

A review of global automotive industry's competitive strategies

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Abstract

Purpose – The purpose of this paper is to study the latest global automotive industry's competitive strategies comprehensively before being categorized into countries, automakers and other scholars.

Design/methodology/approach – In total, 54 most relevant articles have been chosen from various journals and databases between the years 2017 and 2018 with search items "Competitive" and "Automotive" for the most updated review. Based on findings, there are total 133 competitive strategies.

Findings – Based on the review and analysis of the literature, all of these three categories, countries, automakers and other scholars, are using new product development (NPD) as a competitive strategy. As a result, further research on NPD, specifically in the automotive industry area, is vital for industry's competitiveness based on this study.

Research limitations/implications – Firms are advised to be ahead from the competitors in terms of business model or in their management in order to attain sustainability. However, to the authors' best knowledge, there is no comprehensive review on competitive strategies for automotive globally by countries, automakers and other scholars.

Practical implications – The competitive strategies are reviewed comprehensively so that other than guiding the further research, they can help automakers, especially from developing countries, to improve the strategies suitable to the current trend.

Social implications – Automotive industry plays a key role in the day-to-day activity of human life by not only providing mobility but also having an enormous impact of the industry on economic, environmental and social activities throughout the globe.

Originality/value – Most of the articles reviewed related to certain country or comparison between the countries, and certain automaker or comparison between the automakers, but still no study about comprehensive review globally covered in the larger scope, divided into three categories; countries, automakers and other scholars even though the study is vital not only to academicians but also to practitioners.

Keywords Competitiveness, Automotive, New product development

Paper type General review

1. Introduction

The automotive industry has a deep impact on the society and environment; it is one of the most important sectors, dynamic (Smerichevskiy *et al.*, 2018), and one of the largest manufacturing sectors (Mathivathanan *et al.*, 2018). Since it directly correlated with manufacturing and service sectors, the automotive industry is viewed as one of the most pertinent contributors for the economy (Mohiuddin *et al.*, 2017; Lee and Govindan, 2014). The number of vehicles produced in a manufacturing plant over a period of time due to the globalization, the increase of ASEAN population with over 600m (Shukor *et al.*, 2017) and also the intensified competition in the automotive industry (Bartnik *et al.*, 2018; Chrisostom and Monari, 2018) have made the automotive sector powerful worldwide (Pechancová, 2017), including its global auto-component suppliers (Kalogerakis *et al.*, 2017). Besides abundance of opportunities, globalization also paved the way with various challenges for all industries including the automotive industry (Lamprecht and Tolmay, 2017). In Malaysia, the Prime Minister Mahathir Mohamad had announced the direction and policies that will guide industries in Malaysia toward Industrial Revolution 4.0. The brief of industrial revolution from the first IR to the fourth IR, taken from Official Website of the Malaysia Automotive Robotics and IoT Institute (2018), is given as follows:

- Industrial Revolution 1.0:

It can be traced back to 1760s; it was characterized by the transition from hand production methods to machines, the increasing use of steam power, the development of machine tools and the rise of the factory system.



- Industrial Revolution 2.0:
It can be traced back to 1870s and it is known as Technological Revolution. It was characterized by vast movement of people and ideas, enhanced communication and the introduction of new technological systems.
- Industrial Revolution 3.0:
It can be traced back to late 1950s and it is known as Digital Revolution. It was characterized by the transition from mechanical and analogue electronic technology to digital electronics, which caused the widespread use of computer, hand phones and the internet.
- Industrial Revolution 4.0:
It can be traced back to the year 2016 in which the use of cyber-physical systems had started, which were controlled or monitored by computer-based algorithms tightly integrated with the internet and its users such as the use of computer numerical control machines.

There are numerous studies regarding how a firm can maintain its sustainable competitive advantage and improve its performance in fast changing and unpredictable environments (Rahim and Zainuddin, 2017). Competitive strategy is about being different, choosing a different set of activities than competitors (Viltard, 2017) and when other companies cannot duplicate the benefits it provides, a competitive advantage becomes sustainable (Tientavaj *et al.*, 2017). Hence, automobile companies have to make adjustment in their strategies (Sanghavi *et al.*, 2015). This paper makes a comprehensive review related to the competitiveness in the automotive industry as per other countries' and automakers' practices, and it also includes research by other scholars from various journals and databases. The next topic, the purpose, gives a short description of the reason to the initiation of this study. Then, the next section gives an approach from article selection till grouping of strategies, followed by the findings on strategies to become competitive, which are found from the literature review. Then, discussion is provided with practical implications of the review study before suggesting future research and the limitation of this study. Consequently, the final section presents the conclusions of the study.

2. The purpose of the study

For being immensely important to economic and social growth, both in the short and long terms, the automotive industry has continuously proven to be a cornerstone to the development of many countries (Marin and Kaminski, 2018). The automotive industry has been a generator and exporter of leading management practices and the source of continuous stream of high and medium technologies as the car has shaped not only the global economy but also the ways of living of billions of people (Hernández *et al.*, 2017). Due to large demand in emerging economies in Asia, Latin America and Eastern Europe, automotive OEMs have been increasing their global activities (Kalogerakis *et al.*, 2017). The pressures have led automotive companies to look for an edge wherever they can find it (Lee and Govindan, 2014) and to restructure their business strategy (Habidin *et al.*, 2015), especially with the increasing demand of cars in the automobile market, particularly in Malaysia (Lee and Govindan, 2014). In Malaysia, automaker like PROTON needs to update with new automotive business trends (Shatouri *et al.*, 2013) and keep up with changing needs of consumers (Ali *et al.*, 2013).

3. Approach to study

The systematic reviews have been employed for more rigorous and well-defined approaches for reviewing the literature in a specific subject area of new product development (NPD). Systematic reviews are used to strengthen the relevance of studying NPD for suppliers in

automotive industry. The time frame has been set, 2017–2018, and the literature has been selected along with the methods used to evaluate and synthesize findings of the studies. In order to assess the reliability and validity of the review, the authors have set inclusion or exclusion criteria, the methods to select and access the literature, the methods to assess the quality of the literature included in the review, to analyze, synthesize and disseminate the findings. The purpose of the systematic review is to provide a complete list of all published studies related to particular automotive industry in relation to competitive strategies.

Compared to traditional reviews that summarize the results of a number of studies, this systematic review uses explicit and rigorous criteria to identify, critically evaluate and synthesize all the works of literature on a particular topic in automotive industry. In total, 54 most relevant articles have been chosen from various journals and databases such as Emerald, Science Direct, Springer, Sage, etc., along with articles from worldwide university websites such as universities in Germany, Malaysia, the UK, America, etc., due to reliability sources. Google Scholar has been used to search “competitive strategies automotive global” before leading to databases and university websites to get more comprehensive study worldwide and to represent the global scope as this study related to global strategies published from 2017 to 2018 for most updated review. For the first review, 100 articles have been selected that focus specifically on automotive industry, not on general manufacturing, for more focused strategies on the industry. Then, from 100 articles, 54 articles have been selected based on both words “automotive” and “competitive,” which must be available in each article to increase the relevance of the chosen articles. Next, all 54 articles have been reviewed thoroughly to find the names of automakers and countries to generate Tables I and II. Table III is related to other scholars, who do not mention specifically the strategies related to any automakers or any countries. However, it has been grouped into areas related to the mentioned competitive strategies. Some articles mentioned about both automakers and countries, for example by Chen (2017) and Lee and Mah (2017), which are mentioned in both Tables I and II, whereas Akafia *et al.* (2017) is mentioned in both Tables II and III.

4. Findings on competitive strategies

In this topic, the author explains the details of the competitive strategies. The summary of the findings for the competitive strategies can be found in Tables I–III, with 133 competitive strategies from countries, automakers and other scholars.

4.1 Competitive strategies by countries globally

In total, 29 articles have been reviewed, which consist of 14 countries with 56 competitive strategies between 2017 and 2018 for latest strategies. Most of the studies mentioned about China with ten competitive strategies and the second highest was India with nine competitive strategies. According to study by Hertenstein and Williamson (2018), it can be observed that China has overtaken the USA to become the largest automotive market in the world since 2013, and in India, as per Loganathan (2013), multinational companies are setting their foot to leverage the growth in the automobile sector. Most efforts are initiated by governments in their policies such as in South Africa (Lamprecht and Tolmay, 2017), China (Lee and Mah, 2017), Canada (Sweeney and Mordue, 2017) and in Japan (Buigues, 2017). Besides policies, there are numerous efforts by governments, such as China has import quota system (Chen, 2017), Koreans push for export markets (Bartnik *et al.*, 2018), Turkey promotes flexible firm structures (Senlier and Salihoglu, 2017) and Thailand supports to develop mold and die industry quickly (Tiengtavaj *et al.*, 2017). Suppliers play a big role in automotive industries for India, Japan, Thailand, Malaysia, Germany and Turkey. The automobile industry in India is backbone by suppliers (Ibrahim and Vasudevan, 2018) wherein suppliers have advantages in flexible processes

No.	Countries	Strategies to become competitive	Author and year
1	South Africa	1. Duty-free access	Lamprecht and Tolmay (2017)
2	India	2. Trade policies by government	Kalogerakis <i>et al.</i> (2017)
		1. Digitalisation	
		2. Process innovations	
		3. Flexibility of processes	
		4. Skilled workers that can be rented on demand	
		5. State-of-the art technological practices	
		6. Fast with low costs	
		7. Policy making toward EV	Pahurkar and Metha (2017)
		8. Knowledge management	Ibrahim and Vasudevan (2018)
		9. Cooperation between suppliers and manufacturers in product development relationship	Mathivathanan <i>et al.</i> (2018)
3	Japan	1. Toyota Production System (TPS)	Bartnik <i>et al.</i> (2018)
		2. Long-term cooperative relationship between automakers and suppliers	Mohiuddin <i>et al.</i> (2017)
		3. Eco-friendly	Ishida <i>et al.</i> (2017)
		4. National industrial policy-heavy protection	Chen (2017)
4	Thailand	1. Internal and external R&D	Buigues (2017)
		2. A "cluster" focused on the true contribution of all sectors	Chamsuk <i>et al.</i> (2017)
		3. Increase innovation capability	Fongsuwan <i>et al.</i> (2017)
		4. Develop mold and die industry quickly	Tiengtavaj <i>et al.</i> (2017)
		5. High numbers of world class auto parts industry in the country	Ariffin and Sahid (2017)
5	China	1. Investments of foreign multinationals from the advanced multinational economies (AMNEs) and the creation of indigenous Chinese car producers	Hertenstein and Williamson (2018)
		2. Launching an increasing variety of new hybrid and electric models each year	Bartnik <i>et al.</i> (2018)
		3. Modularization	Seyoum and Lian (2018)
		4. Restrictions on passenger vehicle imports with import licenses by government	Chen (2017)
		5. Import quota system from the late 1980s	
		6. Tax reduction policy by government	
		7. Subsidy system by government	
		8. Industrial policy implemented by government	Lee and Mah (2017)
		9. Electric automobile production technology	
		10. A series of "market for technology" policies	Yang <i>et al.</i> (2017)
6	South Korea	1. Merger with larger competitors for the smaller players that could not keep up	Bartnik <i>et al.</i> (2018)
		2. Flexibility, engineering and modularization capabilities	Chamsuk <i>et al.</i> (2017)
		3. Restricting the import of automobile components by the government	Lee and Mah (2017)
		4. Increasing exports	
		5. Electric automobile production technology	
		6. Automobile industry promotion policy	Buigues (2017)
7	Malaysia	1. Strategic partnership with China Geely Auto	Ariffin and Sahid (2017)
		2. Green production strategy	Rashid and Shami (2018)
		3. Regional hub for energy-efficient vehicles (EEV)	Shukor <i>et al.</i> (2017)
		4. Promote investments in green automotive technologies	
		5. Continuously develop local automotive industry	
		6. New product developments' pace acceleration	Rahim and Zainuddin (2017)
		7. Sustainable performance in product development	Rashid and Shami (2018)

(continued)

Table I.
Competitive strategies
for automotive
industry by countries

No.	Countries	Strategies to become competitive	Author and year
8	German	1. Innovation 2. Digitalisation 3. Close and two-interaction with suppliers over a long cycle in vehicle development	Kalogerakis <i>et al.</i> (2017) Hertenstein and Williamson (2018)
9	Turkey	1. Social Media – Facebook 2. Experienced suppliers 3. Technology intensive and flexible firm structures by government aids 4. Interactions with R&D institutions, cluster management and capable workforce	Yuksekbilgili and Bagkur (2017) Senlier and Salihoglu (2017)
10	Canada	1. Maximize the effectiveness of policy support 2. High quality of labor force	Sweeney and Mordue (2017) Yates and Lewchuk (2017)
11	Mexico	1. Competitive wages and benefits packages to recruit and retain workers from the upper echelons	Mordue and Sweeney (2017)
12	Kenya	1. Embrace green logistics management practices	Chrisostom and Monari (2018)
13	Rusia	1. Automotive cluster plays a major role in import substitution	Bazhenov <i>et al.</i> (2017)
14	Brazil	1. Risk management for NPD using failure modes and effects analysis (FMEA)	Baynal <i>et al.</i> (2018)

Table I.

Source: The Author

(Kalogerakis *et al.*, 2017). India practices suppliers and manufacturers relationship in product development (Mathivathanan *et al.*, 2018) similar to Japan (Ishida *et al.*, 2017), and Germany (Hertenstein and Williamson, 2018) supports a long-term relationship with suppliers. Thailand, once championed as the “Detroit of Asia” (Chamsuk *et al.*, 2017; Ariffin and Sahid, 2017), hosts over 50 percent of the world’s top OEM automotive parts suppliers (Tientavaj *et al.*, 2017). Suppliers in Malaysia are forced to shift paradigm in green production strategy (Rashid and Shami, 2018).

Green energy plays an important role in many countries, such as policy making toward electric vehicle in India (Pahurkar and Metha, 2017) and launching of an increasing variety of new hybrid and electric models each year by China (Bartnik *et al.*, 2018). Also, Korea and China are closely linked to each other in the production of electric automobiles (Lee and Mah, 2017), Malaysia promotes itself as the regional hub for energy-efficient vehicles (EEV) (Shukor *et al.*, 2017) and Kenya embraces green logistics management practices (Chrisostom and Monari, 2018). In terms of innovation and NPD, German Association of the Automotive Industry (VDA) and India stated that the innovation is a key to international competitiveness (Kalogerakis *et al.*, 2017) such as, in Thailand, the R&D promoted the development of innovative products. However, in Malaysia, the aims for technological innovation capabilities, which can accelerate the speed of NPD (Rahim and Zainuddin, 2017), and eco-product innovation, which can lead to a positive sustainability development (Rashid and Shami, 2018). For Brazil, the risk management of NPD is by using failure modes and effects analysis (FMEA) technique for the effectiveness (Baynal *et al.*, 2018). Turkey and Canada have capable workforce (Senlier and Salihoglu, 2017; Yates and Lewchuk, 2017). Other competitive strategies implemented are Toyota Production System in Japan (Bartnik *et al.*, 2018; Mohiuddin *et al.*, 2017), mold and die industry in Thailand (Fongsuwan *et al.*, 2017), flexibility for collaboration in new car development by Korean carmakers (Chamsuk *et al.*, 2017), strategic partnership with Geely Auto by Malaysia (Ariffin and Sahid, 2017), social media like Facebook by

No.	Automakers	Strategies to become competitive	Author and year
1	Chrysler	1. Merger with fiat	Oz and Balsari (2017)
2	General motors (GM)	1. Focusing on compact cars to adapt environmental change in the Chinese automobile market	Chen (2017)
3	Toyota	2. Collaboration with Chinese automakers in joint ventures	Choi <i>et al.</i> (2017)
		1. Manufacturing Management	Ishida <i>et al.</i> (2017)
		2. Innovation – R&D	George and Catalin (2017)
		3. Hybrid car	Liu and Meng (2017)
		4. Develop the middle- and low-end market	
		5. Set up research and development centers around the world	
		6. Good quality, fine workmanship and excellent service	
		7. Client services	Akafia <i>et al.</i> (2017)
		8. Lean manufacturing/Toyota Production System (TPS)	Fok-Yew (2018)
4	Fiat	1. Merger with Chrysler	Oz and Balsari (2017)
5	Hyundai	1. Localizing their overseas production base	Choi <i>et al.</i> (2017)
		2. Global production line expansion and aggressive price competitiveness	
		3. Engaging customers through social media like Facebook	Yuksekbilgili and Bagkur (2017)
		4. Product development adjusting to local needs	Chen (2017)
		5. Launch “globally appealing models” to gain scale of economy	Koo (2017)
		6. Joint venture with Ford to improve technology level	Lee and Mah (2017)
6	Kia	1. Joint venture with Honda to improve technology level	Lee and Mah (2017)
		2. Global production line expansion and aggressive price competitiveness	Choi <i>et al.</i> (2017)
7	Daewoo	1. Joint venture with general motors (GM) to improve technology level	Lee and Mah (2017)
8	BMW	1. Harmonizing internal competencies with external changes	Choi <i>et al.</i> (2017)
		2. Commit towards the development of innovations	Karayel (2017)
		3. Strong network and cooperation with suppliers	
9	Volkswagen	1. Innovation – R&D	George and Catalin (2017)
		2. Focusing on compact cars to adapt environmental change in the Chinese automobile market	Chen (2017)
10	Renault	1. Engaging customers through social media like Facebook	Yuksekbilgili and Bagkur (2017)
11	Cherry	1. Reverse engineering to imitate foreign automobiles	Chen (2017)
12	BYD	1. Reverse engineering to imitate foreign automobiles	Chen (2017)
13	Geely	1. Reverse engineering to imitate foreign automobiles	Chen (2017)
14	Tofas	1. R&D orientation	Oz and Balsari (2017)
		2. Fiat partnership	Oz and Balsari (2017)
15	Isuzu	1. Isuzu Manufacturing Management (IMM)	Mohiuddin <i>et al.</i> (2017)
16	Ford	1. Collaboration with Chinese automakers in joint ventures	Choi <i>et al.</i> (2017)
17	Tesla	1. Technology innovation	Liu and Meng (2017)
		2. Promote the development of the new energy vehicle industry innovation environment	

Table II.
Competitive strategies
for automotive
industry by
automakers

Source: The Author

Turkey (Yuksekbilgili and Bagkur, 2017) and localization of automotive component manufacturing by Rusia (Bazhenov *et al.*, 2017).

4.2 Competitive strategies by automakers globally

In total, 13 articles have been reviewed, which consist of 17 automakers with findings of 34 competitive strategies from 2017 to 2018 to find the latest strategies. Most of the studies

No.	Areas	Strategies to become competitive	Author and year
1	Resource	1. Unique resource	Rahim and Zainuddin (2017)
2	Environment	1. Environmental program 2. Environmental responsibility	Vanalle <i>et al.</i> (2017) Pechancová (2017)
3	Digitalization	1. Digital markets or electronics 2. Social media to connect with the consumers	Chrisostom and Monari (2018) Hernández <i>et al.</i> (2017)
4	Delivery	1. On-time delivery 2. Improvement on delivery	Yuksekbilgili and Bagkur (2017) Purba <i>et al.</i> (2018)
5	Supply chain	1. Supply chain strategy in the overall corporate strategy 2. Supply efficiency and performance 3. Sustainability supply chain management practices	Esa and Yusof (2017) Akafia <i>et al.</i> (2017) Sharma <i>et al.</i> (2018) Mathivathanan <i>et al.</i> (2018)
6	Quality	1. Integrate quality into all aspects of products and services in management system 2. Product quality	Esa and Yusof (2017) Pothal <i>et al.</i> (2018)
7	R&D	1. R&D capabilities 2. R&D cooperation	Fongsuwan <i>et al.</i> (2017) Karayel (2017)
8	Supplier	1. Transfer responsibilities to component suppliers 2. Suppliers' technology 3. Suppliers' product diversification 4. Suppliers' knowledge	Badillo <i>et al.</i> (2017) Kotturu and Mahanty (2017) Manello and Calabrese (2018) Karayel (2017)
9	New product development (NPD)	1. Diversity of power trains and increasing product variants 2. Fostering NPD 3. Continuously develop product 4. Process development	Diffner <i>et al.</i> (2018) Kotturu and Mahanty (2017) Pahurkar and Metha (2017) Holtskog (2017)
10	Flexibilities	1. Volume flexibility 2. Design 3. Cope actively with the rapidly changing environment	Winroth and Bennett (2017) Choi <i>et al.</i> (2017)
11	Service	1. After sales service – availability of spare parts (faster) 2. Consultancy services 3. Continuously develop services 4. Aftermarket services	Purba <i>et al.</i> (2018) Akafia <i>et al.</i> (2017) Pahurkar and Metha (2017) Domazet and Stosic (2017)
12	Manufacturing	1. Maximize the operational efficiency with its restricted internal resources 2. Total improvement on productivity 3. Japanese Manufacturing Management (JMM) practices	Choi <i>et al.</i> (2017) Esa and Yusof (2017) Mohiuddin <i>et al.</i> (2017)
13	Knowledge	1. Knowledge Management	Ibrahim and Vasudevan (2018)
14	Credibility	1. Maintain market credibility	Purba <i>et al.</i> (2018)
15	Organizational capabilities	1. Enhancement of core capabilities SMEs 2. Integrating organizational capabilities with its resources 3. Organizational competences 4. Strategic differentiation 5. Strategic alliances 6. Continuous investment in technology	Kotturu and Mahanty (2017) Akafia <i>et al.</i> (2017) Albers <i>et al.</i> (2017) Hernández <i>et al.</i> (2017) Karayel (2017) Pahurkar and Metha (2017)
16	Cost	1. Improvement in cost	Esa and Yusof (2017)
17	System	1. Logistics system	Amran and Yose (2018)
18	Merge	1. Mergers and acquisitions (M&As) strategies	Carvalho and Ogasavara (2017)

Table III.
Competitive strategies
for automotive
industry discussed by
other scholars

Source: The Author

mentioned about well-known Toyota with total eight competitive strategies and the second highest is Hyundai with six strategies, parallel with the finding from Liu and Meng (2017) about Toyota success with sales of hybrid and Hyundai as the largest automobile producer in Korea (Lee and Mah, 2018). For Hyundai, the product development is adjusting to local needs (Chen, 2017) and launching “globally appealing models” (Koo, 2017). Hyundai and Kia have localized their overseas production base, besides aggressive price competitiveness (Choi *et al.*, 2017). The merger of Fiat and Chrysler in 2014 had increased their dominance in the US market (Oz and Balsari, 2017). Volkswagen (VW) and General Motors (GM) focus on compact cars (Chen, 2017), and the market share of Ford and GM increased in China after collaboration with Chinese automakers in joint ventures (Choi *et al.*, 2017). The next are strategies by Toyota, with hybrid car sales more than 700m in the world (Liu and Meng, 2017), lean manufacturing in Toyota way has been recognized as providing manufacturing management with a significant competitive advantage (Ishida *et al.*, 2017; Fok-Yew, 2018). Toyota's overseas strategy is to set up R&D around the world, business model for new energy is fine workmanship, and Toyota develops the middle- and low-end market (Liu and Meng, 2017) besides providing client services as marketing strategies (Akafia *et al.*, 2017). BMW achieved upswing in operating efficiency (Choi *et al.*, 2017) and supported the graduate program in automotive engineering in Clemson University in Greenville (Karayel, 2017). Chery, BYD and Geely use reverse engineering to imitate foreign automobiles (Chen, 2017). Through Fiat partnership, Tofas had a significant growth during the financial crisis (Oz and Balsari, 2017). Isuzu Manufacturing Management was implemented by its parent company in Japan, and similar best practices are adopted and shared by its overseas plants throughout the world (Mohiuddin *et al.*, 2017). Tesla is among the best companies in the world, standing on the forefront of technology innovation environment, and it shared all its patented technology with other companies (Liu and Meng, 2017).

4.3 Competitive strategies discussed by other scholars globally

In total, 28 articles have been reviewed, which consist of 18 areas with 43 competitive strategies from 2017 to 2018 to find the latest strategies. There are four articles related to NPD and three articles related to supplier as competitive strategies in 2017 and 2018. Environmental programs become part of organizational and technological projects (Vanalle *et al.*, 2017), which cannot be seen as annoying cost or inevitable threat but as a competitive opportunity (Pechancová, 2017). The competitive battle will be conducted in the digital arena (Hernández *et al.*, 2017) such as Facebook (Yuksekbilgili and Bagkur, 2017). Companies need to be able to deliver products on time (Purba *et al.*, 2018) and with quality (Winroth and Bennett, 2017; Esa and Yusof, 2017). Some companies use supply chain strategy (Akafia *et al.*, 2017; Sharma *et al.*, 2018; Mathivathanan *et al.*, 2018) and effective logistics system (Amran and Yose, 2018). The product quality is acting as a key to success of companies (Pothal *et al.*, 2018), which needs to be integrated into all aspects as in total quality management (Esa and Yusof, 2017). R&D capabilities have a direct influence on competitive advantage (Fongsuwan *et al.*, 2017) where the cooperation allows knowledge to flow among different firms (Badillo *et al.*, 2017). Supplier's knowledge has a significant importance in the success of auto OEMs (Karayel, 2017), with some automakers transferring as many responsibilities to component suppliers (Kotturu and Mahanty, 2017). In European automotive industry, carmakers see suppliers' technology to make purchasing decisions (Manello and Calabrese, 2018). Fostering NPD is a key factor to compete in the present global market (Kotturu and Mahanty, 2017). Hence, companies need to continuously develop product (Pahurkar and Metha, 2017) and process development (Holtskog, 2017). After sales activities are recognized as a primary source of revenue (Domazet and Stosic, 2017). Automotive manufacturers must prepare to increase the number of product variants required for more customized vehicles (Diffner *et al.*, 2018). Organizational competences are

key drivers of competitive strategies (Albers *et al.*, 2017) in which the enhancement of core capabilities is necessary (Kotturu and Mahanty, 2017) such as to develop cutting-edge software and integrating the car with the smartphone ecosystem (Hernández *et al.*, 2017). It is essential for automakers to take advantage of potential vehicles' sales growth in China through smart joint ventures with Chinese companies (Ferrara, 2017) wherein the strategic alliances undertake a vital role for the company's competitive achievement (Karayel, 2017) along with the mergers and acquisitions strategies (Carvalho and Ogasavara, 2017).

5. Discussion and practical implications of the review study

From the review, it can be observed that NPD plays a significant role to enhance competitive strategies, such as in Brazil, they are using FMEA for risk management in NPD (Baynal *et al.*, 2018). There is no exception in Malaysia, where NPD's pace is accelerated for sustainable performance (Rashid and Shami, 2018). Based on the review, the integration of suppliers and automakers in NPD can be an interesting study to explore further as a lot of studies are related to cooperation and interaction between automakers and supplier has grown year by year. For example in India, Mathivathanan *et al.* (2018) mentioned about cooperation between manufacturers and suppliers in product development relationship. However, Hertenstein and Williamson (2018) mentioned about close interaction with suppliers over a long cycle in vehicle development in Germany. Besides, further studies can specifically focus on suppliers in automotive industry during NPD stage, which is also another interesting study to explore. The study about people behind the NPD process is known as cross-functional team on the supplier side of automotive industry, which can also be considered for further study due to the lack of study. The competitive strategies are reviewed in this study so that other than guiding the further research, they can help other automakers and countries, especially Malaysian automotive industry, to implement strategies that are successfully implemented by other automakers and countries globally.

This review of the works of literature has seen comprehensive competitive strategies and justified the significance and relevance to further study NPD as it is mentioned in the three groups: countries, automakers and other scholars. From Table I or review of the countries' competitive strategies for their automotive industry, it can be observed that four countries, India, Malaysia, Germany, and Brazil, have in common competitive strategies, which are in NPD area. The review of the automakers' latest competitive strategies shows three automakers, Toyota, Hyundai and Tesla, choosing NPD as part of their competitive strategies, as can be seen in Table II. Table III summarizes that competitive strategies have been discussed from the works of other scholars in relation to automotive industry. Authors found that NPD is still the area of interest for those scholars such as the diversity of power trains and increasing product variants (Diffner *et al.*, 2018), fostering NPD (Kotturu and Mahanty, 2017), continuously develop product (Pahurkar and Metha, 2017) and process development (Holtskog, 2017). The research on supplier as competitive strategies has been discussed by Kotturu and Mahanty (2017), Manello and Calabrese (2018) and Karayel (2017) related to transfer responsibilities to component suppliers, suppliers' technology, product diversification and knowledge. Besides strengthening the relevance and justification to further study NPD, the contribution and novelty of this review is that other researchers can also review 133 competitive strategies to be considered in their research. Hence, the authors may extend the study on NPD, particularly as it is the main finding from this research. This study will become the platform as a basis for further research on 133 competitive strategies, especially on NPD and also related to suppliers' of the automakers. This paper contributed to other researchers who want to find the most recent and growing topic regarding the automotive industry trend, especially in Malaysia. From author's review, still lack of study related to NPD, especially in Malaysia as much focus on "go green" topic of articles, there are the ELV (End-of-Life Vehicle), EEV or sustainability even though NPD is a source of competitive advantage.

6. Future research and limitation

This review is an early study to get an overview of the latest trend in the automotive industry globally, specifically on the competitive strategies as a base before moving to in-depth research. Besides, this study has justified that the NPD study is relevant for further research. Most of the review's articles related to certain country or comparison between the countries, and certain automaker or comparison between the automakers, but still no study about comprehensive review globally covered in the larger scope, divided into three categories; countries, automakers and other scholars even though the study is vital, not only to academicians but also to practitioners. In developing countries, for example in Malaysia, there is still a lack of studies related to NPD, even though it is significant to study NPD, especially in terms of the people behind it from various functional backgrounds with different capabilities and expertise known as cross-functional team. The study of cross-functional team in NPD is significant as it is a part of the NPD success, as supported by Roy *et al.* (2017). Hence, the study of cross-functional team in NPD for suppliers of the automakers can be further explored.

7. Conclusion

This paper reviews articles related to competitive strategies by countries, automakers and scholars globally and found that these three have in common in terms of NPD as a competitive strategy for automotive industry. The review of this study involves holistic comprehensive review since apart from using reliable databases, journals sources, and articles from the universities' website, the study involves Google Scholar search so that the articles cover wider areas, becoming more global and novel. Hence, from the review, we can see that Germany and India both involve suppliers in their product development, as stated by Mathivathanan *et al.* (2018) and Hertenstein and Williamson (2018). Hyundai's product development tries to adjust to local needs (Chen, 2017), and Tesla promotes the development of the new energy vehicle industry innovation environment (Liu and Meng, 2017). Other scholars stated that competitive strategies by increasing product variants (Diffner *et al.*, 2018), fostering NPD (Kotturu and Mahanty, 2017), continuously develop product (Pahurkar and Metha, 2017) and process development (Holtskog, 2017).

References

- Akafia, E.K., Muntaka, A.S. and Boahen, S. (2017), "Impact of service operation strategies on the supply chain performance of private automobile companies in Ghana", *Journal of Logistics Management*, Vol. 6 No. 1, pp. 11-25.
- Albers, A., Krämer, L. and Arslan, M. (2017), "Mid-range management theory: competence perspectives on modularity and dynamic capabilities", *Research in Competence-Based Management*, Vol. 8 No. 1, pp. 109-130.
- Ali, N.A.M., Gafar, M.H.A. and Akbar, J. (2013), "Enhancing promotional strategies within automotive companies in Malaysia", *International Conference on Economics and Business Research*, pp. 1-7.
- Amran, T.G. and Yose, M.J. (2018), "Design logistics performance measurement model of automotive component industry for strengthening competitiveness of dealing AEC 2015", *IOP Conference Series: Materials Science and Engineering*, Vol. 319, pp. 1-10.
- Ariffin, A.S. and Sahid, M.L.I. (2017), "Competitiveness analysis of ASEAN automotive industry: a comparison between Malaysia and Thailand", *Journal of Science, Technology and Innovation Policy*, Vol. 3 No. 2, pp. 23-32.
- Badillo, E.R., Galera, F.L. and Serrano, R.M. (2017), "Cooperation in R&D, firm size and type of partnership: evidence for the Spanish automotive industry", *European Journal of Management and Business Economics*, Vol. 26 No. 1, pp. 123-143.

- Bartnik, R., Wilhelm, M. and Fujimoto, T. (2018), "Introduction to innovation in the east Asian automotive industry: exploring the interplay between product architectures, firm strategies, and national innovation systems", *Technovation*, Vols 70-71 No. 1, pp. 1-6.
- Baynal, K., Sari, T. and Akpinar, B. (2018), "Risk management in automotive manufacturing process based on FMEA and grey relational analysis: a case study", *Advances in Production Engineering & Management*, Vol. 13 No. 1, pp. 69-80.
- Bazhenov, Y.N., Elsukov, M.Y. and Podshuveit, O.V. (2017), "The role of international trade in improving the competitiveness of Saint Petersburg", *Baltic Region*, Vol. 9 No. 2, pp. 45-59.
- Buigues, P.A. (2017), "A driver in every car: when the auto industry says jump, do governments say 'how high?'", *Journal of Business Strategy*, Vol. 38 No. 4, pp. 3-10.
- Carvalho, B.d.O. and Ogasavara, M.H. (2017), "A link between post-acquisition acculturation and project management maturity: a case study research in the automotive industry", *Management Research: Journal of the Iberoamerican Academy of Management*, Vol. 15 No. 1, pp. 83-102.
- Chamsuk, W., Fongsuwan, W. and Takala, J. (2017), "The effects of R&D and innovation capabilities on the Thai automotive industry part's competitive advantage: a SEM approach", *Management and Production Engineering Review*, Vol. 8 No. 1, pp. 101-112.
- Chen, J. (2017), "The Chinese automobile market and the strategies of European, American, Japanese, Korean and Chinese auto makers", *International Relations and Diplomacy*, Vol. 5 No. 5, pp. 241-257.
- Choi, K., Kim, C. and Kim, H.J. (2017), "Multi-period efficiency and productivity changes in global automobile: a VRS-VRM and SML productivity index approach", *Expert Systems with Applications*, Vol. 86 No. 1, pp. 77-86.
- Chrisostom, A.O. and Monari, F. (2018), "Influence green logistics management on performance of registered automotive firms in Kenya", *International Journal of Academic Research in Business and Social Sciences*, Vol. 8 No. 4, pp. 351-365.
- Diffner, B., Björkman, M. and Johansen, K. (2018), "Flexibility challenges in automotive assembly, an approach to stay competitive", *International Journal of Industrial Engineering and Management Science*, Vol. 5 No. 1, pp. 34-40.
- Domazet, I. and Stosic, I. (2017), "Basic characteristics of competitive relations in the after-sales market of motor vehicles in Serbia", *Ekonomika Preduzeća*, Vol. 65 Nos 5-6, pp. 413-426.
- Esa, F. and Yusof, Y. (2017), "Perception of TQM implementation and perceived cost of poor quality: a case study of local automotive company's supplier", *International Journal of Mechanical, Aerospace, Industrial, Mechatronic and Manufacturing Engineering*, Vol. 11 No. 2, pp. 395-401.
- Ferrara, G. (2017), "Geographic patterns in the automotive industry", *Geography, Environment, Sustainability*, Vol. 10 No. 1, pp. 78-84.
- Fok-Yew, O. (2018), "The mediating effect of lean's soft factors on lean's hard factors and operational excellence in Malaysia manufacturing companies", *International Journal of Business Marketing and Management*, Vol. 3 No. 1, pp. 26-35.
- Fongsuwan, W., Chamsuk, W., Tawinunt, K., Tiengtavaj, S., Dansomboon, S. and Takala, J. (2017), "Cluster and R&D affecting the competitive advantage of the mould and die sector in the Thai automotive industry", *Management and Production Engineering Review*, Vol. 8 No. 4, pp. 3-12.
- George, T.S. and Catalin, G. (2017), "The world's most innovative companies in the period 2015-2016", *"Ovidius" University Annals, Economic Science Series*, Vol. XVII No. 1, pp. 69-73.
- Habidin, N.F., Zubir, A.F.M., Fuzi, N.M., Latip, N.A.M. and Azman, M.N.A. (2015), "Sustainable performance measures for Malaysian automotive industry", *World Applied Sciences Journal*, Vol. 33 No. 6, pp. 1017-1024.
- Hernández, X.F., Pons, E.T. and Serrat, N.A. (2017), "Disruption in the automotive industry: a Cambrian moment", *Business Horizons*, Vol. 60 No. 1, pp. 855-863.
- Hertenstein, P. and Williamson, P.J. (2018), "The role of suppliers in enabling differing innovation strategies of competing multinationals from emerging and advanced economies: German and Chinese automotive firms compared", *Technovation*, Vols 70-71 No. 1, pp. 46-58.

-
- Holtskog, H. (2017), "Forms of innovation-insights from product development", *Journal of the Knowledge Economy*, Vol. 8 No. 1, pp. 63-76.
- Ibrahim, S. and Vasudevan, H. (2018), "Review and analysis of issues related to the implementation of knowledge management practices in Indian automotive SMEs", *IOP Conference Series: Materials Science and Engineering*, Vol. 376, pp. 1-8.
- Ishida, S., Magnusson, M. and Nagahira, A. (2017), "Factors influencing Japanese auto suppliers' predictions about the future of new technologies – an exploratory study of electric vehicles", *Futures*, Vol. 89 No. 1, pp. 38-59.
- Kalogerakis, K., Fischer, L. and Tiwari, R. (2017), "A Comparison of German and Indian innovation pathways in the auto component industry", working paper, Institute for Technology and Innovation Management, Hamburg University of Technology, Hamburg, October.
- Karayel, S. (2017), "Power of automotive supplier cluster: the case of BMW in South Carolina", *European Scientific Journal*, Vol. 13 No. 4, pp. 87-103.
- Koo, S. (2017), "An analysis on the factors for building the style design competitiveness of the domestic automotive industry", *Archives of Design Research*, Vol. 30 No. 4, pp. 27-35.
- Kotturu, C.M.V.V. and Mahanty, B. (2017), "Determinants of SME Integration into global value chains: evidence from Indian automotive component manufacturing industry", *Journal of Advances in Management Research*, Vol. 14 No. 3, pp. 313-331.
- Lamprecht, N. and Tolmay, A.S. (2017), "Performance of South African automotive exports under the African growth and opportunity act from 2001 to 2015", *International Business & Economics Research Journal*, Vol. 16 No. 2, pp. 131-142.
- Lee, J. and Mah, J.S. (2018), "Korea's foreign direct investment in the automotive industry in China", *China Report*, Vol. 54 No. 2, pp. 175-193.
- Lee, K.-H. and Mah, J.S. (2017), "Foreign direct investment flows from China to Korea in the automobile industry", *China Report*, Vol. 53 No. 1, pp. 26-45.
- Lee, T.W. and Govindan, S. (2014), "Emerging issues in car purchasing decision", *Academic Research International*, Vol. 5 No. 5, pp. 169-179.
- Liu, J.H. and Meng, Z. (2017), "Innovation model analysis of new energy vehicles: taking Toyota, Tesla and BYD as an example", *Procedia Engineering*, Vol. 174 No. 1, pp. 965-972.
- Loganathan, Y.D. (2013), "Contemporary tools and approach for project management sustainability in Indian automotive industry", Nos 01-1278, SAE International, pp. 1-12.
- Manello, A. and Calabrese, G. (2018), "The influence of reputation on supplier selection: an empirical study of the European automotive industry", *Journal of Purchasing and Supply Management*, Vol. 1 No. 1, pp. 1-9.
- Marin, R.O. and Kaminski, P.C. (2018), "Analysing open innovation integration to product development processes within the Brazilian automotive industry", *International Design Conference*, pp. 1915-1924.
- Mathivathanan, D., Kannan, D. and Haq, A.N. (2018), "Sustainable supply chain management practices in Indian automotive industry: a multi-stakeholder view", *Resources, Conservation and Recycling*, Vol. 128 No. 1, pp. 284-305.
- Mohiuddin, A., Julia, H.A.J., Khan, A.A. and Karim, A.N.M. (2017), "Adoption of JMM practices – a key to performance improvement of a local automotive industry", *International Conference on Mechanical, Automotive and Aerospace Engineering 2016*, pp. 1-12.
- Mordue, G. and Sweeney, B. (2017), "The commoditisation of automotive assembly: Canada as a cautionary tale", *International Journal of Automotive Technology and Management*, Vol. 17 No. 2, pp. 169-189.
- Official Website of the Malaysia Automotive Robotics and IoT Institute (2018), "Industrial Revolution (IR): the first IR to the fourth", available at: <http://marii.my/industrial-revolution-ir-the-first-ir-to-the-fourth/> (accessed October 1, 2018).

- Oz, I.O. and Balsari, C.K. (2017), "Growth strategy of a contract automobile manufacturer in Turkey during the 2008–2009 financial crisis", *Asian Journal of Management Cases*, Vol. 14 No. 1, pp. 49-64.
- Pahurkar, R.N. and Metha, P. (2017), "Developing sustainable marketing strategy for electric vehicle (EV) – automotif", *International Journal of Emerging Research in Management & Technology*, Vol. 6 No. 11, pp. 115-129.
- Pechancová, V. (2017), "Renewable energy potential in the automotive sector: Czech regional case study", *Journal of Security and Sustainability Issues*, Vol. 6 No. 4, pp. 537-545.
- Pothal, L.K., Tripathy, S. and Satapathy, S. (2018), "Supplier relationship management towards quality management system of Indian automotive manufacturing industry – a total interpretive structural modeling approach", *IOP Conference Series: Materials Science and Engineering*, Vol. 377, pp. 1-7.
- Purba, H.H., Mukhlisin and Siti, A. (2018), "Productivity improvement picking order by appropriate method, value stream mapping analysis, and storage design: a case study in automotive part center", *Management and Production Engineering Review*, Vol. 9 No. 1, pp. 71-81.
- Rahim, F.T. and Zainuddin, Y. (2017), "Moderating effect of environmental turbulence on firm's technological innovation capabilities (TIC) and business performance in the automotive industry in Malaysia: a conceptual framework", *MATEC Web of Conferences*, Vol. 90, pp. 1-11.
- Rashid, N. and Shami, S.A. (2018), "Business model for sustainable development: an insight from Malaysian automotive industry", *International Journal of Human and Technology Interaction*, Vol. 2 No. 1, pp. 77-82.
- Roy, S., Modak, N. and Dan, P.K. (2017), "Product quality as factors and measures for new product development success in Indian manufacturing industries", *Materials Today: Proceedings*, Vol. 4 No. 1, pp. 1385-1393.
- Sanghavi, P., Rana, Y., Shenoy, S. and Yadav, R. (2015), "A review on green supply chain management in automobile industry", *International Journal of Current Engineering and Technology*, Vol. 5 No. 6, pp. 3697-3702.
- Senlier, N. and Salihoglu, T. (2017), "Investigation of location dynamics of automotive industry: the case of Kocaeli/Turkey", *Journal of Current Researches on Business and Economics*, Vol. 7 No. 2, pp. 148-178.
- Seyoum, B. and Lian, Y. (2018), "Market performance implications of modularization: evidence from global auto firms operating in China", *International Business Review*, Vol. 27 No. 1, pp. 852-866.
- Sharma, S., Singh, R. and Matai, R. (2018), "Force field analysis of Indian automotive strategic sourcing risk management enablers and barriers", *Measuring Business Excellence*, Vol. 1 No. 1, pp. 1-19.
- Shatouri, R.M., Omar, R., Igusa, K. and Filho, F.d.S.P. (2013), "Embracing green technology innovation through strategic human resource management: a case of an automotive company", *American Journal of Economics and Business Administration*, Vol. 5 No. 2, pp. 65-73.
- Shukor, M.S., Sulaiman, Z., Chin, T.A. and Mas'od, A. (2017), "Malaysia automotive industry: moving toward energy efficient vehicle era", *Social Science Postgraduate International Seminar*, pp. 652-658.
- Smerichevskiy, S., Kryvoviazuk, I. and Raicheva, L. (2018), "Economic consequences of financial stability violation of world automotive corporations", *Baltic Journal of Economic Studies*, Vol. 4 No. 2, pp. 229-234.
- Sweeney, B.A. and Mordue, G.D. (2017), "The restructuring of Canada's automotive industry, 2005-2014", *Canadian Public Policy*, Vol. 1 No. 1, pp. 1-15.
- Tiengtavaj, S., Phimonsathienand, T. and Fongsuwan, W. (2017), "Ensuring competitive advantage through innovation capability and clustering in the Thai automotive parts molding industry: a SEM approach", *Management and Production Engineering Review*, Vol. 8 No. 1, pp. 89-100.
- Vanalle, R.M., Ganga, G.M.D., Filho, M.G. and Lucato, W.C. (2017), "Green supply chain management: an investigation of pressures, practices, and performance within the Brazilian automotive supply chain", *Journal of Cleaner Production*, Vol. 151 No. 1, pp. 250-259.

-
- Viltard, L.A. (2017), "Strategic mistakes (AVOIDABLE): the topicality of Michel Porter's generic strategies", *Independent Journal of Management & Production*, Vol. 8 No. 2, pp. 474-497.
- Winroth, M. and Bennett, D. (2017), "International production networks in the automotive industry: drivers and enablers", *24th International Conference on Production Research*, pp. 1-6.
- Yang, D., Chin, T., Liu, R.-H. and Yao, Z. (2017), "Policy support for own-brand innovation in China's auto industry: Panacea or Placebo?", *Chinese Management Studies*, Vol. 11 No. 1, pp. 107-122.
- Yates, C. and Lewchuk, W. (2017), "What shapes automotive investment decisions in a contemporary global economy?", *Canadian Public Policy*, Vol. 1 No. 1, pp. 16-29.
- Yuksekbilgili, Z. and Bagkur, M. (2017), "An outlook to the social media strategies for automotive industry in Turkey", *International Journal of Advanced Multidisciplinary Research and Review*, Vol. 5 No. 8, pp. 28-55.

Further reading

- Feger, A.L.R. (2014), "Creating cross-functional strategic consensus in manufacturing facilities", *International Journal of Operations & Production Management*, Vol. 34 No. 7, pp. 941-970.

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