Technology Entrepreneurship Capability Development in Indian Automotive Industry

Mohd Talha Khan and Niraj Kumar

Abstract Technology entrepreneurship comprises of technical aspects and ability of entrepreneurship skills and competency. The four interrelated and complementary factors of entrepreneurship technology are: context, firm, technology, and entrepreneur. The merging of these four factors is necessary to create a competitive edge in the present scenario. The Indian automobile industries are well equipped with local firms having natural design and development capabilities. These local firms are not only well established global brands but also have a good marketing presence in India and other emerging markets. This study focuses primarily on technology entrepreneurship capability development in the Indian automobile industry and reveals the key attributes that shaped the innovative capabilities developments.

Keywords Entrepreneurship capability development · Indian automotive industry

1 Introduction

Entrepreneurs are the drivers of the economy in almost all of the nations. It is the effort of entrepreneurs that create job opportunities for the people of the nation [1]. Defined entrepreneur as one who moves economic resources from an area of lower productivity into an area of higher productivity with greater yield. When this term becomes entrepreneurship, it is the globalization and liberalization phenomena that are running the economy of the world towards rising competitiveness. Today, the major focus is on technology-based industries such as information technology, biotechnology, automobile industries, and the electrical & electronics industries [2]. The global trend is, therefore, moving toward entrepreneurial activities that are technology-oriented, also termed as 'technology entrepreneurship'. In the last 10 years, the

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Indian automotive industry is one of the fastest growing industries with increasing levels of technological understanding amongst various other emerging countries.

It provides employment in mass for local populations in the country. Also, its export revenues help to increase foreign trade [3]. It is quite clear that the Indian automotive industry also followed the same track of development followed by other emerging countries such as Brazil, Mexico, and Thailand [4]. It started with an assembly of automotive components, after that gradual increase in local content to full-scale manufacturing and after that finally to export promotion phase [5]. In 2006, the Government of India declared Automotive Mission Plan of 10 years from 2006 to 2016 for supporting strongly to the automobile industry, thus, aiming to boost production and increase export of vehicles [6]. As a result of this, in 2008 the Indian firm Tata Motors designed and developed the world's cheapest car named 'Tata Nano' which is against all the expectations of global car makers. Similarly, in the same year, Mahindra and Mahindra launched a sports utility vehicle, named 'Scorpio', which is against the product of the indigenous design and development effort. In 2010, Maruti Suzuki's car named 'Alto' became the world's largest car sold by volume [3]. In Indian car export, Hyundai and Maruti Suzuki share more than 90% of the total sales. Hyundai has located its production sites in Chennai and shipped to 95 countries in the year 2009 [7]. For Hyundai, India is a global automobile hub for production and sales both in India as well as the global market. These developments of the Indian automotive industry surprised other auto firms as their expectation of Indian success in the global market were low due to a perceived disorder between the scale of the challenges and existing capabilities of the Indian automobile companies [8].

2 Technological Capability in Indian Automobile Industry

Technological capability is defined as the ability to make trained manpower for

- Carrying out initial research work.
- Testing general facilities available in the industry.
- Acquire and accept new technologies.
- Provide information, supportive and networking system [9].

Technological capability in general can be best described in terms of three levels:

- Basic level means the ability to operate and maintain a new production plant which is based on imported technology i.e. production capability.
- Intermediate level means the ability to copy and accept the design and technique of an imported plant anywhere else in the country or abroad, i.e., investment capability.
- Advanced level means a capability to adopt new designs and develop new production systems and components, i.e., innovation capability (Table 1).

Table 1 Elements of technology capability

Level	Components
Basic level, i.e., production capability	Production engineering, production management, maintenance of capital equipment, and marketing of output produced
Intermediate level, i.e., investment capability	Project engineering, project management, capabilities to procure and training of manpower
Advanced level, i.e., innovation capability	Generates new technical possibilities for the purpose of profit making

Source Author

Most of the Indian manufacturing firms like food processing, metal forming and forging, steel, machine tools, pharmaceuticals, etc. appear to beat the basic or intermediate level of technological capability, whereas Indian automobile industry is at an advanced level [2, 10]. The industrial policy of the Indian government leads to the development of basic capabilities but on the other side, it restricted technology capability development in Indian automobile manufacturing. The key attributes of firm ownership, such as managerial vision and diversified nature of the business, helped Indian firms in the development of technological capabilities [3].

3 Salient Features of Indian Automobile Industry

The performance of Indian Automobile Industry is measured in three contexts: Automobile Production Trends, Automobile Domestic Sales Trends and Automobile Exports Trends.

3.1 Automobile Production Trends

A growth of 5.41% has been registered in industrial production in the year from April–March 2016 to 24,016,599 over April–March 2017 to 25,316,044 of vehicles which includes two wheelers, passenger vehicles, three wheelers, and commercial vehicles. [11]. The industrial production growth in the past 6 years is shown in Fig. 1.

3.2 Automobile Domestic Sales Trends

In the same time frame of last year, i. e., from April–March 2016 to April–March 2017, sales of passenger vehicles increased by 9.23% during April–March 2017.

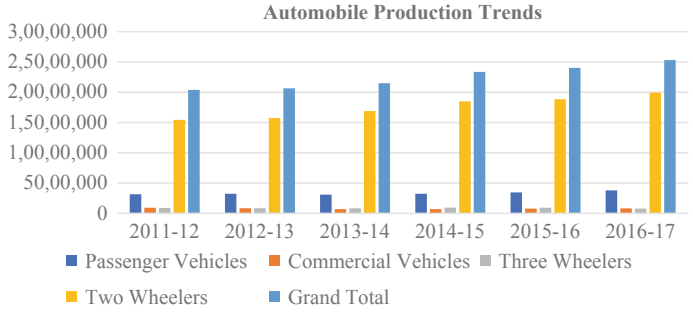

Fig. 1 Automobile production trends in the past 6 years. *Source* [12]

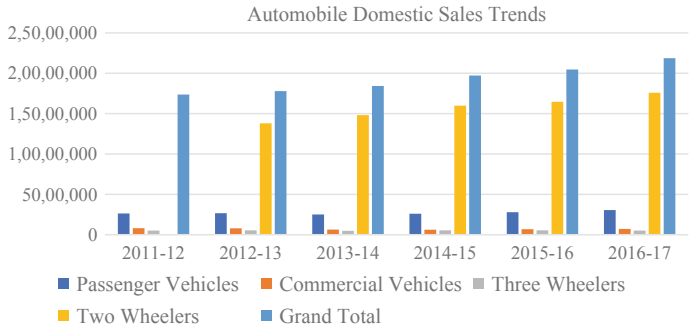

Fig. 2 Automobile Domestic Sales Trends in the past 6 years. *Source* [13]

Similarly, in this time period amongst all passenger vehicles, around 3.85% rise was in passenger cars, a 2.37% rise was in vans and 29.91% rise was in utility vehicles. In April–March 2017 net commercial vehicle segment represented 4.16% growth over the past 1-year period. Light commercial vehicles rise by 7.41% and M & HCVs (Medium and Heavy Commercial Vehicles) grown up by 0.04% in April–March 2017 over the past 1-year span. There is a decline of −4.93% in three wheelers during April–March 2017 over the last 1-year period. Sales of goods carrier increase by 12.75%, while sales of passenger carrier reduce by −8.83% during April–March 2017 over the last 1-year span. A rise of 6.89% has been registered in the sales of two wheelers during April–March 2017 over April–March 2016 which includes a 23.02% increase in mopeds, an 11.39% rise in scooters and 3.68% hike in motorcycles within two wheelers segment has been registered in April–March 2017 over April–March 2016 [11]. The industry domestic sales trend of the last six years is shown in Fig. 2.

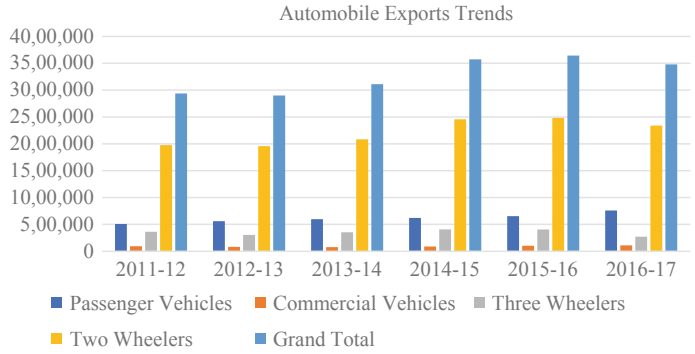

Fig. 3 Automobile Exports Trends in the past 6 years. *Source* [14]

3.3 Automobile Exports Trends

There is a reduction of −4.50% of overall automobile exports in April–March 2017 over April–March 2016. The rise of 4.99%in commercial vehicles and 16.20% in passenger vehicles has been registered within the same time period. Exports of two wheelers dropped by −5.78% and three wheelers dropped by −32.77% in April–March 2017 over April–March 2016 [11]. The industry exports trend for the past 6 years is shown in Fig. 3.

4 Analysis of Technology Entrepreneurship Capability Development in the Indian Automobile Industry

The analysis found that factors for Technology Entrepreneurship Capability Development in Indian Automobile Industry are growing demand, policy support and support infrastructure and high investments [15] (Table 2).

5 Indian Automotive Market 2020

India is a key pillar of the world's automotive market. Strategies, policies, and actions of India automotive market will have core impact on the worldwide auto landscape. It is thus expected that India automotive sales lead the US market around the mid-2030s. The global automotive game will be pretty much decided by the twin forces for China and India. With global economic shift, automotive sales are resonating towards the India market in the Asian region [16]. Passenger vehicle sales distribution

Table 2 Factors of technology entrepreneurship capability development

Growing demand	• Key driver of technology entrepreneurship capability development due to the rise in income of the individual and a large youth population
	• Enough availability of credit and finance related support
	• Rise in demand for commercial vehicles which results due to the high level of activity work in the infrastructure sector
Policy support	• Indian government adopted the Public Private Partnership model with Maruti Udyog Limited and Suzuki to make India as an automobile manufacturing hub
	• Missions like Make in India, Automotive Mission Plan 2026, NEMMP 2020 etc. all are going to improve the automobile sector to triple, i.e., 9.4 million units of passenger vehicles by 2026
Support in infrastructure and high investments	• Developing road infrastructure is one of the key segments of technology entrepreneurship capability development and India at present has the second largest road network in the world
	• Recognized firm ownership and managerial vision of Indian Automobile Industry thus providing necessary support to encourage the growth of the sector
	• 5% of total Foreign Direct Investment inflowing to India went into Indian Automobile sector which resulted in higher supplier productivity, better and cheaper products

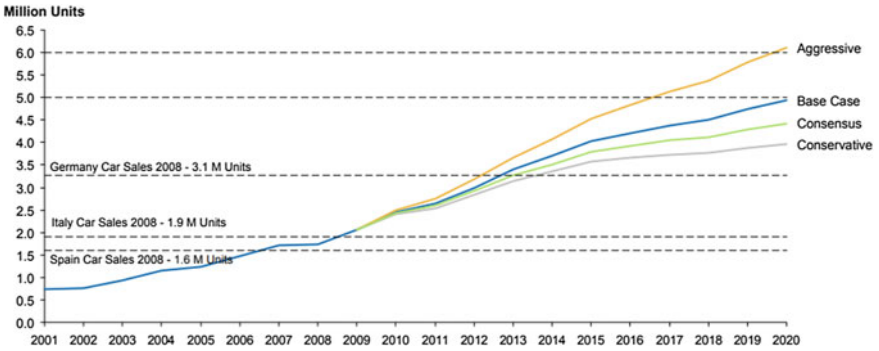

Fig. 4 Growth of passenger vehicles sales in India from 2001 to 2020. *Source* [16]

is represented in Fig. 4 shown below thus indicating the potential for rapid growth of the Indian car market to 6+ millions of units annually by 2020.

Self-governing cars are expected by 2020 to be on the roads. Amongst consumers efficiently performing hybrid cars will be most populous [17]. As India is moving towards Smart Cities Mission smart transportation is its key element.

6 Conclusion

In India, the automotive industry has a prominent future. Technology Entrepreneurship Capability Development in Indian Automobile Industry is presented in this paper. The three levels of Technology Capability, i.e., basic level (production capability), intermediate level (investment capability), and advanced level (innovation capability) are described. The performance of Indian Automobile Industry for the past 6 years is analyzed. Important growth factors of the automobile industry, i.e., growing demand, policy support and support infrastructure and high investments are identified. India's automobile market is penetrating the International automobile market and apart from this also meeting the advancing national automobile demands. Technology Entrepreneurship Capability development in the Indian Automobile Industry is also emphasized with the future scope of Indian Automotive Market by 2020.

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