

Interaction between client and design consultant: The stance of client to design consultant and its influence on design process

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Abstract

Design is essential in product development but several small and medium-sized enterprises (SMEs) relatively capable of manufacturing are suffered from lack of in-house design ability. For new product design, these SMEs typically employ external designers. In this client-designer interaction, designers propose design solution alternatives to their clients, which clients may accept or reject. In some cases, clients provide designers further design requirements. A study on how interactions are performed and what effects these interactions have on the results of product development is essential to determine what is needed to achieve successful collaborative relationships. Thus, this study analyzed three design development cases that were previously performed to understand how interactions work between clients and designers and its effect on the outcomes. In all cases, the design team developed designs for the clients based on their technological requirements. This study focused on the effect of client stance on the process and deliverables. Clients usually take various actions that accept or reject design solutions or give additional demands. This is because clients take initiative in decision making. Clients' stance was divided into receptive and expressive stances. As a result, a receptive stance ensured the design capabilities of design consultants, whereas expressive stance confined design capabilities to some extent but a new design direction may be proposed based on a client's knowledge, information, and judgment.

Keywords: client-designer relationship, collaborative design, product development, client stance

Designers in consulting firms are engaged in product design development for clients. Many product design works performed by designers include both exterior design and interior structural design. In this setting, product design is essentially achieved through collaborative processes between engineering and industrial designs (Horvath, 2004; Hosnedl et al., 2008; Hubka, 2013; Kim & Lee, 2010). Thus, designers should consider various elements such as a product's exterior, interior, operating structure and parts, and use scenarios.

In this regard, large conglomerates where product development actively takes place frequently operate their own industrial and engineering design teams. However, SMEs that attempt product development for the first time or individual inventors will face great difficulty during product development in general. It is normally important for

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those companies without design teams to utilize external designers to gain competitive advantages as a business strategy (Bruce et al., 1999; Filippetti, 2010; Lewis & Brown, 1999; Von Stamm, 1998).

The relationship between designer and client, particularly for SMEs, venture entrepreneurs, and individual inventors, may simply be a commissioner-deliverer relationship. However, it can be a co-work relationship instead. It is, thus important to understand which co-work relationships exist and what is the effect of a co-work relationship? When designers co-work with colleagues from other fields during the design development process, they find it difficult to communicate with them since they have different expertise (Kleinsmann & Valkenburg, 2008). In the product development process, designers and other experts may have different knowledge and experiences, which cause conflicts (Kim & Lee, 2014). This can also be applied to the relationship between designers and clients. The present study focused on this perspective and investigated the type of cooperation between client and designer and its effects. As such, three collaborative design projects under designer-client relationship and how different interactions affect the outcomes were analyzed.

Research framework

The case projects were conducted from 2014 to 2016 between our institute's design team including the authors of the present study and three different SMEs. These projects aimed to develop products that had potential market entry based on the ideas, technologies, and patents of each company. The first case project was conducted in 2014 in which a mechanical-based recliner chair was developed proposed by the client. The second case project was conducted in 2015 - a multi-functional baby carrier based on another client's initial design. The third case project was conducted in 2016 in which a radiation shielding garment was developed for a client company who have developed radiation shielding materials. The common points in these three were: (1) a process of typical technology-based product development based on technology devised by a client, (2) the number of employees at each SME less than five persons, and 3) the first time startup of attempting product development through design.

In each case project, an attempt was made to produce design deliverables that satisfy the clients' requirements and marketability. Clients and our design team made continuous interactions for the whole product development processes. For the analysis, the interaction data such as meeting data, interview data, exchanged information, etc. was collected with clients particularly focusing on clients' attitude towards the design team.

Basically, the designers' perspective is formed in a contract relationship that completes the requested design and delivers it to the client. Even if clients and designers are in a good cooperative relationship, designers should continuously propose design solutions, whereas clients accept or reject them or demand further design requirements. This becomes interaction that affects the design execution of design consultants by their actions; this is because clients generally have the right to decide. Accordingly, the present study aims

to determine the effect of clients' stance towards designers and changes in stance on design deliverables.

Clients' stance was analyzed from two viewpoints. First, an expressive stance in which the client wants to express their ideas or intentions continuously to exercise their influence on the design team, and second a receptive stance in which the client accepts and recognizes the opinions of the design team. According to Gericke and Maier (2011), the cooperative modes of interaction between a client and design consulting team can be divided into two parts to understand whether a client participates in the design process. The first part can be passive coupling where the client leaves all processes and decisions up to the design team completely, and the second part can be active coupling where designers from the client side actively participate in the design team. As such, the design projects here are based on passive coupling because clients did not actively participate in the design process. However, it is still not genuine that clients do nothing even in a passive coupling relationship. For example, clients constantly interact in the design process by providing necessary information, delivering requirements, evaluating, accepting, rejecting, or re-persuading with the design solutions proposed by designers. In general, the design team proposes a design solution to a client, and the client then accepts or rejects the proposal. Clients provide information for the design team or make specific demands. In summary, the stance is divided into two parts: The expressive stance where the client's stance is to express their ideas or intentions continuously to exercise influence over the design team, and the receptive stance where clients accept and recognize the decisions made by the design team. Some examples of expressive stance are the cases in which clients do not accept the designers' proposal, and provide further information to the design team to fulfill their intention, or put forward their own draft to modify and revise the design elements. Receptive stance includes agreeing and accepting the design solution when the designer proposes a draft or accepting the designer's draft in recognition of the designer's expertise even if the client do not agreeing with.

Analysis of case projects

Case 1: A recliner chair design project

This project aimed to design a new recliner chair that could be launched in the market based on the client's technical patent of a mechanical mechanism. Initially, the client provided drawings, patent specifications, and test prototypes (See Figure 1). In fact, the client's recliner technology was based on a mechanism where a chair back plate was pushed back when a user exerted a certain amount of force in the preferred direction, and a seating plate and back plate pushed the user when the user wished to mount up from the chair.

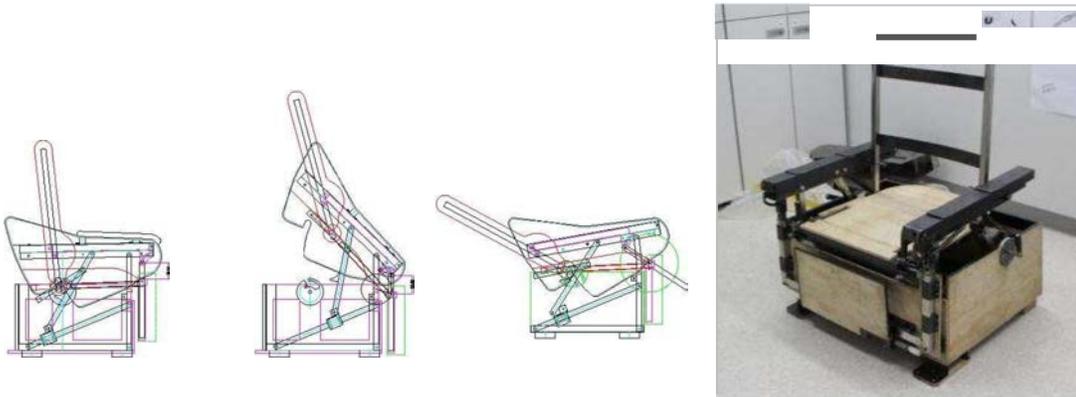


Figure 1: Drawing and test prototype

Firstly, the design team analyzed the drawings and the test prototype provided by the client and then the recliner chair market was analyzed where user study was conducted. Based on the received data, the design team reconstructed a chair structure using three-dimensional (3D) computer-aided design (CAD) to create design alternatives. However, the design team suggested possible improvement of the structure because it was excessively complicated, thereby losing some competitiveness against the existing products, and users were vulnerable being thrown forward upon while getting up from the chair. Nonetheless, the improved structure was not adopted because the client rejected it on the grounds that the patented technology should be applied to create differentiation. The design process was then started on the exterior design over the main frame based on the 3D CAD data, and the design team produced three design proposals as shown in Figure 2.



Figure 2: Three design proposals, Type A, B, and C respectively

Type A and B were simple designs because they maintained the original internal mechanism, whereas Type C modified the internal structure into external visual elements while maintaining the working principle in the internal structure, resulting in a significant modification from the original configuration. The design team preferred to decide the final proposal based on market analysis, but the client who received three drafts adopted Type A to suit their preference. In particular, the client expressed strong opposition against Type C, which showed a unique shape that outwardly revealed the internal structure. During the process, the client did not adopt any new mechanism as proposed with innovative elements or a unique shape such as Type C did, but selected Type A according to the client's preference.



Figure 3: Final selected design solution

The client's stance revealed during the design development process can be depicted through expressive and receptive stances as shown in Figure 4.

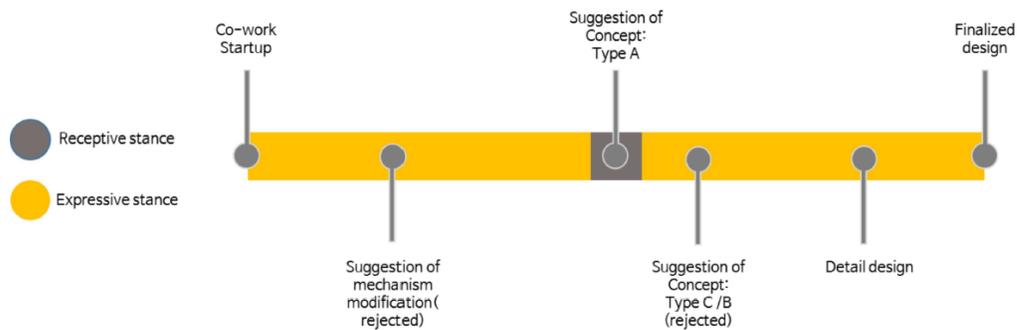


Figure 4: Client stance changes in Case 1

As explained above, the client desired to intervene in the overall process. A part from the moment of accepting Type A (marked with a receptive stance in Figure 4), the client took a consistently expressive stance where no improvement drafts proposed by the design team were accepted. In particular, the client strongly wished to select the preferred design rather than an appearance style based on the opinions of design experts and market surveys. The client's stance prevented the design team from additional in-depth ideation, which made innovative design development difficult resulting, the design team's capabilities limited. The reasons for the client's consistent expressive stance were (1) the client's strong insistence on a specific exterior shape had placed the client's intentions above the decisions made by the design team and (2) the client judged that competitiveness ensured via the use of the patented technology was more advantageous than improving the product. The client was holding the final decision rights, due to which the client's intention was ultimately applied in the design. This project was a case where the design team and client disagreed each other.

Case 2: Multi-functional baby carrier

This project aimed to develop a product design based on the client's patent composed of a

baby carrier that could transform into a wooden horse rider. Initially, the client provided the design team with operating structure, patent, test prototype, and use scenarios (See Figure 5). Since the test prototype was out of sorts for a commercial product, the design team initiated a complete overhaul of the test prototype.

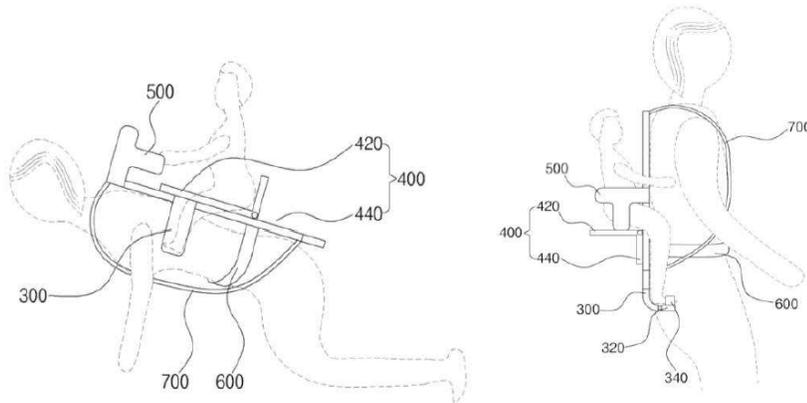


Figure 5: Initial design and scenario

The initial design provided by the client had a structure that changed mode between baby carrier and wooden horse rider by rotating a hip seat (See part 400 in Figure 5) via pushing the wooden handle down (See part 500 in Figure 5) that was inserted in the main body. In the market, most baby carrier products are composed of textile material rather than a rigid body to ensure the safety and comfort of the baby. However, the design proposed by the client did not consider such elements, which had resulted in an unsophisticated structure as a commercial product. Furthermore, rearranging the parts to change the mode required a cumbersome process, generating significant inconvenience. Accordingly, design team created a totally different design solution from the original design proposed by the client as shown in Figure 6.

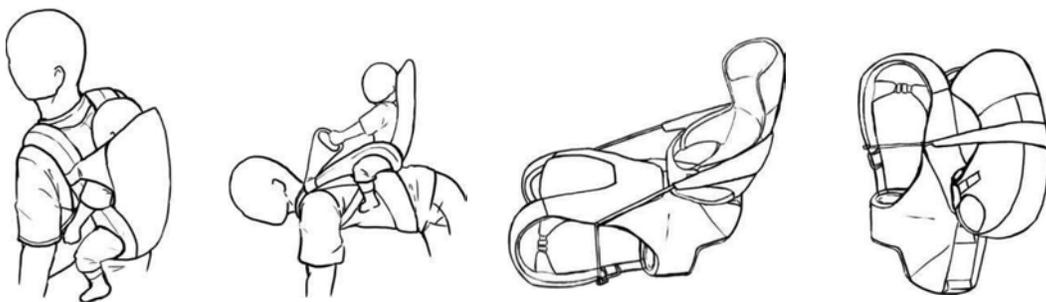


Figure 6: Proposed design sketch

In Figure 6, the mode can be changed between baby carrier and wooden horse rider immediately using a shoulder band while wearing the baby carrier. In addition, it was composed of a textile material to increase comfort. The client stance towards the design team regarding the proposed design was neutral-to-somewhat-negative. Nonetheless, the client accepted the new design solution, as the design team convinced the client based on user test studies and product reviews. Thus, it was significantly improved from the original design.



Figure 7: Final selection

The client's stance revealed during the design development process of Case 2 can be depicted as both expressive and receptive stances (See Figure 8).

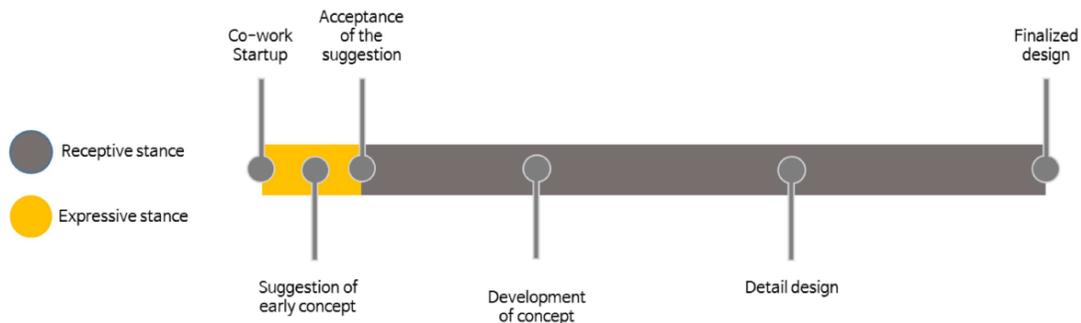


Figure 8: Client stance changes in Case 2

The inventor, who was a representative of a corporation, provided the initial design solution to the design team and requested to closely follow (expressive stance). However, the analysis results conducted by the design team concluded that the design the client had proposed would not be competitive in the market. Therefore, the design team proposed a new structure, shape, and use method. The client initially responded to the design team's proposal negatively. However, the other members from the client side had baby carrier use experience and accepted the design team's idea. Accordingly, the inventor reluctantly accepted the new design proposal. The design team developed a final design solution based on the proposal, which was confirmed by the inventor. Later on, the inventor received product reviews from potential customers acknowledged that the decision made by the design team was genuine.

The series of processes can be explained in terms of the client stance as expressive stance followed by receptive stance. One important note in this case is that how the company representative who made important decisions could change his stance from expressive to receptive. The change in stance was possible because a colleague whom the representative, the inventor completely trusted took a receptive stance and convinced the inventor at all. If a colleague of the inventor had not taken a receptive stance or another colleague who was not trusted by the inventor took a receptive stance, the inventor might have not accepted the design team's proposal as found in Case 1.

Case 3: A radiation shielding suit design project

This project aimed to develop a new radiation shielding garment by using the client's company own shielding materials. The radiation shielding material developed by the company was flexible and easy to fabricate with high shielding performance against radiation.

Initially, the client provided the design team material samples and related information. The design team conducted studies on radiological workplace, users, and market surveys to identify opportunities for the design development of radiation shielding garments. Radiation shielding garments should be equipped with a vest and genital protector to protect the internal organs and genitals, which are the most vulnerable areas to radiation. Currently, existing shielding garments used in South Korean nuclear power plants are heavy and inconvenient, because they often place lead blocks in the vest. Furthermore, radiological sectors are divided into three zones according to the amount of potential radiation exposure. The workers must wear different types of shielding garment at each zone.. Basically, a worker has to use three different types of vests when move from a place with low radiation to a medium and high radiation zone.

The design team sought to overcome these problems by proposing a new design with better workability and more comfort than the existing radiation shielding garments. Thus, it was required to provide attachable vests that did not require additional shielding garments for different working areas when moving between the three different radiation zones. The new design also has increased usability and cost effectiveness due to its modular design and reduced waste materials. Existing radiation shielding garments required each amount of material for the types A (light), **B** (middle), and C (heavy). However, the modular design only needs an amount of material used in type C, which can shield the most radiation as it is attachable whenever a worker travels from a low- to a high-radiation zone. Figure 9 shows the design solution. In contrast with conventional products in which the thickness of lead blocks differs according to the required radiation shield amount, the design proposed by the design team has a basic type (the two upper left images in Figure 9) that is used for zone 1 (the low-radiation environment), and two modular types (two upper right images and two lower images in Figure 9) that can be added on the basic type in zone 2 and 3 as the amount of radiation increases.



Figure 9: Design solution of the modular radiation shielding suit (basic type & modular type)

Although the client firstly accepted the design solution proposed by the design team for further development, the client later requested for changes in design direction in the middle of the process, providing potential merit in medical equipment markets. The radiation amount generated by medical equipment such as X-ray imaging or computerized tomography equipment is relatively constant and easy to shield against radiation. Therefore, medical radiation shielding garments do not need modularization. Since medical radiation shielding garments often need to protect the hands of workers, thus the client also requested the development of a wristlet protector. The design team acknowledged it and the design direction was changed to develop a medical shielding suit design (Figure 10).



Figure 10: Design of medical radiation shielding suit

The client did not intervene in the design process much compared to the client in Case 1, and took a receptive stance overall. In the middle of the design process, the client took an

expressive stance by demanding a change in the design target because of the product potential in the medical market (See Figure 11). The client then took a receptive stance regarding the design developed by design team during the development of the medical shielding suit following the client's request. This stance helped the design team ensure autonomous activity.

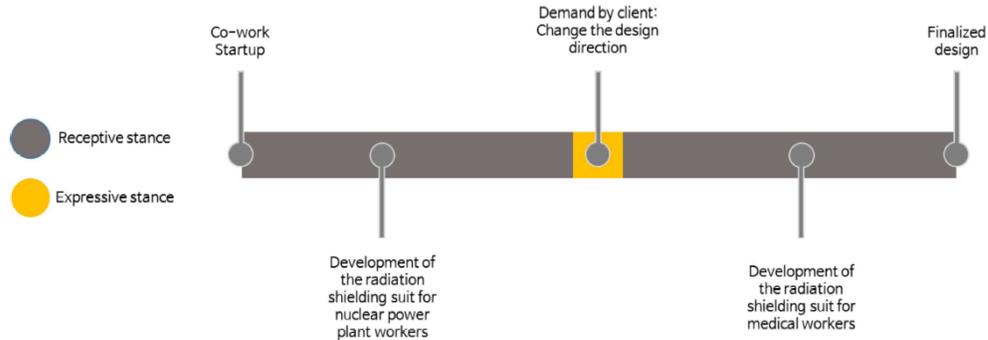


Figure 11: Client stance changes in Case 3

Insights from the case studies

The case studies show the effects of the client's stance during the interaction between clients and the design team and are summarized below:

- i. *Expressive stance*: The intervention of clients without justifying the views of design team can disturb the design development by limiting the design team's capabilities. However, reasonable intervention by convincing the design team can help them come up with new design alternatives.
- ii. *Receptive stance*: This provides an environment where the design team can sufficiently exhibit their capabilities.

Case 1 is an example of a client taking a constantly expressive stance. In this case, the design team made constant efforts to persuade the client but unsuccessful. The clients continuously intervene in the design process and stand on their preferred design solutions regardless of the market study or the design consultant's recommendation. Thus, the capabilities of design team become limited and could not produce a final solution. In such a case when the client takes an expressive stance, it is necessary for the design team to persuade the client with rationales. Otherwise, the design results may satisfy neither the client nor the design team.

In Case 2, the inventor as a corporation representative initially took an expressive stance, but changed to receptive in a dramatic manner. Similar to Case 1, the inventor initially requested to accept the ideas. However, one of the inventor's colleagues accepted the design team's proposal and convinced the inventor's stance to a receptive one. Although the inventor's stance was still expressive against the design team's proposal and acknowledged flaws in the initial judgment after receiving the final design solution and supportive product reviews from the real users.

Basically, clients have to argue in a cooperative relationship; however the design team should play the role of persuaders. If the design team cannot convince the clients, the results will not be successful in case if a client continuously insists to select a design that the design

team find difficult to accept. Therefore, persuasion and communication should be a two-way process; this is particularly apparent if a client takes an expressive stance. Changing a client's stance from expressive to receptive stance requires removing a barrier from the client's mind. Thus, the design team should understand the barrier of the clients who have taken an expressive stance, and persuade them. The ability to persuade clients can also be regarded as one of the design team's social skills. In contrast, a client should give credibility to the proposals of design consultants, which may be advantageous in terms of the design team's performance.

The client in Case 3 took a receptive stance. Thus, the design team's design choices were not limited by the client's intentions, but were able to progress the design process freely. Clients temporarily changed to an expressive stance during the development process when they discovered another potential market entry point. Although limitations or changes in design direction can burden the design process due to unknown and subjective knowledge, ideas, and judgments by clients through an expressive stance. It can also lead to product improvements and innovation that may be missed by the design team. In such interventions, the validity of the clients' judgment and how reasonable the logic behind their judgment is are both important. Since the client in Case 1 continuously intervened in the process based on its personal preference, which limited the designers' capabilities, whereas the client in Case 3 intervened in the process by providing sufficient knowledge and information that designers could implement the new design direction.

Discussion and conclusions

It is difficult to conclude that design process and results are affected positively by client's stance in the cooperative design development process under client-designer relationship. The outcomes of the case projects have not yet launched in the market. Thus, the effect of the expressive or receptive stances taken by the clients in the design processes cannot be known for the design outcome in terms of commercial success or market acceptability. Nonetheless, the present study showed how the client's stance during the design process can influence both the design process and outcome.

The present study investigated the client's stance within the passive coupling relationship (Gericke & Maier, 2011), in which the clients had no design expertise or capabilities. Although the client's intervention in the design team's work can help the design team recognize what may have been missed in the design process as shown in Case 3. It can also limit the designers' capabilities, thereby preventing the design team from achieving the best outcomes. However, active coupling (Gericke & Maier, 2011) where designers from the client side participate in the design process with design consulting company may have a different effect to the expressive and receptive stances in contrast with the case of passive coupling. That is, since clients have a higher degree of understanding about the design project in active coupling, it can reduce the negative effects of an expressive stance. If clients are excessively consistent with a receptive stance, the design team becomes vulnerable to neglecting practical factors such as productivity or price, which may be a problem in terms of the potential implementation of the final design although this is not discussed in the above cases.

However, better design results can be achieved if design team recognizes new information when the clients provide sufficient information and positive influence with an expressive stance.

Although the present study specifically discusses the relationships between clients and the design team. The insights can be applicable to the relationships between superiors who make decisions and the designers of in-house product development teams. That is, any relationship between a superior and designer in a product development team at a company can be compared to that between a client and a consulting designer. It may have a different effect on the design process and outcomes according to which stance a higher organization or superior takes with a product development team; this presents an interesting subject for future study.

Furthermore, interactions between teams in product development projects where several teams collaborate are also regarded as taking expressive or receptive stances. Kim and Lee (2016) argued that idea exchanges between design teams are frequent when different fields of expertise are discussed, and the efficiency of the design process or quality of outcomes can be affected by the stances that different teams initiate. For example, an engineering team may take a receptive stance that accepts an exterior design proposed by an industrial design team in the process of product development without any objection, or take an expressive stance in which they demand modifications or reject the proposal. When an engineering design team takes a receptive stance, an industrial design team may show their capabilities to the fullest. However, if an engineering design team takes an expressive stance, an industrial design team may be limited and take a receptive stance, or take an expressive stance by opposing the design proposed by the engineering design team. In reverse, an industrial design team may take a receptive or expressive stance regarding a specification proposed by an engineering design team. Such a relationship is horizontal, as neither team has the absolute decision right, in contrast with the relationship between clients and design teams, where most decisions are made by the clients. Therefore, a study on the effect of stance between partners in design process management for the design process and outcomes will be an interesting subject.

Overall, the insights from the case studies can provide basic guidance for exploring the effect of stance between partners in the design process and outcomes in various types of cooperative design development processes. It can also provide hints about which stance should be taken by a client while cooperating with designers during a new product development process based on technologies. For designers, this study furthers specific guidelines about how to respond to a client's stance in collaborative settings of a client-designers relationship.

Acknowledgements

This work is supported by the Ministry of Education and National Research Foundation of the Republic of Korea (NRF-2015S1A5A8010614). The work is also supported by the Promotion of Special Design-Technology Convergence Graduate School of Korea Institute

of Design Promotion (N0001436) with a grant from Ministry of Trade, Industry & Energy of the Republic of Korea.

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