EMNEs seem to have an edge in earlier stages of innovation but during the later stages, DMNEs tend to have an upper hand. It is important because this gives an idea for EMNEs to evade competition from DMNEs in any particular stage of RI. Below is a summarized classification based on the existing studies of RI and own adaptation.

Stage/Step	EMNEs	DMNEs	Relative advantage
Stage 1 – Implementation of innovation in a developing country	• Lower cost structures of labour and operations. • Knowledge of better distribution channels. • Supply chain benefits.	• Equipped technology reservoirs. • Familiarity with several emerging markets.	✓ EMNEs • Downgraded versions by DMNEs in EEs.
Intermediate Stage – Innovation adoption in a developing country	• Better understanding of local customer needs. • Cost-effective product design for financially challenged customers.	• DMNEs deliver aspirational or high-end products.	✓ EMNEs • EMNEs have better product pricing over DMNEs.
Stage 2 – Implementation of innovation in the developed country	• Make use of different business models to implement their innovation in different countries.	• Hold a strong image of inventing technically-sound innovations. • Bigger customer base. • Brand recognition.	✓ DMNEs • EMNEs face difficulty while coping with high costs of manufacturing.

Table 3.1: EMNES vs. DMNEs- RI in its three stages. (In reference to *Stages of RI* mentioned in figure 1.2)
Sources: Own adaptation from text reference of Govindarajan and Ramamurti, 2011; von Janda et al., 2018, Seke, 2017.
✓ : Legend refers to whether EMNEs or DMNEs have a relative advantage.

3.3 Reverse Innovation and similar approaches

RI has been compared to several other approaches in parallel (Hadengue et al., 2017). This section discusses various approaches that researchers and firms have applied in their innovation schemes. It is because RI has gained popularity and there are evident clashes and differences that overshadow the original definition and purpose of the concept (Hadengue et al., 2017). Hence, a clear distinction of the approaches has to be made to understand the true essence of RI. Some approaches such as

Frugal innovation, Gandhian Innovation, Good enough innovation, Cost innovation and Shanzhai innovation have been used in conjunction with RI (Zeschky, Winterhalter and Gassmann, 2014; von Zedtwitz et al., 2015; Govindarajan and Ramamurti, 2011; Christensen, 1997; Prahalad and Mashelkar, 2010).

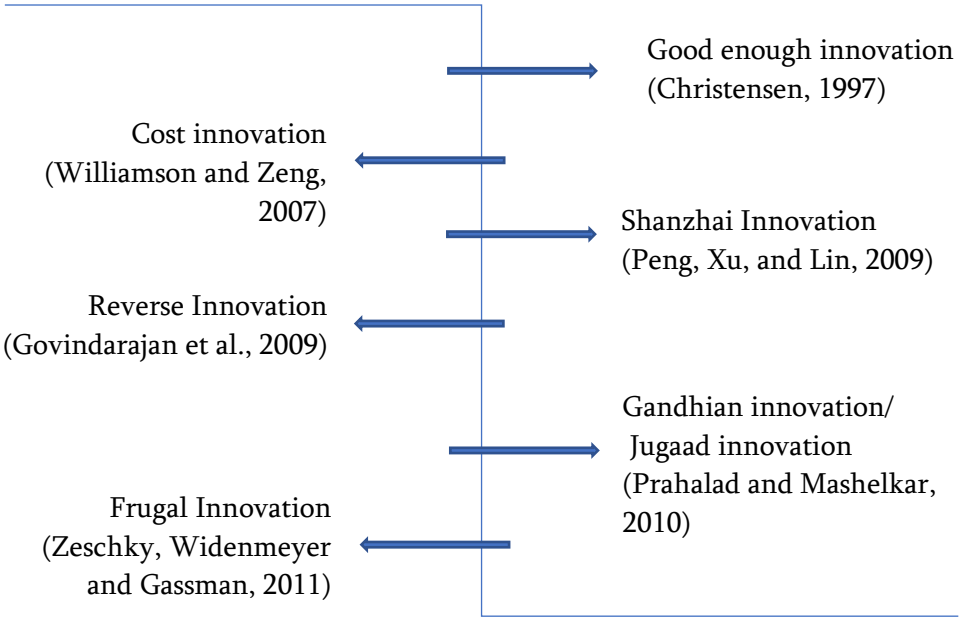

Figure 3.1: Depiction of similar innovation approaches in emerging economies over the years (1997-2011). Sources: Own elaboration based on Hadengue et al., 2017; Zeschky, Winterhalter and Gassmann, 2014; Govindarajan and Ramamurti, 2011.

FRUGAL INNOVATION

Frugal innovation has been often confused with RI or both have been considered as the same concept (Hadengue et al., 2017). However, frugal innovation which is also a raging topic in the field of innovation approaches in emerging economies, has been termed as an innovation approach where the innovations are developed only for the resource-constrained environments and not with a motive to scale it to developed countries (Zeschky, Winterhalter and Gassmann, 2014). It is also claimed that the innovations arising from frugal innovation approach have very poor product performance compared to the existing resource-constrained innovations (von Zedtwitz et al., 2015). RI however, does not innovate low-quality products but has an aim to create fundamentally varied products to meet the needs of customers (Govindarajan and Euchner, 2012). Studies have classified that RI is the frugal innovation which is transferred from developing countries to developed countries (Zeschky, Winterhalter and Gassmann, 2014, Hossain et al., 2016). For example, General Electric's portable ECG machine was first envisioned for China and India.

GANDHIAN INNOVATION

Frugal innovation has often been coined with Gandhian innovation in some research studies (Zeschky, Winterhalter and Gassmann, 2014). The term Gandhian innovation or Jugaad Innovation is the innovation developed for the Indian market specifically with a motive to meet the affordability and sustainability standards (Prahalad and Mashelkar, 2010).

GOOD ENOUGH INNOVATION

Good-enough innovation is also a similar approach to RI that falls under the category of resource-constrained environments (von Zedtwitz et al., 2015). The main motive is to meet the demands of resource constrained environments but going beyond the capital constraints (Zeschky, Widenmayer and Gassmann, 2011). Like RI, good-enough innovations also require some extent of novelty in the products (Zeschky, Widenmayer and Gassmann, 2011). But in contrast to RI, these good-enough innovations usually address the price-sensitive customers (Gadiesh, Leung and Vestring, 2007). It is one of the very few discussed innovation approaches in the research studies amongst the other approaches.

COST INNOVATION

The idea behind cost innovation in developing countries is to have innovations which are cost-effective (Williamson and Zeng, 2007). Studies also show that the various innovation strategies which used this approach circle around the costs of the innovation such as cost cutting products and cheaper solutions to the existing innovations (Ostraszewska and Tylec, 2015). Unlike RI which is referred from the market concept, cost innovation is referred from the product concept (Zeschky, Winterhalter and Gassmann, 2014).

SHANZHAI INNOVATION

Shanzhai innovation has been one of the innovations arising after the famous Shanzhai mobile phones in China (Peng et al., 2009). It is the innovation approach of innovating low-cost Chinese low-priced imitation goods of various foreign branded products (Peng et al., 2009). Shanzhai innovation makes use of the ingenuity of mixing techniques and technologies that allows Chinese businesses to delve into niches that have been popular in other markets (Peng et al., 2009).

Approach	Definition	Reference
Cost Innovation	Innovation is referred from the product concept, i.e., providing cost cutting products and cheaper solutions to the existing innovations	Williamson and Zeng, 2007
Frugal Innovation	Innovations only restricted to the resource-constrained environments and not developed countries	Zeschky, Widenmeyer and Gassman, 2011
Gandhian Innovation	Innovation for the Indian market with a specific motive to meet the affordability and sustainability standards	Prahalad and Mashelkar, 2010

Good Enough Innovation	Innovation meets the demands of resource constrained environments beyond the capital constraints and usually addresses price-sensitive customers	Christensen, 1997; Gadiesh et al., 2007
Shanzhai Innovation	Innovation of low-cost Chinese low-priced imitation goods of various foreign branded products	Peng et al., 2009

Table 3.2: Definition and references of similar RI approaches.
Sources: Own elaboration based on Hadengue et al., 2017; Zeschky, Winterhalter and Gassmann, 2014; Govindarajan and Ramamurti, 2011.

In conclusion, it can be understood that these are some innovation approaches which are similar to Reverse Innovation. The essence of these innovation approaches is to cater to the resource-constraints environments and thus the approaches hold overlapping characteristics. Even though these innovation approaches are different than RI, they have the ability to become Reverse Innovation when their innovations trickle-up to developed countries.

3.4 Drivers and Barriers of RI

3.4.1 Importance of understanding drivers and barriers in different stages of RI

For RIs to grow in emerging markets, EMNEs must innovate and not rely on exports from other developed countries (Seke, 2017). Seke (2017) also mentions that innovations by these EMNEs must be in a position to be migrated to the developed countries. It is said that firms lack knowledge on how to transfer their innovations from developing to developed countries (von Janda et al., 2018). Hence, it is important to comprehend the ways or factors by which the innovations can be implemented in developed markets and not just developing markets because only then can RI be actually successful (von Janda et al., 2018). Govindarajan and Ramamurti (2011), postulate 3 stages of RI which are similar to this research. While moving from developing to developed countries, according to this research, there are two stages and an intermediary stage. Firms can engage in all the stages of RI but they will have different positives and negatives in each stage (Govindarajan and Ramamurti, 2011). Hence, drivers and barriers can exist in any stage of RI, where the factors may or may not be different from each other and it is important to understand them for an innovation to successfully go through an RI approach.

Even though RIs may boost developing economies (Seke, 2017), not many case studies have been highlighted in research studies of RI and the acumen in these knowledge areas remain low. Both drivers and barriers of RI are loosely articulated around generic situations and most of these influencing factors go unaccounted. Studies show that firms are aware of the potential in RI approaches but most of them struggle with the process of managing these innovation types (Bryman and Bell, 2011; von Janda et al., 2018).

3.4.2 Existing literature studies on drivers and barriers in different stages of RI

In order to understand what drives and restricts RI approach in emerging countries, there have been studies that have attempted to list few factors that affect this innovation approach (Hossain et al., 2016; Govindarajan and Ramamurti, 2011; Ostraszewska and Tylec, 2015; Martin, 2018). For example, Hossain et al. (2016), list the two sets of factors that drive RI and classifies it as micro-level and macro-level factors. The first set of micro-level factors are mentioned to be, the increased cost of raw material prices due to economic downfall, and, increase in various products' retail prices due energy and transportation prices. Political turmoil and aging populations are the other two factors that have led to the demand for novel products and services that deliver more value with less input. The second set of macro-level factors mostly involves customer behaviour towards an innovation. For example, the study claims that customers are not willing enough to pay for features that are of no use to them instead they focus more on the sustainability of the innovation.

Another research study by Martin (2018), makes use of three cases in Africa to find the driving factors of RI. One of the factors from this study is poverty; a social issue, which is considered to be the driver of RI in emerging economies. However, the paper has not made clearer distinctions of other factors and claims that with the current understanding of RI it is unable to yield a particular set of factors leading to RI approach (Martin, 2018). A study lists some factors by western MNCs or DMNEs, to help create successful innovations in the developing countries which then make it easier for these innovations to traverse back to Western countries with new ways of competitive advantage (Simula et al., 2015). Hence, a holistic view of drivers for RI from the perspective of emerging economies is still not exhaustive in the literature.

While reading relevant contexts of RI for the proposed study, some knowledge gaps on barriers were also encountered. Some accounts regarding the barriers of RI did not have enough explanation on concepts such as, importance of local factors in implementing an innovation (Martin, 2018; Rowthorn et al., 2016), low records of learning outcomes from analysing failures of RI (Zanello et al., 2016) and ways to overcome the challenges in Western Markets (Zeschky, Winterhalter and Gassmann, 2014). Hence, research shows that both managers and researchers have been keen to understand the newer approach, RI (Zeschky, Widenmayer and Gassmann, 2011).

3.4.3 List with categorization of drivers from existing studies

There are some studies which particularly use the same examples of innovations used in the case studies of this research and mention its drivers. One study is by Hossain et al. (2016), where they list drivers to be- new ways of competitive advantage, reorganizing structure, re-orienting product development, marketing channels and logistics, and so on. Hossain et al. (2016) also make a distinction of drivers between ChotuKool and Tata Nano. The drivers for the former are- simplicity, portability and affordability whereas the drivers for the latter are- low cost innovation- for a low-cost market, push from headquarters, pull from potential customers.

Some studies do not however explicitly mention that these are the drivers of RI. The reason why they can be considered as drivers is because some of the factors mentioned in these studies coincide with other studies that directly label them as drivers. For example, Seke (2017), mentions local teams to be important whereas Zanello et al. (2016), directly term local R&D and teams to be positively influencing RI. Similarly, few drivers can be seen in Govindarajan and Euchner (2012), where drivers can be- meet customer needs, quality over functionality, affordability and importance of R&D in poorer countries. Immelt et al. (2009), also explain the importance of local growth teams run as separate firms, which can be seen as a driver of RI in an EE. Zeschky et al. (2014), list- process improvements, offshoring, internal knowledge transfer (developing to developed), which can be considered as drivers of RI. They also discuss that it is strategic in RI to first sense resource-constraints in emerging economies and then seize opportunity to leverage relevant customer segments in developed countries.

Similarly, there are numerous other studies which have mentioned directly the influencing factors and some have not explicitly mentioned. Further, few studies have grouped drivers into broad categories. For example, von Janda et al. (2018), have three categories of drivers of RI, namely structural drivers, cultural drivers and resource-related drivers. Each of the three again have a number of drivers within that classification.

After understanding and analysing the way literature has derived drivers of RI and categorized them, below is the grouping of these drivers by using similar adaptation from existing literature. This research has classified eight categories of drivers as the drivers of RI. They are 'business-model', 'technical', 'resource-constraints', 'economic', 'cultural value', 'social embeddedness', 'regulatory' and 'political'.

The first, *business-model* category here is the attribute for factors that are related to elements of the firm itself. This category entails factors such as 'Reorganizing firm structure', 'pre-existing brand recognition', 'marketing', and so on. These factors are considered to be a part of the business-model category because studies recall these factors as important aspects for firms to consider in order to prosper in RI approach (Zeschky, et al. 2014; Simula et al. 2015). For example, since changing or reorienting an organizational structure is an element of a firm's business model, the factor 'Reorganizing firm structure' has been placed in this category.

Technical category encompasses the factors which are related to the technical aspects of the innovation such as 'material-diffusion', 'technical knowledge', 'product development', and so on. The technological characteristics associated with an innovation are considered to be effective in channelizing RI approach (Zanello et al., 2016).

Resource- constraint factors are the ones related to innovation due to lack of material resources, financial constraints, etc. Resource scarcity is one of the drivers of RI (Simula et al. (2015), and hence is used interchangeably in this research as resource-constraints category. Studies claim that

cost constraints, financial resources, other resource-constrained environments are important drivers for RI (Martin, 2018; Burger-Helmchen et al., 2013). These factors thus can fall under the category of resource-constraints.

Economic factors are the ones whose aspects are related to being cost-effective or that requires less resources to be produced. It also includes the economic factors in the perspective of a country's development, such as 'poverty'. Factors such as 'affordability', 'social development' and other economic aspects of both customer level and country level, are placed in this categorization.

Cultural value factors entail ethics, moral beliefs and so on. It has been adapted from the study by von Janda et al. (2018), where they mention that cultural drivers are the norms and values seen in firms that undergo RI. Here 'management diversity', 'an open and flexible innovation mindset' can be clustered under the category of cultural value factors.

Social embeddedness is the depth of how firms are connected to their actors in social relationships such as the trust between customers and firms. Factors such as 'Trust and brand reputation with selected B2B customers', 'Strong commitment to local market' and so on fit into this category.

Regulatory category has factors that are related to the legal actions circulating around firms and innovations. Factors such as 'No internal resistance to expansion', 'Decentralize power' can fall into this category.

And the *political* category includes the factors which contribute to various policy decisions, laws of the state and central governments that can affect innovation. For example, 'Political turmoil' mentioned in Simula et al. (2015), can be considered as a political driver to an innovation. 'Recession' can also bring about RI and hence can be considered to fall in this category.

So, in this research the drivers have been categorized upon inspiration from existing studies (Govindarajan et al., 2012; Gwarda, 2016; von Janda et al., 2018; Govindarajan and Euchner, 2012; Simula et al., 2015) and since they cater to only a few categories, the rest of the categories are built upon logical reasoning whose definitions are explained above. The table 3.3 below, consists of the categorization of drivers into 8 aforementioned categories. The codes seen in the table have been noted down with initials of the categories the drivers fall into. Also, the overlapping drivers are coded with the same number alongside the initials so that they can be grouped as one.

AUTHOR	DRIVERS (FROM LITERATURE)	CODE	CATEGORY
Govindarajan and Euchner, (2012).	Understand and meet customer needs	SE1	Social Embeddedness
	Quality over functionality	E1	Economic
	Affordability	E2	Economic
	Importance of R&D in poorer countries	B1	Business-model

Immelt et al., (2009).	Local Growth Teams run as separate firms	B1	Business-model
Zeschky et al., (2014).	Internal knowledge transfer (developing to developed)	T1	Technical
	Sense resource-constraints in EE and then seize opportunity to leverage relevant customer in DC	RC1	Resource-constraints
Hossain et al., (2016).	Reorganizing firm structure	B2	Business-model
	Re-orienting product development	T2	Technical
	Providing sales force with new settings	B3	Business-model
	Marketing channels and production facilities	B4	Business-model
	Understanding the need of customer	SE1	Social Embeddedness
	Trust and brand reputation with selected B2B customers	SE2	Social Embeddedness
	High-end material diffusion into developed countries (global diffusion)	T3	Technical
	State-of-the-art technologies upon diffusion (global diffusion)	T3	Technical
	ChotuKool- Simplicity Portability	T4	Technical
	ChotuKool- Affordability	E2	Economic
	Nano- Lost cost innovation- for low cost market Push from headquarters, pull from potential customers Low price- USP	E2	Economic
Martin, (2018).	Need for new technologies	T3	Technical
	Glocalization- Innovations that suit local market and helps in reaching economies of scale	B5	Business-model
	Poverty and alleviation of its impacts	E3	Economic
	Strong and established partners	B6	Business-model
	Loose firm regulations aid innovations	RE1	Regulatory
	Infrastructure constraints	RC2	Resource-constraints
Simula et al., (2015).	Raw material prices	B7	Business-model
	products' retail prices	B7	Business-model
	aging populations	E4	Economic
	Political turmoil	P1	Political
	cost awareness in customers	SE3	Social Embeddedness
	social development	E5	Economic
	Poverty reduction	E3	Economic
	Resource scarcity	RC3	Resource-constraints
	Technological advancements in innovations	T3	Technical
	Global community networks within customers	SE4	Social Embeddedness
Govindarajan and Ramamurti, (2011).	Local technology reservoirs	B1	Business-model
	Pre-existing brand recognition	SE2	Social Embeddedness
	Familiarity with several other emerging markets	B5	Business-model
	Customer intimacy	SE1	Social Embeddedness
	Flair for low-cost solutions	E2	Economic
	Clean slate approach because of fewer prior investments	B8	Business-model
	Strong commitment to local market	SE5	Social Embeddedness
	Access to local resources and capabilities	B1	Business-model
	Patient capital (also known as long-term capital)	B9	Business-model
	Product pricing and features better suited to emerging markets	B7	Business-model
	Positive FDI Spillovers- helping upgrade local competitors, suppliers, and customers	B10	Business-model
	Leapfrogging legacy technologies to frontier technologies	T5	Technical

Gwarda-Gruszczyńska, (2016).	Local resources	B1	Business-model
	Support from global technology	B7	Business-model
	Decentralized power in firms	RE2	Regulatory
	Experimental and risk-taking behavior of firms	C1	Cultural Value
	Frugal, functional, good-enough quality products	E1	Economic
	clean-slate innovation (also known as from scratch innovation)	B2	Business-model
	low-price, high-volume orientation	E2	Economic
	customer-centric, market-back approach	SE1	Social Embeddedness
	identify customer behaviour	SE1	Social Embeddedness
	create new consumption among noncustomers	B11	Business-model
	create the market by building new core competencies	B12	Business-model
Von Janda et al., (2018).	local R&D units	B1	Business-model
	internal embeddedness of firms	C2	Cultural value
	global market screening units	B5	Business-model
	problem-based market clustering (firms clustering around areas that have key-issues)	B10	Business-model
	management diversity	C3	Cultural value
	an open and flexible innovation mindset	C1	Cultural value
	value innovation (innovations that offer superior value)	T3	Technical
	legal and regulatory know-how	RE3	Regulatory
	product adaptation ability (products that have the ability to adapt to value innovations)	T5	Technical
	lobby management (to ensure that innovations are not suppressed by competitors or other stakeholders)	B13	Business- model
Zanello et. al, (2016).	internal R&D activities	B1	Business-model

Table 3.3: Categorization of drivers of RI.
Sources: Own elaboration based on Govindarajan et al., 2012; Gwarda, 2016; Von Janda et al., 2018; Govindarajan and Euchner, 2012; Simula et al., 2015.

3.4.4 Grouping of overlapping drivers from existing studies

From the list of drivers from literature (table 3.3), the next step was to club all the drivers and the other overlapping drivers together under a category to understand the total drivers that can be interpreted from the literature (refer table 3.4).

There are 13 drivers under the category of business-model. These drivers are 'local R&D', 'modify organization structure', 'Providing sales force with new settings', 'Marketing channels and production facilities', 'Glocalization in EE', 'strong external stakeholders', 'product-pricing', 'clean-slate approach', 'patient capital', 'positive FDI spillovers', 'Consumption among noncustomers', 'Build new core competencies', 'lobby management'. The factor 'Local R&D' has been added because some papers talk of how having a local R&D would aid RI (von Janda et al., 2018; Zanello et al., 2016) and some mention it to be established as different local organisation unit altogether (Immelt et al., 2009; Govindarajan and Euchner, 2012). But both emphasize the importance of R&D in an emerging economy. 'Clean-slate approach' which means starting an innovation from scratch and 'modify organization structure' are attributes of an organization hence have been added in this category. 'Glocalization in EE', has been strongly used in research where it is an important feature

in an organization. Factors such as 'strong external stakeholders', 'product-pricing', 'positive FDI spillovers', 'new salesforce settings', 'build new core competencies' and 'marketing' have all been considered as attributes of a business- model (Zott et al., 2011). Other factors such as 'Create consumption among noncustomers' has been considered as a business model because the term speaks of new ways of innovation and 'patient capital' is basically making a long-term capital so it is also attributed with business-model category.

There are 3 drivers under cultural value, Experimental and risk-taking behaviour', 'Firm's internal embeddedness' and 'Diversity in management structures and decision'. 'Firm's internal embeddedness' emphasizes the relationships and the networking of employees amongst themselves and other internal stakeholders. They fall in this category because it is an internal behavior of the firm pertaining. 'Experimental and risk-taking behaviour' and 'diversity in management structures' are cultural values related to the behavior of the firm's personnel.

There are 5 economic factors namely 'Quality over functionality', 'Affordability', 'Poverty', 'Aging population' and 'social development'. Factors such as 'quality over functionality', 'affordability' and 'social development' all comply with the definition of economic category in this research. 'Poverty' is an economic factor because it has been considered that the reduction in poverty can serve as a driver to RI approach. The factor 'Aging population' is put under this category because the economic category in this research includes both the economic factors of an innovation such as affordability and economic factors of the country, such as poverty reduction. Simula et al. (2015), mention 'Aging populations' the reasons to create precarious positions in the economy and hence may be a driver of RI.

There are 3 resource constraints drivers of RI here. The factors are 'Leverage opportunity with the resource constraints', 'Infrastructure constraints', 'Resource scarcity'. These factors mean the lack of physical infrastructure, material resources, etc., for an innovation hence can be termed are resource-constraints.

There are 5 technical drivers of RI. The factors are 'Knowledge transfer', 'Re-orienting product development', 'High-end material and technology diffusion', 'Leapfrogging to frontier technology', 'Product adaptation ability'. 'Leapfrogging to frontier technologies' can be seen as a driver in some cases where there is a need for new technologies in the market because other countries have already reached or are using advanced technologies. Govindarajan and Ramamurti (2011), mention the importance of leapfrogging for RI and cites the example in switching from no telephones to wireless technologies for communication in African countries. For 'product adaptation ability', Von Janda et al. (2018), explain the importance of firms' potential to adapt to earlier innovations, according to market requirements for RI to prosper.

There are 3 regulatory drivers of RI. The factors 'Loose firm regulations aid innovations', 'Decentralization of power' and 'International rules and regulations' are placed in this category.

These factors deal with regulations and firm's policies in terms of innovations. Lenience and decentralized policies in the firms enables more innovations to arise (Martin, 2018).

There is 1 political driver namely 'Political turmoil'. Simula et al. (2015), mention that during political agitation or crisis, it leads to new needs in the market by the public. This means there will be a need for more valuable products over expensive possessions. Hence political turmoil can act as a political driver of RI.

There are 5 social-embeddedness drivers of RI. 'Identify customer needs', 'Trust with customers', 'Cost awareness', 'Global community networks', 'Commitment to local market'. All these factors mention the firm's relationships with its customers as a whole. The way in which these actors' relationships are maintained is discussed from these factors.

OVERLAPPING DRIVERS	DRIVERS	ADJUSTED CODE	CATEGORY
Local Growth Teams run as separate firms, Local resources, local R&D units, Importance of R&D in poorer countries, Local technology reservoirs, Access to local resources and capabilities, R&D units, local, internal R&D activities,	Local R&D	D-BM1	Business-model
Reorganizing structure	Modify organisation structure	D-BM2	
Providing sales force with new settings	New salesforce settings	D-BM3	
Marketing channels and production facilities	Marketing channels and production facilities	D-BM4	
Glocalization, build new global growth platforms based in emerging markets, global market screening units, Familiarity with several emerging markets,	Glocalization in EE	D-BM5	
Strong and established partners, Support from global technology,	Strong external stakeholders	D-BM6	
Raw material prices, products' retail prices, Product pricing and features better suited to emerging markets,	Product-pricing	D-BM7	
Patient capital	Patient capital	D-BM8	
From scratch innovation approach, Clean slate approach because of fewer prior investments, clean-slate innovation	Clean-slate approach	D-BM9	
Positive FDI Spillovers, problem-based market clustering	Positive FDI Spillovers	D-BM10	
create new consumption among noncustomers	Consumption among noncustomers	D-BM11	
create the market, build new core competencies	Build new core competencies	D-BM12	
lobby management	lobby management	D-BM13	

Experimental and risk-taking behavior of firms, an open and flexible innovation mindset	Experimental and risk-taking behaviour	D-C1	
internal embeddedness of emerging market business units	Firm's internal embeddedness	D-C2	
management diversity	Diversity in management structures and decisions	D-C3	
Quality over functionality, Functional and technological qualities, Frugal, functional, good-enough quality products, low-price, high-volume orientation,	Quality over functionality	D-E1	Economic
Affordability, Lost cost innovation-for low cost market, push from headquarters, pull from potential customers, Low price- USP, Flair for low-cost solutions, frugal,	Affordability	D-E2	
Poverty, economic development	Poverty	D-E3	
Aging populations	Aging population	D-E4	
social development	social development	D-E5	
Sense resource-constraints in EE and then seize opportunity to leverage relevant customer in DC,	Leverage opportunity with the resource constraints	D-RC1	Resource-constraints
Infrastructure constraints	Infrastructure constraints	D-RC2	
Resource scarcity	Resource scarcity	D-RC3	
Internal knowledge transfer (developing to developed)	Knowledge transfer	D-T1	Technical
Re-orienting product development,	Re-orienting product development	D-T2	
High-end material diffusion into developed countries (global diffusion), State-of-the-art technologies upon diffusion (global diffusion), Need for new technologies, Technological advancements, value innovation,	High-end material and technology diffusion	D-T3	
Leapfrogging legacy technologies to frontier technologies	Leapfrogging to frontier technology	D-T4	
Simplicity, Portability, product adaptation ability,	Product adaptation ability	D-T5	
Loose firm regulations aid innovations	Loose firm regulations aid innovations	D-RE1	Regulatory
Decentralized power in firms	Decentralization of power	D-RE2	
legal and regulatory know-how	International rules and regulations	D-RE3	
Political turmoil	Political turmoil	D-P1	Political
Meet customer needs, Understanding the need, Customer intimacy	Identify customer needs	D-SE1	Social Embeddedness
Trust and brand reputation with selected B2B customers, Pre-existing brand recognition	Trust with customers	D-SE2	
Cost awareness	Cost awareness	D-SE3	

Global community networks within customers	Global community networks	D-SE4	
Strong commitment to local market	Commitment to local market	D-SE5	

Table 3.4: Categorization of overlapping drivers into a final list.
Sources: Own elaboration based on Govindarajan et al., 2012; Gwarda, 2016; Von Janda et al., 2018; Govindarajan and Euchner, 2012; Simula et al., 2015.
Highlighted text: Not placed in the different stages of RI classification in table 3.5.

3.4.5 Classification of literature drivers in different stages of RI

	LITERATURE DRIVERS							
	Business-model	Cultural Value	Economic	Resource-constraints	Technical	Regulatory	Political	Social Embeddedness
STAGE 1	• Local R&D • Clean-slate approach • Positive FDI Spillovers • Strong external stakeholders • Glocalization in EE	• Experimental and risk-taking behaviour • Firm's internal embeddedness	• Social development • Poverty • Quality over functionality • Affordability	• Resource scarcity • Infrastructure constraints	• High-end material and technology diffusion • Patient capital • Value innovation • Product adaptation ability	• Decentralization of power • Loose firm regulations aid innovations		• Identify customer needs • Trust with customers • Global community networks • Commitment to local market
INTERMEDIATE STAGE	• Positive FDI Spillovers • Strong external stakeholders • Glocalization in EE	• Experimental and risk-taking behaviour • Firm's internal embeddedness	• Social development • Poverty • Quality over functionality • Affordability		• High-end material and technology diffusion • Leapfrogging to frontier technology • Product adaptation ability	• Decentralization of power • Loose firm regulations aid innovations		• Global community networks • Trust with customers
STAGE 2	• Product-pricing • lobby management • Build new core competencies	• Experimental and risk-taking behaviour • Diversity in management structures	• Aging population	• Leverage opportunity with the resource constraints	• High-end material and technology diffusion • Knowledge transfer	• International rules and regulations	• Political turmoil	• Cost awareness • Trust with customers

Table 3.5: Classification of literature drivers in different stages of RI.
Sources: Inspired from referred literature studies.

Above is the classification of drivers into stages (table 3.5) inspired from the literature. Simula et al. (2015), mention drivers to be beneficial in different stages of RI. For example, 'political turmoil' has been mentioned as a driver of RI when the innovation has reached the developed country. Likewise, Govindarajan also explain the importance of various factors in different stages of RI. For example, 'clean-slate approach' has been mentioned to have been beneficial in early stages of RI which is

analogous to stage 1 of RI in this research. However, few factors in table 3.4 have not been classified into different stages of RI. It is due to the fact that it is not clear in studies which stage would these factors best fit into. They are highlighted in grey ( ) in table 3.4 and are 'Modify organisation structure', 'New salesforce settings', 'Marketing channels and production facilities' and 'Re-orienting product development'. These factors have not been clearly mentioned in the existing studies as to which stage can it either best fit into or if they fit into all the stages of RI. From literature studies, it also appears that there are no political drivers in stage 1 and intermediate stage of RI. This could be due to the fact that firms have an advantage to transfer innovations to a developed country when it is undergoing an economic recession or other political downfall. Further, there are no resource-constraints in intermediate stage because the it is due to the resource-constraints that the innovation was first envisioned and implemented in the economy. The drivers of resource-constraints can thus be experienced in the first stage of RI.

3.4.6 List with categorization of barriers from existing studies

As the concept of RI is growing, it is important to investigate the obstacles faced in the RI process (Rowthorn et al., 2016). From Seke, (2017), two factors can be seen as barriers of RI, one is still using old organisational structures and the other one is using legacy manufacturing methods. Shortages of technology and talent, operating from different business environments, limited venture capital and state support, Nano- universal safety standards and ChotuKool- lower-end technology are considered as barriers of RI by Hossain et al. (2016). Rowthorn et al. (2016), state few barriers of RI in health sectors in the USA, which are reimbursement, work challenges and international licenses. These can be considered as barriers in terms of international issues. Similarly, von Janda et al. (2018), mention a few political and regulatory barriers, namely political activities, resistance in transferring innovations across market borders and attracting a tough audience as some barriers of RI.

Zero-based innovation in foreign market, subsidiary access to firm's global technology, risk of cannibalization are barriers mentioned by Govindarajan and Ramamurti (2011), and some barriers are explicitly mentioned for DMNEs using RI, such as familiarity trap, complacency trap and competency trap which are not mentioned in this study because this study is from the perspectives of EMNEs.

Zanello et al. (2016) mention a few obstacles in the RI approach, namely, foreign investment contributes only to static industry capabilities, lack of the right technology in emerging economies and so on. They also mention that most obstacles circulate around current economic situation in emerging economies. Below is the categorization of barriers yet into 8 categories by using similar adaptation from drivers (table 3.3 and table 3.4). It is because the barriers almost correlated to the definitions of the categories used earlier to demarcate the drivers. However, there can be few ambiguities which will be discussed later in the results chapter.

AUTHOR	BARRIERS (FROM LITERATURE)	CODE	CATEGORY
Seke, (2017).	Old organisational structures	BM1	Business-model
	Legacy manufacturing methods	T1	Technical
Hossain et al., (2016).	Shortages of technology, and talent	T2	Technical
	Operating from different business environments	BM2	Business-model
	Limited venture capital and state support	RC1	Resource-constraints
	Nano- universal safety standards	T3	Technical
	ChotuKool- lower-end technology	T2	Technical
Martin, (2018a).	Unfavourable policy environment	P1	Political
	High labour costs	E1	Economic
Govindarajan and Ramamurti, (2011)	Zero-based innovation in foreign market	BM3	Business-model
	Risk of cannibalization	BM4	Business-model
	Negative FDI Spillovers- crowding out local firms suppressing local technologies.	BM5	Business-model
Von Janda et al., (2018).	Political activities	P1	Political
	Attracting tough audience	BM6	Business-model
Zanello et al., (2016)	foreign investment contributes only to static industry capabilities	BM7	Business-model
	lack of the right technology in emerging economies	T2	Technical
	firm size	BM8	Business-model
	lack of communication technologies- barrier to knowledge diffusion	T2	Technical
	cultural and linguistic distances	C1	Cultural Value
	level of corruption	P2	Political
Gwarda-Gruszczyńska (2016).	Cost conscious customers	E2	Economic
	Incomplete regulatory systems	RE1	Regulatory
Rosenström and Sommer, (2016).	Cannibalization of products within the same market	BM4	Business- model
	Mismatches in cultural settings regarding miss trust	C2	Cultural value

Table 3.6: Categorization of barriers of RI.
Sources: Own elaboration based on Von Janda et al., 2018; Rowthorn et al., 2016; Govindarajan and Euchner, 2012; Govindarajan et al., 2012; Simula et al., 2015; Gwarda, 2016.

3.4.7 Grouping of overlapping barriers from existing studies

Below is the grouping of the repetitive or overlapping drivers into the same 8 categories as shown in the previous table 3.6, by using similar adaptation from existing literature. The eight categories are 'business-model', 'technical', 'resource-constraints, 'economic', 'cultural value', 'social embeddedness', 'regulatory' and 'political'. All the barriers however do not fit into all the 8 eight categories.

There are 8 barriers in the *business-model* category. They attribute to factors that are related to firms itself such as partnerships with vendors, investors, organizational structures, etc. 'Old organisational structures', 'risk of cannibalization', 'attracting tough audience', and 'static industry

capabilities' are directly and indirectly attributed to a business-model (Zott et al., 2011). A barrier 'operating from different business environments' has been added in this category because it means that dealing in various business contexts is quite demanding and are often yielded to pressures (Hossain et al., 2016). The factor 'negative FDI spillovers' are termed when crowding out of local firms takes place and when technology suppresses other local technologies (Govindarajan and Ramamurti, 2011). 'Zero-based innovation in foreign market' is considered under this category because this factor can be posed as an obstacle while the innovation is transferred to another market. For example, it is challenging to use the same price structures of a home country in a different country. Hence, it is considered important to innovate with newer ideas and provide new schemes that can be implemented in other countries as well without being subjected to competition and backlash from customers. The factor 'Cannibalization' in terms of innovation is when a product is succumbed by its own earlier products or similar products in the market. In this context, it is the fear of cannibalization that provokes EMNEs to innovate in a RI approach. If there is a low fear of cannibalization then firms may be relaxed and will not upgrade its own innovations and by the time they tend to upgrade or bring new innovations, other advanced firms may take over the market.

There are 2 barriers in the *cultural value* category. It entails linguistic issues, cultural differences, firms' value, behavior and other behavioural aspects associated within a firm. 'Organisational cultural values' and 'Mistrust' are the two factors in this category. It means that mistrust amongst employees within different firms and also different countries. Further, cultural settings also play a substantial role in defining how employees react and function in a firm.

There are 2 *economic* factors in this category. These barriers are related to costs such as operational costs, labour costs, and other factors related to the economic situation of the firm and its customers. 'Labour costs' and 'Cost conscious customers' fall in this category. The labour costs are extremely high in developed countries than in developing countries. For India specifically, the labour costs are low which is also exploited by countries as well. 'Cost-conscious customers' can be a barrier because in the quest of providing high-end innovations to target customers the price my increase invariably. These customers are the hardest to please and to design an innovation that is economical to them.

There is 1 barrier in the *resource-constraints* category. It is 'limited funding for niches' and is contested as a barrier that is relevant with newcomers or emergent businesses in the market. Funding is very important especially for niches in the market. It is also seen in markets as to how the startups struggle with finding a right investor, seek funding from a venture capitalist and so on. As difficult as it is to get support financially for startups, SMEs, it is also quite arduous to return the monetary lending by them.

Technical category encompasses 3 barriers which are factors related to the technical aspects of the innovation such as legacy technologies, lack of satisfactory technologies, etc. The factors are 'Legacy manufacturing methods', 'shortages of technology and talent' and 'universal safety standards' which are placed in this category. For innovations to be accepted by the public there are few technical

barriers that innovations should overcome. It is because the technical aspects of the product play a crucial role in the innovation's viability. Legacy technologies on the other hand go outdated when compared to other new technologies and they do not serve high functionalities unlike the newer advanced technologies.

There is 1 *regulatory* barrier in this category. It 'Incomplete regulatory systems' as a barrier. It means that there is a threat in diffusing innovations from EE to DC without good regulatory systems. Study shows that there is a lack in such regulations systems within firms (Gwarda, 2016).

Lastly, there are 2 *political* factors in this category. It has barriers that are considered to be factors that are influenced by politics and governments. 'Political activities' and 'Corruption' fall under this category as political agitation and corruption may lead to obstacles for innovations in using RI approach. For example, some new innovations in the market may face bias by other innovations because the government is in support of the other innovations. Irrespective of the new product's functionality, the generic public which is in favour of the government is aligned to using the older innovations supported by the government. Similarly, political activities such as elections or protests may lead to a lower acceptance of an innovation if the innovation is launched during the same time.

OVERLAPPING BARRIERS	BARRIERS	ADJUSTED CODE	CATEGORY
Old organisational structures	Old organisational structures	B-BM1	Business-model
Operating from different business environments	Operating from different business environments	B-BM2	
Zero-based innovation in foreign market	Zero-based innovation in foreign market	B-BM3	
Risk of cannibalization, Cannibalization of products within the same market	Risk of cannibalization	B-BM4	
Negative FDI Spillovers- crowding out local firms suppressing local technologies.	Negative FDI Spillovers	B-BM5	
Attracting tough audience	Attracting tough audience	B-BM6	
foreign investment contributes only to static industry capabilities	Static industry capabilities	B-BM7	
Firm size	Size of the firm	B-BM8	
cultural and linguistic distances	Organisational cultural values	B-C1	Cultural Value
Mismatches in cultural settings regarding miss trust.	Mistrust	B-C2	
High labour costs,	Labour costs	B-E1	Economic
Cost conscious customers	Cost conscious customers	B-E2	
Limited venture capital and state support	Limited funding for niches	B-RC1	Resource-constraints
Legacy manufacturing methods	Legacy manufacturing methods	B-T1	Technical

Shortages of technology, and talent, lack of the right technology in emerging economies, ChotuKool- lower-end technology, lack of communication technologies- barrier to knowledge diffusion	Shortages of technology, and talent	B-T2	
Nano- universal safety standards	Universal safety standards	B-T3	
Incomplete regulatory systems	Incomplete regulatory systems	B-RE1	Regulatory
Unfavourable policy environment, political activities	Political activities	B-P1	Political
level of corruption	Corruption	B-P2	

Table 3.7: Categorization of overlapping barriers into a final list.
Sources: Own elaboration based on Von Janda et al., 2018; Rowthorn et al., 2016; Govindarajan and Euchner, 2012; Govindarajan et al., 2012; Simula et al., 2015; Gwarda, 2016.

3.4.8 Classification of literature barriers in different stages of RI

Below is the classification of barriers into its corresponding RI stages (refer 1.2) upon adaptation from the literature (table 3.7). Here all the factors noted from literature have been successfully placed into each and every stage of RI. It however becomes evident that there have been no barriers found from literature that fits into the social-embeddedness category in any stage of RI. It could be due the reason that most factors that includes social relationships with the customer have been considered as drivers in literature. It could also mean that involvement and engagement of customers in RI processes is a beneficial driver of RI and should not be considered as a barrier. Further, there are no resource-constraints and regulatory barriers in stage 2 of RI. For resource-constraints as mentioned earlier, it has to be taken into consideration in earlier stages of RI which is also the innovation stage. Regulatory barriers have not been mentioned that much because most firms follow a lesser complicated regulation system if they have to undergo RI approach. It is because the innovation has to complete all stages of RI and a rigid system will not allow for much lenience in boosting innovations.

LITERATURE BARRIERS								
	Business-model	Cultural Value	Economic	Resource-constraints	Technical	Regulatory	Political	Social Embeddedness
STAGE 1	• Operating from different business environment • Risk of cannibalization • Size of the firm • Old organisational structures	• Organisational cultural values • Mistrust	• Cost conscious customers	• Funding for niches	• Legacy manufacturing methods • Shortages of technology, and talent	• Incomplete regulatory systems	• Political activities • Corruption	
INTERMEDIATE STAGE	• Risk of cannibalization • Negative FDI Spillovers • Old organisational structures • Operating from different business environments	• Organisational cultural values • Mistrust	• Cost conscious customers	• Funding for niches	• Legacy manufacturing methods • Shortages of technology, and talent	• Incomplete regulatory systems	• Political activities • Corruption	
STAGE 2	• Zero-based innovation in foreign market • Static industry capabilities • Attracting tough audience • Old organisational structures	• Organisational cultural values	• Labour costs		• Legacy manufacturing methods • universal safety standards		• Political activities	

Table 3.8: Classification of literature barriers in different stages of RI.
Sources: Inspired from referred literature studies.

4

Case Studies

4.1 Description and motivation behind choosing the three case studies

The motivation to choose these three cases is because all the innovations are in different stages of its RI lifecycle and they align with the definition and stages of RI assumed for this research (refer figure 1.2). This kind of selection aims to draw a comparative analysis of the drivers and barriers of RI through the perspectives of EMNEs. The EMNEs from the case studies are Tata Motors, headquartered in Mumbai, Godrej Group, headquartered in Mumbai, and Suzlon Energy, headquartered in Pune. These three firms have their headquarters in the same geographical location of Maharashtra, India.

Tata Nano and Godrej ChotuKool, both are B2C innovations. B2C innovations are targeted to customers directly (Kumar and Raheja, 2012). Nano is a low-cost four-wheeler car, which is an innovation under the passenger vehicle division of Tata Group. ChotuKool is a low-cost and mobile refrigeration unit, which is an innovation by Godrej Group. Suzlon, a wind-turbine manufacturer, on the other hand is a B2B innovation. B2B innovations are for other businesses such as a manufacturer or a retailer (Kumar and Raheja, 2012). Suzlon is a pioneer in terms of the turn-key model which ensures that the company itself will manufacture, install, maintain, repair and provide other services related to the wind turbine to its customer.

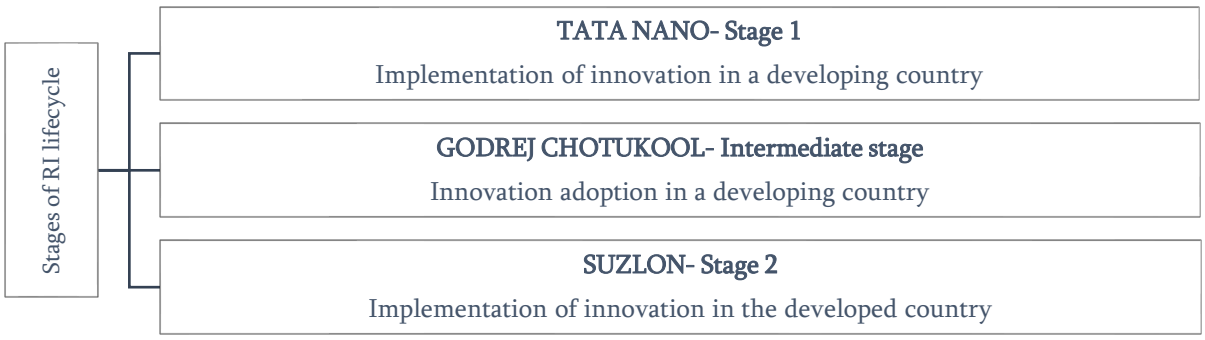

Figure 4.1: Graphical representation of the case studies in its stage of RI lifecycle.

4.2 Case Study I: Tata Motors- Tata Nano

Tata Motors, an Indian automobile manufacturer, is one the world's largest truck manufacturers. As of 2018, it stands in the second spot behind Daimler Group, A German manufacturer (TGDaily, 2018). Tata Motors, launched the Tata Nano in 2009. The Tata Nano, a flagship product of Tata Motors, then owned by Ratan Tata, was launched with a vision to appease the financially-challenged sections of India. The car is compact with a unique design, priced at only about $2500. Tata Nano became the world's most inexpensive four-wheeler ever made in the history of automobiles. Tata also planned to launch Tata Nano later in Europe and the USA.

Tata Nano was envisioned right after the success of Tata's previous innovation, Tata Ace truck, in 2005. Tata Ace came into picture right after the recession in the commercial vehicles sector in the late 90's. The truck was a huge hit in the market as nobody really thought of a four-wheeled truck until then. Tata Nano was the next project after launching Tata Ace which was intended to be an affordable passenger vehicle. All the non-essential features of a car were removed which brought down the price of the car to a great extent. Parts such as the passenger's side wing mirror, one wiper blade and other interior parts were removed. The size is approximately 10 feet long which is unconventional to the other four-wheelers on road in India. It is a compact car that is low-cost, fuel-efficient and can easily manoeuvre on the busy road lanes in India. Tata suggests that the car has been designed to address the needs of a middle-class Indian family. In India, most motorbike riders of middle-class families have their partner in the pillion with their kids sandwiched between them. At an auto Expo, Mr Ratan Tata, had said that Nano can be seen as a "people's car", which serves families as their personal mobility vehicle. Below is the picture of the car which took about four years to be fabricated and the car was launched in the year 2009.

Figure 4.2: Tata Nano
Source: Flickr, from https://bit.ly/3gPrxjp.

However, the sales of the car subsequently dropped during the later months after its launch. The car's production ended in 2018 and hence did not reach the depths of the Indian economy. One of the issues associated with the decline of sales was in terms of delivery expectations of the customers. Statistics show the delivery of the car was delayed by 22 months from its date of booking. Additionally, Nano was aimed at the Bottom of the Pyramid but as Indian consumers are aspirational, the aspirational value was moving upwards. The general public wanted a more substantial car which also had better safety standards. An irony is seen that, families prefer riding on a two-wheeler with the mother behind the father, a child sandwiched between them and an infant on the side saddle of the mother. This is because most middle families ride a motorbike in such a manner. So, suddenly shifting from a motorbike to a car becomes a matter of aspiration. They would rather pay more and buy a better car. Nano also had a strong rival, Maruti Suzuki's Alto. Alto is an Indian car, which was preferred over Nano even though it was priced almost two-three times more than Nano.

To understand in depth, what happened in the case of Tata Nano, previous case studies on Tata Nano give few insights. A study, 'values-based product innovation-the case of Tata Nano' discusses how to manage the innovation within different phases and across the innovation lifecycle (Breuer and Upadrasta, 2017). The study shows that there were issues right from the beginning of the production and manufacturing gradually decreased. Amidst this chaos, Tato Nano did gain widespread attention but was associated with negative connotations in the news headlines; "The Little Car That Could not" (Thottam, 2011), "Stuck in Low Gear" (The Economist, 2011), "Tata's Nano, the Car That Few Want To Buy" (Bajaj, 2010). Authors, Breuer and Upadrasta (2017), mention some factors as the prime ones for the retention of the innovation in developed countries, which are relatable in the broad spectrum of factors mentioned by Govindarajan et al. (2009); infrastructure, preferences, sustainability, regulatory and performance. Additionally, it does provide insights to properly involve stakeholders in an organisation. Few factors were mentioned in studies and articles which were claimed to have negatively affected the car's lifecycle. One of it mentioned branding, denoting that Nano was an unreliable car which eventually led to negative branding. Another factor was in terms of its delivery being late and hence provides no relational value. Manufacturing was

questioned saying that the car gave a low performance. It was also termed as inefficient as three cars had caught fire. Few articles also mentioned that it lacked aspirational value as there was no association with emotions on being labelled as 'cheap'. Financial structuring was also blamed as the stated price increased over time. The car was claimed to have not been able to create a position after the audience backlash as the company failed to create a positive rebuttal. (Breuer and Upadrasta, 2017; Tybout and Fahey, 2017; Hundal and Grover, 2010).

But there still needs to be a better understanding of factors that affected the innovation in its lifecycle. The car initially was marketed extensively which caught the attention of the public but in a negative connotation. Low standards and improper marketing, as the few reasons behind Tata Nano reaching only the first stage of RI is not an elaborate interpretation in general. Since it is a breakthrough innovation there are many attributes that have not been covered in literature studies to fully understand the case of Nano. Analysing influencing factors of RI in Tata Nano may help understand the innovation better in terms of stage 1 of RI lifecycle and may serve as a reference to other ongoing or future similar innovations by EMNEs.

4.2.1 Stage in the RI approach

According to this research, Tata Nano seems to fit in the first stage of the RI cycle. Figure 1.2 shows the first stage is the innovation as 'Implementation of innovation in a developing country'. The gap between the intermediate stage and stage 1 is the level of adoption in the developing country. Tata Nano was launched in 2009 and had been in the market until 2018 after which its production ceased. The car was implemented in the country but could not advance to the intermediate stage, as assumed in this research of the RI lifecycle, i.e., innovation implementation and adoption in a developing country, due to the various reasons.

Irrespective of how the car turned out in the automobile sector, it is important to understand that Tata Nano was responsible for a new market creation (Singh and Srivastava, 2012). This market tapped the bottom of the pyramid by providing diversity in the four-wheeler segment (Singh and Srivastava 2012). Even after the car did not reach the interiors of the towns and small cities, Tata group had set up access points in interiors for test drives. They also established 'F' class showrooms, which had only one car in the showroom and hired additional men to man the showrooms (Singh and Srivastava 2012). It is thus necessary to understand the main drivers and barriers for the innovation in this stage of RI lifecycle as there may be important challenges and achievements that would enable future researchers and firms which are in the first stage of the RI cycle to refer from.

4.2.2 Interview responses on drivers and barriers of Tata Nano

The drivers and barriers of RI approach behind Tata Nano as derived from the interviews conducted in this research are diverse and elaborate.

The first respondent's idea of RI states that the innovation is already an established product in a developing country which is later implemented into different developed markets. The respondent notifies that Asian countries, such as India, Thailand, Malaysia, have a large percentage of two-

wheeler mobility and the share of this population is very large. An interesting fact of consideration is that a lot of countries, Sri Lanka, Thailand, Malaysia, India, Indonesia, etc., have three-wheeler vehicles which are not safe. They lack sturdiness, safety features and are also not energy efficient. So, one of the key drivers is termed to be safe mobility. These drivers can be applied to countries with similar economic backgrounds as there already exists a market for the three-wheeler segment. Bajaj, an Indian manufacturer had also implemented its three-wheeler in India and also in Sri Lanka with the same specifications of the vehicle. Other examples where the innovation traversed from a developing nation to a developed country is of Grameen Bank, whose presence is present in the USA which was first implemented in Bangladesh.

When it comes to the number of stage gates in the business process of Nano's journey, the respondent's department had about five to six stage gates. The respondent mentions the importance of leadership at every stage gate process and in the organization as a whole. *"The single most important or the main driver of the innovation, I would say is Ratan Tata's leadership and his desire to serve the vast majority of people who still did not have mobility. It was not only about mobility but to provide safe mobility" (Respondent 1.1, 08 May 2020).* The respondent says that for almost all manufacturing processes in every organization has different phases in the innovation process. Few are related to appearance, manufacturable drawings, technical features, etc., but what remains important is the leadership interventions at each stage. Mr. Ratan Tata himself was keen on the outcome of each stage process. This level of determination, motivation and one-on-one interaction seems a herculean task but Mr. Tata maintained it throughout the product lifecycle.

The respondent remembers that on a personal level also, the higher designation employees spent time with students who joined as trainees. "*During the starting period in the company, even at 11 o'clock in the night, they would do rounds and there were almost 10 departments. Yet they would make sure to spend atleast one-two minutes with each employee who was working in their division. This to me was very encouraging and I am sure to the rest of us. We were motivated throughout our journey" (Respondent 1.1, 08 May 2020).*

The respondent additionally shares that not just local R&D but super local R&D is beneficial with innovations as such. Local R&Ds are of tremendous importance because to maintain a balance between safety and price, a lot of low-cost materials were required which are also safe to use. *"All my vendors were not farther than half a mile from where we were put up. The industrial vehicle will go from their plant to my plant" (Respondent 1.1, 08 May 2020).* Super local R&Ds had thus reduced the cost of inventory and transportation to a big margin. Hence super local R&Ds should be preferred.

The innovation process was designed with the strategy termed as JiT, i.e., Just in Time. MIS, Manufacturing Information System, was deployed at each plant at Tata's and also at the vendors' plants in an attempt to integrate all the teams. The respondent mentions that stakeholders are on two levels, one is the customer level which includes customers and the other is the organizational level which includes vendors, employees and the company itself. All the organizational levels have

their own subgroups of logistics, manufacturing, etc., which resemble smaller organizations. Collaboration schemes were implemented to ensure that all the stakeholders within each level are managed. The respondent says that an effective collaboration with external stakeholders or partners for example, is another driver in terms of a management practice that enforces RI.

The second respondent had a slightly different version to the definition of RI. *"I rather prefer a more technical term, like segment specific innovation. I think what we are talking about when we talk about reverse innovation is the fact that you might innovate for a specific segment and that segment may be cost-conscious. However, not just cost-conscious segments but also other large-scale innovations like innovation of wind turbines for low-wind regimes in India" (Respondent 1.2, 08 May 2020).*

The respondent mentions that for a country like India, there are huge market demands in all fields, for example, the energy capacity has already been doubled from the previous numbers to this day. This increase in installed capacity also brings in a lot of jobs for the economy. The West is moving towards renewables but for a country like India, the consumption numbers go hand in hand. There is a difference in the per capita numbers of energy usage when compared to the western countries. So, an entire drift to renewables may be difficult to tackle in the future for India. The respondent gives an example of healthcare care today in India, which is about 4% of GDP spent whereas Europe is 10% of the GDP and the USA about 15% of the GDP. Hence, growth is very much needed for our scenario. Additionally, this growth resembles the accessibility of innovations to the rural parts of the country. The respondent explains that growth is needed in many such sectors such as in agriculture, water, reduction in food wastages, etc., because of which segment-specific innovation is very much important for a country like India. "*And so, what I'm trying to emphasize is that the amount of need to be met in India over the next few years is so high that innovation for India is important. This should be done in a manner that is specific to the country itself. The idea of modifying or updating existing innovations of some other market or available in some earlier era, will definitely corrupt the planet, rob the environment and will destroy the future generation" (Respondent 1.2, 08 May 2020).*

Few examples of RI in India include, Tata Motors' Tata Nano, GE's Mac-i, lullaby baby warmers, jaundice recovery lighting devices, etc. An interesting example is the lullaby baby warmers. Idea behind this innovation was that babies which are born prematurely do not have enough fat layers on their skins to keep themselves warm. This is an artificial warmer until the baby builds up the body fat. India has a high number of premature births and not everybody could afford the western market's product- giraffe baby warmers. The lullaby baby warmer was simple and was economical which could be purchased by any person from any section of the society. The respondent mentions the important thing to understand here is identifying the customer. The customer is not the baby but the nurses because they would be putting the warmer on and off the baby. So, a similar innovation named as Embrace baby warmer did not click in the market because the innovation was built in the perspective of a baby and not a nurse. Likewise, for any innovation, it is very important to identify the target customer and understand the needs of the customer before an innovation is launched in the market. The target customer should be involved in the whole innovation process.

Another point is that while innovation happens in a developing country, leveraging materials on aspects such as low-cost production, reusability, etc., shall help reduce the overall innovation costs. This can be termed as the idea of functional breakdown of innovations.

The respondent shares his personal experience with Nano. "*My father used to own a Nano and it may look small from the exterior but inside was very spacious and comfortable for four people*" *(Respondent 1.2, 08 May 2020).* The reasons for this were the small design of the wheels, the placement of the chassis and the positioning of the engine which is at the rear unlike other vehicles. Tata Nano had managed to revolutionize the price-point of the four-wheeler in India and the world. It was an affordable car which had the necessary features that is required of a four-wheeler.

"You can buy a computer or you can buy a car. Such a mentality was brought to the customers by Tata Group with its innovation of Nano" (Respondent 1.2, 08 May 2020). The respondent explains that, although the car was a revolutionary innovation, the car did have a few issues from which one can learn and look out for, when an innovation is implemented. Some of the issues were related to the positioning of the car in the market. Media termed it as the 'world's cheapest car' which could have been positioned better as 'the next generation car' or something else. But it would not have made a difference to that. One has to understand that in spite of all the pros and cons, the product must be world class meaning no compromise should be made with the innovation, whether in India or anywhere else. Respondent shares that nobody has gotten it right in terms of marketing in either RI or segment-specific innovation as the respondent calls it. It is not just about an innovation for the cost-conscious customer but also advertising it right.

Local R&Ds is very much important to penetrate markets like India in an effective manner. One issue is that Indian firms, EMNEs, do not have the clear investment minds that is required in an innovation as such. Further, meaningful R&Ds should be set up over the ones which would bring tax incentives in a particular location. Unfortunately, most firms do not comply with this and hence innovation does not seem to happen in a desired way.

"The leadership style in Tata Group is humble and has always been so" (Respondent 1.2, 08 May 2020). Respondent says that leadership can be considered as one of the important aspects of the innovation. The leadership style reflects in Nano's product and reflects in the team as well. The respondent suggests that the delegation of leadership should also be applied from lower segments in the organization which can ensure closer relationships with its stakeholders. The investors, vendors and partners should also be educated on the future of the innovation through effective leadership.

Below is the summarized list of all the drivers and barriers accounted for, by the respondents who had experience in working with Tata Group. These drivers and barriers of RI account for the first stage of RI lifecycle as mentioned earlier in the research.

TATA NANO			
Respondents	**Drivers**		**Barriers**
RIA1.1	Leadership style		Total cost of ownership
	Safety		Poor performance
	Similar economic background		Imbalance between safety and price
	Collaboration with partners		Less local vendors for economical materials
	Leadership interventions		Total cost of ownership
	Super local R&Ds		
	JiT- Just in Time		
	Interpersonal connectivity with employees		
	Leadership style		
RIA1.2	Meet huge market demands		Ethos
	Job opportunities		Poor product positioning
	Accessibility in rural areas		Low quality
	Growth in each sector		Investment needs
	Understand customer needs		Relying on Tax benefits
	Identify the right customer		Not involving customers in the innovation process
	Functional breakdown or functional teardown		Unhealthy partnerships with vendors, investors
	Live with the customer to understand their needs		
	Local R&Ds		
	Invest in technology		
	Marketing		
	Leadership		

Table 4.1: Tabular representation of drivers and barriers of RI lifecycle from Tata Nano case study.
(Coding performed in Atlas.ti.)

TATA NANO DRIVERS IN CATEGORIES								
	Business-model	Cultural Value	Economic	Resource-constraints	Technical	Regulatory	Political	Social Embeddedness
STAGE 1	• Local R&D • Leadership style • Collaboration with partners • JiT- Just in Time • Marketing	• Leadership interventions • Interpersonal connectivity with employees	• Meet huge market demands • Job opportunities • Accessibility in rural areas		• Safety • Functional breakdown • Invest in technology			• Understand customer needs • Identify the right customer

Table 4.2: Tabular representation of drivers from Tata Nano case study in categories.

TATA NANO BARRIERS IN CATEGORIES							
	Business-model	Cultural Value	Economic	Technical	Political	Social Embeddedness	Fiscal (New category)
STAGE 1	• Poor product positioning • Investment needs • Unhealthy partnerships with vendors, investors • Less local vendors for economical materials	• Ethos		• Poor performance • Imbalance between safety and price • Low quality	• Rigid governmen t	• Not involving customers in the innovation process	• Total cost of ownership • Relying on Tax benefits

Table 4.3: Tabular representation of barriers from Tata Nano case study in categories.

4.2.3 Major challenges faced by the EMNE- Tata

The challenges mentioned in this section stand different to the barriers as explained in the project scope. The outcome of some of the challenges is quite unknown. While some challenges have been overcome and the learnings are mentioned in the recommendations section in the last chapter.

One of the challenges encountered by the Tata Nano team was in shifting the plant from one location to a different geographical location within the country. A respondent mentions this challenge as one of the crucial ones because it was very difficult to deal with political issues presented in the state. The state of West Bengal is the eastern part of India whereas Maharashtra falls in the western peninsular region. Sometimes, there is a huge cultural drift in moving from one state to another and even in different cities within the state. In this situation, the plant was situated far off east now and the political traction led to the delay in production and delivery of the car. This now became a web of both technical and political challenges. The other challenge faced after the car was in the market was media-management. There were a lot of commotions associated with Nano and there were also social groups which resisted and disliked the car. This created a negative atmosphere around its fame and the media was difficult to be managed by the company in that situation. To summarize, there are typically three challenges in this RI lifecycle, technological development, political and media-management.

One of the respondents mentions that the marketing inventions should also be done timely to ensure the proper product deployment and functioning in the market. Deploying right marketing methods even with high utility products is very important. As at the end of the day, customers who look for a high utility product also want high safety and performance standards. This was missing in Tata Nano and should be present in all the innovations. It is also mentioned that a challenge in a particular innovation approach would be devising plans to take an innovation from the rural background to the urban population.

	Shifting of plants in between production

Challenges (Tata Nano)	Political resistance
	Media-management
	Timely marketing interventions
	Product transfer from rural to urban population

Table 4.4: Tabular representation of challenges faced in Tata Nano case study.
(Coding performed in Atlas.ti.)

4.3 Case Study II: Godrej and Boyce Manufacturing Co. Ltd- ChotuKool

In February 2010, the appliances division of Godrej Group, tested a low-cost refrigerator that was referred to as the lowest-priced model in the world at about $70 aimed primarily for rural areas and economically backward Indian consumers (Hossain et al., 2016). The appliance was developed for the approximate 80% of the population who did not have refrigeration systems in their vicinity and livelihoods (McDonald et al., 2016). This particular market segment was never tapped by Godrej before. The make of ChotuKool is such that it runs on a battery and has refrigerator chips without a compressor. Godrej in India, is majorly known for air conditioners, refrigerators that range from and beyond 80-300l capacity, and other home furniture. One of the breakthrough technologies incorporated in the innovation was the inexpensive thermoelectric chip that was designed according to the requirements of ChotuKool (McDonald et al., 2016).

ChotuKool was popularly known as the brainchild of Mr. Sunderraman Gopalan, former Executive Vice President of Godrej and Boyce Manufacturing Co. Ltd. The inspiration of addressing the core cooling needs of rural households was adapted from the work done by Harvard professor, Mr. Clayton M. Christensen on disruptive innovation. A unique approach was used, termed as, "jobs-to-be-done" approach, where the professor collaborated with Innosight, a management consulting firm founded by Mr. Christensen himself. This approach observed targeted customers to understand consumer behaviour (Innosight website).

The vision for the product was not to compare it with the actual refrigerator but rather sell it as a different category in the financially challenged sectors of the Indian economy. The main challenge in rural India is power shortages, lack of electrification and other issues such as cable hooking, also known as electricity theft. So, to counter these issues, ChotuKool was designed to run on battery or an inverter (Tiwari and Herstatt, 2012). Hence, Godrej ChotuKool, attracted the rest of the large section of the population that did not have access to a refrigerator. It was the perfect example for Disruptive innovation (WIPO, 2013). The company's prime concern was to create a cost effective and efficient appliance unlike what other organisations promised so far. During its inception, Godrej's ChotuKool became the only white good in India to address rural India (WIPO, 2013).

Figure 4.3: Portable Godrej ChotuKool
Source: WIPO Magazine, from https://bit.ly/32fNAvT

The picture showcased above is one of the earliest prototypes of ChotuKool. The observatory research to create this product was led by Mr. Sunderraman in rural India to learn about the daily lives of its residents. Over time the results of understanding its customers and their needs led to the assembly of the desired features of Godrej ChotuKool and hence there were different prototypes (Innosight website).

The company however did not scale Godrej ChotuKool to other countries in its decade of being in the market. Research shows that it is difficult to scale the product to developed countries as it poses a challenge in terms of local embeddedness (Hossain et al., 2016). It is seen that there is an export advantage for the product in locations with similar market conditions of developing countries (Tiwari and Herstatt, 2012). Other products and innovations by Godrej group, however, exist in Africa, Middle East, etc (Tiwari and Herstatt, 2012). Claims also exist that this innovation cannot be considered as a good for the developed market as ChotuKool is currently unable to meet the developed country's requirements (Hollensen and Raman, 2012). So, there are studies that discuss the product and innovation behind it but the key drivers and barriers behind ChotuKool particularly is less discussed (Tiwari and Herstatt, 2012; Hossain et al., 2016).

4.3.1 Stage in the RI approach

According to this research, Godrej ChotuKool seems to fit in the intermediate stage of RI lifecycle. Figure 1.2 shows the intermediate stage as 'Innovation adoption in a developing country'. Godrej ChotuKool was envisioned in 2006 and still continues to sell in the market. The product ChotuKool has been implemented and launched for Indian markets. It has been adopted in the economy and fits into this research's assumption of the intermediate stage of RI lifecycle.

ChotuKool was first envisioned for the rural areas but then eventually was sold to some urban towns and cities in some states (Tiwari and Herstatt, 2012). The company does, however, wishes to extend its base to developed countries by enhancing its existing technology (Eyring et al., 2011). Studies explain that countries with geographic and economic conditions can be the hot-spots for this product to be exported and adopted there. It is thus necessary to understand the main drivers and

barriers for the innovation in this stage of RI lifecycle as there may be important challenges and achievements that would enable future researchers and firms which are in the intermediate stage of the RI cycle to refer from.

4.3.2 Interview responses on drivers and barriers of Godrej ChotuKool

The drivers and barriers of RI approach behind Godrej ChotuKool from the interviews conducted in this research are similar and extensive. The respondents shared almost the same information and had the same idea of RI which resonates with this research. One respondent mentions that when the research of such a product was decided, the company's main concern was to see who are the people who do not have access to refrigeration systems and why could not nobody provide a solution or cater to their needs. After the company found out that most of these people lie in the Bottom-of the pyramid, the next step was to act and work according to their needs.

The first respondent states that in developing countries there is a lot of young talent pool and hence it is very likely that new discoveries and innovation happen in developing countries. Additionally, migration is observed less from emerging economies to developed countries, meaning that most engineers, researchers and other associated personnel will work from the developing country itself. The respondent added that any technically-adept innovation which solves any problem in our daily life can be ported regardless of its origin. Such is the aspect of RI in today's life. Also, problems faced by economically backward developing countries are not that different from the lower middle-class problems in developed countries. For example, cleaning drinking water is a universal problem in India, African countries and also in the USA. The purification methods are expensive in the USA but affordable solutions from developing countries can be introduced to developed countries. The respondent explains that when they were working with the idea of ChotuKool, their first approach was to find out why a financially challenged person living in rural India would want a refrigeration system. This also involved the target customers' needs to devise a product that is affordable, economical and serves the purpose. Their research explained that most rural populations buy vegetables over meat and that was the main purpose to store food. Unlike the urban population where there is a lot more need in terms of meat, cold beverages, etc. Another important finding was that since new-born babies require milk frequently, there was a large demand among newly married couples for preserving milk. Likewise, for small commercial purposes, such as a *paan-wallah*, betel-leaf seller, has a booming business in the rural as well as in the urban area. So, the *paan-wallahs* can also be the customer as they can use ChotuKool to store the *paan* which can be sold as a cool *paan* for consumption in hot summers.

Respondent quotes that few technological drivers for the innovation of ChotuKool would be portability, use of battery over electricity and smaller size. With these requirements for ChotuKool, there was an immense need for many low-cost components in India to bring down the price. All these components were possible to make in India, but the initial efforts of Indian industries were not as sophisticated or reasonable as in China. Two years later, Godrej and Boyce developed an Indian supplier who could make aluminium heat sinks as good as the Chinese counterparts, but it

took time and investment from a large conglomerate to develop that capability. "*So, local R&D effort makes a huge difference in making reverse innovation successful, otherwise we will be always following the footsteps of China in manufacturing" (Respondent 2.1, 06 May 2020).*

Respondent goes on to mention the unique selling point of ChotuKool being its portability and that it could run on batteries even by omitting a compressor. To produce an innovation as such and then to market to the desired customer base is also important. The targeted customer should know the product is for them, where to find them, where to send for repairs if any and also the guide to use the products. To achieve this motto, Godrej did a brilliant job in tapping the Indian postal system. Indian postal system is one of the largest and widely distributed postal systems in the world. The idea was as such that the postman visits remotest villages and would deliver the components so he could act as parts supplier for the refrigerator. So, using the existing channels for distribution and sales was quite an innovative way to market ChotuKool.

The respondent says that there are few explicit barriers behind selling the innovation in other western markets, both American and European markets. One barrier is the design as developed markets insist on better industrial design of the innovation. Second is that any consumer electronics sold in developed markets need to be qualified under rigorous safety standards, such as UL certified and so on. Final barrier is that developed countries have reliable electricity and they have access to already established refrigerator markets. Also, for developed markets, the technology used for ChotuKool has to be changed considerably to be sold to everyone. For example, freezing is important in western nations as there is a lot of consumption of meat which requires freezing. So, ChotuKool will basically not appeal to the consumers in the developed countries.

The respondent continues by saying that since ChotuKool was targeted for the poor households, it could not afford a huge advertising campaign. There were EMI schemes and small loans were available. The Godrej group was also successful in terms of their business models as it had a detailed market survey, to find out exactly how much cooling is needed to satisfy the basic needs. *"Make a product that the poor persons would aspire to buy, do not make a product which will be a label on their status" (Respondent 2.1, 06 May 2020).*

The second respondent quotes that the target customer was looking only for vegetables and other greens to store. This eventually gave them the understanding that the price point has to be on the lower side unlike the conventional refrigerators. There were different versions of the ChotuKool and the team constantly tried optimizing it to the desired power. Now that the ChotuKool was ready, the challenge was, how to get the product to the people. The team needed a good and effective distribution channel for the product to reach the depths of the rural population. Distribution was first targeted by using Indian postal service and this was one of the most effective means of mass distribution. Even during this pandemic, Indian postal service has been transferring money to the rural population which shows the effectiveness of the system, says the respondent.

One barrier was to shift the target customer base along with the production of different versions of ChotuKool. Difficulty lay in convincing the upper middle-class population in the importance of the product because they already had a high capacity refrigerator in their residences. A way of promotion was to advertise the product's capability to store water, beverages and snack items in their bedrooms. This did appeal to the targeted section of the society since their residences had bedrooms and guest rooms that were relatively far from the kitchen. The respondent adds that one of the major success events was the launch of the product in a music festival to attract the youth as well. They used ChotuKool to store drinks, disposable water packets and small juice bottles in the whole arena. A small promotional event followed during the concerts about the use of ChotuKool. Sending it out to the top of the pyramid and its success there had incited and increased the aspirational value of the product in the Bottom-of the pyramid also.

One of the important aspects of attracting the customer was to enable customizable designs on the skin of ChotuKool itself, inspired by different heritage art forms such as Gujarat's "Mata Ni Pachedi" design which has animated images of gods and goddesses, devotees and other followers. This allowed the customers to customize ChotuKool's skin according to their likes and beliefs. Along with digital, textile and block prints, it can also be personalized with photographs. These contemporary styles and ideas had further enhanced the aspirational value of the product.

GODREJ CHOTUKOOL		
Respondents	**Drivers**	**Barriers**
RIA 2.1	Local R&D	Unable to meet the aspirational value
	Designing according to target customer	Less economic support
	Marketing	Rigid government
	Useful and functional	Second-hand goods
	Affordability	Other low-cost manufacturing goods
	Bridging the demand and supply GAP	
	understand customer needs	
	Safety	
	Infrastructure	
	Efficient	
	Dealer-distribution model	Unable to meet the aspirational standards of the product
	Marketing	Chinese manufacturers
	Promotional events	Inability to react as per customer feedback

RIA 2.2	Finding the target customer		Differences in male and female reactions towards an innovation
	Leveraging customer sentiments		Lack of awareness on the innovation
	Extensive advertising channels		
	Lower-price points		
	Positioning the innovation in the market		

Table 4.5: Tabular representation of drivers and barriers of RI lifecycle from Godrej ChotuKool case study. (Coding performed in Atlas.ti.)

GODREJ CHOTUKOOL- STAGE 1 AND INTERMEDIATE STAGE DRIVERS								
	Business-model	Cultural Value	Economic	Resource-constraints	Technical	Regulatory	Political	Social Embeddedness
STAGE 1	• Local R&D • Bridging the demand and supply GAP • Dealer distribution model • Leveraging customer sentiments • Extensive advertising channels		• Affordability	• Infrastructure	• Efficient • Useful and functional • Safety			• Understand customer needs • Finding the target customer
INTERMEDIATE STAGE	• Bridging the demand and supply GAP • Dealer distribution model • Leveraging customer sentiments • Extensive advertising channels		• Affordability		• Efficient • Useful and functional • Safety			• Understand customer needs • Finding the target customer

Table 4.6: Tabular representation of drivers from Godrej ChotuKool case study in categories.

GODREJ CHOTUKOOL- STAGE 1 AND INTERMEDIATE STAGE BARRIERS							
	Business-model	Cultural Value	Economic	Technical	Political	Social Embeddedness	Fiscal (New category)
STAGE 1				• Second-hand goods • Other low-cost manufacturing goods	• Less economic support	• Inability to react as per customer feedback	
INTERMEDIATE STAGE	• Lack of awareness on the innovation		• Differences in male and female reactions towards an innovation	• Second-hand goods • Other low-cost manufacturing goods	• Less economic support	• Unable to meet the aspirational value • Inability to react as per customer feedback	

Table 4.7: Tabular representation of barriers from Godrej ChotuKool case study in categories.

4.3.3 Major challenges faced by the EMNE- Godrej

Even in this section, the challenges mentioned stand different to the barriers as explained in the project scope. The outcome of some which have been overcome are mentioned as learnings in the later chapter.

One of the biggest challenges was the competition ChotuKool faced from the second-hand goods market. India has a huge market for buying and selling second-hand goods both online and physically as well. Second-hand refrigerators are also sold on a huge scale of platforms where buying and selling is readily done along with delivery of the product. Additional challenge was that even though ChotuKool was budget-friendly, it was close to the price of a 100l second-hand refrigerator. Despite of the label of second-hand goods, they come with a provision of a freezer, more refrigerator space, a door with a handle and an interior which lights up as one opens the door, all of which are absent in ChotuKool.

Besides this, respondent says that a product should not be marketed "only for the poor", that turns down the aspirational buyers. Just like a financially secure middle-class person may mind buying a Tata Nano, a poor person would aspire to buy a second-hand Maruti. So, he would rather buy a proper refrigerator, even though second-hand, because that is what is in the house of rich people. That would improve the customer's status in his family and among his neighbours. So, ChotuKool needs a better marketing and it fell short of performance as compared to a compressor-based refrigerator.

An important learning one respondent mentions was usage of the technology in a developing market. When the team designed and tested ChotuKool in the clean, air-conditioned laboratories, it performed very well. Now the same refrigerator in an Indian village, where it is dry and sandy, was a challenge for the product to be operational. Within a month of its working in the village, the heat sinks were clogged with dust and thus stopped performing well. A designer in developed country has not faced the amount of dust that comes from the roads in a village. A designer in an air-conditioned room does not realize the havoc caused by heat and humidity during Indian monsoon. Humidity combined with heat would cause the thermoelectric chip inside the ChotuKool engine to eventually fail. So, the challenges in developing a technology that would work under such harsh environments is much more than designing a portable fridge for someone in a developed country. So, the respondent concludes by saying that future innovations in developing countries should be organic, more in line with the realistic environment and usage.

Challenges (Godrej ChotuKool)	Realistic environment product testing
	Product transfer from developing to developed country
	Marketing
	Targeting the aspirational value
	Second-hand goods

Table 4.4 Tabular representation of challenges faced in Godrej ChotuKool case study.
(Coding performed in Atlas.ti.)

4.4 Case Study III: Suzlon Energy Ltd.

Suzlon Energy Ltd. is a manufacturer and global supplier of wind turbines, headquartered in Pune, India. It was founded by Mr. Tulsi Tanti in 1995, before which he was managing his 20-employees textile company. During that time, all the profits were offset by the expensive costs of electricity to run the textile factory. He envisioned the idea of wind energy production to provide electricity for his textile company and eventually founded Suzlon. What made Suzlon popular in the industry was its unique turn-key model. This model provides a '360-degree total solutions package' where the firm takes care of everything related to their turbines, ranging from installation, modification, maintenance, repairs, etc. Suzlon had risen to popularity in a short time and was ranked as the fifth largest wind turbine manufacturer in the world (Pradhan, 2012). Today Suzlon has presence in Asia, Australia, Europe, Africa, North and South America. It is also one of the world leaders in the production of renewable energy solutions such wind and solar energy. An interesting feature was the creation of a working space that stands as a self-sustaining corporate office, named Suzlon OneEarth.

Figure 4.4: Suzlon's wind turbines
Source: EQ International, From https://bit.ly/3iT8x5u

After the company was established, it received the first order of only 0.27 MW turbine in Dhank, Gujarat, India for IPCL, also known as Indian Petrochemicals Corporation Limited. IPCL is a public sector firm and Suzlon's management was happy with the first order as it would bring them into the national limelight. Later, the Executive Director and other higher management officials had conceptualised the idea of a wind park. This had changed the way every stakeholder, from bankers, investors to other firms, perceived Suzlon. Now Suzlon is known for the product excellence for not just one turbine but installing turbines in a park which was delivered in a stipulated time. But unlike any other innovation, the company also had its shares of ups and downs. They encountered the first highly impossible issue with Tata Group, where a wind turbine was non-functional. Tata Group had given Suzlon a 72-hour deadline to restore the same. The company took this as a challenge and restored the turbine within only 48 hours. This feat had brought trust and satisfaction to the Tata Group, which instantly placed the second order of 80MW which is 8 times more than the first order. Subsequently, the cyclone of 1998 in Gujarat, destroyed about 28 Suzlon turbines in India. Now, the company looked at it as an opportunity and promised the delivery of all the turbines within 6 months. Suzlon commissioned the turbines as promised by them which as a result brought them another order for 28 more turbines.

After a series of challenges, the first export was in the year 2003 to the United States of America, then Brazil, Germany, Netherlands, Australia, etc., and so on. It had a reach of 32 countries with more than 10,000 wind turbines. The company has also powered electricity for a population of 50 million people in the last 20 years, that is about 9000 MW in total. The company's website shows that they have 17,000 MW of wind power deployed globally as of today. The expansion scheme was well planned and well timed as mentioned by several senior officials in the press and media. The company's first acquisition was with Senvion and the later was with Hansen transmissions.

The fall of Lehman Brothers posed another operational challenge as the market had disappeared completely but Suzlon handled it tactically. Suzlon's management had to choose between holding a strong asset or to fix the capital structure permanently. The mammoth company took an instant decision to fix the capital structure permanently and completed the sale of the German subsidiary, Senvion, that was a net of approximately 980 million USD, exchange rate as of today. This decision is proudly shared by the employees who praise the management for saving the company from liquidity issues.

News, magazines and other sources of media mention Suzlon as one of the firms known for their effective delivery which is on time and strongly built on trust. It is also known for its feat in manufacturing that entails large scale production and skilled labour. This is reflected by its customers, the businesses, leaving a positive influence on the perceptions of the company. The existing literature has accounts of Suzlon's success, its emergence and other related information. However, there is not much covered in the aspects of its drivers, barriers and challenges starting from developing country to a developed country. There are also low records of how the management had to overcome the obstacles to remain in competition (Pradhan, 2012; Barad, 2013).

4.4.1 Stage in the RI approach

According to this research, Suzlon seems to fit in the second stage of RI lifecycle. Figure 1.2 shows the second stage as 'Implementation of innovation in the developed country'. Suzlon was set up in 1995 and still has a functional business. The turnkey model of Suzlon was the first of its kind in India which was also set up in other countries along with its expansion. It has been implemented and adopted in the developing country and then also further implemented in the developed country. Thus, it seems to fit into this research's assumption of the characteristics of the second stage of RI lifecycle.

With Suzlon's popularity and reach in other nations, it had adopted various manufacturing strategies for unrestricted growth in its business (Barad, 2013). Suzlon also increased its production facilities in foreign markets that has left an imprint globally. It also had made many agreements internationally with suppliers, investors, vendors, etc. (Barad, 2013). Studies have explained about Suzlon's product operations, management, its services and other related information but there are low accounts of the necessary drivers and barriers in their RI lifecycle. However, some challenges have been explicitly mentioned but its achievements and learnings from them are not clearly articulated. Understanding and analysing the list of influencing factors may help researchers and firms following a B2B perspective or innovations that have an aim to undergo RI approach.

4.4.2 Interview responses on drivers and barriers of Suzlon

The drivers and barriers of RI approach behind Suzlon obtained from the interviews of two respondents are similar and give access to a lot of new information. The respondents shared similar views but had different stories in their own ends. One respondent had a technical explanation to the questions posed whereas the other respondent had a more management perspective associated with it.

The **first respondent** mentions that Suzlon is a RI approach because Suzlon 1st entered and established the business in a developing country and then to the developed country. Suzlon had managed to learn, to earn profit and established execution proficiency. Gradually, Suzlon optimized its offering and business model once it got comfortable in its in-home market. Then it launched its business operations in developed markets. Suzlon's motivation lay in the fact that each market has its uniqueness. The company had understood well in advance that for any new start up, it cannot start from the beginning in multiple markets at the same time. The reasons for it are multiple risks associated with it and operational cash constraints. Also, that there are multiple barriers to innovations especially when it comes to renewable energy businesses. So, understanding these important points and acting accordingly had made Suzlon one of the leading Indian turbine manufacturers in India and abroad.

The respondent says that there are certain drivers behind the innovation. The first one is the demand and supply gap where there was a significant gap in the Indian consumption and the supply in the country. It is necessary to understand that Suzlon was established due to unstable energy

supply and thus Suzlon understood the demand in this particular sector. Additionally, one of the most important drivers is the policy support. Additionally, in emerging markets green-house gases, GHG, reduction drive is of utmost importance. The functionalities of Suzlon abide to Paris agreement for GHG reduction and thus is an international player without issues in the emission standards. Another driver is funding and is quintessential in this case as renewable energy business is more capital intensive and has a long operational or working capital cycle. Profitability is a driver relating to policy support due to the feed-in-tariff which is attractive to the investors and the company also maintains a good equity and debt ratio. Tax credit is also a driver because it is attractive towards high income individuals.

The respondent quotes that there is no clear answer whether these drivers can be applicable to markets of similar economic background. *"The answer is yes and no because to this there are a lot of barriers for entering into any new markets, for example, each market has its own geo-political influence on policy, government stability, motivation towards GHG reduction and all such parameters will impact the success of the renewable energy business" (Respondent 3.1, 17 May 2020).* The respondent explains that geo-political influence includes not only economic background but also geographic background such as wind resources, wind type which is either high, mid or low, weather could be cold, snow, de-icing, hot, sand protection, etc. It also depends on the occurrence of natural disasters such as typhoons and earthquakes.

Suzlon also had a good hold in land banks which have high wind resources and thus gives better IRR to the customer. Suzlon also has a well-established product development methodology that is country specific. For example, developed countries do not approve of the turn-key model as they have demand for high volumes and they want to maintain their power plant by themselves which is not in the case of India.

Few major steps explained to understand how Suzlon became successful in developed markets are discussed in this section. The respondent says that developed markets have unique features that are entirely opposite to the drivers mentioned previously. For example, motivation for reduction in GHG and having a stable government can be considered as barriers. These are general barriers for RE businesses in developed countries. However, some of the barriers are more specific for Suzlon's case. Firms cannot sustain in developed markets because of factors such as low LCoE, more competition, less economic support, high cost of execution and less margins. Further, RE businesses have long development and working capital cycles. An interesting and least accounted for barrier is forex transaction. For EMNEs of India, to run businesses in other countries is a tricky task in terms of its earning and expenditure because Suzlon has headquarters in India so its earning is in INR whereas spending is in euro or dollars.

"SWOT analysis of the Business can be- Strengths: key USP's, Weakness: Landed cost, forex, high cost of capital, Opportunity: volume market vs profit market, Threat: competition, product suitability, business model acceptance" (Respondent 3.1, 17 May 2020).

Regarding R&D, it is a question of low-cost, landed cost, product and local manufacturing footprint is much important that local R&D. Other way round, respondents say global R&D is a different aspect that is spread around the world like materials and mechanical can be seen more in Germany and software in India, etc. Global working is quite possible for R&D however, for manufacturing it should be very close to market to optimize the cost, uncertainty and risks. It is equally important to capture the VoC before each product launch along with understanding the market needs, barriers and support mechanism, both political and financial mechanisms.

"One solution does not fit all that is why a country specific business model and earning strategy is important" (Respondent 3.1, 17 May 2020). The respondent explains that in some countries when there are low margins one would like to work with volumes that are focused on top line revenue to gain the market share. However growing market share and increasing top line brings another challenge such as how to support high volume at low-cost. One strategy could be to produce a low-cost product in developing countries and sell in the developed market. The challenge to this would be in the landed cost after overseas logistics, quality risk, uncertainty of execution and long working capital cycles. Few ways to counter these barriers would be in having nearshore manufacturing facilities which need huge investment or acquisitions and other is that forex neutral finance cost that is capital in-country for developed country. *"There are two main achievements, pioneer in Turn key solution and still being the market leader in the home market" (Respondent 3.1, 17 May 2020).*

The **second respondent** says that RI works greatly in terms of business models, very obviously because business models are different. Although, the way the businesses are run, the laws, what is acceptable in the market and what is acceptable to people, are very different from country to country or even state to state within India. So, business models are the areas where the respondent has seen the greatest number of business innovations. But the respondent also mentions a significant presence of product innovations in the firm. The website also shows that the story of Suzlon which starts with the whole family trying to extend their textile business in the state of Gujarat. In the early 90s they had to struggle because the textiles industry is a very energy intensive business. They got hold of a few firms from European countries and they delivered the wind-turbine machines. The families themselves had to learn about the machines in order to install the machines. Eventually, they created a little bit of a niche for themselves in their community around them. They thought maybe others are also going through the same problem and that is how it started.

The existence of policies had also led to the ease of Suzlon's journey. The respondent says that since 1981 or 82 onwards, India has been at the forefront of alternate sources of energy. It is also a story not well-known where Indian Government is one of the few first few governments in the world to have a department for alternative energy. So, the Indian government actually pushed alternative energy because being heavily dependent on oil and oil shocks in the 70s had a huge impact on India's economy. The Ministry of Renewables was set up during early 90s and there was a visionary picture of India to be able to provide for the electricity needs on its own. Suzlon was present at the right place at the right time and policies were also created jointly between government and industry.

The respondent mentions that a lot of the local governments at that point of time had many policies dictated by the trends in Europe. Countries like Denmark and Germany were ahead of those days in terms of framing wind-friendly or renewable-friendly policies. So, the government of India learned from them in the early 90s and came up with feed-in-tariff policies and electricity under the Constitution, which is however still a concurrent subject in India.

Suzlon actually did a lot of projects in countries, some of the new territory other than India, like Brazil, as they have got low wind farms. But historically, what has happened is these countries require a lot of local knowledge. What worked in India, worked in Europe, but may not work in countries of similar economic situations. Language, policies, culture are few factors that may restrict the growth of the business in these countries. Respondent says that the challenge is that these innovative business models which succeed in one country may not translate very well to another country.

The respondent emphasizes on the importance of local R&D and how location of R&D also plays a quintessential role. *"Location and local knowledge are important aspects of RI. Innovations do not happen in isolation" (Respondent 3.2, 28 April 2020).* The respondent further explains that innovation is founded by the society itself under which it is trying to innovate by the rules and regulations and by the scenario under which the stakeholders are existing.

The respondent mentions that understanding the technology itself can be a barrier. During that time RE businesses were new and people were still venturing to gain trust in the technology. It was difficult to make the people aware of REs and to get them to let go of the mainstream technologies by investing in something that they have never seen. Trust amongst customers and all other stakeholders remains essential throughout the business cycle.

SUZLON			
Respondents	**Drivers**		**Barriers**
RIA 3.1	Local R&D		Forex transaction
	Tax credits- Attractiveness towards high income individuals		Maintain Equity and debt ratios
	Bridging the demand and supply GAP		Rigid government
	Political support		Motivation for reduction in GHG
	Funding for capital intensive market		Low LCoE (Levelized cost of Electricity)
	Safety		
	Efficient		
	Infrastructure		
	Local R&D		Poor performance

RIA 3.2	Country-specific business model		Less migration of new ideas
	Local policies		Less economic support
	Earning strategies		Lack of local knowledge
	Location		Trust
			Economic differences in society

Table 4.8: Tabular representation of drivers and barriers of RI lifecycle from Suzlon case study.
(Coding performed in Atlas.ti.)

SUZLON- STAGE 1, INTERMEDIATE STAGE AND STAGE 2 DRIVERS								
	Business-model	Cultural Value	Economic	Resource-constraints	Technical	Regulatory	Political	Social Embeddedness
STAGE 1	• Local R&D • Bridging the demand and supply GAP • Tax credits-Attractiveness towards high income individuals • Earning strategies			• Funding for capital intensive market • Infrastructure	• Safety • Efficient		• Political support • Local policies	
INTERMEDIATE STAGE	• Tax credits-Attractiveness towards high income individuals • Earning strategies			• Funding for capital intensive market	• Safety • Efficient		• Political support • Local policies	
STAGE 2	• Tax credits-Attractiveness towards high income individuals • Country-specific business model				• Safety • Efficient			

Table 4.9: Tabular representation of drivers from Suzlon case study in categories.

SUZLON- STAGE 1, INTERMEDIATE STAGE AND STAGE 2 BARRIERS							
	Business-model	Cultural Value	Economic	Technical	Political	Social Embeddedness	Fiscal (New category)
STAGE 1		• Motivation for reduction in GHG	• Economic differences in society	• Low LCoE • Poor performance • Lack of local knowledge	• Rigid government • Less economic support	• Trust	• Maintain Equity and debt ratios
INTERMEDIATE STAGE		• Motivation for reduction in GHG	• Economic differences in society	• Low LCoE • Poor performance	• Rigid government • Less economic support	• Trust	• Maintain Equity and debt ratios
STAGE 2	• Less migration of new ideas	• Motivation for reduction in GHG	• Economic differences in society	• Low LCoE • Poor performance • Lack of local knowledge	• Rigid government • Less economic support	• Trust	• Forex transaction • Maintain Equity and debt ratios

Table 4.10: Tabular representation of barriers from Suzlon case study in categories.

4.4.3 Major challenges faced by the EMNE- Suzlon

Some challenges have been overcome and the learnings are mentioned in the recommendations section in the last chapter.

Respondents mention that there are other challenges such as no more policy support that is no more FiT but more auction or open wholesale markets. It gives more uncertainty in the getting projects financed where equity and debt risk is not assured or has an uncertain cash flow. Challenges can also be seen from more mature markets or advanced technologies. Additionally, lower LCoE levels, non-profitable to OEMs, only cash risk OEMs can sustain in such markets due to very thin margins. One solution does not fit all that is why a country specific business model and earning strategy is important. However growing market share and increasing top line brings another challenge which is, how to support high volume at low cost.

Biggest challenges in 25 years of Suzlon's journey is in RI itself in moving business from developing to developed countries. Some businesses neither get enough subsidies, nor much policy support. Low motivation of investors due to uncertain cash flows and revenues stream is also a challenge. LCoE and competition are some challenges that are inescapable in the RE businesses. High cost of capital due to forex borrowing and high cost of production are other sets of challenges. The company had major learnings from some of the failed acquisitions such as Hansen Gear Box manufacturing and OEM Senvion which was formerly known as RE-Power etc.

Challenges (Suzlon)	Not having subsidies
	No strong policy support
	Uncertain cashflows and revenues
	High cost of capital due to forex borrowing
	High cost of production

Table 4.6 Tabular representation of challenges faced in Suzlon case study.
(Coding performed in Atlas.ti.)

5

Comparative Analysis

5.1 Cross-case analysis

This section aims to cross- compare all the three case studies with each other. This is to understand which factors mentioned in a case are present or not in the other case. This will help to give an idea of similarities, differences and relative occurrences of the drivers and barriers from the three different cases. Such an analysis may give rise to some unique findings regarding the relevance of factors in the three EMNEs and may dispute the findings related to the thesis topic.

5.1.1 Analysis of Tata Nano drivers with ChotuKool and Suzlon

The first analysis is of Tata Nano with the drivers of ChotuKool and Suzlon. There are about 20 drivers from Tata Nano. It can be seen that safety and local R&D are drivers common to all the three cases. It can be interpreted that for an RI the quintessential drivers can be seen as 'safety', meaning safe to use and the 'presence of local R&Ds'. Further, 'understanding customer needs' and 'marketing' are drivers common to Godrej ChotuKool. This is verified from the interviews where the respondents mentioned understanding and meeting the needs of customers as primary factors for RI to sustain. Marketing has also been mentioned as an important aspect of an innovation process because poor marketing can change the whole product perception in the market. Considering the firm's way of commercial transactions, it is known that both are B2C firms and hence it may be the reason for a greater number of matching factors between Nano and ChotuKool.

An interesting finding of Tata Nano is that during the inception of Nano, there were a lot of innovations in the market. The respondent quoted *"An important achievement was that a lot of*

patents arose with the car's production. Not just within India but also in other countries for example, a patent of a paint- based manufacturer from Germany which partnered with Tata". This shows that there was an increase in various innovations, inspired along similar lines of Tata Nano. One of the major milestones experienced in the tenure of Nano was that the company had made a position for itself in the low-cost innovations' category. Since, Godrej ChotuKool was initially targeted for the BOP market, it could be a reason why Nano has a greater number of drivers matching with ChotuKool.

	TATA NANO DRIVERS	SUZLON	GODREJ CHOTUKOOL	FINDINGS
1.	Leadership style	×	×	
2.	Safety	✓	✓	Safety and Local R&D is a driver common to all three cases.
3.	Similar economic background	×	×	
4.	Collaboration with partners	×	×	
5.	Leadership interventions	×	×	
6.	Super local R&Ds	×	×	
7.	JiT- Just in Time	×	×	
8.	Interpersonal connectivity with employees	×	×	
9.	Huge market demands	×	×	Understanding Customer Needs is a driver common with ChotuKool.
10.	Job opportunities	×	×	
11.	Accessibility in rural areas	×	×	
12.	Growth in each sector	×	×	
13.	Understand customer needs	×	✓	
14.	Identify the right customer	×	×	
15.	Functional breakdown or functional teardown	×	×	
16.	Live with the customer to understand their needs	×	×	
17.	Local R&Ds	✓	✓	
18.	Invest in technology	×	×	Marketing is also a driver common with Godrej ChotuKool.
19.	Marketing	×	✓	
20.	Leadership	×	×	

Table 5.1 Cross-case analysis of Tata Nano drivers with ChotuKool and Suzlon.

5.1.2 Analysis of Tata Nano barriers with ChotuKool and Suzlon

Unlike the other two case studies, where the factors cited were almost similar, Tata Nano's respondents had different viewpoints which gives more exposure into understanding the innovation. The respondents had different definitions of RI, however, the interpreted it in the same way.

One barrier of Tata Nano that matched with Suzlon is performance. The performance of innovation has been mentioned as a factor that determines the trust with customers. It can be noticed that both the B2B and the B2C innovations have performance of the innovation as a common factor. This could mean that for Tata to reach the international standards, one of the focus areas could have been performance. It is also inferred from the previous sections and literature that the car did have performance issues and overcoming this barrier could have let to more acceptance in the society. For example, few of the Tato Nano's caught fire and were hence termed as not having any performance value.

Tata's respondents explicitly mentioned factors such as 'not involving customers in the innovation process' and 'unhealthy partnerships with vendors' to be important barriers of RI. This is not mentioned by Suzlon's respondents which might be because it is a B2B innovation whereas Tata Nano is a B2C innovation. It can be inferred that it is crucial to maintain good relationships with customers, vendors and other stakeholders. It can also be inferred that Suzlon and ChotuKool might have overcome similar barriers to proceed onto further stages in the RI though there is not much evidence from this research method to substantiate this finding.

	TATA NANO BARRIERS	SUZLON	CHOTUKOOL	FINDINGS
1.	Economy	×	×	No common barriers with ChotuKool.
2.	Total cost of ownership	×	×	
3.	Performance	✓	×	
4.	Balance between safety and price	×	×	
5.	Vendors for economical materials	×	×	
6.	Know customer needs	×	×	
7.	Ethos	×	×	
8.	Product positioning	×	×	
9.	Safety	×	×	
10.	Low quality	×	×	
11.	Investment needs	×	×	
12.	Relying on Tax benefits	×	×	One common barrier shared with Suzlon – Performance.
13.	Not involving customers in the innovation process	×	×	
14.	Unhealthy partnerships with vendors, investors	×	×	

Table 5.2 Cross-case analysis of Tata Nano barriers with ChotuKool and Suzlon.

5.1.3 Analysis of ChotuKool drivers with Tata Nano and Suzlon

It can be seen that the drivers mentioned for Godrej ChotuKool have an equal number of common factors with both Tata Nano and Suzlon. The factors common with Nano are– Safety, Local R&D, Marketing and Understanding customer needs. The factors common with Suzlon are- are Local R&D, Bridging the demand and supply GAP, efficiency and infrastructure.

The interviewees of ChotuKool also explain that it was able to align the innovation with affordability and aspiration. One of the reasons could be that ChotuKool had involved its target customers in the innovation process. This led to understanding customers better and producing an outcome that did not come by surprise to its customers. The constant involvement of the consumer in the innovation process is advantageous since at every step their recommendations can align with the innovation as per the end user and not the designer. Additionally, unlike Nano, the marketing of ChotuKool had positive connotations associated with it. It was accepted by both the bottom and middle sections of the pyramid.

With Suzlon also, ChotuKool has some drivers in common which shows the importance of efficiency in innovation. It can be interpreted that for a technological innovation, the efficiency of

an innovation is what the customers seek for. Further infrastructure, both physical and financial, are considered to be essential driving factors of RI.

	GODREJ CHOTUKOOL DRIVERS	TATA NANO	SUZLON	FINDINGS
1.	Local R&D	✓	✓	Godrej ChotuKool and Tata Nano have the following drivers in common – Safety, Local R&D, Marketing and Understanding customer needs. Driver common between Godrej ChotuKool and Suzlon are Local R&D, Bridging the demand and supply GAP, efficiency and Infrastructure.
2.	Designing according to target customer	×	×	
3.	Marketing	✓	×	
4.	Useful and functional	×	×	
5.	Affordability	×	×	
6.	Bridging the demand and supply GAP	×	✓	
7.	understand customer needs	✓	×	
8.	Safety	✓	×	
9.	Infrastructure	×	✓	
10.	Efficient	×	✓	
11.	Dealer distribution model	×	×	
12.	Promotional events	×	×	
13.	Finding the target customer	×	×	
14.	Leveraging customer sentiments	×	×	
15.	Extensive advertising channels	×	×	
16.	Lower-price points	×	×	
17.	Positioning innovation	×	×	

Table 5.3 Cross-case analysis of ChotuKool drivers with Tata Nano and Suzlon.

5.1.4 Analysis of ChotuKool barriers with Tata Nano and Suzlon

This analysis shows that Godrej ChotuKool shares no common barriers with Tata Nano. This could mean that the barriers addressed for ChotuKool had other crucial aspects to overcome such as innovation spread in the market, competition, manufacturing, knowledge transfer in developed markets and other logistical issues. ChotuKool is already in the intermediate stage and it may not have experienced as many barriers as Tata Nano had.

ChotuKool shares two common barriers with Suzlon, which are 'Rigid Government' and 'Less economic support'. It could mean that as innovation traverses along the RI lifecycle, there may be resistance because of political issues. This could be because the innovations have been adopted by different sections of the society which are bounded by different geographical areas. Each state has its own sets of rules and regulations, laws and policies and different mindsets of political leaders.

	GODREJ CHOTUKOOL BARRIERS	TATA NANO	SUZLON	FINDINGS
1.	Aspirational value	×	×	Godrej ChotuKool shares no common barriers with Tata Nano. It shares two barriers with Suzlon – Rigid Government and
2.	Less economic support	×	✓	
3.	Rigid government	×	✓	
4.	Second-hand goods	×	×	
5.	Other low-cost manufacturing goods	×	×	
6.	Meeting the aspirational standards of the product	×	×	
7.	Chinese manufacturers	×	×	
8.	Inability to react as per customer feedback	×	×	
9.	Differences in male and female reactions towards an innovation	×	×	

10.	Lack of awareness on the innovation	×	×	Less economic support.

Table 5.4 Cross-case analysis of ChotuKool barriers with Tata Nano and Suzlon.

5.1.5 Analysis of Suzlon drivers with Tata Nano and ChotuKool

Suzlon has three matching drivers with Nano and five matching drivers with ChotuKool. It can be seen that safety and local R&D are considered to be important factors by both Nano and Suzlon. It can be inferred that these two factors are important in all stages of RI assumed in this research.

Suzlon has factors like Local R&D, Bridging the demand and supply GAP, Safety, Efficiency and Infrastructure as drivers common to ChotuKool. It can be seen that these factors match with ChotuKool which is in the intermediary stage. This might be because ChotuKool and Suzlon have reached the later stages of RI and hence they have more common factors.

	SUZLON DRIVERS	TATA NANO	GODREJ CHOTUKOOL	FINDINGS
1.	Local R&D	✓	✓	Drivers common between Suzlon and Tata Nano are Safety and Local R&D. Godrej ChotuKool and Suzlon have a few drivers in common like Local R&D, Bridging the demand and supply GAP, Safety, Efficiency and Infrastructure.
2.	Tax credits- Attractiveness towards high income individuals	×	×	
3.	Bridging the demand and supply GAP	×	✓	
4.	Political support	×	×	
5.	Funding for capital intensive market	×	×	
6.	Safety	✓	✓	
7.	Efficient	×	✓	
8.	Infrastructure	×	✓	
9.	Local policies	×	×	
10.	Earning strategies	×	×	
11.	Location	×	×	
12.	Country-specific business model	×	×	

Table 5.5 Cross-case analysis of Suzlon drivers with Tata Nano and ChotuKool.

5.1.6 Analysis of Suzlon barriers with Tata Nano and ChotuKool

Suzlon shares two common barriers with Godrej ChotuKool which are rigid government and less economic support. The respondents of Suzlon mention that having a rigid government which has poor policies may curb new innovations to be in market. The low economic support refers to the low financial support associated with the innovation. This can be an issue when the innovation is in the developed country where there are high capital costs. It can be inferred that these barriers seem to be common as they are concerned with the adoption of innovation in different geographical locations. Suzlon shares one common barrier with Tato Nano which is performance. It means that an innovation must have good performance not just in the developing country but also while moving from a developing country to a developed country, in an innovation's RI lifecycle.

	SUZLON BARRIERS	TATA NANO	GODREJ CHOTUKOOL	FINDINGS
1.	Forex transaction	×	×	Suzlon shares one common barrier with Tato Nano - Performance. It shares two common barriers with Godrej ChotuKool – Rigid Government and Less economic support
2.	Maintain Equity and debt ratios	×	×	
3.	Rigid government	×	✓	
4.	Less margins	×	×	
5.	Motivation for reduction in GHG	×	×	
6.	Low LCoE (Levelized cost of Electricity)	×	×	
7.	Performance	✓	×	
8.	Less migration	×	×	
9.	Less economic support	×	✓	
10.	Lack of local knowledge	×	×	
11.	Trust	×	×	
12.	Economic differences	×	×	

Table 5.6 Cross-case analysis of Suzlon barriers with Tata Nano and ChotuKool.

5.2 Comparison of all case study factors in different stages of RI

By referring to the earlier cross-case analysis, the factors can be placed in different stages of RI. Comparing all the case studies together in different stages of RI will give a holistic idea of influencing factors from case studies. It will also be easier to understand and compare the factors from literature which are placed in different categories and stages of RI. Both respondents of a case study have mentioned some similar drivers and barriers which are clubbed as one. For example, 'leadership' and 'leadership style' have been clubbed into one, namely 'leadership style'.

5.2.1 Classification of case study drivers in different stages of RI

It can be seen in table 5.7 that with Tata Nano, Godrej ChotuKool and Suzlon, 'local R&Ds' and 'safety' are common to all the case under stage 1 of RI. Here Tata Nano's respondents mention of not just having Local R&D but a super local R&D which is to set up R&D centres in the interior of the cities such as in villages and small towns. This is to also involve customers in the innovation process. Respondents of ChotuKool and Suzlon have also mentioned the importance of having a local R&D to ensure the effective of local resources and to understand the ground reality of the targeted customers.

In intermediate stage, there are factors such as 'safety' and 'efficient' as common factors to Godrej ChotuKool and Suzlon. This could mean that for an innovation to reach to the intermediate level of RI, safety and efficiency of the innovation are the key concerns. Alternatively, technical drivers are important for the case studies to have reached intermediate stage of RI.

In stage 2 of RI, Suzlon mentions 'country-specific business-model' which can be important in stage 2. This can be considered an important factor for firms advancing to stage 2 of RI. Further, safety and efficiency of the innovation can be considered important in all stage of RI.

CASE STUDY DRIVERS									
		Business-model	Cultural Value	Economic	Resource-constraints	Technical	Regulatory	Political	Social Embeddedness
STAGE 1	TN	• Local R&D • Leadership style • Collaboration with partners • JiT- Just in Time • Marketing	• Leadership interventions • Interpersonal connectivity with employees	• Meet huge market demands • Job opportunities • Accessibility in rural areas		• Safety • Functional breakdown • Invest in technology			• Understand customer needs • Identify the right customer
	GC	• Local R&D • Bridging the demand and supply GAP • Dealer distribution model • Leveraging customer sentiments • Extensive advertising channels		Affordability	• Infrastructure	• Efficient • Useful and functional • Safety			• Understand customer needs • Finding the target customer
	S	• Local R&D • Bridging the demand and supply GAP • Tax credits- Attractiveness towards high income individuals • Earning strategies			• Funding for capital intensive market • Infrastructure	• Safety • Efficient		• Political support • Local policies	
INTERMEDIATE STAGE	TN								
	GC	• Bridging the demand and supply GAP • Dealer distribution model • Leveraging customer sentiments • Extensive advertising channels		• Affordability		• Efficient • Useful and functional • Safety			• Understand customer needs • Finding the target customer
	S	• Tax credits- Attractiveness towards high income individuals • Earning strategies			• Funding for capital intensive market • Infrastructure	• Safety • Efficient		• Political support • Local policies	
STAGE 2	TN								
	GC								
	S	• Tax credits- Attractiveness towards high income individuals • Country-specific business model				• Safety • Efficient			

Table 5.7: Classification of drivers from three cases in eight possible categories (refer section 3.4.3).

Representation: TN-Tata Nano, GC- Godrej ChotuKool, S-Suzlon.

Now, we will look into the basis of classification of the drivers in different categories. It is to understand why drivers are placed in one category and not the other. This understanding provides relevance and importance of the drivers in different categories.

'JiT', 'Interpersonal connectivity with employees', and 'Accessibility in rural areas' of Tata Nano are in Stage 1 of RI. 'JiT' means having the required technology and acumen at a very close distance to the production site. Respondents consider it important because for big innovations or innovations that involve a lot of components should have its resources at close proximity for fast and swift procurement of the same. 'Interpersonal connectivity with employees' has been mentioned as one of the important factors by the respondents of Tata Nano. Interpersonal connectivity with the employees keeps them motivated and devoted to the end goal. 'Accessibility in rural areas' can be seen as a driver in the stage 1 of RI lifecycle because to attract the targeted rural customers, the innovation has to first reach them. 'Leadership interventions' and 'leadership style' have been mentioned by the Tata Nano respondents and are placed in stage 1. An efficient leadership style is considered important to implement stage-gates in the project lifecycle to understand where there are needful changes to be done or not. These can thus be seen as important factors in stage 1 of RI. Similarly, 'meet huge market demands' is a salient factor to capture the market in stage 1 of RI. By implementing this driver, the firm can have the first-mover advantage if the technology of the innovation is novel.

In intermediate stage of RI, ChotuKool has 'Infrastructure' as a driver which means that for an innovation to move from one country to another, the need for physical infrastructure and most importantly financial infrastructure becomes important. It could be because the infrastructure constraints are witnessed more when innovations are transferred to other states of the country and prepared to reach developed countries. It also has 'dealership-distribution model', 'leveraging customer sentiments' and 'extensive advertising channels' (can also be clubbed as marketing) as business strategies in the intermediate stage of RI. It seems relevant because of the fact that to be adopted by the targeted customer base and in the interiors of the market, the innovation has to reach the mass audience. The innovation also has to create awareness amongst its customers and one way of doing so is the dealer-distribution model.

'Understand customer needs' and 'identify right customer' are placed in stage 1 of Tata Nano and also for ChotuKool. The respondents mention that identifying customer needs and finding the right target customer is important in the initial periods of the innovation and even before the innovation is in the market. This means that these two factors are crucial in both stage 1 and intermediate stage of RI as ChotuKool is in the intermediate stage of RI.

Both ChotuKool and Suzlon have the driver 'Bridging the demand and supply GAP' which means that it can be an important factor in all stages of RI as Suzlon is in the stage 2 of RI. Other factors such as 'Country-specific business model', 'Attractiveness towards high income individuals', 'Safety' and 'Efficient', can be considered to be important factors in stage 2 of RI. It means that, for the

innovation to reach the last stage of RI, it needs to consider the elements that affect the innovation's international state of affairs.

5.2.2 Classification of case study barriers in different stages of RI

CASE STUDY BARRIERS								
		Business-model	Cultural Value	Economic	Technical	Political	Social Embeddedness	Fiscal (New category)
STAGE 1	TN	• Poor product positioning • Investment needs • Unhealthy partnerships with vendors, investors • Less local vendors for economical materials	• Ethos		• Poor performance • Imbalance between safety and price • Low quality	• Rigid government	• Not involving customers in the innovation process	• Total cost of ownership • Relying on Tax benefits
	GC				• Second-hand goods • Other low-cost manufacturing goods	• Less economic support	• Inability to react as per customer feedback	
	S		• Motivation for reduction in GHG	• Economic differences in society	• Low LCoE • Poor performance • Lack of local knowledge	• Rigid government • Less economic support	• Trust	• Maintain Equity and debt ratios
INTERMEDIATE STAGE	TN							
	GC	• Lack of awareness on the innovation		• Differences in male and female reactions towards an innovation	• Second-hand goods • Other low-cost manufacturing goods	• Less economic support	• Unable to meet the aspirational value • Inability to react as per customer feedback	
	S		• Motivation for reduction in GHG	• Economic differences in society	• Low LCoE • Poor performance	• Rigid government • Less economic support	• Trust	• Maintain Equity and debt ratios
STAGE 2	TN							
	GC							
	S	• Less migration of new ideas	• Motivation for reduction in GHG	• Economic differences in society	• Low LCoE • Poor performance • Lack of local knowledge	• Rigid government • Less economic support	• Trust	• Forex transaction • Maintain Equity and debt ratios

Table 5.8: Classification of barriers from three cases in seven possible categories. (new category- fiscal)
Representation: TN-Tata Nano, GC- Godrej ChotuKool, S-Suzlon.

From the case studies it can be seen that in stage 1 there are only few similar factors from Tata Nano and Suzlon, which are 'poor performance' and 'rigid government'. It could mean that in stage 1 of RI, political and technical factors may seem to be important. It is also validated from the respondents that in their own experience these factors seemed to play a crucial role in determining the innovation's future in the market.

There is only one common factor in intermediate stage which is 'less economic support'. This could mean that in intermediate stage, it is necessary to gain support from the public, other non-governmental organisations and political support for the innovation to penetrate in the market. For example, in case of ChotuKool, everybody in the villages were in favour of the innovation and was widely appreciated. Had there been a clash with the local political bodies or self-help groups, it could have created a negative connotation to the innovation.

The stage 2 of RI has two barriers mentioned by respondents to be of crucial importance, 'forex transaction' and 'less migration of new ideas'. These can be seen important in stage 2 because ideas and innovations arising from EEs do not always make it to the DCs and also foreign exchange comes into picture only in the international level.

Further, we will look into the basis of classification of the barriers in different categories. It is to understand why one barrier is placed in one category and not in any other category. This understanding will help to differentiate between the nature of the barriers.

'Not involving customers in the innovation process' is placed in stage 1 because it is the initial process of an innovation, i.e., in the innovation planning to launch phase. An ambiguity, however, is that it can be added in the business- model category because customer involvement can be considered a part of the business-model. 'Total cost of ownership' and 'Relying on Tax benefits' has been added in stage 1 in the fiscal category. It is because there was no substantial evidence from the research or extensive conversation on tax benefits in international markets for an innovation arising from EEs.

'Other low-cost manufacturing goods' (Chinese manufacturers- clubbed under this) is placed in technical category because firms face competition in terms of manufacturing components while fabricating the innovation. It is during fabrication of the idea that firms look out for better and efficient components. In India, the Chinese components are obtained at very low-costs and hence, they are preferred over the Indian manufacturers of the same components. This increases the Chinese goods' market value over Indian goods.

'Forex transaction' is mentioned by Suzlon. This factor it comes to picture for an Indian EMNE only when the businesses are functioning abroad which is stage 2 of RI. 'Maintain Equity and debt ratios'

and 'Motivation for reduction in GHG' are important in all the stages of RI, especially for energy-intensive businesses. It is because Suzlon's respondents were keen on mentioning that it is beneficial for the firms to maintain their debt-to-equity ratios at every stage of the innovation cycle and after every acquisition, merger or any other investment whatsoever. Further, the technical barrier of 'motivation for reduction in GHG' is appropriate in all stages of RI because firms dealing with Renewables and other technologies that can affect the environment are constantly scrutinized for their residual matter released into the environment. However, most firms do not take this into serious consideration.

There are a lot of factors which do not fit into the existing category assumption and hence a new category has been devised, namely fiscal category. This category deals with all the financial factors associated with an innovation. The factors included in the fiscal category are 'Relying on Tax benefits', 'Forex transaction', 'Maintain Equity and debt ratios' and 'Less margins' in stages of RI. Before this point, most of the factors fit into the assumed categorization and the need for a fiscal category was not felt. One factor namely, 'Differences in male and female reactions towards an innovation' has been added in economic category. However, it can be contested to be placed under either business-model or social embeddedness categories.

It can be seen that there are no barriers in two assumed categories for this research, resource-constraints and regulatory.

5.3 Case comparison with the literature findings in three stages of RI (Adjusted Lists)

This section has an analysis of all the factors from literature and case studies, combined in the different stages of RI. The reason for this comparison is to get an idea of which are the new factors from case studies and which are the factors that are pre-existing in the literature. The results will help to analyse the common factors in each phase of RI. It will also give an idea of which category factors are more prevalent than the rest in different stages of RI. In the tables of the following sections, there are factors with blue font colour. These factors in blue font are from the case studies and are added to the list of factors from the literature. The common factors are explained below in each section of different stages of RI lifecycle.

5.3.1 Adjusted list of drivers in Stage 1 of RI

	Business-model	Cultural Value	Economic	Resource-constraints	Technical	Regulatory	Political	Social Embeddedness
STAGE 1	• Local R&D • Clean-slate approach • Positive FDI Spillovers • Strong external stakeholders • Glocalization in EE • Leadership style • JiT- Just in Time • Marketing • Bridging the demand and supply GAP • Dealer distribution model • Leveraging customer sentiments • Tax credits-Attractiveness towards high income individuals • Earning strategies • Country-specific business model	• Experimental and risk-taking behaviour • Firm's internal embeddedness • Innovation mindset • Leadership interventions • Interpersonal connectivity with employees	• Social development • Poverty • Quality over functionality • Affordability • Meet huge market demands • Job opportunities • Accessibility in rural areas	• Resource scarcity • Infrastructure constraints • Funding for capital intensive market	• High-end material and technology diffusion • Patient capital • Value innovation • Product adaptation ability • Safety • Functional breakdown • Efficient • Useful and functional	• Decentralization of power • No internal resistance	• Political support • Local policies	• Global community networks • Commitment to local market • Identify customer needs • Trust with customers • Identify the right customer

Table 5.9: Adjusted list of drivers from both literature and case studies in stage 1 of RI.

In this table 5.9, it can be seen that there are many new factors from case studies which can be added to the literature studies. There are only two factors that have been exactly mentioned in literature and in the case studies as well. They are namely 'Local R&D' and 'Affordability'. Whereas there are few factors from the case studies such as 'Collaboration with partners', 'Invest in technology', 'Infrastructure' and 'Understand customer needs' that are not mentioned exactly in literature but are of the same nature. For example, 'infrastructure' and 'infrastructure constraints' can be inferred to be of the same nature.

From this table, it can be inferred that there are a greater number of drivers in the business-model category than in other categories. It could mean that firms need to focus on devising better business-strategies to be able to implement RI approach. Here the driver 'country-specific business model' has been mentioned by the Suzlon respondents which is placed in all stages of RI. However, it may be relevant only when the innovation is transferred from intermediate stage to stage 2 of RI. It can also be seen that there are no new regulatory factors from case studies. Further, there are no political drivers from literature studies.

5.3.2 Adjusted list of barriers in Stage 1 of RI

	Business-model	Cultural Value	Economic	Resource-constraints	Technical	Regulatory	Political	Social Embeddedness	Fiscal
STAGE 1	• Operating from different business environment • Risk of cannibalization • Size of the firm • Old organisational structures • Poor product positioning • Investment needs • Unhealthy partnerships with vendors, investors • Less local vendors for economical materials • Lack of awareness on the innovation • Less migration of new ideas	• Organisational cultural values • Mistrust • Motivation for reduction in GHG	• Cost conscious customers • Differences in male and female reactions towards an innovation • Economic differences in society	• Funding for niches	• Legacy manufacturing methods • Shortages of technology, and talent • Poor Performance • Imbalance between safety and price • Low quality • Second-hand goods • Other low-cost manufacturing goods • Low LCoE	• Incomplete regulatory systems	• Political activities • Corruption • Rigid government • Less economic support	• Not involving customers in the innovation process • Unable to meet the aspirational value • Inability to react as per customer feedback • Trust	• Total cost of ownership • Relying on Tax benefits • Forex transaction • Maintain Equity and debt ratios

Table 5.10: Adjusted list of barriers from both literature and case studies in stage 1 of RI.

From table 5.10, it can be inferred that there are no common factors from literature and case studies. Factors such as 'ethos', 'economic differences' and 'lack of local knowledge' can be considered factors of similar nature from literature. It can be seen that there are many new factors in the business-model and technical category as compared to other categories. It could mean that it is important to overcome technical category and busines-model category drivers to establish RI in stage 1. However, there are a greater number of business-model barriers than the rest of the categories. Factors from

case studies 'Lack of local knowledge' and 'mistrust' has been not been exactly mentioned in the literature studies but they are factors of similar context and hence can be considered the same.

It can be seen that there are more technical, business-model and social embeddedness barriers in stage 1 of RI. There seems to be very low political constraints that EMNEs undergoing RI approach may face in stage 1 of RI lifecycle. There are no regulatory and no resource-constraints barriers from case studies that can be added in the literature. Further, there are no factors from the fiscal category and social-embeddedness category that have been listed from the literature.

5.3.3 Adjusted list of drivers in Intermediate Stage of RI

	Business-model	Cultural Value	Economic	Resource-constraints	Technical	Regulatory	Political	Social Embeddedness
INTERMEDIATE STAGE	• Positive FDI Spillovers • Strong external stakeholders • Glocalization in EE • Local R&D • Bridging the demand and supply GAP • Dealer distribution model • Leveraging customer sentiments • Extensive advertising channels • Tax credits-Attractiveness towards high income individuals • Earning strategies • Country-specific business model	• Experimental and risk-taking behaviour • Firm's internal embeddedness • Leadership interventions • Interpersonal connectivity with employees	• Social development • Poverty • Quality over functionality • Affordability	• Infrastructure • Funding for capital intensive market	• High-end material and technology diffusion • Leapfrogging to frontier technology • Product adaptation ability • Efficient • Useful and functional • Safety	• Decentralization of power • No internal resistance	• Political • Local policies support	• Global community networks • Trust with customers • Understand customer needs • Finding the target customer

Table 5.11: Adjusted list of drivers from both literature and case studies in Intermediate stage of RI.

From table 5.11, it can be seen that 'affordability' has been mentioned in both literature and case studies. Further, 'collaboration with partners' and 'interpersonal connectivity with employees' have similar nature to factors in literature. Like previously mentioned, 'leveraging customer needs' can be placed in other category.

It can be seen that there are fairly lower number of overall drivers than that are present in Intermediate stage of RI. There are no regulatory drivers collected from the case studies in this stage of RI. Another finding is that there are low resource-constraints and political factors in this stage.

5.3.4 Adjusted list of barriers in Intermediate Stage of RI

From table 5.12, it can be interpreted there are no factors from literature that are exactly mentioned or are of similar nature in the case studies. All the barriers in social-embeddedness and fiscal category in this stage of RI have not been mentioned in literature so far. Moreover, there are no barriers pertaining to resource-constraints or regulatory category from the case studies.

There are more technical barriers in this stage of RI. It can be interpreted that in the first and intermediate stages of RI, more technical, political and busines-model related barriers should be overcome to aid RI for EMNEs.

	Business-model	Cultural Value	Economic	Resource-constraints	Technical	Regulatory	Political	Social Embeddedness	Fiscal
INTERMEDIATE STAGE	• Risk of cannibalization • Negative FDI Spillovers • Old organisational structures • Operating from different business environments • Lack of awareness on the innovation • Less migration of new ideas	• Organisational cultural values • Mistrust • Motivation for reduction in GHG	• Cost conscious customers • Differences in male and female reactions towards an innovation • Economic differences in society	• Funding for niches	• Legacy manufacturing methods • Shortages of technology, and talent • Second-hand goods • Other low-cost manufacturing goods • Low LCoE • Poor performance • Lack of local knowledge	• Incomplete regulatory systems	• Political activities • Corruption • Less economic support • Rigid government • Less economic support	• Unable to meet the aspirational value • Inability to react as per customer feedback • Trust	• Forex transaction • Maintain Equity and debt ratios

Table 5.12: Adjusted list of barriers from both literature and case studies in Intermediate stage of RI.

5.3.5 Adjusted list of drivers in Stage 2 of RI

It can be seen in table 5.13, that are no common drivers from literature that are also observed from the case studies. 'Understand customer needs' is a factor from case studies that is mentioned in

literature which is of similar nature. For example, 'Strong external stakeholders' have been interpreted as the same factor. However, there are no new factors in the resource-constraints, regulatory and political category.

In all the stages of RI, business-model factors are more in number than the other category factors. It can also be seen that when innovation reached to the developed country there are not much political or regulatory factors that can aid RI approach.

	Business-model	Cultural Value	Economic	Resource-constraints	Technical	Regulatory	Political	Social Embeddedness
STAGE 2	• Product-pricing • lobby management • Build new core competencies • Collaboration with partners • Leadership style • Bring huge market demands • Marketing • Leveraging customer sentiments • Country-specific business model	• Experimental and risk-taking behaviour • Diversity in management structures • Leadership interventions	• Aging population • Similar economic background • Job opportunities	• Leverage opportunity with the resource constraints	• High-end material and technology diffusion • Knowledge transfer • Safety • Functional breakdown • Efficient • Useful and functional	• International rules and regulations	• Political turmoil	• Cost awareness • Trust with customers • Understand customer needs • Identify the right customer

Table 5.13 Adjusted list of drivers from both literature and case studies in stage 2 of RI.

5.3.6 Adjusted list of barriers in Stage 2 of RI

From table 5.14, it can be seen that there are more new barriers in the business-model and technical category as compared to other categories. Further, it can be observed that there are some barriers in fiscal category in all the stages of RI. This shows the importance of fiscal quantities while undergoing an RI approach because it can become a challenge in the long run when innovation transfers to the developed country.

Here, there are no resource-constraints and regulatory barriers from case studies or from literature studies in this stage of RI lifecycle. Overall, there are very few barriers in stage 2 of RI as compared to stage 1 and intermediate stage of RI.

	Business-model	Cultural Value	Economic	Resource-constraints	Technical	Regulatory	Political	Social Embeddedness	Fiscal
STAGE 2	• Zero-based innovation in foreign market • Static industry capabilities • Attracting tough audience • Old organisational structures • Less migration of new ideas	• Organisational cultural values • Motivation for reduction in GHG	• Labour costs • Economic differences in society		• Legacy manufacturing methods • Universal safety standards • Low LCoE • Poor performance Lack of local knowledge		• Political activities • Rigid government • Less economic support	• Trust	• Forex transaction • Maintain Equity and debt ratios

Table 5.14: Adjusted list of barriers from both literature and case studies in stage 2 of RI.

5.4 Inclusive Lists of drivers and barriers

This section discusses the entire set of drivers and barriers in a single table that has the literature factors and the generalizable factors from all the three case studies.

5.4.1 Inclusive list of drivers from literature findings and cases studies

This is the combined list of drivers from this research added in a table. It consists of factors from the literature (refer table 3.5) and the added drivers that are generalizable from all three cases. There are only two factors from all three case studies that can be generalized and added to the list of literature drivers. They are 'safety' and 'local R&D'. However, local R&D is already mentioned in the literature study. So, safety in using the innovation is the only driver that has been derived from the case studies.

SOURCE	LIST OF DRIVERS
LITERATURE	1. Local R&D 2. Clean-slate approach 3. Positive FDI Spillovers 4. Strong external stakeholders 5. Glocalization in EE 6. Experimental and risk-taking behaviour 7. Firm's internal embeddedness 8. Social development 9. Poverty 10. Quality over functionality 11. Affordability 12. Resource scarcity 13. Infrastructure constraints 14. High-end material and technology diffusion 15. Patient capital 16. Value innovation 17. Product adaptation ability 18. Decentralization of power 19. Loose firm regulations aid innovations 20. Identify customer needs 21. Trust with customers 22. Global community networks 23. Commitment to local market 24. Experimental and risk-taking behaviour 25. Firm's internal embeddedness 26. High-end material and technology diffusion 27. Leapfrogging to frontier technology 28. Product adaptation ability 29. Decentralization of power 30. Loose firm regulations aid innovations 31. Global community networks 32. Trust with customers 33. Product-pricing 34. Lobby management 35. Build new core competencies 36. Diversity in management structures 37. Aging population 38. Leverage opportunity with the resource constraints 39. Knowledge transfer 40. International rules and regulations 41. Political turmoil 42. Cost awareness
GENERALIZED FACTORS FROM CASE STUDIES	43. Safety

Table 5.15; Combined list of drivers from literature and generalizable drivers from case studies.

INCLUSIVE LIST OF DRIVERS								
	Business-model	Cultural Value	Economic	Resource-constraints	Technical	Regulatory	Political	Social Embeddedness
STAGE 1	• ***Local R&D*** • Clean-slate approach • Positive FDI Spillovers • Strong external stakeholders • Glocalization in EE	• Experimental and risk-taking behaviour • Firm's internal embeddedness	• Social development • Poverty • Quality over functionality • Affordability	• Resource scarcity • Infrastructure constraints	• High-end material and technology diffusion • Patient capital • Value innovation • Product adaptation ability • Safety	• Decentralization of power • Loose firm regulations aid innovations		• Identify customer needs • Trust with customers • Global community networks • Commitment to local market
INTERMEDIATE STAGE	• Positive FDI Spillovers • Strong external stakeholders • Glocalization in EE	• Experimental and risk-taking behaviour • Firm's internal embeddedness	• Social development • Poverty • Quality over functionality • Affordability		• High-end material and technology diffusion • Leapfrogging to frontier technology • Product adaptation ability • Safety	• Decentralization of power • Loose firm regulations aid innovations		• Global community networks • Trust with customers
STAGE 2	• Product-pricing • lobby management • Build new core competencies	• Experimental and risk-taking behaviour • Diversity in management structures	• Aging population	• Leverage opportunity with the resource constraints	• High-end material and technology diffusion • Knowledge transfer • Safety	• International rules and regulations	• Political turmoil	• Cost awareness • Trust with customers

Table 5.16: Inclusive list of drivers from literature and generalizable drivers from case studies with categorization.
In bold & italics: Common factors in both literature and case studies.
In blue font: New drivers from case studies.

5.4.2 Inclusive list of barriers from literature findings and cases studies

This is the combined list of drivers and barriers from this research added in a table. It consists of factors from the literature (refer table 3.5) and the added barriers that are generalizable from all three cases.

There are no factors from all three case studies that can be generalized and added to the list of literature barriers. However, there are occurrences of few factors in more than one stage of RI such as 'rigid government', 'political support' and 'poor performance'.

SOURCE	LIST OF BARRIERS
LITERATURE	1. Operating from different business environment 2. Risk of cannibalization 3. Size of the firm 4. Old organisational structures 5. Organisational cultural values 6. Mistrust 7. Cost conscious customers 8. Funding for niches 9. Legacy manufacturing methods 10. Shortages of technology and talent 11. Incomplete regulatory systems 12. Political activities 13. Corruption 14. Negative FDI Spillovers 15. Zero-based innovation in foreign market 16. Static industry capabilities 17. Attracting tough audience 18. Labour costs 19. Universal safety standards
GENERALIZED FACTORS FROM CASE STUDIES	-

Table 5.17: Combined list of barriers from literature and generalizable barriers from case studies.

INCLUSIVE LIST OF BARRIERS								
	Business-model	Cultural Value	Economic	Resource-constraints	Technical	Regulatory	Political	Social Embeddedness
STAGE 1	• Operating from different business environment • Risk of cannibalization • Size of the firm • Old organisational structures	• Organisational cultural values • Mistrust	• Cost conscious customers	• Funding for niches	• Legacy manufacturing methods • Shortages of technology, and talent	• Incomplete regulatory systems	• Political activities • Corruption	
INTERMEDIATE STAGE	• Risk of cannibalization • Negative FDI Spillovers • Old organisational structures • Operating from different business environments	• Organisational cultural values • Mistrust	• Cost conscious customers	• Funding for niches	• Legacy manufacturing methods • Shortages of technology and talent	• Incomplete regulatory systems	• Political activities • Corruption	
STAGE 2	• Zero-based innovation in foreign market • Static industry capabilities • Attracting tough audience • Old organisational structures	• Organisational cultural values	• Labour costs		• Legacy manufacturing methods • universal safety standards		• Political activities	

Table 5.18: Inclusive list of barriers from literature and generalizable barriers from case studies with categorization.
In bold & italics: Common factors in both literature and case studies.
In blue font: New barriers from case studies.

6

Discussion and conclusion

6.1 Answering the research questions

Developing countries are now abreast with the unconventional innovation approaches. Not only are they innovating for issues pertaining to its needs but are also transferring the innovations to the developed nations. This very idea of Reverse Innovation approach, has been in the picture here and now. There are also few innovation firsts that have emerged out of developing countries. For example, in 2013, Jordan became the first country ever to try the iris-scanning payment technology at its Zaatari refugee camp. India's Cipla, a pharmaceutical company, has produced Quadrimune, strawberry-flavoured HIV drug, which costs less than $1. It has taken over the bitter, old and non-recommended medicines by the WHO. The drug is currently undergoing FDA approvals in the USA. These two pioneering innovations are examples which show potential for innovations arising from emerging economies to be implemented in developed countries as well. However, reverse innovations face issues while being accepted in both developing and developed countries. There are a lot of factors that cause EMNEs using the reverse innovations to falter from its stages (refer figure 1.2) of RI lifecycle and there are also ample factors that drive reverse innovations in its RI lifecycle. This research thus attempted to list the drivers and barriers of RI approach for EMNEs to understand the RI approach better in a developing country, specifically India. The motive is achieved by dividing the research context into three sub questions which are discussed below.

6.1.1 Discussion on Sub-RQ 1

What are the main drivers and barriers listed in the literature of RI? How can the drivers and barriers be categorized?

The aim of first sub research question was to list all the possible drivers and barriers of RI in the literature onto a list. The list was to understand the influencing factors of RI approach for EMNEs. In the first step, the drivers and barriers were listed manually from the literature. The second step was to group the factors into categories. Here, the categories had been inspired from existing studies and upon logical interpretation of the underlying nature of the factors. There were eight categories in the list which cover almost all factors in them. The third step was to group the factors stagewise. This was one of the hardest steps and maybe has the most ambiguity. It is because, the literature had no studies related to classification of drivers and barriers in different stages of a RI lifecycle. There had been significant issues in the first stage and the intermediate stage of classification while it was easy to allocate factors in the second stage. The findings from this sub-question shows that there are a lot of factors, both drivers and barriers, in category 'business-model' and 'technical'. The interviewee respondents also emphasize some of these factors more than the rest which affirms them to be quintessential in the process of RI, such as 'local R&D', 'cannibalization', 'affordability' and so on. Another finding is that the number of factors, both drivers and barriers, is more in initial stages of RI than in the later stages. This could be due to the fact that overcoming the initial factors in the RI lifecycle may make it easier for the innovations to trickle to the developed countries.

This research has listed 42 factors as drivers and 19 factors as barriers of RI from the existing literature studies. Stage 1 has the highest number of drivers and the number of drivers reduce as proceeded to further stages of RI. In overall there are more factors in business-model and technical categories as compared to the rest. Stages 1 and 2 have a greater number of business-model factors and intermediate stage has a greater number of economic factors. The literature lacked the proper demarcation of factors and in different stages of RI. Hence, this research added a valuable addition to the stage-wise classification of influencing factors of RI. But there are low accounts of factors that affect EMNEs from emerging economies in literature.

To understand the drivers and barriers of RI better for EMNEs, case studies of EMNEs from India were conducted. The case studies were contemplated to comprehend how different are the factors mentioned by interviews to the factors obtained from literature studies. It was also to identify if there were any new factors mentioned by the interviews which are deemed to be important. The next discussion leads to analysis of the case studies and categorization of its factors.

6.1.2 Discussion on Sub-RQ 2

How are the drivers and barriers from case studies classified? How relevant are the drivers and barriers listed from the three cases, to the listed drivers and barriers in the theoretical literature?

The aim of the sub-research questions was to categorize the factors and understand the relevance of the factors that are mentioned in the literature.

The first step was to categorize the factors stated by the interviewees from the three case studies, namely Tata Nano, Godrej ChotuKool and Suzlon. The research makes use of 6 interviews, 2 interviews per case study, to gather the factors. The classification of categories used for the case

studies were inspired from the classification used in literature study. It was because few factors mentioned by the interviewees were already mentioned in the literature, such as 'efficient', 'political support', 'understand customer needs' and so on. However, for barriers from case studies, a new category was introduced namely, 'fiscal' category. This category is for factors that are explicitly related to financial aspects of an innovation. The factors could not fit in any other previously devised 8 categories and hence 'fiscal' category was framed. The factors were listed into codes after transcribing and coding in Atlas.ti software, the factors were listed into codes. These factors now were placed in the assumed stages of RI lifecycle for EMNEs (refer figure 1.2). The placement of factors was again solely done from understanding the interview respondents, previous similarities from literature and upon own logical understanding. However, there are few ambiguities with the factors.

Factors such as 'patient capital' and 'limited venture capital' weren't placed in literature in the barriers section because it was not an exact fit to the assumed categories. Even here, a category can be added termed as 'fiscal' to ensure that the factors are categorized. For a factor such as 'JiT' is it difficult to analyse whether it can be placed in stage 2 of RI because it basically deals with innovation in the developed country. It is a contestable topic because Just-in-Time schemes works well for local markets because EMNEs know the right mechanism to procure and place its vendors around their plants. But the same strategy may not work in developed countries because of the lack of acumen about the developed markets. Even if the vendors are made available, it may not be beneficial to set up vendor parks around their plants outside the launch-country because the innovation is already in place and they may not require as much resources as they needed during the inception and creation of the innovation. Factors such as 'extensive advertising channels', 'positioning' and 'Positioning innovation' have all been collectively termed as 'marketing'. 'Promotional events' are a subset of marketing and it has been combined as a single factor of marketing in this research. After careful interpretation from interviews, it can be seen that 'designing according to target customer', 'marketing', 'useful and functional' and 'affordability' have been mentioned by both respondents from Godrej and Tata. This shows that for innovations still in the emerging economy stage need to concentrate on these factors to succeed in the launch-country itself.

From the respondent's interview and their content correlation, it was seen that both Tata Nano respondents had different definitions of RI but same notion of RI. Both the respondents mentioned few factors that are same such as 'Leadership', 'Identify the right customer', 'understand customer needs' which seem to be of prime importance in undergoing RI approach. However, Suzlon and ChotuKool respondents had same definition of RI to go by but did have many distinct factors to list in the case studies.

There are few factors which could not be put under any category, 'tax credits' and 'location'. Tax credits attracts high income individuals and could not be placed in any category and maybe a new category could be created. Location means the location of local R&D is also important as mentioned by the respondents. Other factors such as 'Total cost of ownership', 'Vendors for economical

materials', 'Aspirational value' and 'Differences in male and female reactions towards an innovation' has been placed in no category. However, these factors are crucial to understand how pan customer base reacts to an innovation. For example, with ChotuKool there was a difference in the way female and male population perceived the innovation. Males had thought of the innovation to be not of great importance but females considered it as an asset inside the house and would spread the news rapidly by Word-of-mouth, WOM, communications. WOM has seen to be important in spreading the news about the innovation amongst friends and families in the villages. So, a clear distinction and better categorization that fits all these categories could have been made possible.

There are 17 drivers mentioned by Godrej ChotuKool's respondents, 20 drivers mentioned by Tata Nano's respondents, and 12 drivers mentioned by Suzlon's respondents. For barriers, Godrej ChotuKool's respondents mentioned 9 factors, Tata Nano's respondents mentioned 14 factors, and Suzlon's respondents mentioned 12 factors. It can be concluded that there are more factors in early stages of RI which stands similar to the findings in the literature review.

The final step is to understand relevance of these factors with the factors from literature. If the cases are viewed separately then are a lot of additional factors to stage-wise classification of drivers and barriers. The factors are also relevant because the nature of some of the case study factors were quite similar to the ones mentioned in literature as seen from the analysis.

6.1.3 Discussion on Sub-RQ 3

How can these drivers and barriers from the cases be integrated in the categorization of the list from the literature?

It can be seen from the adjusted and inclusive lists that there are not many factors that can be generalized. To integrate the factors with the literature was hence easily understandable than the other analysis. There is only 1 generalized driver and 0 generalizable barriers from the three case studies. This is because the nature of all of the three firms are different. They cater to different customer groups and businesses. Hence, there are very few common factors to all the three cases.

6.2 Limitations of the Research

6.2.1 Limitations of the research methods

The research method has three limitations.

Firstly, there were some practical issues at stake with this research method. Some practical issues were related to time constraints, gathering experiences from customers and collecting other supporting logistics. To obtain information related to the general experience was easier in comparison to statistics, associated with the innovation. It also led to some biased responses towards a DMNE when an interviewee had previous experiences in DMNEs. However, face-to-face virtual

interviews have the potential to make the situation uncomfortable where the respondent hesitates to answer some questions if it includes examples on a personal level.

Secondly, the study has some theoretical issues to ponder over. One issue is that RI is still a significantly untapped region of study. It is also the field where few researchers have explored and analysed driving factors and barriers related to it. However, to be aligned with a particular concept pertaining to RI and understanding the same was a very critical task. Carefully identifying and analysing factors and barriers was a challenge as different respondents had argued various unrelated reasons of failures while some have been unaccounted for.

The third limitation is that there may be few factors that might have been omitted because listing the drivers and barriers from the literature was completely a manual task. It is very likely possible to have missed out on few factors that can be labelled as drivers and barriers of RI. According to Sekaran and Bougie (2016), an exploratory research's findings cannot be generalized to all cases. This stands true from the findings and hence cannot be assured for the usage of results on the generalized population sample.

6.2.2 Limitations of using the three case studies

The three cases chosen for the research are different kinds of businesses. Suzlon is B2B innovation whereas Tata Nano and Godrej ChotuKool are B2C innovations. There are few differences in their functions and hence can be reasons for differences in factors affecting the innovations in the RI lifecycle. In B2B transactions, the customers behaviour in purchasing, buying and everything else depends on the relationship they have with the firms whereas in B2C, all customers pay and buy the same thing at the same cost. Another difference is that in B2B, the decision-making process is complex because it involves many parties while making a business transaction while in B2C, the customers involve a much simpler buying behaviour.

6.3 Future work

6.3.1 To increase the sample size of the respondents

An immediate step after this research can be to increase the number of respondents in each case study. Each respondent from the case study can also be classified in terms of their designation. This would bring in more relevance with respect to different functionalities associated within the firm. For example, technical head, production and manufacturing head and other executive employees. Doing so will also help to determine the reliability of the categorization of the factors that are obtained in this study. This would support and affirm the results of this research.

6.3.2 To find correlations between the factors

Now that the factors, both drivers and barriers, are obtained from literature and case studies, one can find out the relationships between these factors. It can be helpful in terms of understanding the dependency of each factor over another. This will determine if one factor is influenced by another

factor or not. A way to do this is by conducting an Interpretive Structural Modelling, also known as ISM approach. ISM approach is usually preferred when there is a need to determine relationships between variables. This approach first identifies the variables pertaining to the outcome and then a relationship is chosen. Upon choosing the relationship an SSIM is created. A structural self-interaction matrix (SSIM) analyses the pairs of variables, factors in this case, depending on the relationship chosen. There are other steps in the ISM approach but since it is to find relationships, only SSIM can be constructed to see the correlation between the factors. But in order to attain this, there also needs to be statistical figures that supports how these factors are related. Only then it is possible to find correlation while conducting a SSIM.

6.4 Recommendations of strategies for EMNEs using RI

The recommendations are devised upon understanding the challenges faced by the case study EMNES. Results show that the main challenges faced by Tata Nano and Godrej were similar than that of Suzlon. The reason can be that Suzlon is a B2B company which focuses on transactions in business whereas Nano and ChotuKool are B2C companies that cater to customers directly. Tata Nano has challenges that are interlinked with each other. The challenge of 'shifting of plants in between production' was a huge set back to the company as mentioned by the respondent. This was attributed to 'political resistance' in the state which led to the delayed production of the car. Eventually, 'media-management' was not proper because stories, articles and news spread about Tata Nano's inability to deliver the expectations. Respondent mentioned that it could have been solved by 'timely marketing interventions' by the firm itself. The company could have also worked on 'product transfer from rural to urban population' because the car was designed to be an affordable car that can be used by every middle-class household.

For ChotuKool the challenges are also on the similar lines. The most important challenge was in 'realistic environment product testing' because the initial testing happened in USA and the product had worked fine but in India due to dry and dusty climate the product had issues. This is one of the warning signs in terms of testing the product because it the product were sold without testing in India it won't have been successful in the market. To cater an innovation that is 'aspirational' and is desired by the targeted customer is of prime concerns because India has a highly aspirational population. Other challenges have been 'marketing' and 'second-hand goods' to which Godrej created rural advertising schemes and lowered the price of the product so that it costs lower than second-hand goods.

Finally, for Suzlon international and fiscal issues can be seen as challenges. The reason may be because it has reached to the final stage of RI which is to be implemented in the developed country. It is likely to happen that an EMNE has to face 'forex transactions' and 'high capital costs' while being on the international front. The firm has its base in India and some organizational units in other countries such as Germany and USA, and so has to deal with a lot of forex inflow and outflow. Further, to establish a project internationally, it requires huge funds and if there is high borrowing

then it also means there are high capital costs. Other challenges also arise in terms of debts, mergers and acquisitions which can lead to long-term effects.

"My lesson learned from something like Nano is that it is important to know that there are many good things which came out of Nano. One of the good things will be, is to take insights from the things which did not work as well" (Respondent 1.2, 08 May 2020). This is one of my favourite quotes by a respondent of the case studies. Likewise, with this research all the three case studies have their own set of challenges and strategies that they have used in the innovation's lifecycle. Some might have been successful and some have been unsuccessful. The point of this research is understanding the unique strategies that were used by the firms that gave them a stronghold in the market. These three innovations have always been the talk-of-the-town and most analysed to understand various viewpoints.

In 2017, Parthasarathy et. al, quoted "Indian firms are as much challenged by the latecomer disadvantages faced by emerging market multinationals (EMNEs) in general" (p. 437). It is seen in firms with their innovation have to undergo immense competition, acceptance from the customers and to take over an incumbent technology. Many start-ups and even firms have been overthrown by the aforementioned circumstances after they have launched their innovations. Not just in the EE but also in DC where firms have to face competition and other challenges internationally.

This section thus aims to mention and discuss the few business strategies used by the three case studies in their innovations. The aim to do so is to provide with insights in terms of different strategies that can be implemented by similar other EMNEs within India and firms in other EEs to augment the RI approach. These strategies or findings may be useful to counter challenges while implementing an innovation in India and transferring the innovation from India to a developed country. Tata Nano's respondents mention few business strategies which seem to have been momentous according to me. They are namely 'JiT', 'Decentralized leadership' and 'Dealer-distribution model'. Suzlon mentions its 'Turn-key strategy' which is a breakthrough model in the field of renewables. ChotuKool mentions it 'dealer-distribution' strategy which are worth looking into. In quicksilver environs of today, these strategies are not recommended to be set-in-stone. However, these above-mentioned strategies used by the case study firms can stand as a precedent for future innovations in EEs using a RI approach.

6.4.1 Strategy- JiT (Tata Nano)

JiT (Just-in-Time) model is an inventory management system used by the Tata group. The firm has its vendors, which include small-parts manufacturers, paint shops, training centres, service centres and more, all integrated into vendor parks that are located nearby to the main Tata Plants. For example, a plant in Pantnagar, Uttarakhand, has an integrated vendor park that accounts for about 70 percent of the total supplies needed for its product manufacturing. It has been vividly emphasized by the respondent that JiT was one of the sure-shot strategies that they have witnessed during Tata Nano's manufacturing in its production facilities. This JiT system can help to reduce the cycle time and decrease the in-house inventory. This can be used effectively in automotive manufacturing

firms in India. It is however being used by some Indian EMNEs namely, Maruti, Mahindra, Bajaj Auto, etc.

6.4.2 Strategy- Decentralized leadership (Tata Nano)

Both the Tata Nano respondents have acclaimed Mr Ratan Tata's impeccable leadership in the entire lifecycle of Tata Nano. During the inception of the Idea, a respondent mentions Mr. Ratan Tata's involvement with each team and would even have brief conversations with each trainee working towards the dream of Tata Nano. Not just him, but other important personalities in the firm had spent quality time with the related employees of the project. This relationship with the employees had motivated and bolstered their resolve of creating a visionary innovation, i.e., the Tata Nano as we know of today. The decentralization of authority and power from executive levels to project levels has been discussed well off in literature too. So, firms with breakthrough innovations may decentralize their processes and leadership styles for more personal and actuating relationships between employees and executives. This allows everyone to be aligned to a common goal, flexible and encouraged throughout the innovation process.

6.4.3 Strategy- Rural sales & distribution (Godrej ChotuKool)

One of the ChotuKool respondent discusses in-depth the importance of having good dealers and distribution strategies in a rural setting. It was crucial to find dealers in order to distribute the product in the interiors of villages and small towns as these residents were the target customers. ChotuKool exploited the largest connected chain of a communication channel, Indian Postal System. It is the most widely distributed network that connects multitude of rural and urban areas. The mastermind of Godrej's ChotuKool, Mr. Sunderraman, realized the fact that in India, postmen are considered to be close acquaintances to the village residents. Hence, post offices were used as methods to spike ChotuKool's sales and established a distribution channel. Similar kinds of rural distribution strategies have been used by few EMNEs such as Parle Agro, Dabur India, Britannia, etc. However, more firms with innovations that caters to the rural population can make use of such a distribution strategy to alleviate the lack of awareness and increase distribution outlets.

6.4.4 Strategy- Turn-key (Suzlon)

The respondents mention that when Suzlon had come into existence, there were indeed few designs and standards in place but the technology was very much standardized. The innovation here did not lie in making a completely new wind technology but it was to bring in new business strategies. Then was the inception of Turn-key deals that worked very well in India because of the lack of knowledge on renewable energy. This Turn-key strategy allowed investors to invest in wind turbines with confidence as the firm would provide installation, maintenance, repair, etc, of the turbines. The firm was solely responsible to take care of all the aspects that came along with the turbine. This in-house idea of Suzlon had basically pushed customers who ideally would invest in such a technology.

6.5 Why a RI approach can be useful in EEs as of today?

RIs are not necessarily innovations meant to suffice for only low-income consumers or lower quality of innovations but rather innovations arising from new contexts (Hadengue et al., 2017). For example, Simula et al. (2015) mention that RI is the most effective when cost-effective innovations are applied in wealthy environments when there is an economic downturn because the consumers are sensitive during this time and do not enjoy paying for extra features. There are few examples that do explain the emergence of cost-effective innovations during an economic downturn. For example, Grameen America, a non-profit microfinance organization was launched in 2008 in New York by a Bangladeshi entrepreneur who is also a Nobel Peace prize awardee, Mr. Muhammad Yunus, with a motive to provide loans only for small businesses (Goyal and Stefanel, 2018). During the economic crisis of 2008, this microcredit initiative, Grameen America, became very famous with the fall of Lehman Brothers, where the poverty stricken were given financial education, enrolled in savings programs and credit establishments for women.

COVID-19 has led decline in economic conditions of not just India but other countries as well. This can be considered as one of the leveraging situations to change the face of innovations in countries. After political and economic tensions in India, the country now is actively engaging in making itself self-sufficient and self-reliant. In the recent news, the country has started initiatives to provide incentives for new ideas, start-ups, small ventures, to develop in-house mobile applications, low-cost innovations and innovations in other categories. Reverse Innovation can thus become a good fit into the given situation and EMNEs should try to design innovations using this approach.

6.6 Reflection

The reason I wanted to pursue a topic as such was inspired by my work in first year of Masters. I had presented on a topic related to upliftment and securing trade amongst farmers in African countries. From the very beginning I wanted to research in a field that would in a way benefit the developing countries. I came across this topic of Reverse Innovation and I straightway decided to take it. Looking back to when I started this journey, I did not have concrete ideas on how to proceed with the topic but I wanted to use case studies from India as it would be my small way of giving back to my country. Eventually, I planned on conducting an exploratory research.

As interesting the concept is, since it is still a novel topic, the theory had too many facets and versions which were sometimes too hard to follow. However, slowly grasping the essence of the topic I narrowed down the scope of the research. After I started to work on the topic, the literature review was the most demanding of all phases in my research. On completion of the theoretical study, I conducted interviews with the respondents from various backgrounds of the firms chosen for the case study. The interviews were the most interesting part for me in the entire thesis. I got the chance to talk to people at executive levels who gave inferences from their own experiences. It was a great way to understand the firm, the key aspects of the innovations and their personal knowledge regarding the topic. This particular data method was also effective during an ongoing

pandemic in the world. Having virtually interviewed them, regardless of the time differences and quick responses showed their interests in the topic. This in turn motivated me to understand the essence and emotions behind an innovation.

If I were asked to do the research all over again, I would reach out to potential interviewees way before the scheduled dates. Reaching out to unknown contacts is a time-taking process and not everyone responds as per thought. So, it was crucial to have a plan B, if one respondent had denied. I would also include more interviewees and increase the sample size. This time, I would classify the interviewees based on their designation because a manager, an engineer and CEO, all will have different viewpoints to share. This is however, a very strenuous process and the likelihood of finding all the desired interviewees in a short span is not highly possible.

The research duration was intense to handle with my thesis, the COVID-19 pandemic and family emergencies, all cooped up in the same time frame. However, one thing that this research brought in me is, resilience. As the final words for this thesis, I would say that it feels gratifying to be able to apply concepts learned in the duration of two years of Masters into the research. It also is satisfying to believe that I had started my journey, wanting to give back to the country I come from and in my small way I have accomplished it. It may be a small step but not the end as I venture into the corporate field from here on.

Keywords

ABSORPTIVE CAPACITY: Absorptive capacity is an organization's ability to identify, assimilate, transform, and use external knowledge, research, and practice.

ACQUISITION: An acquisition is when one company purchases most or all of another company's shares to gain control of that company.

BOTTOM OF THE PYRAMID: Bottom of the pyramid (BOP), also called base of the pyramid, term in economics that refers to the poorest two-thirds of the economic human pyramid, a group of more than four billion people living in abject poverty.

CANNIBALIZATION: The reduction of the sales of a company's own products as a consequence of its introduction of another similar product.

CAPITAL INTENSIVE MARKET: The term "capital intensive" refers to business processes or industries that require large amounts of investment to produce a good or service and thus have a high percentage of fixed assets, such as property, plant, and equipment (PP&E).

CLEAN-SLATE APPROACH: A state in which you are starting an activity or process again, not considering what has happened in the past at all.

CYCLE TIME: The total time from the beginning to the end of a process between a firm and customer.

DEBT-TO-EQUITY RATIO: The debt-to-equity ratio is a financial ratio indicating the relative proportion of shareholders' equity and debt used to finance a company's assets.

DECENTRALIZATION: The movement of departments of a large organization away from a single administrative centre to other locations.

DE-ICING: The process of removing snow, ice, or frost from a surface.

ETHOS: The characteristic spirit of a culture, era, or community as manifested in its attitudes and aspirations.

FDI SPILLOVERS: It can be broadly defined as the impact of foreign firms' presence on domestic firms' economic performance.

FEED-IN-TARIFF: Feed-in Tariffs (FiT), also known as standard offer contract or advanced renewable tariff, are policy mechanisms that are designed to accelerate investment in renewable energy systems and technologies. They achieve this by offering long-term contracts to renewable energy producers, typically based on the cost of generation of each different technology.

FISCAL: Relating to financial quantities, such as revenue and taxes.

FOREIGN EXCHANGE TRANSACTION: Foreign exchange transaction is a type of currency transaction that involves two countries. Generally, a foreign exchange transaction involves conversion of currency of one country with that of another.

GHG STANDARDS: Protocol or standards to minimize the use of Green-house gases emissions. the most commonly followed GHG accounting standards are from ghgprotocol.org.

GLOBALIZATION: The process by which businesses or other organizations develop international influence or start operating on an international scale.

GLOCALIZATION: The practice of conducting business according to both local and global considerations.

INCUMBENT FIRM: In business, incumbent means a company or product that is already established with a demonstrated level of success in the market.

INTERNAL RATE OF RETURN (IRR): The internal rate of return (IRR) is a metric used in capital budgeting to estimate the profitability of potential investments.

LAND BANK: It is the practice of investing in land for future sale or development.

LANDED COST: A landed cost is the total charge associated with getting a shipment to its destination.

LEAN MANUFACTURING: Lean is a methodology to reduce waste in a manufacturing system without sacrificing productivity. The customer defines what is of value in terms of what they would pay for the product or service.

LEAPFROGGING: The core idea behind the leapfrogging principle is that small and incremental innovations propel the dominant firm to remain ahead. Occasionally, however, radical innovations can allow new firms to leapfrog the old and dominant enterprise.

LEGACY TECHNOLOGIES: An old method, technology, computer system or application program, of, relating to, or being a previous or outdated computer system

LEVELIZED COST OF ENERGY (LCOE): The levelized cost of energy, or levelized cost of electricity, is a measure of the average net present cost of electricity generation for a generating plant over its lifetime.

LOBBY MANAGEMENT: Established firms that try to prevent the launch of reverse innovations through lobbying such as pressuring industry and government leaders.

LOCALIZED: Restrict (something) to a particular place.

MAMMOTH: Something immense of its kind.

MICROFINANCE: Microfinance, also called microcredit, is a type of banking service provided to unemployed or low-income individuals or groups who otherwise would have no other access to financial services.

ORIGINAL EQUIPMENT MANUFACTURER (OEM): An original equipment manufacturer is a company that produces parts and equipment that may be marketed by another manufacturer.

PATIENT CAPITAL: Funds invested for medium or long term (generally for 5 to 10 years).

PRODUCT POSITIONING: Positioning is where a product or service fits in the marketplace. It is a strategic exercise that defines what makes a product unique and why it is better than alternative solutions.

STATE-OF-THE-ART TECHNOLOGY: State of the art (sometimes cutting edge) refers to the highest level of general development, as of a device, technique, or scientific field achieved at a time. It also refers to such a level of development reached at any time because of the common methodologies employed at the time.

TECHNOLOGY-PUSH INNOVATION: Technology Push is when research and development in new technology, drives the development of new products.

TYPHOON: A tropical storm in the region of the Indian or western Pacific oceans.

V E N D O R : A person or company offering something for sale, especially a trader in the street.
V E N T U R E C A P I T A L : Venture capital is a form of private equity financing that is provided by venture capital firms or funds to startups, early-stage, and emerging companies that have been deemed to have high growth potential or which have demonstrated high growth.

Appendix A

#1 Tables 1
(Additional information from literature sources)

Study Name. Author, Year, Journal Name	Which Definition of RI is used	Approach of the Study	Listed Drivers	Listed Barriers	EMNEs/MNEs	Context Developing or Developed country	Other Information
RI: A Systematic Literature Review. Hadengue et al., 2017, *International Journal of Emerging Markets*, *12*, 142–182.	No single use of a definition. Explain various definitions used in the literature. Suggest to formulate a balanced definition of RI. "Originally, RI referred to any innovation first adopted in the developing world that then flowed into a developed market"	Systematic review		-	Both	Both	Analysis on the various definitions of RI available in literature.
RI: An Interview with Vijay Govindarajan. Govindarajan, V., and Euchner, J. (2012). *Research Technology Management*, *55*(6), 13–17	No single use of a definition. However, the concept has been explained.	Interview	Meet customer needs Quality over functionality Affordability Importance of R&D in poorer countries	not establishing the local growth team not creating the necessary partnerships not taking on innovation as a disciplined experiment	MNEs	Developing country	Urges MNEs to undergo innovation in developing country or claims a local firm will do it.

RI – how it works. Ostraszewska, Z., and Tylec, A. (2015). *International Journal of Business and Management*, *3*(1), 57–74	"The development of ideas on emerging markets and then the export of this knowledge and innovation to developed economies"	Explanatory research			Both	Both	Suggests new directions for the development of enterprises
From cost to frugal and RI: Mapping the field and implications for global competitiveness. Zeschky, et al., (2014). *Research-Technology Management*, *57*(4), 20–27.	"The firms are redeploying their resource-constrained innovations to Western markets, to attract cost-minded customers"	Explanatory research	Process improvements Offshoring		Both	Developing Country	Provides concepts for resource-constrained environments. RI is a resource-constrained Innovation.
Can frugal go global? Diffusion patterns of frugal innovations. Hossain et al., (2016). *Technology in Society*, *46*, 132–139.	"RIs imply low-cost innovations, which are first adopted in emerging economies and then 'trickle up' to developed countries"	Exploratory Research	New ways of competitive advantage	Recession Poverty	MNEs	Developed Country	It is a resource-constrained Innovation.
Legal and Regulatory Barriers to RI. Rowthorn et al., 2016. *Annals of Global Health*, *82*(6), 991–1000.	"RI to high-income countries from the developing world."	Exploratory Research	-	Reimbursement Work Challenges International Licenses	EMNEs	Developed Country	-

Drivers of RI. Martin, L. (2018a). *2018 IEEE International Conference on Engineering, Technology and Innovation.*	"Innovation in emerging economies for the markets there and then spreading to developed economies."	Exploratory Research	Leap Frogging Infrastructure Need for new technologies Economic		Both	Developing Country	Three case studies to gain deeper understanding of potential Drivers.
Frugal and RIs – Quo Vadis? Simula et al., (2015).	"Innovation originating to respond to serve a set value conscious customer in developed countries."	Exploratory study	Raw material prices, products' retail prices Political turmoil aging populations cost awareness feature fatigue		MNEs	Developing Country	Emphasis on the correlation of reverse and frugal innovation
RI: An Interview with Vijay Govindarajan. Govindarajan, V., and Euchner, J. (2012). *Research Technology Management*, *55*	"Innovation is adopted first in emerging economies before 'trickling up' to rich countries."	Explanatory study	Local technology reservoirs. Pre-existing brand recognition	Zero-based innovation in foreign market subsidiary access to firm's global technology risk of cannibalization	EMNEs	Developing Country	Emphasis on FDI, i.e., Foreign Direct Investment Spillovers
RI and Intercultural Management Aspects. Gwarda-Gruszczyńska, E. (2016). *Journal of Intercultural Management*, *8*(2), 71–84	"Innovations initially launched in developing countries are introduced to advanced countries (reverse innovations)."	Exploratory study	Resources and decision-making localized. Support from global technology Decentralize power	Infrastructure gap Performance gap	Both	Developing Country	Suggests to pay attention to intercultural aspects of firms for RI to be successful
A Typology of RI. von Zedtwitz et al., (2015). *Journal of Product Innovation Management*, *32*(1), 12–28	"Innovations adopted first in developing countries before being adopted"	Descriptive study			Both	Both	Aggregates key structural dimensions, that management research employs to study innovation.

Appendix B

#1 Approaching the respondents by email (After initial conversations on LinkedIn)

Dear Mr. XYZ,

Hope this email finds you well!

I, Meghna Vipparthi, am a Graduate Student in Management of Technology at Delft University of Technology, Netherlands. I hail from Visakhapatnam, India, with a bachelor's degree in Electrical and Electronics Engineering from Birla Institute of Technology, Mesra. The intent behind this email is that I am conducting a research in the topic of reverse innovation and I would be grateful if you could participate in my research.

~

Reverse innovation is where the innovation is first launched in developing countries and then scaled to the developed countries. **The focus of my thesis is to find drivers and barriers of reverse innovation in emerging economies.** It includes finding the existing literature gap on drivers and barriers of reverse innovation approach and make an attempt to bridge this gap by doing a comparative analysis with a list of influencing factors, i.e., drivers and barriers, upon conducting a research based on three different case studies from India.

I have chosen ABC as of the case studies for the exploratory research project whose research methodology requires interviews to be conducted. I believe the expertise you hold if coherent to the required skills for the participants of the interview. I hope you can help me document the needful to aid the research in the field of reverse innovation. Your views on drivers, barriers, challenges, learnings and other related attributes in the innovation behind ABC will help me understand the perspectives of EMNEs in developing countries.

Previously conducted research by various authors indeed mention some factors as the prime ones for reverse innovation but dominantly in developed countries. To conceptualize my study there still needs to a better understanding of management values, difference in product-related values from one country to another, business model components and marketing instruments throughout the innovation's life cycle. Analysing these attributes with your inputs might be helpful for future researchers and companies who are willing to undergo reverse innovation and be motivated in using relevant ideas and decisions that sustains their innovations in emerging economies.

To achieve this motive, I would like to schedule about an hour-long interview whenever it is possible for you in the weeks to come. With this, I hope to receive a positive response from you as your valuable inputs will be a great addition to my research in the field of reverse innovation. If you

are unavailable for the same, could you kindly connect me to anyone else in your company or from your network who I can interview regarding my research on Reverse Innovation.

Note: *Please find the attachment in thread mail for detailed explanation of the same and feel free to contact me for further queries.*

Thank you,

Regards,
Meghna Vipparthi,

#2 Sample interview transcript with Suzlon (Transcribed using Sonix software)

[00:00:21]- [00:01:12] Introduction.

[00:01:21] Right. So, did you get a chance today to through the question set that I sent you?

[00:01:28] Yes, I did. But I think I will try to answer some of them later as the interview proceeds. Hope that is alright for you.

[00:01:36] Yes, of course. I just wanted to tell you before we start that this is a semi structured interview. So, the questions that can be changed to a minimal extent, if need be. This interview is basically to get an idea from you because you hold an experience for long time in the field of renewables in general. Let's start the interview with the first question which is how do you perceive reverse innovation.

[00:02:24] Yeah. So, I think I think my idea of reverse innovation, specifically with my experiences in taking product or a business model that is successful somewhere else and trying to see whether it can be useful in meeting the market needs or the country needs of India.

[00:02:50] And maybe also, you know, trying to adapt to the specific needs of the country, which has specific legal requirements and needs. What works very well somewhere else and what is being designed for somebody else may need to be tweaked in order to work well in India. So that's my idea. There was innovation mostly everywhere. I have seen reverse innovation work in terms of business models, very obviously because business models are very different, though, the way the businesses are run, the laws, what is acceptable in the market, what is acceptable to people are very different from country to country or even state to state within India. And so business models are the places where I have seen the most amount of business innovation, but it was innovation happening.

[00:03:41] So what was the motivation behind the launch of Suzlon in India, a developing country, and then to not just India, but also neighbouring developing countries?

[00:03:54] Suzlon has a very interesting story. Obviously, this really predates my statements with Suzlon. I've been in Suzlon for a short period of time. But those were stories that I have heard all along while I worked with renewables.

[00:04:05] Very interesting and very, very inspiring. I would say the story starts, I'll just give you a brief is people for people who may not know what this is but it is also publicly available in some place or the other. If you see our website, the story starts with the whole family is trying to extend business in the state of Gujarat in India. In the early 90s, in the interiors of a town, the family found that for them to undertake sales of textiles as a very energy intensive business and energy and electricity was not ready, not very well generated. So, what they did was they started with trying to meet their own needs. They said, okay, this is expensive. We need electricity but it is expensive. So, can I bring in other sources of electricity? Can I generate my own power? And they basically got hold of a couple of phones to companies in Germany and imported wind turbines here for installation.

[00:05:11] And these companies came and, you know, basically imported the machines into India. And then they left the machines that they didn't have the equipment to build the machines and run the profit under the turbines.

[00:05:23] The families themselves learned about the machines. They installed, the machines. They actually ran it very well, you know, it worked very well for them. And so, they created a little bit of a niche for themselves in their community around them. From there it starts. There was the thought from the members of the family that decided that, hey, this is a good business. And so, you started to say, I have this problem that I need to find other alternative source of energy. There must be others who have the same problem. And that's how it started. Tt just became pretty much a use case in a way, you know. You're bringing the turbine and also installing it. All you do is for your customers. You do the whole thing, and then you tell you about five of them. That's all the motivation behind the launch of wind turbines that India started to build better.

[00:06:28] So this is the family's story. What do you do to go back a little further? This is they're talking about mid 90s when it was started, which is actually finish 25 years of existence. But if you will see further than 1981 or 82 onwards, India has been at the forefront of alternate sources of energy. And a story not well-known. India is one of the few first few countries in the world to have a or a department for alternate energy. Starting in 1982. So the Indian government actually pushed alternative energy because we know, as all of us always are, dependent on oil, oil, oil shocks in the 70s, much, much before opening up the younger ones, those in shops in the 70s, 80s, oil prices being idolized had a huge impact of India's economy. And so, then what in 81, 82? They started with the Ministry of Renewables. And in 92, actually, Ministry of Non-convertible Energy was set up. And

so, they came up with this whole thing, that visionary picture that, look, India needs to rely on itself.

[00:07:35] You know, take the lands of oil out of the picture and try to see if there are alternative sources of energy.

[00:07:40] And so then so, you know, these 92 and the government started 95 and Suzlon started I think it was a good time to really start getting into renewable energy. Suzlon was there at the right place and at the right time. Policies were created jointly between government and industry. And that's how it started.

[00:07:58] Exactly right. So, by this, I understand that the time at which the innovation we want to bring it into the country is important in respect to the government policies. It is also important to think long term because it's not a small entrepreneurial business. In what way was the Central Government in favour of Suzlon and how did the Government circumvent its policies around renewables?

[00:08:46] I think. I think a lot of these local government at that point of time, a lot of the policies were dictated by what was happening in Europe. I think Denmark. Denmark was one of the key areas from where policies were adapted.

[00:08:59] Countries like these were actually much ahead in those days in terms of sort of framing wind friendly or renewable friendly policies. So, the feeling that it was something that was a long way in which subsidies would be given to the industry to grow. The Government of India learned from those in the early 90s and came up, you know, with food in feed, in tariff policies and electricity under the Constitution is a concurrent subject. So, you know, in the electricity policies are not only built by the same token, also by the states. A lot of these state-by- state openness also took this policy forward.

[00:09:50] So you can see that there are so many ways tap wind in India these days, which one would go to. India is on the western and the southern coast of India. And these are states that were in benefit from the wind turbines were in support of framing policies which were saying that wind is environment-friendly and uplifted renewable energies and to win in particular.

[00:10:08] Right.

[00:10:10] So, moving on to the next question, I'd like to ask you, what are the drivers behind the innovation of Suzlon energy using RI (Reverse Innovation) in a culturally diverse country like India. Like I would want to know that since it was started in Gujarat without any cultural hindrances by the communities. And how did Suzlon overcome it, if there were any? And what were their drivers to attract the whole country?

[00:10:37] Yes, I think Suzlon aced it business model from day one. By the early 90s, wind turbines had pretty much standardized around the world. This is a proliferation effect. By the 90s, though, their designs, little standards are taken, you know, and their technology was fairly standardized. Obviously, there was some innovation. That innovation did not lay in making a completely new window. It lay in making a completely new business model. The business model in India, which worked very well, was because of the lack of knowledge, of the ability of renewable energy to supply power to the great. So, they basically said, we will do everything. Then it eventually came to the point of the will to invest in a wind farm and not just the infrastructure. And so pretty much till the end to end value chain, the company owned to every responsibility. The customer has to just pay the money and ensure that they have certain fixed place or land. And obviously that is a return on investment. Moreover, here is a black box product. And it is a financial investment that will do it.

[00:12:49] I can imagine. A new technology sense, creates a lot of speculations that, first of all, it's something very new and not mentioned yet.

[00:13:03] Yeah. Exactly. In those days, if you had gone to a client and said, I want to show wind turbines with a holistic plan, they would love it. Yes. So, this was actually the skill of Suzlon which was to say, OK, I will do everything myself.

[00:13:15] All of these things are two-dimensional skills. You know, development is a different skill than building a turbine is a completely different skill than constructing a waterfall. You know, a lot of people, so long as did all of this in-house and they basically pushed customers who ideally would never be by producers. It needed someone who would meet these guys and say, OK, you don't have to worry about knowing anything about electricity or turbine or anything.

[00:14:53] It is very interesting in terms of the way they could tap the right customers and they could tap even the stakeholders. It is indeed very clever and very innovative business perspective. So, can these drivers be applied to countries with similar economic backgrounds, like even if they would like if the like? I have known that Suzlon has presence in Western companies and the U.S. has been. But then I do not really know much about if a similar economic situation and how have countries reacted. And what are the actions that were taken to actually enforce these drivers?

[00:15:47] Suzlon actually did a lot of projects in countries of some of the new territory, India, like South Africa and Brazil, as long as they got low wind farms, you know, Brazil, which was again, for the growth of the economy. But there was one reason they were not happy with. Historically, what has happened with Suzlon requires a lot of local knowledge. So, you know, Suzlon had long good buddies in India because companies grew around in India and hence, they trusted in Suzlon. Whereas in these countries, you know, every country is different. What worked in India, like we started the discussion, worked well, worked in Europe, may not work in Brazil. And the business

model that has been developed in some other country cannot be completely applied to other countries.

[00:16:46] You are absolutely correct.

[00:17:18] You know, innovation does not does not exist in isolation. That innovation is founded by the society itself under which it is trying to innovate by the rules and regulations, by the scenario under which the stakeholders are existing. And so, I think that balance of local knowledge and location will make the innovation successful. It is actually a lane together.

[00:18:31] So, let's move ahead. And what are the barriers behind innovation essence?

[00:19:00] I think really there's one Lack of knowledge about renewables. You know, I can see it from my own experience. I started in this industry in 2004 and a lot of people didn't understand wind energy or renewable energy. And was fake as a very, you know, because it was then that these energies are never going to be mainstream because they are only there when wind blows or sun shines, you know, it's foreign power. How can you talk about this? Because people who don't think about the concept, you can't actually manage them effectively. So, I think a lot of changes need to happen. So that was a very tough time in the initial years.

[00:19:55] I think disseminating knowledge and showing that, you know, you're asking people for even in those days, you're asking people to vote, let's change their mind in those days or across the board.

[00:20:14] Another barrier is the willingness to invest into a technology or something that they have never seen in their lives. I think that was that was the most important thing, to make it as good as possible for them. And I would come back to this one in the sense that innovation is great. But you have to then go ahead with innovation because as the market matures the innovation may be discarded or discontinued if not incremental updates are made.

[00:20:43] You're right. One wishes to understand the innovation first and only then invest in it.

[00:21:32] Yes absolutely. Now that also requires some serious level of trust. And maybe I think it is also important on a personal level, when management deals with such stakeholders. I think they also need to build that trust. And I think Suzlon had that capability to ensure that they have stakeholder attention and customer attention and all of that. And I think that they do a very good job in maintaining as well as delivering on those expectations.

[00:22:04] That's why, even after all these years, some of these customers are very loyal customers.

…… rest of the transcript has been audio coded on Atlas.ti.

#3 Coding on Atlas.ti

3 a. Drivers mentioned by respondents

All drivers mentioned by respondents, also contains overlapping drivers			Case Studies: 1.1-1.2 Tata; 2.1-2.2 chotuKool; 3.1-3.2 Suzlon.					
	Code	Comment	RIA1.1	RIA1.2	RIA2.1	RIA2.2	RIA3.1	RIA3.2
1	Business-Model	Local R&D	■					
2		Growth in each sector	■					
3		Local R&Ds	■					
4		Marketing	■					
5		Leadership	■					
6		Leadership style		■				
7		Collaboration with partners		■				
8		Super local R&Ds		■				
9		JiT- Just in Time		■				
10		Local R&D			■			
11		Designing according to target customer			■			
12		Marketing			■			
13		Bridging the demand and supply GAP			■			
14		Dealer-distribution model				■		
15		Marketing				■		
16		Promotional events				■		
17		Extensive advertising channels				■		
18		Positioning the innovation in the market				■		
19		Local R&D					■	
20		Funding for capital intensive market					■	
21		Local R&D						■
22		Country-specific business model						■
23		Earning strategies						■
24		Location						■
25	Cultural Value	Leadership interventions		■				
26		Interpersonal connectivity with employees		■				
27	Economic	Meet huge market demands	■					
28		Job opportunities	■					
29		Accessibility in rural areas	■					
30		Similar economic background		■				
31		Affordability			■			
32		Lower-price points				■		
33	Fiscal	Tax credits- Attractiveness towards high income individuals					■	
34	Political	Political support					■	
35		Local policies						■
36	Resource-constraints	Infrastructure			■			
37		Infrastructure					■	
38	Social-Embeddedness	Understand customer needs	■					
39		Identify the right customer	■					
40		Live with the customer to understand their needs	■					
41		understand customer needs			■			
42		Finding the target customer				■		
43		Leveraging customer sentiments				■		
44		Bridging the demand and supply GAP					■	
45	Technical	Functional breakdown or functional teardown	■					
46		Invest in technology	■					
47		Safety		■				
48		Useful and functional			■			
49		Safety			■			
50		Efficient			■			
51		Safety					■	
52		Efficient					■	

3 b. Barriers mentioned by respondents

All barriers mentioned by respondents, also contains overlapping barriers			Case Studies: 1.1-1.2 Tata; 2.1-2.2 chotuKool; 3.1-3.2 Suzlon.					
	Code	Comment	RIA1.1	RIA1.2	RIA2.1	RIA2.2	RIA3.1	RIA3.2
1	Business-Model	Poor product positioning	■					
2		Investment needs	■					
3		Unhealthy partnerships with vendors, investors	■					
4		Less local vendors for economical materials		■				
5		Lack of awareness on the innovation				■		
6		Less migration of new ideas						■
7		Lack of local knowledge						■
8	Cultural Value	Ethos	■					
9		Unable to meet the aspirational value			■			
10		Unable to meet the aspirational standards of the product				■		
11		Trust						■
12	Economic	Differences in male and female reactions towards an innovation				■		
13		Economic differences in society						■
14	Fiscal	Relying on Tax benefits	■					
15		Total cost of ownership		■				
16		Forex transaction					■	
17		Maintain Equity and debt ratios					■	
18	Political	Less economic support			■			
19		Rigid government			■			
20		Rigid government					■	
21		Less economic support						■
22	Social-Embeddedness	Not involving customers in the innovation process	■					
23		Inability to react as per customer feedback				■		
24	Techincal	Low quality	■					
25		Poor performance		■				
26		Imbalance between safety and price		■				
27		Second-hand goods			■			
28		Other low-cost manufacturing goods			■			
29		Chinese manufacturers				■		
30		Motivation for reduction in GHG					■	
31		Low LCoE (Levelized cost of Electricity)					■	
32		Poor performance						■

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