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제조업 경쟁사 분석을 통한 품질 개선 전략 수립: 대시보드 카메라 시장에 적용

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Quality Improvement Strategy Development based on Competitor Analysis of Manufacturing Companies: Application to the Dashboard Camera Market

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■ Abstract ■

In a fiercely competitive environment, quality is a key factor that enables dashboard camera makers to maintain their competitive advantage. Quality affects consumer satisfaction, brand loyalty, and firm performance. Therefore, to remain competitive, it is important that manufacturers maintain product quality that meets consumer expectations. To this end, it is necessary to investigate customer preferences and product performance in terms of product quality and to properly allocate resources to improve the quality level such that the firm can maintain a competitive advantage. In this paper, we proposed the various ways in which manufacturing firms can determine which quality dimensions need improvement in order to secure competitiveness. To this end, we analyzed a case study of Urive to develop a quality improvement strategy through importance performance competitor analysis (IPCA). Urive's IPCA results showed that 14 quality dimensions, namely performance, size, price, ease of use, country of origin, manufacturer, brand, product certificate, warranty, distribution channel, market share, reliability, durability, and conformance, were not absolutely competitive compared with those of Mando, Inavi, and Finevu. In terms of color, Urive had an absolute competitive advantage over Mando, but not Inavi and Finevu. Urive's appearance was more competitive than Mando's, but not Inavi's and Finevu's. In terms of advertisement and serviceability, Urive was absolutely less competitive than Mando and Inavi, but had a competitive advantage over Finevu. Therefore, it is necessary to put resources and time as the first priority for performance, reliability, and durability, which have a large performance difference in common among the three brands. The quality dimensions in which resources and time need to be put in second place are price and ease of use, which have a large performance difference in common among the two brands.

Keyword : Importance Performance Competitor Analysis, IPCA, Urive, Perceived Quality

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1. Introduction

Dashboard cameras play an important social role in terms of determining who is responsible for traffic accidents, investigating hit-and-run accidents without witnesses, preventing insurance fraud, cracking down on traffic violations, and inducing compliance with traffic laws by taking video recordings of accidents that may occur while driving and parking cars. Recently, the use of dashboard cameras has become increasingly pervasive due to the increased connectivity with new technologies such as driving route analysis using location information, transmission of real-time accident information through the linkage with telecommunication networks, confirmation of information through the linkage with smartphones, navigation, and on-board diagnostics (OBD). Consequently, the dashboard camera market has been rapidly growing every year. According to Modor Intelligence (2020), the global dashboard camera market is expected to rise from about $19.1 billion in 2019 to approximately $51.2 billion by 2025. As dashboard cameras become more important, global dashboard camera manufacturers, such as DCS Systems Ltd (RoadHawk), Pittasoft Co Ltd (BlackVue), Qrontech Co Ltd (LUKAS), Garmin International Inc (Garmin), Papago Inc. (Papago), and Delphi Automotive Systems Pvt Ltd, have appeared in the market, unlike conventional navigation manufacturers such as Analog Devices Inc, CORDENKA GmbH & Co KG, Freescale Semiconductor Inc, General Electric Company, Hitachi Ltd, Hyosung Corporation, Inven Sense Inc, Panasonic Corporation, Robert Bosch GmbH, and SRF Limited.

In Korea, the dashboard cameras market is growing annually due to their usefulness in obtaining evidence to evaluate the actual situation in the event of accidents and special offers provided by insurance companies regarding dashboard cameras. According to the Macromill Embrain Report (2019), the installation rate of dashboard cameras has increased from 38.2% in 2013 to 88.9% in 2019. Accordingly, specialized dashboard camera manufacturers, such as Dooco, Mando, Thinkware, and Finedigital, are competing fiercely to secure customers by manufacturing a variety of dashboard cameras equipped with state-of-the-art features such as time-lapse, blind spot detection (BSD), and lane departure warning system (LDWS). Moreover, since 2019, Hyundai and Kia have released vehicles equipped with dashboard cameras, further intensifying the competition among dashboard camera manufacturers in Korea.

A key determinant of firms' ability to maintain a competitive edge is quality (Dominic et al., 2010; Kroll et al., 1999; Lakhal, 2009; O'Dwyer and Gilmore, 2019; Redman, 1995; Su et al., 2014). Quality affects not only consumer satisfaction (Baker and Crompton, 2000; Han and Hyun, 2015; Kang et al., 2004; Kasiri et al., 2017), but brand loyalty as well (Khan et al., 2016). Moreover, quality affects corporate performance (Zhou et al., 2008). Therefore, maintaining product quality that meets consumer expectations is important for manufacturers to gain a competitive advantage. To this end, many previous studies have focused on evaluating service quality from a service-oriented logic perspective (Ali and Raza, 2017; Butt and de Run, 2010; Kouthouris and Alexandris, 2005; Pakdil and Harwood, 2005; Yin et al., 2016)

Therefore, it is necessary for firms to investigate customer preferences and expected perfor-

mance of product quality dimensions to develop quality products that meet customer expectations. Therefore, firms must accurately distribute resources to quality dimensions that need improvement so that they can maintain their competitive advantage.

In this paper, we utilize importance performance competitor analysis (IPCA) to facilitate the development of quality products that meet customer needs in a competitive environment. To this end, we proposed ways in which enterprises can identify product quality dimensions that require improvement. Additionally, we developed a quality improvement strategy by conducting a case study of Urive.

2. Research Background

2.1 Perceived Product Quality

In previous literature, quality has been defined value (Abbott, 1955; Feigenbaum, 1951), conformance to specifications (Gilmore, 1974; Levitt, 1972), conformance to requirements (Crosby, 1979), fitness for use (Juran and Gryna, 1988), loss avoidance (Ross, 1989), and meeting customer's expectations (Parasuraman et al., 1985). Zeithaml (1988) defined perceived quality as the consumer's judgment regarding the overall superiority of the product. In particular, Zeithaml (1988) argued that (1) perceived quality differs from an objective or actual quality, (2) perceived quality is an abstract level higher than the nature of the product, (3) perceived quality is an overall assessment similar to attitude, and (4) a product's quality is rated as high or low depending on its relative superiority to identical services or products considered as alternatives by the consumer. Therefore, perceived product quality is defined by the consumer's judgment regarding not only the quality of the product provided by a supplier (Bei and Chiao, 2001), but also the relative superiority of the product compared to other substitutes (Aaker, 1991; Beneke et al., 2013; De Chernatony, 2009; Richardson, 1997). Based on this definition of perceived product quality, Schiffman and Kanuk (2000) argued that consumers evaluate product quality based on the physical characteristics of the product.

To strategically manage quality, Garvin (1987) presented eight dimensions, namely performance, features, reliability, conformance, durability, serviceability, aesthetics, and perceived quality, while Brucks et al. (2000) proposed versatility, ease of use, durability, serviceability, performance, and image as dimensions of perceived product quality. Snoj et al. (2004) measured perceived quality using the subjective indicators of quality, appearance, flexibility of use, size, and color. Vantamay (2007) presented the physical characteristics such as size, color, and appearance as well as external factors such as price, brand image, manufacturer's image, retailer store image, country of origin, distribution channels, brand image, certificates, warranty, advertising, advertising, and market share as determinants of perceived product quality. Hazen et al. (2017) measured perceived product quality using lifespan, features, and performance. Molina? Castillo et al. (2013) classified perceived product quality as internal and external quality. The internal quality dimensions include performance, feature, conformance, reliability, service, durability, workmanship, responsiveness, company reputation, overall quality, aesthetics, image, ergonomics, distinctiveness, ease of use, prestige, exclusive,

stylish, symbolic, and attention drawing, while the external quality dimensions includes price, brand, and country of origin.

Perceived product quality has a significant positive effect on customer satisfaction and loyalty (Bei and Chiao, 2001) as well as customer brand identification. However, it has a negative effect on switching behavior (Nikhashemi et al., 2017).

There are six sigma and quality function deployment as tools for measuring service quality. though these tools can measure the focal company's quality, they have the limitation of not being able to know its strengths and weaknesses compared to its competitors.

Therefore, this study intends to use the IPCA method to compare its strengths and weaknesses compared to its competitors.

2.2 Importance Performance Competitor Analysis

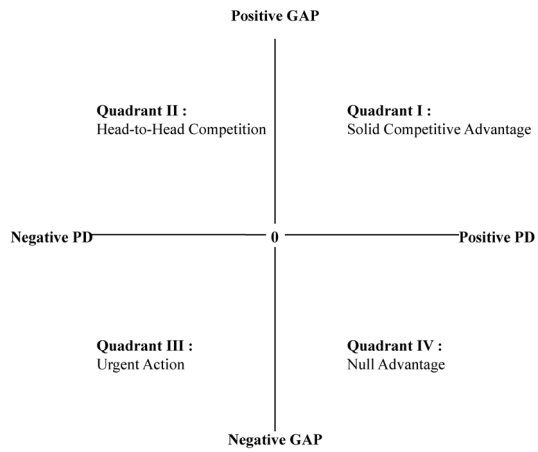
The importance performance analysis (IPA) tends to ignore competitors' performance because it analyzes only the expected importance before use and the perceived performance after use of the attributes of products or services provided by firms (Albayrak, 2015). To overcome these limitations of the IPA, Albayrak (2015) proposed the IPCA. IPCA is an analysis based on GAP (the differences between the performance and importance of the attributes of products or service provided by focal firms) and PD (the difference between the performance of the attributes of products or service offered by focal firms and the performance of the attributes of products or service offered by competitors, i.e., performance difference). In this study, IPCA was performed using Equations (1) and (2).

$$GAP_i = P_{Focal\,firm,i} - I_{Focal\,firm,i} \quad (1)$$

$$PD_i = P_{Focal\,firm,i} - P_{Competitor,i} \quad (2)$$

Here, $P_{Focal\,firm,i}$ and $I_{Focal\,firm,i}$ represent the perceived performance and expected importance, respectively, of an attribute i of a product or service provided by the focal firm. $P_{Competitor,i}$ is the perceived performance of attribute i of a product or service provided by a competitor.

In general, IPCA displays GAP_i and PD_i in a two-dimensional space as shown in [Figure 1].



[Figure 1] IPCA Grid

In the first quadrant, GAP_i and PD_i are both greater than 0 for the attributes of products or services provided by the focal firm. Therefore, the attributes of products or services provided by the focal firm are more competitive than the attributes of products or services provided by competitors. Thus, the focal firm needs to maintain these attributes continuously. In the second quadrant, GAP_i is greater than 0 but PD_i is less than 0 for the attributes of the products or services provided by the focal firm. This means the second quadrant is an area that competes fiercely with the attributes of products or services provided

〈Table 1〉 Previous IPCA Researches

Authors	Domain	Number of Subjects (or Reviews)	Number of Attributes				
			I	II	III	IV	Sum
Albayrak (2015)	Hotel	Focal: 325 Competitor: 153	4	3	23	7	37
Albayrak et al. (2018)	Resort	Focal: 141 Competitor: 110	7	7	5	9	28
Albayrak et al. (2021)	Theme park	Focal: 13,398 Competitor: 13,398	3	3	3	1	10
Caber et al. (2017)	Congress Destination	Focal: 102 Competitor: 106	0	0	7	10	17

by competitors. In the third quadrant, GAP_i and PD_i are both less than 0 for the attributes of products or services provided by the focal firm. Therefore, the product or service provided by the focal firm must be urgently improved to help the focal firm obtain a competitive advantage. Lastly, in the fourth quadrant, GAP_i is greater than 0 but PD_i is less than 0 for the attributes of the products or services provided by the focal firm. Although the fourth quadrant can be viewed as an area in which the focal firm maintains its superiority over its competitors, the firm's expected importance is higher than its perceived performance, so it does not actually maintain a competitive advantage.

Since the IPCA can help to identify dimensions that create a competitive advantage for products or services provided by a focal firm, it is used in various fields such as hotels (Albayrak, 2015), congress destinations (Caber et al., 2017), resorts (Albayrak et al., 2018), and theme pasrks (Albayrak et al., 2021), as shown in <Table 1>.

3. Results

3.1 Perceived Product Quality

The questionnaire used for the analyses was completed by 1,200 respondents, including 300 respondents each for Urive, Mando, Inavi, and Finevu. The demographic characteristics of each group are shown in <Table 2>.

First, regarding the gender distribution of the respondents, the respondents included 826 men (68.8%) and 374 women (31.2%). In particular, Finevu was mainly used by men, while Mando and Inavi were mainly used by women. Second, the age distribution of the respondents was as follows: 59 in their 20s, 321 in their 30s, 382 in their 40s, and 279 in their 50s. In particular, Inavi users in their 20s, Finevu users in their 30s and 60s, and Urive users in their 40s and 50s are frequently used. Third, looking at occupation, there were 915 office workers, 15 students, 59 public servants, and 115 housewives. In particular, Finevu is used by students, Mando by office workers, Urive by public employees, and Inavi by housewives. Fourth, regarding the car type, there were 817 passenger cars, 367 SUVs, 11 trucks, and three buses. In particular, Mando and Finevu are the most installed dashboard cameras in sedans and SUVs, respectively. Lastly, regarding the dashboard camera retention period, there were 349 people with under 1 year of ownership, 363 people with under two years, 272 people with under three years, 94 people with under four years,

〈Table 2〉 Demographic Characteristics of the Respondent Sample

Variables	Urive	Mando	Inavi	Finevu	Sum	Percentage
Gender						
Male	213	196	196	221	826	68.8%
Female	87	104	104	79	374	31.2%
Age						
20-29	13	9	25	12	59	4.9%
30-39	67	79	72	103	321	26.8%
40-49	112	95	94	81	382	31.8%
50-59	87	73	80	39	279	23.3%
≥60	21	44	29	65	159	13.3%
Occupation						
Student	5	1	3	6	15	1.3%
Salaried man	215	246	231	223	915	76.3%
Official	17	15	11	16	59	4.9%
Housewife	31	22	33	29	115	9.6%
Others	32	16	22	26	93	8.0%
Vehicle Type						
Sedan	210	216	198	193	817	68.1%
SUV	85	80	101	103	369	30.8%
Truck	4	2	1	4	11	0.9%
Bus	1	2	0	0	3	0.3%
Length of Dashboard Camera Ownership (year)						
≤ 1	69	111	64	105	349	29.1%
≤ 2	101	83	105	74	363	30.3%
≤ 3	65	64	80	63	272	22.7%
≤ 4	37	19	19	19	94	7.8%
≤ 5	28	23	32	39	122	10.2%

and 122 people under five years, accounting for 29.10%, 30.30%, and 22.70% of the sample, respectively. Furthermore, the dashboard camera retention period is less than one year for Mando, less than two and three years for Inavi, less than four years for Urive, and less than five years for Finevu. Additionally, Mando and Finevu had a dashboard camera installation period of less than one year, whereas Inavi and Urive had a dashboard camera installation period of two years or less.

3.2 Importance Performance Competitor Analysis of Dashboard Cameras

IPCA was performed by using $GAP_i(P_{Urive,i} - I_{Urive,i})$ and $PD_i(P_{Urive,i} - P_{Competitor,i})$ analysis to confirm the quality dimensions that provide Urive with a competitive advantage over other brands (Mando, Inavi, and Finevu). Here, P, I, and i mean performance, importance, and quality dimension, respectively.

The results of the GAP_i and PD_i analysis of

〈Table 3〉 GAP and PD for Urive

No.	Dimensions of Perceived Product Quality	GAP (Urive. P-Urive.I)	Urive vs Mando		Urive vs Inavi		Urive vs Finevu	
			PD	t	PD	t	PD	t
1	Performance	-0.76	-0.14	-1.738	-0.28	-3.659***	-0.10	-1.380
2	Size	-0.20	-0.01	-0.136	-0.11	-1.734	-0.12	-1.748
3	Color	0.07	0.03	0.375	-0.08	-1.294	-0.04	-0.625
4	Price	-0.76	-0.10	-1.298	-0.13	-1.725	-0.12	-1.642
5	Appearance	-0.11	0.02	0.325	-0.07	-1.070	-0.03	-0.464
6	Ease of Use	-0.58	-0.07	-0.915	-0.19	-2.567*	-0.14	-1.835
7	Country of Origin	-0.20	-0.07	-0.873	-0.13	-1.831	-0.02	-0.281
8	Manufacturer	-0.29	-0.08	-1.026	-0.25	-3.687***	-0.03	-0.492
9	Brand	-0.28	-0.05	-0.689	-0.22	-3.077**	-0.05	-0.739
10	Product Certificate	-0.36	-0.03	-0.330	-0.23	-3.238**	-0.06	-0.872
11	Warranty	-0.36	-0.15	-1.990*	-0.21	-2.782**	-0.09	-1.172
12	Distribution Channel	-0.24	-0.09	-1.202	-0.13	-1.861	-0.02	-0.251
13	Market Share	-0.30	-0.09	-1.160	-0.23	-3.468***	-0.08	-1.115
14	Advertisement	-0.15	-0.11	-1.652	-0.18	-2.897**	0.00	0.000
15	Reliability	-0.65	-0.11	-1.393	-0.25	-3.247**	-0.19	-2.560*
16	Durability	-0.71	-0.13	-1.609	-0.23	-2.937**	-0.14	-1.794
17	Serviceability	-0.67	-0.07	-0.918	-0.20	-2.593*	0.02	0.209
18	Conformance	-0.45	-0.09	-1.208	-0.16	-2.362*	-0.11	-1.571

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

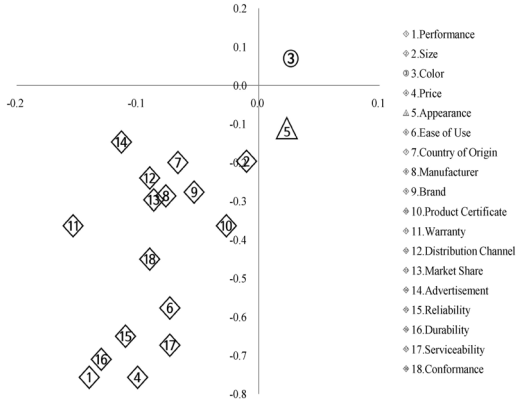
the quality dimensions of Urive are shown in <Table 3>. First, the GAP_i of quality dimensions, such as performance, size, price, appearance, ease of use, country of origin, manufacturer, brand, product certificate, warranty, distribution channel, market share, advertisement, reliability, durability, serviceability, and conformance, excluding color, were all less than 0. Second, the $PD_i(P_{Urive,i} - P_{Mando,i})$ of sixteen quality dimensions, excluding color and appearance, was less than 0. In particular, the t-value of the warranty derived from the independent sample t-test was -1.990 and statistically significant. In other words, Urive customers' rating of the performance of the warranty dimension was lower than that of Mando customers. Third, the $PD_i(P_{Urive,i} - P_{\mathrm{Inavi,i}})$ of all quality dimensions was less than 0. In particular, the independent sample t-test showed that the t-values of twelve quality dimensions, namely performance, ease of use, manufacturer, brand, product certificate, warranty, market share, advertisement, reliability, durability, serviceability, and conformance, were -3.659, -2.567, -3.687, -3.077, -3.238, -2.782, -3.468, -2.897, -3.247, -2.937, -2.593, and -2.362, all of which were statistically significant.

In other words, Urive customers evaluated the performance of the performance, ease of use, manufacturer, brand, product certificate, warranty, market share, advertisement, reliability, durability, serviceability, and conformance dimensions lower than Inavi customers did. Fourth, the $PD_i(P_{Urive,i} - P_{Finevu,i})$ of sixteen quality dimensions, excluding advertisement and serviceability, was less than 0. Moreover, according to an independent sample t-test, the t-value of reli-

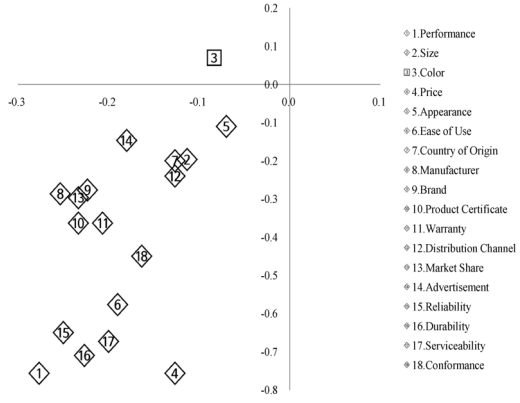
ability was -2.560, which was statistically significant. Urive customers assigned a lower rating to the reliability dimension than Finevu customers. In other words, compared with Finevu customers, Urive customers assigned a lower rating to the performance of the reliability dimension.

The IPCA results regarding Urive's quality dimensions obtained by using $GAP_i(P_{Urive,i} - I_{Urive,i})$ and $PD_i(P_{Urive,i} - P_{Competitor,i})$ were as follows. First, the IPCA results of Urive, compared with those of Mando, are shown in [Figure 2]. The quality dimension corresponding to the first quadrant (solid competitive advantage) was (3) color. There were sixteen quality dimensions, namely (1) performance, (2) size, (4) price, (6) ease of use, (7) country of origin, (8) manufacturer, (9) brand, (10) product certificate, (11) warranty, (12) distribution channel, (13) market share, (14) advertisement, (15) reliability, (16) durability, (17) serviceability, and (18) conformance, in the third quadrant (urgent action) and only (5) appearance in the fourth quadrant (null advantage). In contrast, there was no corresponding quality dimension in the second quadrant (head-to-head competition). These results indicate that Urive maintains an absolute competitive advantage in terms of color only when compared with Mando.

Second, the IPCA results of Urive, compared with those of Inavi, are shown in [Figure 3]. The quality dimension corresponding to the second quadrant (head-to-head competition) was (3) color. There were seventeen quality dimensions, namely (1) performance, (2) size, (4) price, (5) appearance, (6) ease of use, (7) country of origin, (8) manufacturer, (9) brand, (10) product certificate, (11) warranty, (12) distribution channel, (13) market share, (14) advertisement, (15) reliability, (16) durability, (17) serviceability, and (18) conformance in the third quadrant (urgent action). In contrast, there were no quality dimensions corresponding to the first (solid competitive advantage) and fourth quadrant s(null advantage). These results indicate that Urive has no competitive quality dimensions compared with Inavi.



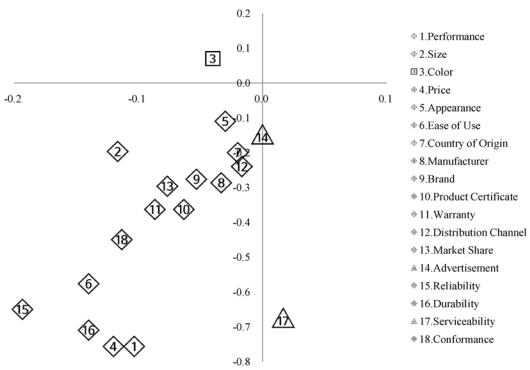
[Figure 2] IPCA Results for Urive Compared to Mando



[Figure 3] IPCA Results for Urive Compared to Inavi

Third, the IPCA results of Urive, compared with those of Finevu, are shown in [Figure 4]. The quality dimension corresponding to the second quadrant (head-to-head competition) was (3) color. There were sixteen quality dimensions,

namely (1) performance, (2) size, (3) color, (4) price, (5) appearance, (6) ease of use, (7) country of origin, (8) manufacturer, (9) brand, (10) product certificate, (11) warranty, (12) distribution channel, (13) market share, (14) advertisement, (15) reliability, (16) durability, and (18) conformance in the third quadrant (urgent action) and only (17) serviceability in the fourth quadrant (null advantage). In contrast, there was no quality dimension corresponding to the first (solid competitive advantage) and fourth quadrant (null advantage). From these results, it is evident that Urive has no competitive quality dimension compared with Inavi. In contrast, there was no quality dimension corresponding to the first quadrant (solid competitive advantage). This shows that Urive has no quality dimension that provides it with a competitive advantage over Finevu.



[Figure 4] IPCA Results for Urive Compared to Finevu

<Table 4> presents Urive's IPCA results. First, Urive had an absolute competitive disadvantage compared with Mando, Inavi, and Finevu in terms of fourteen quality dimensions: performance, size, price, ease of use, country of origin, manufacturer, brand, product certificate, warranty, distribution channel, market share, reliability, durability, and conformance. Second, regarding the color dimension, Urive had an absolute competitive advantage over Mando, but was less competitive than Inavi and Finevu. Third, regarding the appearance dimension, Urive was more competitive than Mando, but less competitive than Inavi and Finevu. Fourth, in terms of advertisement and serviceability, Urive had an absolute competitive advantage over Mando and Inavi, but competitive disadvantage over Finevu.

Firms have limited time and resources and must allocate them to quality dimensions that can achieve the best performance possible. Therefore, for Urive to secure its competitiveness, it must improve its quality dimensions, which show more differences in performance compared with Mando, Inavi, and Finevu. Compared to Mando, the performance difference for quality dimensions, such as performance, price, reliability, and durability, was large, while the performance difference for quality dimensions, such as performance, ease of use, reliability, durability, and serviceability, was large compared to Inavi. Moreover, compared to Finevu, the performance difference for quality dimensions, such as performance, price, ease of use, reliability, durability, and conformance, is large. Therefore, it is necessary to put resources and time as the first priority for performance, reliability, and durability, which have a large performance difference in common among the three brands. The quality dimensions in which resources and time need to be put in second place are price and ease of use, which have a large performance difference in common among the two brands.

For example, there are strategies to increase performance such as installing in-plane switching (IPS) panels, expanding the capacity of SD

<Table 4> Summary of IPCA Results for Urive

Dimensions of Perceived Product Quality		Urive's IPA	Urive vs Mando	Urive vs Inavi	Urive vs Finevu	Sum(PDi)
1	Performance	I	III	III	III	-0.52
2	Size	III	III	III	III	-0.24
3	Color	III	I	II	II	-0.09
4	Price	II	III	III	III	-0.35
5	Appearance	III	IV	III	III	-0.08
6	Ease of Use	I	III	III	III	-0.4
7	Country of Origin	III	III	III	III	-0.22
8	Manufacturer	III	III	III	III	-0.36
9	Brand	III	III	III	III	-0.32
10	Product Certificate	I	III	III	III	-0.32
11	Warranty	III	III	III	III	-0.45
12	Distribution Channel	III	III	III	III	-0.24
13	Market Share	III	III	III	III	-0.4
14	Advertisement	III	III	III	IV	-0.29
15	Reliability	II	III	III	III	-0.55
16	Durability	I	III	III	III	-0.5
17	Serviceability	I	III	III	IV	-0.25
18	Conformance	II	III	III	III	-0.36

cards that are basically installed, and storing images in one frame per second. Through this, it is possible to deliver the leading image technology through product development of the highest specification. Strategies to increase reliability include extending the free warranty period of the main body and SD card, managing and grasping critical items at the design stage, identifying defects in design alternatives, recognizing alternatives to work even in the event of component failure, selecting reliable parts, and strengthening the reliability process through application and supplier monitoring and management. Strategies to increase durability include adding inspection items and conducting full inspection of the entire process, such as import, quality and packaging, thorough part import inspection, standardization of parts, application of high-level parts at the battlefield level, and product design with a solid image.

4. Conclusions

In this paper, we proposed a method to enable manufacturing firms to identify quality dimensions that need improvement to secure competitiveness. To this end, a case study of Urive was analyzed to develop a quality improvement strategy. In other words, the expected importance and perceived performance of eighteen quality dimensions including performance, size, color, price, appearance, ease of use, country of origin, manufacturer, brand, product certificate, warranty, distribution channel market share, advertisement, reliability, durability, serviceability, and conformance of Urive, Mando, Inavi, and Finevu were investigated. Based on this data, we performed IPCA.

Looking at the IPCA results from Urive's perspective, fourteen quality dimensions, namely performance, size, price, ease of use, country of origin, manufacturer, brand, product certificate, warranty, distribution channel, market share, reliability, durability, and conformance, were absolutely not competitive, compared with Mando, Inavi, and Finevu. Urive had an absolute competitive advantage in terms of color over Mando, but not Inavi and Finevu. Regarding appearance, Urive was more competitive than Mando, but not Inavi and Finevu. In terms of advertisement and serviceability, Urive was absolutely less competitive than Mando and Inavi, but had a competitive advantage over Finevu.

The following are suggestions for allocating resources to improve the quality of Urive. In general, according to the expectancy disconfirmation theory, if performance is less than expected, customers become dissatisfied, which consequently affects their repurchase intention. Therefore, firms must invest their resources in quality dimensions that can maximize performance using their limited time and resources.

However, this paper has the following limitations. First, dashboard camera manufacturers produce and sell various dashboard cameras every year. Therefore, it is necessary to investigate the expected importance and perceived performance of dashboard cameras that have the same specifications of dashboard cameras produced and sold by manufacturers. Second, the importance of product quality dimensions should be measured before purchase, and the performance of these product quality dimensions should be investigated after purchase; However, in this study, the importance and performance of dashboard camera quality dimensions were measured simultaneously. This creates the problem that customers' post-purchase experience may have been affected by the expected importance of quality dimensions.

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서울대학교에서 산업공학학사, 한국과학기술원에서 경영정보시스템 전공으로 석사 및 박사학위를 취득하였으며 현재 경희대학교 경영대학 및 빅데이터 응용학과 교수로 재직하고 있다. 미국 미네소타 주립대학교 그리고 텍사스 주립대학교(달라스)에서 교환교수를 역임하였다. 주요 관심 분야로는 개인화 서비스, 추천시스템, 빅데이터, 및 딥러닝 등이다. IEEE Transaction on Services Computing, IEEE Transaction on SMC-A, International Journal of Human Computer Studies, International Journal of Information Management, Information and Management, Expert Systems with Applications, Applied Artificial Intlligence, 등 다수의 학술지에 논문을 게재하였다. 현재 4단계 BK21사업 연구단장 (빅데이터분야) 및 AI 비즈니스 연구센터 센터장을 맡고 있다.

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