

A SYSTEMATIC REVIEW ON THE EVALUATION OF CUSTOMER SATISFACTION FROM SMART CARS IN AUTOMOBILE INDUSTRY, A CASE STUDY OF MICRO COMPACT CARS, LONDON, UK¹Achu Somasekharan,²Abhishek Sharma³Nirmal Acharya⁴Avijit Chowdhury⁵Chandani Joshi⁶Preeti Sharma¹ Edinburgh Napier University,² Swinburne University of Technology³ University of Newcastle, Australia.⁴ University of Southern Queensland⁵ IIPM, Mumbai⁶ Centre of Management Studies**ABSTRACT**

In the present business scenario gaining competitive advantage mainly by meeting the needs of customers providing them satisfaction by creating value. Automobile industry such as Micro Compact Cars: Smart Cars, UK aims to do this by improving the performance objectives of company by improving speed, reducing cost, flexibility, reliability and durability. The aim of this research is to evaluate customer satisfaction of Micro Compact Cars, UK in meeting the needs and expectations of customer with the use of postponement strategy of focussed differentiation strategy. The research examines the concept of competitive strategies of Porters and use of focussed

Postponement strategy focussing on the needs of market segment based on differentiation features. The researcher also examines the trade off as a result of customisation and operations performance. This trade off will have impact on customer satisfaction and loyalty. A framework of customer satisfaction based on customisation and postponement is provided. A primary research is conducted by evaluating customer satisfaction from various customisation features offered by MCC Smart Cars such as variations in Model line, Various Packages, and customisation features internal and external to cars. The creation of customised differentiation leads to tradeoffs related to flexibility, price, delivery time, quality and customer services have an impact on customer satisfaction and the same are evaluated in light of overall customer satisfaction. It was found that focussed differentiation strategy of using customisation by providing product flexibility using postponement requires a thorough understanding of needs of individual customers. Customers are willing to pay more prices for customisation based on flexibility in product offering but the other trade-offs such as speed related to delivery time, quality, and customer services needs to be of high standards impacting customer satisfaction. MCC smart cars needs to improve its segmentations to target needs of more specific customers, use customer information based on feedback to make changes in its postponement strategy creating differentiation features which are justified by prices and supported by other operations performance to delivery flexible products, at right price, quality, in right time with effective customer services meeting the needs of each individual customers. This will help to increase customer satisfaction and loyalty. This in turn will help MCC Smart Cars to adopt mass customisation understanding the needs of larger customer base reducing prices.

Keywords:

Strategic Analysis of Smart Cars, Customer Satisfaction, Automobile Industry

INTRODUCTION

According to Feitzinger & Lee, (2011) mass customization ideology is the product's very aspect which needs to be tailored for customers specifically. The emergence of postponement has given rise to a powerful tool / methodology in order to achieve a mass customization which is effective and is shown by the success of Hewlett Packard. Dell is leader in-built to order as it waits till they receive the orders from the customers for purchasing

the parts from the suppliers. According to Alderson (2012) the adoption is mainly due to rise in internet as it allows customers to reach the manufacturer and get exactly what they require. Thus the companies are in a tight spot trying to meet the demands of the customer which are high in demand within a short span of time given for development, make and deliver the products. Manufacturers who are prominent adopted the idea of personally tailored products and they are manufactures of computers and many others. Big auto companies like Ford motor, BMW, GM in the US and Japan's – Toyota have invested much on this effort for pursuing the mass customization years ago but will little success. According to Vonderembse *et al.*, (2012) the mass customization system had benefitted many manufacturers by way of providing the services and achieving customer satisfaction that is higher and also brand loyalty. In automobile industry the production is still in the mass production range and it has not changed yet the mass customization. As per Gilmore & Pine, (2013) many operational changes are needed to achieve strategic production agility for mass customisation in automobiles. Therefore it is not yet flexible enough to acclimatize to the demands of mass customization in a manner that is efficient and to the satisfaction of customers. Smart Cars is also known as Micro Compact Cars that provides cars that are customized where they are one by one assembled, though the production of modules done in a flow shop style. The inventory and risk associated with variety and inventory is reduced by storing the generic modules only (Fisher & Raman, 2012). In the year 2000 it was introduced in UK and it did not take long time for the smart car to become popular among the drivers specifically in the City locations. In a special way, smart gave many answers to the individual mobility questions especially in the urban areas. A high level of customization is offered in Smart Cars which allows the customers to constitute the body panels that are external, comfort features that are internal and also choose the size and type of engine (Mercedez, 2015). Smart fortwo model of Mercedes does not include the assembly flow line that is costly but still allowing a car that is fully customized and that too within a lead time of three weeks. In practicality there is no doubt about the Smart forTwo as it is a very good product, ideal for the city conditions and adequately powerful. It is relatively always been expensive when it is compared to the subcompacts with four seats. It has to be seen how the postponement strategy supports adequately the product of the company that is offering the improvement with respect to customer satisfaction.

AIM & OBJECTIVE

The aim of the research is to evaluate how use of mass customisation and postponement strategies have helped Smart cart to increase business through customer satisfaction.

- 1-To evaluate various strategies suitable for automobile industry catering to niche market.
- 2-To analyse use of postponement strategy can improve customer satisfaction in automobile industry through mass customisation.
- 3-To provide recommendations to MCC Smart Cars, UK to improve product offering using suitable strategy.

1.2 Significance

This study will examine Powerful methodology of postponement for achieving cost effective through mass customization when it is applied to supply chain. It will help us ascertain the satisfaction level of customer from postponement strategy in one of the leading automobile manufacturing company Smart Cars. This research will help us understand suitable strategy which can be adopted by other companies in automobile industry to meet the changing demands of customers.

LITERATURE REVIEW

The literature begins by explaining various strategies options are discussed with help of Porters generic strategy (1985) to understand what strategy Smart cars must pursue to be successful in market. The literature explains the need of use of postponement strategy in

Automobile industry. It critically evaluates how focussed differentiation is apt strategy to be followed by MCC Smart cars.

The literature critically evaluates various types of postponement strategy which can be adopted. It examines how customisation and modularity and postponement together will form the bases of framework which will lead to customer satisfaction. The trade-off between customisation between various aspects such as Product flexibility, Price, Quality, Delivery Time, Customers services and how it has an impact on customer satisfaction are examined. The use of Porters Generic strategy () is combined with postponement and mass customization () to provide framework which will help to build companies capacity to serve larger market and increase customer satisfaction.

2.1.2 Understanding Markets and Customers' needs to gain competitive advantage

As per Alderson (2012), companies now a day's confront markets that are new, increase competition and customer expectation are more. Therefore the companies have to regularly re engineer the procedures, business practices and has to be more responsive to competition and customers. Actions and plans devised by companies for competing for a specific product gives a scope to ask a question "in an industry how can we compete internally?" It's a business strategy. According to Lee & Tang (2015) in today's competitive market which is customer driven in order to survive the companies are trying to serve the products that fit exactly the customer requirements. In this time for competitive factor market demands manufacturer's needs to be more responsive by giving lead times that reliable and short. Salvador & Forza, (2013), argue about Customer Responsiveness. The expectations are to give customers what they need by understanding the needs and desires. Responsiveness is known by product customization, quality, immediate delivery, proper after sale service and design. Distinctive Competence is a special strength which allows the organization to get quality, innovation, superior efficiency and responsiveness of the customer. It helps the company to change the price for getting across the low cost rivals, which gives them rise in profits. Ex. Toyota has manufacturing process which is world class. For doing competency distinctively it needs to have 3 conditions – value – contribution to the perceived value of the customer. Extendibility – development of new products capability – both for competitiveness and responsiveness with focus on improvement of company position. A suitable strategy needs to be selected for positioning smart cars amongst its customers. The use of Porters generic strategy will help us understand what strategy Smart cars can pursue to become more successful in broader market with focus on differentiation and costs.

2.1.3 Porter Generic Strategy

According to Porter (1985) many policies give the firms a competitive edge over the others in the business in three essential criteria which are differentiation, focus and cost leadership. Porter calls these as generic strategies. It makes it easier for firms of all the sectors to use these policies irrespective of the gain-loss they make or their nature of business (Porter, 1985). As per Porter (1985) Cost Leadership gives significance to producing goods at a low cost for customers to use at all price point. These companies get a competitive edge and earn higher profit as against the others in the business as their cost of production is comparatively less. Differentiation Strategy refers to the production of goods and services which have got differential properties with respect to the other options available in business and are mainly for customers that are not as much price sensitive. As per Thomson et al (2006), a firm must take up the policy of differentiation after doing a complete analysis of the market and the needs and demands of the customers so that the firms could include the same in their designing process so that the products get a discrete functions. This strategy is beneficial only when the firm is looking at a small customer base and not for generic customers as this strategy might not help for a wider customer base as the economies of scale might not be the same and it would give significance to the firms that believe in cost leadership to gain more revenue and profits. According to Porter M. (1985) focus strategy refers to manufacturing for a certain group of customers to fulfill their specific demands. The firm that gives significance to cost leadership produces goods at low cost for the targeted market. Thomson et al., (2006) said that these firms provides goods little more expensive as they have more plans and offers as against the rest in the market. As per Porter (1998), this strategy is helpful for the firm and the business sector which has high growth prospects, high capacity and it is not important for the others in the business. MCC cars come under the category of focussed differentiation catering to niche market segment. Natural limitations are there in Focus strategy. For the company the challenge is not getting single point focus (Mercedes, 2015a). In every industry the customer wants higher and higher levels of customization with respect to products and services as per their need. With greater transparency and characterized economy they are confident, laden with information technology and operational advances customization is possible and they have a very good chance of getting it from the supplier base – external or internal. As per Bardacki & Whitelock, (2014), the strategy of differentiation can be taken either by target market that is small. It may not be very effective for moving ahead with strategy in a bigger market – reason – scale of economics will also vary and would favour the cost leadership which has the best value and advantage. MCC cars which are perceived by customers to be high priced are only catering to niche market. If it wants to make it big just like the Dell model the company will have to combine benefits of differentiation and low costs.

2.1.4 Need for Postponement in Automobile Industry

As per Salvador *et al.*, (2012) the automobile industry is going through some revolutionary changes. In the Auto industry the main candidate for the postponement has various reasons. Firstly it could be a car that is defined with modular system components. This brings in the commonality opportunity by making a platform and then adding customized modular assemblies for making the model for the end user. Secondly there is high forecast variability for the individual customized vehicles. Here the case points state that there are too many varieties for the accurate forecast of each combination and have a typical disagreement of a company (2009). Third as soon as the car is driven out of the lot it depreciates. Every year new models come out and has new features, technologies and capabilities. Lastly the holding cost of inventory is high. It is very much riskier to hold a vehicle that is ready and is waiting for final customization because the forecast of high variability for the end product and high obsolescence product cost. As per Anderson *et al.*, (2013) the ultimate weapon that is emerging is speed. The pace is picking up across all industries like software, consumer goods, electronics, medical devices etc. delay in customization is a method to getting these benefits. It is not so simple to fulfil all needs of individuals in present volatile environment of market. Since these days media particularly internet facilitates consumers to find any producer which manufactures according to consumer's requirements, survival is not possible without fulfilling exact demands of consumers. These constant changing needs of customers makes it compulsory for automobile industry to makes its products adapted to accommodate changes by adoption of postponement strategy.

2.1.5 What is Postponement?

As per Van Hoek, (2007) postponing any current activity of the supply chain in anticipation and expectation of future needs and demand of customers for personalized products is also referred to as delaying of process. Until the receipt of final order from customers, the firm postpones activities like procurement, designing, production, packaging and delivery of goods. As per Comstock & Winroth (2013), the delay or postponement is beneficial as it allows customization and the goods are made as per needs of buyers and are not like for all. Because of postponement, all the needs of the customers are clubbed in one to fulfil the needs and demands of the customers. Since the postponement is to meet the specific needs of the customers the forecasting and planning time decreases and the delay is also as per the prior commitments made to the customers. This also reduces the time and efforts taken in promotion and sales of goods.

Yang *et al.*, (2012) calls the postponement process as the end line to assemble, design, differentiation late point and product differentiation delayed. Johnson & Anderson say that the production unit refers to it as the "Delayed Product Differentiation" since the study mainly works on the delay in due to study on the characteristics that give the products uniqueness. These products are not only made in a unique manner but are also marketed and sold in a differentiating manner. As per Waller *et al.*, (2014) it is best to decrease the gap between order placement and delivery so that the production process becomes easier and there is no further change in the needs and demands of the customers as the goods are made as per the needs of customers.

2.1.6 Types of Postponement Strategies

Swaminathan & Tayur (2011) makes use of three main postponement strategies which are Place, time and form postponement. In time postponement, the goods and their location is kept unchanged till the time confirmed orders are received from customers. In place postponement the raw material are kept at the ware house and are not moved to the production unit till the time orders are confirmed. As per Duray *et al.*, (2010) in case of form postponement, the designing process is delayed till the time demands and order confirmation is received from the customers. MCC Smart car is an example of form postponement which shows importance to product design (Mercedes, 2015d). It give a high degree of customization that allows the customers to configure the external panels, the interior trim and also choose the size and engine type. But the fortwo model is left hand drive, two-seater car as it avoids change over on assembly line while allowing it to be fully customized and supplied in a lead time of three weeks. This applications crucial part is its single stage delivery where customer place orders at smart car centers and it comes straight from the factory ensuring production is customized as per customer order thereby reducing the inventory.

As per Ernst & Kamrad (2015), postponement operational could be applied in many ways –postponement of assembly and manufacturing and postponement of logistics. Another postponement mentioned by Johnson & Anderson (2014), called as Manufacturing Postponement is the same thing as postponement of assembly. The only difference is the

warehouse degree assembly operations. Assembly postponement does simple components assembly from a single source, manufacturing postponement is based on warehouse job shop operation of parts detailed from multiple sources as per the reception of customer order. Few manufacturing final processes are delayed so that downstream of supply chain of real orders got during distribution of semi finished goods and not the actual demand. Thanks to the configuration that is generic with respect to product inventory. This inventory cost can be reduced; the management will get easier because of less number of stock keeping units, lesser possibility of obsolescence. On the other side lack of economic scale and more lead time due

to manufacturing final process the cost per unit will go up and the customer order fulfilment may come down. As per Feitzinger & Lee, (2011) argues that assembly postponement could be applied to products that consists of a product base and various common parts that are different. Postponement of assembly could be applied to products that based on a variety of features that are cosmetic Like T- shirts, iPods, Printers, etc. Hewlett-Packard (HP) gives a very good example of postponement of assembly. Consolidation of Inventory brings down the cost of inventory and the unassembled shipment product cost, as they can have better density ratios. This could result in low cost in freight class. The common example of this case of postponement shows delay in customization that involves exterior painting of a standardized goods that is pre produced, a coffee mug. There are many examples that exist of postponement where the differentiation occur in the early stage of design and could be as late as labeling the product and packaging.

As per Pine (2011), the logistics postponement strategy: - combination of logistic postponement and manufacturing speculation. The strategy raises the visibility of the management of inventory and reduces the inventory amount and gives the customers with availability of high stock. This case pertains to business function postponement level used as logistics strategy. Zinn and Bowersox (2009) mention this kind of approach as “time postponement” where it is suggested that inventories are maintained only at limited central locations and wait for actual orders. This approach has been recently leveraged for retailing

via internet known as “drop shopping” strategy. Here the responsibility is transferred to suppliers for managing inventories physically. Example is Amazon – com. They coordinate with the vendors for the movement of goods and its logistics for postponement of product movement. Yang *et al.*: (2004a) says that the cost of transportation can go up as logistic postponement needs a transportation system which is fast and responsive. Example DeskJet printers of HP are finalized as per the specifications of the customer in the local warehouse.

The full postponement strategy: This brings together the logistics postponement (inventory centralized with distribution that is direct) with manufacturing postponement (made to order) as there is a lack of scale of economics the manufacturing cost is likely to increase. The increase in costs can be tacked using Mass Customisation of product features with help of modularity.

2.1.7 Mass Customisation and Modularity

As per Whang & Lee, (2013) the literature about the relationship between mass customization and modularization is properly developed the contribution by Kumar (2004) on literature with important study on relationship. He communicates that firms with multifunctional products and marketing multi feature necessarily need to have modularity for achieving the economics scale.

2.1.7.1 Mass Customisation

Hart (1998) states two diverse definitions for concept of mass customization. First is the visionary definition: “the ability of providing consumers with everything they require profitably, anywhere and anytime they require that as well as anyway they want that.” Second

is the practical definition: “the utilization of flexible processes as well as structure of organization for producing diverse and generally individually customized services and goods at lower costs of mass and standardized systems of production.”

Piller (2008) states regarding this problem and gives an ultimate definition for solving the issue: “Consumer co-designs process of services and products that fulfils the requirements of every individual consumer in respect of some product characteristics. Every operation occurs in a set solution space, featured by stable yet responsive and flexible processes. As a consequence, costs of customization allows for a level of price which does not involve switching in a higher segment of market.”

2.1.8 Modularity and Postponement

As per Vonderembse *et al.*, (2012), two types of modularity is defined by Yang *et al.* 2009 modularity in production is designing of the production process for producing complicated goods through development and designing of modules at diverse sites and thereby bringing them together for creating the entire system (Clark

and Balswin 2007). The entire system of production process is broken down into sub-processes which may be performed in a diverse order of sequence or concurrently (Lee 2006). Modularity in Design is to define the design boundaries of products and its parts in order that tasks and design features evade creation of stronger interdependencies in particular parts (modules) designs (Clark and Balswin 2007). A complete modular architecture implies that an alteration in one component doesn't need an alteration in other components (Ulrech 2005). Two impacts of modularity over postponement are stressed by Van Hoek (2006). First is that modularity facilitates fast final production at lower costs of processing and increases the prospect of adjusting products to the markets. This happens as generic modules assemble as

per orders of consumers is less time taking and more cost-effective related to fabrication of consumer-ordered goods. Second is that inventory levels are reduced and risk of obsolete inventory is lowered due to greater commonality of modules. This is because of effect of pooling of inventories. When utilization of modules is for greater than one product family or product related to utilizing diverse modules for them, the probable demand for modules grows and subsequently, the risk of obsolescence connected with modules reduces. Hence, processes modularity is essential for postponement and product modularity simplifies postponement through contribution of cost performance and lowering the risk of obsolescence. As per Rac (2015) modularity is used in MCC is used for balancing the forces of flexibility and effectiveness. Modularization (process modularity) is required for postponement which increases the delivery and manufacturing (or assembling) speed (product modularity). As per Autointell (2012) at MCC Smart Cars 40-50 modules are used to develop cars in 4.4 hours having capacity to produce two lakh cars in a day using modular systems allowing customer to renew car completely which is assembled on basis-frame. This allows customer to upgrade cars changing colours and adding modules of new features with time to gain more satisfaction.

2.1.9 Trade-off for using Customisation affecting Customer Satisfaction

As per Swaminathan (2015), trade-off exists between Postponement and Customer Satisfaction based on Various Factors. Product Flexibility is the service range regarding choices for consumers purchase. Product's flexibility is even to be correlated positively to mass customization and customer satisfaction. This is sensible as organizations are required to be flexible for providing customized goods. This is the construct of customization which is same as construct of product flexibility. Evidence was found by Lee & Tang (2015),

regarding positive impact of customization on flexibility of product and customer satisfaction. The trade-off between product's customization and price is a debate of long-run, in-fact as long as the initialization of industrialization. As per Ulrich *et al.*, (2013) Price (PC) – the issues connected to terms of contract and price. Immense attention is received in the literature regarding the trade-off among costs and customization. Few studies on the basis of cumulative capabilities strive to demonstrate the compatibility among various manufacturing competitive preferences and cost. Yet, it is argued by various studies that costs are increased due to customization and, thus, generating higher sales prices. According to Van Hoek, (2007) Quality (QL) is the conformance of service, maintenance service and number of failures perceived by consumers. It is believed that likelihood for a service/product is increased through customization, suiting the requirements of consumers. The quality of service and product would be as desired by the consumers. Some empirical evidence supports the compatibility among quality and customization affecting customer satisfaction. Delivery Time (DT) refers to the time between process of purchase and installation of service. Delivery time and customization are even based on the kind of product as well as the level of customization affecting customer satisfaction. In a study done by Squire *et al* among 104

manufacturing organizations of U.K., it was observed that the delivery time is impacted by the level of customization. Moreover, facilitating distinctive components in a shorter lead time is essential for the success of strategy of customization. Consumer Service (CS) refers to information quality and service rendered by back office and salesmen. The consumer is core of mass customization as they facilitate essential information to organizations manufacturing product or services as per their requirements. Interaction and information with consumers are, thus, a significant premise of success in strategy of mass customization.

2.1.10 Postponement, Mass Customization and Customer Satisfaction

Squire *et al.*, (2014) communicates that the main thing which explains the postponement and mass customization relationship as : 'The key for mass customizing effectively is postponing the differentiation task of the product for a particular customer till the last possible point in supply network (manufacturing, distribution, company's supply) They also say that for the order to increase the responsiveness and efficiency the companies should integrate the logistics and manufacturing process, product designs and the network

supply. Hence differentiation that is delayed for the mass customization needs appropriate supply network, processes, and product design.

Waller *et al.*, (2014) believe in the fact that the concept of postponement and personalization of goods have a huge impact on the operations and planning of the firm and business. To start with the customers are kept at the centre and are the heart of all business activities. A firm must be well aware of the needs of the customers and so should take personal interest in knowing the customer so that they can customize goods as per their needs and demands along with understanding the requirements of customers by the sales personnel or the various online and offline interactions done with the customers depending on the nature of goods and services. If a customer is completely involved in the product designing and production process then not only the end result be satisfactory but also this will result in more satisfaction of both the maker and user as well. Ernst & Kamrad are of the view that the procurement and production process must take place after the sales process so that personalization can be done at the maximum level and most appropriate products are given to the customers that suit their needs and are better than the basic ones. Analysis done by Whang & Lee (2013) have been backing up the theory which says that the personalization is barter with time, cost and competitive position in the business. This barter results in high satisfaction of the customers. Ulrich *et al* (2013) is of the view that along with personalization of goods, firms also have to work on cost reduction and quality management of the goods used and produced in big quantities. Over prized mass customized goods will not be accepted in the market. In mass customization the idea is to give the individual

customers the customized goods at a very nominal rate and is in proportion to the price of goods customized in mass quantities. It thus provides firms economies of scale and also enables the customers to get to choose from a wide range of good quality goods and that too at a decent price point (Piller & Schaller, 2013).

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