Considerations for avoiding commoditisation in the automotive industry – analysis of factors that enhance customisation

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Abstract: The automotive industry has been achieving profits by creating new value through innovations while the Japanese consumer electronic industry has been suffering from low profitability due to commoditisation. To analyse the factors helping the automotive industry avoid commoditisation, this study focuses on optional parts sales as a means to provide new customer value. It conducts customer surveys to analyse customisation and the effectiveness of directly managed stores’ explanations of such value. The results suggest that customers favour customisation, and that directly managed store explanations encourage a performance-oriented customer mind-set, resulting in price increases. Thus, a mechanism is established in the automotive industry where the value created is explained to customers. This mechanism then contributes to price increases. From this, there are implications on ways to avoid commoditisation: 1) create new customer value; 2) enhance customisation to provide new value; 3) establish a value communication mechanism that encourages a performance-oriented mind-set.

Keywords: avoiding commoditisation; automotive industry; value capture; mass customisation; directly managed stores; commoditisation; value co-creation.


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1 Introduction

The Japanese consumer electronic industry has been facing difficulties in achieving ongoing profits as its products are becoming commoditised in only a few years after technology development and market exploration (Sakakibara, 2005; Nobeoka, 2011; Uehara et al., 2015). On the other hand, it is said that the automotive industry is achieving profits by avoiding commoditisation through the continuous creation of new value from innovations (Fujimoto, 2014).

However, just innovation alone cannot explain the differences between the consumer electronic and the automotive industries. The consumer electronic industry has been continually creating innovations such as the internet-connected TV (smart TV) and the 4K-definition TV in the flat-screen TV segment and the Blu-Ray Disc (BD) (Youngim and Hyunjoon, 2012; Sudoh, 2015).

It is possible that the automotive industry has avoided commoditisation through a mechanism where consumers can choose new value from optional functions and the staff at the ‘directly managed stores’ in the industry explain this new value to customers (‘directly managed store’ is a store owned by a carmaker or by a local franchise owner). Another possible factor is that the automotive industry evolves its products by equipping subsequent products with popular optional functions chosen by many customers.

There have been many prior studies on commoditisation. According to Reimann et al. (2010), commoditisation is not limited to a single industry but rather is a general trend pertaining to an increasing number of industries (Greenstein, 2004; Sharma and Sheth, 2004; Olson and Sharma, 2008) and commoditisation is a result of intensive marketing competition (Unger, 1983; Heil and Helsen, 2001).

Commoditisation has been analysed from two major viewpoints (Kado, 2009). The first is from the viewpoint of the factors that cause commoditisation (Christensen, 1997; Christensen and Raynor, 2003; Nobeoka et al., 2006). The second is from the viewpoint of the strategies needed to generate a profit once commoditisation has occurred (Narver and Slater, 1990; Rangan and Bowman, 1992; Guiltinan and Gandlach, 1996; Heil and Helsen, 2001; Davenport, 2005; Matthyssens and Vandenbemot, 2008).

In this study, commoditisation is defined as product price decline as a result of price competition that hinders companies from gaining profits due to the entering of many companies into a specific business and difficulty in differentiating products. This study mainly focuses on discovering the factors of commoditisation. Nobeoka (2011) points out
that value creation and value capture are necessary to enable manufacturing to be a value-added and profitable industry, and that the Japanese consumer electronic industry has recently failed to capture value. Nobeoka’s study focuses on manufacturing company activities and processes, such as product architecture, from the ‘value creation’ standpoint, and on activities and mechanisms regarding relations with customers and competitors in the market, from the ‘value capture’ standpoint.

There have been prior studies on value creation covering the product architecture theory and the innovation dynamics theory. From the product architecture perspective, Fujimoto et al. (2001) define product architecture as a basic design concept about how to divide a product into components, how to map functions to the components, and how to design and adjust interfaces between these components. Their study points out that the Japanese integrative organisational capability enables the Japanese manufacturing industry to outperform others through its highly integrative products, and that such integrative capability is typically represented by the automotive industry. Nobeoka (2011) also points out that key to Japanese manufacturer resurgence will be the design and manufacture of products that utilise this highly integrative capability. From the innovation dynamics perspective, Abernathy and Utterback (1978) advocate the product life cycle theory, explaining the general rise and fall of industrial products and the commoditisation trend. During the first phase, when a new product enters the market, product innovation activities increase that create higher performance and better designs. After product performance and design reaches a certain level, the second phase begins where process innovation activities to improve manufacturing methods increase, per-unit manufacturing cost decreases, and sales price decline starts, resulting in commoditisation. In addition, from the innovation dynamics perspective, Fujimoto (2014) studies an architecture evolution approach (from modular to integral) and states that a function-oriented mind-set arising from energy, safety, and environmental societal concerns and from more sophisticated customers create a long tail of product innovations (such as fuel-efficient engines and air bags safety systems). This then results in the avoidance of price competition and commoditisation.

As mentioned above, there have been prior studies on value creation, mainly from the perspective of product development and of industrial life cycles such as selection and evolution of product architecture. However, there are very few studies from the perspective of value creation through interactions between companies and customers.

There have been prior studies on value capture through marketing theory and mass customisation theory. In marketing theory, Vargo and Lusch (2004, 2008) advocate a service-dominant (SD) logic that both companies and customers create value based on the concept that the only companies are not value providers. Payne et al. (2008) point out the importance of marketing activities that manage the connection between companies and customers, stating that values are co-created through various activities among companies, customers, and encounters (an ‘encounter’ is an entity or a person who connects companies and customers). Prahalad and Ramaswamy (2004) state that both companies and customers co-create value and that a shift has started to occur, moving value from products to value from co-creation experiences. They advocate that the four basic constituents of value co-creation are represented by dialog, access, risk-benefits, and transparency (DART) between companies and customers.

In mass customisation theory, customisation is defined as companies’ activities for individual end consumers. According to Usui (2004), prior studies of the mass
customisation theory are mainly from the manufacturing process approach and the consumer behaviour approach. The manufacturing process approach analyses the supply of customised products. Studies from this approach discuss the customisation of product architecture, stating that the modular architecture, which enables development and manufacturing of products by combining components, is suitable for product customisation (Pine, 1993; Sanchez and Mahoney, 1996; Duray et al., 2000; Fujimoto et al., 2001; Duray, 2002; Usui, 2004). The consumer behaviour approach analyses companies’ activities for each individual customer. Studies from this approach mainly discuss the relation between bidirectional consumer-company communication and customer satisfaction. Pine (1992, 1993) points out that customisation enhances customer satisfaction by meeting various customer needs. To further support this, Osaki and Torii (2013) state that customisation actually raises customers’ willingness to pay by 20%. Koga (2014) also states that the automotive industry’s efforts to explain to customers’ new product functions developed through electrification and innovation lead to product price increases.

As stated above, there are many studies pointing out the importance of marketing activities that manage communication with customers and the profound relationship between activities for individual customers (customisation) and product price increases. However, there have been very few studies that comprehensively analyse how companies explain customisation to customers and how this leads to customer satisfaction and product price increases.

The contribution of this study is to discover the factors that help avoid commoditisation by clarifying how product customisation and directly managed store activities influence customer purchasing activities and product price increases.

2 Methodology

2.1 Framework of study

The framework of this study is shown in Figure 1. This study analyses the avoidance of commoditisation in the automotive industry from the perspectives of product customisation and directly managed store activities. The following analysis model is used:

1. Carmakers’ provide innovations (new value) as optional functions.
2. Customers consider and decide whether to buy these optional functions.
3. If the optional functions are chosen by many customers, the prevalence rate increases. Carmakers begin to add such functions to subsequent products as standard functions.
4. Value is added to all products. As a result, product prices are increased or maintained. Commoditisation is avoided.
To verify this mechanism, this study assumes the following hypotheses.

Hypothesis 1 Wide range of grades and optional functions provide sufficient range of choices for customers.

Hypothesis 2 Directly managed stores’ explanations to customers shift customers to performance-oriented mind-sets.

Hypothesis 3 Customers decide to add optional functions based on their own experiences (knowledge) and directly managed stores’ explanations.

Hypothesis 4 Directly managed stores’ sales promotional activities for optional functions raise the prevalence rate of the functions.

The backgrounds of the hypotheses are as follows:

Hypothesis 1 Generally, customisation increases customer satisfaction (Pine, 1992, 1993). Thus, various grades and optional functions in the automotive industry offer value to each customer, resulting in higher customer satisfaction.

Hypothesis 2 Activities between customers and directly managed stores (companies), especially dialog, access, and transparency, influence customers’ sense of value.

Hypothesis 3 Customers’ experiences (knowledge) and DART in their interactions with directly managed stores are major factors that influence customer choice of optional functions.

Hypothesis 4 Carmakers adopt a product structure where customers choose new innovations as a grade and/or optional function (such as a car navigation system). Directly managed stores promotional activities, implemented through dialog and information sharing, encourage customers to choose higher grades and more optional functions, resulting in the higher prevalence of these functions. Wider prevalence of optional functions means that more customers choose these functions, and this leads to product price increases and the avoidance of commoditisation.
2.2 Methodology analysis

To verify Hypotheses 1 through 4, the following two analyses were conducted:

1. Hypotheses 1 through 3: using a questionnaire survey of car buyers (customers), an analysis was conducted of the effects of customisation through optional function choice and customers’ mind-set changes from directly managed stores’ explanations.

2. Hypothesis 4: analysis of which sales channel influenced optional parts sales and contributed to prevalence of optional functions.

This study uses car navigation systems, which started to gain popularity in 1990, as its case analysis. With the cooperation of seven Toyota Corolla Osaka dealers, the questionnaire was given out to customers from 1 December to 26 December 2014. There have been very few questionnaire surveys about interactions between customers and companies because directly managed stores seldom cooperate for such surveys. Although the number of valid answers is limited, the questionnaire survey is useful as a case analysis about product customisation, directly managed stores’ activities, and customer purchase behavioural change.

Table 1 and Table 2 present the questions asked. There were 64 valid answers. Below are the definitions of the terms in the questionnaire.

1. Staff: sales people at the directly managed stores.

2. Option: an optional function that customers could choose. The number of options varied depending on car type, from 10 to 100. Option is generally referred to as the ‘maker option’ and ‘dealer option’ (Dealer option is an option sold and mounted on a car by a directly managed store. Maker option is an option sold by directly managed stores and mounted on a car by the carmaker).

3. Grade: a package of popular options (all are maker options). The number of grades varied depending on car type, from four to 20. Customers chose a grade during a sales pitch.


The questions used a five-point Likert scale from strongly agrees to strongly disagree. Multiple choice was also designed for several questions. The questionnaire consisted of two segments: one, a set of questions shown in Table 1 on the influence of customisation on customers for the purpose of categorising customers based on impressions of directly managed stores and customisations. The other set of questions shown in Table 2 on the influence of directly managed stores on customers’ purchase activities for the purpose of researching customer mind-sets and behavioural changes during sales discussions with the directly managed store personnel.

Customers were asked about the prices of purchased cars, car types, and grades in order to gather data about price increases due to optional function choices. Questions about customer attributes (age, gender, family structure, etc.) were also asked in order to compare the demographics of customers and general car buyers in Japan.
Table 1 Questions on customisation

<table>
<thead>
<tr>
<th>No.</th>
<th>Question 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1</td>
<td>Do you think it is preferable that customers can choose performance and functions?</td>
</tr>
<tr>
<td>1-2</td>
<td>Do you think grades and options give customers opportunities to discover new functions and equipment?</td>
</tr>
<tr>
<td>1-3</td>
<td>Do you think the staff’s explanation influences your choice of car and functions?</td>
</tr>
</tbody>
</table>

Table 2 Questions on the influence of directly managed stores on customer purchase activities

<table>
<thead>
<tr>
<th>No.</th>
<th>Question 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-1</td>
<td>Did you discover many new functions and equipment when you came to the store?</td>
</tr>
<tr>
<td>2-2</td>
<td>If ‘strongly agree’ or ‘agree in question 2-1. How did you discover new functions and equipment? (multiple choice) Staff’s explanation catalogue test driving. Actual car other.</td>
</tr>
<tr>
<td>2-3</td>
<td>Did you choose a higher grade or more options than you had planned after you received the staff’s explanation?</td>
</tr>
<tr>
<td>2-4</td>
<td>Did you choose a lower grade or fewer options than you had planned after you received the staff’s explanation?</td>
</tr>
<tr>
<td>2-5</td>
<td>Do you prioritise performance and function over price?</td>
</tr>
<tr>
<td>2-6</td>
<td>Did you become more performance/function-oriented as you received explanations during the sales talk?</td>
</tr>
<tr>
<td>2-7</td>
<td>If ‘strongly agree’ or ‘agree’ in question 2-6. What made you prioritise performance and function? (multiple choice) Staff’s explanation catalogue test driving. Actual car other.</td>
</tr>
<tr>
<td>2-8</td>
<td>What did you prioritise when you added options and chose a grade? (multiple choice) Drivability comfort fuel efficiency. Safety appearance low price other.</td>
</tr>
</tbody>
</table>

3 Results of analyses

3.1 Result of questionnaire survey

Figure 2 shows age groups of the questionnaire respondents and general car buyers in Japan. In this study, for the sake of simplicity, age group data of the main drivers provided by the Japan Automobile Manufacturers Association are used for the age group data of general car buyers in Japan. The questionnaire respondents covered most age groups, although there were more respondents in their 30s and 40s and fewer in their 60s compared to general car buyers in Japan. It can be said that the respondents’ income levels were equal to or slightly higher than that of general Japanese car buyers. The respondents’ average car purchase price was approximately 2.7 million yen, which is slightly higher than the average car price in Japan (2.3 million yen). Thus, this questionnaire can be noted as valid as a means to identify customer preferences.
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3.1.1 Results of questions on customisation

- **Question (1-1):** customers’ impression on customisation.
  84% of the respondents answered it was preferable that they could choose performance and function, with a high average of 1.11. This implies customers’ preferable impression of customisation.

- **Question (1-2):** influence of customisation on customers’ recognition of functions.
  80% of the respondents answered that grades and options gave them opportunities to discover new functions and equipment, with a relatively high average of 0.94. This implies that customisation contributes to customers’ recognition of functions.
• **Question (1-3):** customers’ purchase behavioural change (effectiveness of customisation).

80% of the respondents answered that the staff’s explanations influenced their choice of functions, with a high average of 1.09. This implies that directly managed store staff helps customers choose functions by utilising options.

3.1.2 **Results of questions on the influence of directly managed stores on customers’ behavioural change**

• **Questions (2-1) and (2-2):** influence of directly managed stores on customers’ recognition of options.

**Question (2-1):** 70% of the respondents discovered many new functions at the stores, with a relatively high average of 0.89. Very few customers had sufficient information about new functions before they visited the directly managed stores.

**Question (2-2) (multiple choice):** 70% of the respondents learned about new functions by the staff’s explanation and 31% by seeing new functions on actual cars. This implies a high influence from the directly managed stores on customers’ recognition of options.

• **Questions (2-3) and (2-8):** influence of directly managed stores on customer choice of higher grades.

**Question (2-3):** 67% of the respondents changed to higher grades or added options, with a relatively high average of 0.73. This implies a heavy influence of the directly managed stores’ explanations on customers’ choice of higher grades and on purchase price increases.

**Question (2-8) (multiple choice):** more respondents answered more positively for drivability (47%) and comfort (39%) that require the staff’s explanation than for low price (9%) and appearance (9%) that do not require the staff’s explanation. This result implies that directly managed stores greatly influence customers’ choice of higher grades and the addition of options.

• **Question (2-4):** influence of directly managed stores on customers’ choice of lower grades or reduced options.

19% of the respondents changed to lower grades or reduced options after they received the staff’s explanations, with a low average of –0.33. Directly managed stores’ explanations seldom led to customers’ choice of lower grades or option reductions. This result proves the validity of Question (2-3).

• **Question (2-5):** customers’ performance-oriented mind-set before they came to the stores.

Only 34% of the respondent prioritised performance and function over price before they came to the stores, with a low average of 0.28.

• **Question (2-6) and (2-7):** customer performance-oriented mind-set after coming to the stores.
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Question (2-6): 61% of the respondents began to prioritise performance and function during the sales talk with the staff, with a relatively high average of 0.55. Directly managed stores explanations encouraged customers to become performance-oriented.

Question (2-7) (multiple choice): 71% of the respondents became performance-oriented by the staff’s explanation. This number is more than twice those who answered ‘catalogue’. The answer implies the heavy influence of the directly managed stores.

3.2 Analysis results on sales and prevalence of optional parts

Figure 4 shows the prevalence rate of a car navigation system, which is an optional part. It shows that the prevalence for a car navigation system started to increase in the late 1990s, reaching 50% in 2010.

![Figure 4](image)

Source: Author generated based on data provided by the Japan Automobile Manufacturers and Japan Electronics and Information Technology Industries Associations

Figure 5 Total sales of car navigation products in Japan (see online version for colours)

![Figure 5](image)

Source: Author generated based on data provided by Japan Electronics and Information Technology industries Association
Figure 5 shows the number of car navigation products sold through each sales channel. Car navigation products are mainly sold through the following three sales channels:

- aftermarket: retail stores or car specialty stores sell parts (functions) and mount them on cars
- dealer option: directly managed stores sell parts (functions) and mount them on cars
- maker option: directly managed stores sell parts (functions), and carmakers mount them on cars.

As shown in the figure, sales of car navigation products began in the aftermarket channel. The dealer option expanded in the late 1990s. The maker option channel has been dominant since the late 2000s. As the prevalence of car navigation products became wider, dominance of the maker option channel expanded. This is because of the increase in sales of grades that include a package of popular options installed as standard functions.

**Table 3** Results of multiple regression analysis of car navigation product prevalence and sales channel

<table>
<thead>
<tr>
<th>Car navigation product prevalence</th>
<th>Adjusted R square</th>
<th>F change</th>
<th>Significance probability</th>
<th>Analysis period</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.954</td>
<td>160.40</td>
<td>3.7E-14</td>
<td>1990–2013</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 presents the results of multiple regression analysis, with the car navigation product prevalence in Figure 4 as the explanatory variable and the number of units sold through sales channels in Figure 5 as the independent variable.

**Table 4** Partial regression coefficient between car navigation product prevalence and sales channels

<table>
<thead>
<tr>
<th>Standardised partial regression coefficient</th>
<th>Significance probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant) 1.552</td>
<td>0.413</td>
</tr>
<tr>
<td>Maker option 0.010</td>
<td>0.045</td>
</tr>
<tr>
<td>Dealer option 0.024</td>
<td>4.0E-07</td>
</tr>
<tr>
<td>Aftermarket −0.005</td>
<td>0.390</td>
</tr>
</tbody>
</table>

Table 4 presents the standardised partial regression coefficient and significance probability of each independent variable in the multiple regression analysis.

The adjusted R square in Table 3 shows that the model formula is highly applicable. The significance probability of 1% indicates statistical significance. Table 4 shows positive standardised partial regression coefficients for the maker and dealer options. This result confirms that the sales increase at directly managed stores (maker and dealer options) raises the prevalence of car navigation products. This supports Hypothesis 4: directly managed stores’ sales promotional activities for options raise the prevalence rate of the functions.
4 Discussion

4.1 Customisation and directly managed stores’ activities

The result in Section 3.1 confirms that customisation contributes to customers’ deeper recognition of functions and that staff’s explanations encourage customers to choose higher grades and add options. In this section, partial correlation coefficients between questions are calculated to analyse correlation between customisation and directly managed stores’ influence on customers and to verify Hypotheses 1 through 3.

4.1.1 Partial correlation analysis of questionnaire survey results

Partial correlation coefficients are calculated among the eight questions whose answers can be quantified, shown in Table 5. The left column shows the question number and the right the question.

Table 5 Questions to calculate partial correlation coefficients

<table>
<thead>
<tr>
<th>Item</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1-1)</td>
<td>Do you think that it is preferable that customers can choose performance and function?</td>
</tr>
<tr>
<td>(1-2)</td>
<td>Do you think grades and options give customers opportunities to discover new functions and equipment?</td>
</tr>
<tr>
<td>(1-3)</td>
<td>Do you think the staff’s explanations influence your choice of car and functions?</td>
</tr>
<tr>
<td>(2-1)</td>
<td>Did you discover many new functions and equipment when you came to the store?</td>
</tr>
<tr>
<td>(2-3)</td>
<td>Did you choose a higher grade or more options than you had planned after you received the staff’s explanation?</td>
</tr>
<tr>
<td>(2-4)</td>
<td>Did you choose a lower grade or fewer options than you had planned after you received the staff’s explanation?</td>
</tr>
<tr>
<td>(2-5)</td>
<td>Do you prioritise performance and function over price?</td>
</tr>
<tr>
<td>(2-6)</td>
<td>Did you become more performance/function-oriented as you received explanations during the sales talk?</td>
</tr>
</tbody>
</table>

Table 6 Partial correlation coefficient matrix

<table>
<thead>
<tr>
<th>Item</th>
<th>(1-1)</th>
<th>(1-2)</th>
<th>(1-3)</th>
<th>(2-1)</th>
<th>(2-3)</th>
<th>(2-4)</th>
<th>(2-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1-1)</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1-2)</td>
<td>0.666</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1-3)</td>
<td>–0.072</td>
<td>0.275</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2-1)</td>
<td>0.045</td>
<td>0.005</td>
<td>0.132</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2-3)</td>
<td>0.328</td>
<td>–0.131</td>
<td></td>
<td>0.323</td>
<td>0.122</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>(2-4)</td>
<td>–0.068</td>
<td>–0.038</td>
<td>–0.299</td>
<td>0.222</td>
<td>0.039</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>(2-5)</td>
<td>0.237</td>
<td>0.018</td>
<td>0.030</td>
<td>–0.021</td>
<td>–0.183</td>
<td></td>
<td>0.267</td>
</tr>
<tr>
<td>(2-6)</td>
<td>–0.194</td>
<td>0.328</td>
<td>0.005</td>
<td>0.300</td>
<td>0.247</td>
<td>–0.121</td>
<td>0.174</td>
</tr>
</tbody>
</table>

Note: Black and grey cells show 1% and 5% significance, respectively.
Table 6 is a matrix of partial correlation among the eight questions. Black and grey cells show 1% and 5% significance in the test of partial correlation coefficient, respectively.

The results of the questions with high partial correlation coefficients ((1) to (9)) in Table 6 are shown in Table 7.

**Table 7** Consideration of questions with high partial correlation coefficients

<table>
<thead>
<tr>
<th>No.</th>
<th>Questions</th>
<th>Result of consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(1-1) and (1-2)</td>
<td>Partial correlation (coefficient of 0.666). Significance of 1%. Customers who favour customisation through options are highly likely to discover new functions and equipment through options.</td>
</tr>
<tr>
<td>(2)</td>
<td>(1-1) and (2-3)</td>
<td>Weak partial correlation (coefficient of 0.328). Significance of 1%. Customers who favour customisation through options are likely to choose a higher grade or more options than they planned.</td>
</tr>
<tr>
<td>(3)</td>
<td>(1-2) and (2-6)</td>
<td>Weak partial correlation (coefficient of 0.328). Significance of 1%. Customers who discover new functions and equipment through options are likely to become performance-oriented during sales talks.</td>
</tr>
<tr>
<td>(4)</td>
<td>(1-3) and (2-3)</td>
<td>Weak partial correlation (coefficient of 0.323). Significance of 1%. Customers who choose a higher grade or more options than they planned are likely to be influenced by the staff’s explanation.</td>
</tr>
<tr>
<td>(5)</td>
<td>(2-1) and (2-6)</td>
<td>Weak partial correlation (coefficient of 0.300). Significance of 5%. Customers who discover many new functions and equipment when they come to the store are likely to become performance-oriented during sales talks.</td>
</tr>
<tr>
<td>(6)</td>
<td>(1-3) and (2-4)</td>
<td>Weak negative partial correlation (coefficient of −0.299). Significance of 5%. Customers who are influenced by the staff’s explanation are unlikely to change to a lower grade or fewer options than they planned.</td>
</tr>
<tr>
<td>(7)</td>
<td>(1-2) and (1-3)</td>
<td>Weak partial correlation (coefficient of 0.275). Significance of 5%. Customers who discover new functions and equipment through options are likely to be influenced by the staff’s explanation.</td>
</tr>
<tr>
<td>(8)</td>
<td>(2-4) and (2-5)</td>
<td>Weak partial correlation (coefficient of 0.267). Significance of 5%. Customers who prioritise performance and functions over price are likely to choose a lower grade or fewer options than they planned after they receive the staff’s explanation.</td>
</tr>
<tr>
<td>(9)</td>
<td>(2-3) and (2-6)</td>
<td>Weak partial correlation (coefficient of 0.247). Significance of 5%. Customers who become more performance/function-oriented as they receive explanations during sales talks are likely to choose a higher grade or more options than they planned.</td>
</tr>
</tbody>
</table>

4.1.2 Consideration of results of partial correlation analysis

To consider the correlation among the questions, the eight questions are classified into three groups:

**Group 1** Features of customers before purchase. Questions (1-1), (2-1), (1-2) and (2-5) are classified into this group.

**Group 2** Features of customers that were changed by directly managed store staff’s explanations. Questions (1-3) and (2-6) are classified into this group.

**Group 3** Actual customers purchase behaviour. Questions (2-3) and (2-4) are classified into this group.
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These three groups of questions are related to customers’ purchase behavioural changes according to time, as shown in Figure 6.

**Figure 6** Correlation among questions (see online version for colours)

In relation to Figure 6, the correlations (a) to (e) are considered as follows.

- **Relation (a):**
  Customers who believe options give them opportunities to discover new functions and equipment are likely to favour customisation. This implies that customisation through options effectively delivers new value to customers and supports Hypothesis 1: wide range of grades and options provide sufficient range of choices for customers.

- **Relation (b):**
  Customers who discover new functions and equipment through options tend to be influenced by the staff’s explanations in their choice of car or functions. This implies that options enable directly managed stores to effectively deliver value to customers.

- **Relation (c):**
  Customers who discover many new functions and equipment when they come to the store are likely to become more performance/function-oriented during sales talks. Communication of value through the directly managed stores’ explanations about the options shifts customer mind-sets to a performance-orientation. Thus, Hypothesis 2 is supported: directly managed stores’ explanations to customers shift the customers to a performance-oriented mind-set.
• **Relation (d):**

Customers who favour customisation and/or who are influenced by the staff’s explanations in their choice of car and functions are likely to choose a higher grade or more optional functions than they planned. Furthermore, customers who become performance/function-oriented during sales talks tend to choose a higher grade or more options. This supports Hypothesis 3: customers decide to add options based on their own experience (knowledge) and the directly managed stores’ explanations.

• **Relation (e):**

Customers who prioritise performance and function over price or who are not influenced by the staff’s explanations are likely to choose a lower grade or fewer options than they planned. This implies that grades and options provide value to individual customers, and supports Hypothesis 1: wide range of grades and options provide sufficient range of choices for customers.

The correlations among the questions in Figure 6 support the Hypotheses 1 through 3. The correlations shown in Figure 6 can be explained from the standpoint of DART, which are the basic constituents of value co-creation advocated by Prahalad and Ramaswamy (2004). From the dialog perspective, the Relations (c) and (d) prove that customers change their choice of functions to improve their driving experience value through dialog with directly managed store staff. From the access and transparency perspectives, information access and transparency is secured through the customer interactions with the directly managed stores. Directly managed store staff generally give advice to customers as employees as well as general end consumers. They offer advice to customers according to customer needs as they cherish good and long-term relations with their customers. From the risk and benefits perspective, customers judge risk and benefits in relation to choosing higher grades/adding options [Relation (d)] or lower grades/reducing options [Relation (e)] according to their needs. Thus, customisation in the automotive industry is achieved through sales discussions between directly managed stores and customers, with directly managed stores’ heavily contributing to value co-creation with customers.

4.2 **Relation between involvements of carmakers in directly managed stores’ activities and prevalence of functions**

The results in Section 3.2 confirm that directly managed stores contribute to the prevalence and expansion of optional parts. In this section, measures that carmakers implement at directly managed stores to promote the prevalence of functions along with the actual prevalence of functions are considered.

According to Kanzaki (2014), Toyota started sales management improvement activities (‘GNT plan’) at directly managed stores in the late 1990s to enhance the management base of the directly managed stores. Specifically, Toyota encouraged directly managed stores to promote activities in used car sales, service, car insurance, and installment sales. Toyota referred to these business segments as ‘value segments’ (unexplored treasure mountain). Toyota managed the progress of these activities in an index called the ‘value chain cover rate’ (VC rate) that represents the rate (%) of profits other than new car sales versus general administrative expenses.
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Figure 7  Value chain cover rate at Toyota directly managed stores (see online version for colours)

![Value chain cover rate at Toyota directly managed stores](image)

Source: Author generated based on data in Kanzaki (2014)

Figure 7 shows the VC rate beginning in the year 2000. In fiscal year 2000, the rate was 60%, 85.5% in fiscal year 2007, and it reached 91.1% in fiscal year 2010. The rate increased approximately 30% in the 10 years, during which Toyota conducted various support activities for directly managed stores such as the launch of the Toyota Financial Service Corporation that supports financial management and instalment sales, and the distribution of a system that enables a search of used car inventories of all Toyota’s directly managed stores in Japan.

Table 8  Results of multiple regression analysis of car navigation product prevalence and VC rate

<table>
<thead>
<tr>
<th>Car navigation product prevalence</th>
<th>Adjusted $R^2$</th>
<th>$F$ change</th>
<th>Significance probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.937</td>
<td>178.32</td>
<td>3.9E-08</td>
</tr>
</tbody>
</table>

Table 8 presents the results of multiple regression analysis, with the car navigation product prevalence in Figure 4 as the explanatory variable and the VC rate in Figure 7 as the independent variable. Table 9 shows the standardised partial regression coefficient and significance probability of each independent variable in the multiple regression analysis.

Table 9  Partial regression coefficient between car navigation relevance and VC rate

<table>
<thead>
<tr>
<th>Standardised partial regression coefficient</th>
<th>Significance probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>-0.592</td>
</tr>
<tr>
<td>VC rate</td>
<td>1.211</td>
</tr>
</tbody>
</table>

Adjusted $R^2$ square in Table 8 shows that the model formula is highly applicable. The significance probability of 1% indicates statistical significance. Table 9 shows a positive
standardised partial regression coefficient for the VC rate. This result suggests correlation between the high VC rate and the high prevalence of car navigation products.

As mentioned above, carmakers enhance the management base of directly managed stores and sell new value through optional parts from the directly managed stores, resulting in the higher prevalence of the products and in increase of product prices.

4.3 Practical implications for avoidance of commoditisation

The analysis above clarifies how the automotive industry uses product innovations to appeal to customers as new options and thereby encourages customers to choose more functions (higher grades). This then leads to product price increases. As the prevalence of these options grows, carmakers add popular functions chosen by many customers to subsequent products as standard functions (maker option expands). This has two practical implications for manufacturing companies in avoiding commoditisation.

The first implication is the necessity of a mechanism that enables the explanation of product innovations (new value) to customers. Most customers do not have a performance-oriented mind-set when they first visit the directly managed stores. The directly managed store staff’s explanations contribute to shift the customers toward performance-oriented mind-sets. Customers’ satisfaction in their choice of options leads to a willingness to pay more, thereby leading to product price increases.

The second implication is the necessity for a mechanism that integrates popular functions chosen by many customers to subsequent products as standard functions. If the value chosen by many customers is added as a standard function, customer satisfaction is enhanced and product prices are maintained or increased.

The failure of the consumer electronic industry to avoid commoditisation can be juxtaposed in a comparison with the success of the automotive industry. Consumer electronic companies integrate various new functions collectively into new products, and consumer appliances are sold at retail stores. This means that customers usually do not have many opportunities to receive explanations about these products and they cannot choose functions according to their preferences. As a result, the consumer electronic industry cannot shift customers to performance-oriented mind-sets. Instead, customers buy electronic products with price-oriented mind-sets. These factors accelerate commoditisation in the consumer electronic industry. To avoid this, companies in the consumer electronic industry will need to increase the customisation of products, increase contact with customers, and better communicate the value proposition to customers. For example, the consumer electronic industry could contact a wide range of customers and distribute valuable information (such as customisation and service options) and collect customer preferences through the internet connection installed in products. Such measures will be necessary for the consumer electronic industry going forward.

4.4 Research limitation/future research

This study is a case analysis of Toyota’s directly managed stores in Japan. Similar customisation in the automotive industry can be seen at European and North American carmakers. However, the sales channels for new cars and explanations to customers vary depending on region. Thus, further study of other regions will increase the accuracy of the analysis of factors that enhance customisation in the automotive industry.
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The questionnaire used in this study does not fully verify whether directly managed stores function as a forum for value co-creation between customers and companies or whether important constituents in interactions between customers and companies (namely, information access and transparency) are established. Further study on these points will fully analyse the value co-creation mechanism between customers and companies.

5 Conclusions

This study analyses customisation through the selection of grades and options, and a mechanism where directly managed stores’ activities deliver benefits. The analysis confirms that product customisation and the communication of value to customers from the directly managed stores encourages customers to take a performance-oriented mind-set, contributing to sales price increases.

This mechanism is supported by carmakers’ efforts to improve the management foundation of the directly managed stores. The automotive industry has a mechanism where carmakers create value and the value is explained to customers, which thereby results in product price increases.

The implication of this analysis is that companies in manufacturing industries should establish strategies that not only include a value-creation mechanism but also a value-capture mechanism that communicates value to customers, lets customers co-create value through customisation, and shifts customers toward performance-oriented mind-sets.

References


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