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# TEAM BASED PROJECTS FOR MASTERS DEGREE THESIS IN DESIGN EDUCATION

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## ABSTRACT
Design students would learn by many team-based design projects. But in a typical master level graduate programmes in design, most of thesis projects are done by individual design students. A desirable project-type masters degree option would be such that two students conduct a collaborative project, sponsored by industry, for the duration of one year. As an approach to satisfy the dual requirements of desirable team-based design projects with industry sponsors and individual evaluation for degree conferral, collaborative thesis design projects can include individual tasks within the overall project objectives. In this paper, how team-based design projects for thesis project of masters degree can be conducted is discussed through an illustrative project where a project team conducted a collaborative design project for a year and team members had their individual components.

*Keywords: Project-based learning, team-based projects, design education, master-level graduate education*

## 1 INTRODUCTION
Project-based learning and learning by doing are typical approaches in design education [1]. Design tasks are often conducted through collaboration of design team members. In design education, an important aspect is team-based projects [2]. Throughout the curriculum in a typical masters degree education, students would learn by many team-based design projects. But the culmination of the degree conferring is the thesis project in a typical master level graduate programmes in design. Due to the nature of evaluation of degree candidate, most thesis projects are done by individual design students. On the other hand, it is critical that such a thesis project should involve proper industry relevance. It is important that design projects involve industry collaboration at a level that industry partners are sincere in their collaborative help in design education. Thus, it is very desirable that industry partners sponsor thesis projects with their problems of interest.
A desirable project-type masters degree option would be such that two students conduct a collaborative project, sponsored by industry, for the duration of one year and they prepare project reports and defend their projects through presentations. These projects deal with design projects with strong industry relevance and their breaths and depths are ensured by the two-person team aspect and the two-semester long duration. Yet, the degree candidates are required to write individual thesis to satisfy typical degree conferring requirements at the university level. Also, design team members may need to be evaluated individually while they conduct the design projects as teams. As an approach to satisfy the dual requirements of desirable team-based design projects with industry sponsors and individual evaluation for degree conferral, collaborative thesis design projects can include individual tasks within the overall project objectives.
In this paper, how team-based design projects for thesis projects of masters degree can be conducted is discussed through an illustrative project where the project team conducted collaborative design project for a year and team members collaboratively and collectively designed a product-service system (PSS) [3] for a manufacturing company and they also have their individual components in the PSS design. The paper also discusses remaining issues in conducting team-based design projects for degree conferral. For example, the student team of two students produced three reports typically, two individual theses and a project report. Inevitably, these reports contain many common contents to properly describe what they have conducted. Sometimes, the students and instructors could be criticised that these theses have overlapping contents by those who do not consider the detailed context and the educational intent of this kind of project-based design education.

In the remaining parts of the paper, a curriculum where industry-sponsored design projects were used for master thesis projects is briefly explained so that how the design education was done overall. Then an illustrative project is presented with project overview and design tasks conducted individually by two students. The paper is concluded with discussions and conclusion where some other project-based masters degree design educations are compared and how this type of design education can be enhanced while industry-relevance and team-based design issues can be fully accommodated within the situation of degree conferral requirements of typical master-level education systems with theses.

## 2 GRADUATE PROGRAMME OF SERVICE DESIGN

Industry requires a new special kind of experts in service design and servitisation to lead innovations in manufacturing, healthcare and social innovation. Based on new design methodology developed for PSSs and the software systems with such a methodology embedded, an interdisciplinary graduate programme had been launched in Sungkyunkwan University [4].

The curriculum of the master degree programme is composed of the following 5 layers as shown in Figure 1: (1) *Integrated Design Foundation* with Human Thinking, Human Living, and Human Environment & Integrated Design, (2) *Service Design Core* with Service Design Processes 1 and 2, (3) *Service Design Social Sciences* with Service Management, Service Communication, and Service Cognition, (4) *Service Design Applications* with Product-Service Systems Design, Healthcare Service Design and Social Innovation Service Design, and (5) *Project or Research Options* with Global Collaborative Project or Service Design Research options.

This programme had been supported by the Ministry of Education, in the programme of Specialized Professional Graduate Education, as an innovative graduate education initiative. The unique nature of this programme is that its masters degree education based on project-based learning. The programme offers the project-type masters degree option where two students conduct a collaborative project, sponsored by industry, for the duration of one year and they prepare reports and defend their projects through presentations. These projects deal with service design projects with strong industry relevance and their depths and breaths are ensured by the two-person team aspect and the two-semester long duration. The projects that are related to master theses are conducted in conjunction with those courses of rounded boxes, e.g., Collaborative Design and one of *Service Design Applications* courses.

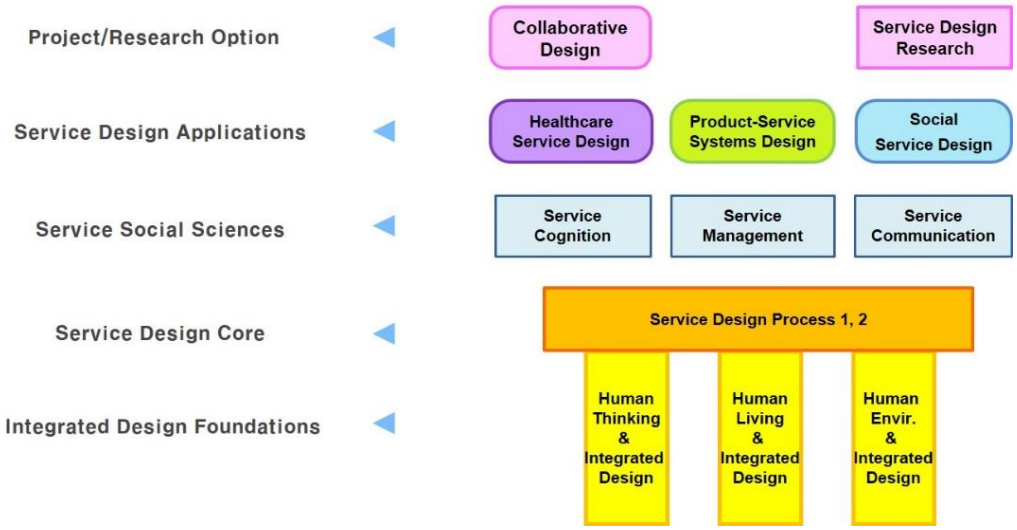



*Figure 1. Curriculum of the masters degree programme*

## 3 AN ILLUSTRATIVE PROJECT

A PSS had been designed for a glasses sales company with more than 200 franchise stores to improve customer purchase experiences [5]. A student team supervised by the author with two more faculty members as evaluators conducted PSS design for the duration covering last two semesters of their 2-year masters degree graduate study. A very close collaboration with the company including the CEO and the headquarter store had been made throughout the project.

### 3.1 Project overview

The design team identified value themes [6], including *functional values* of customization, expertise and choice, *social values* of empathy, pressure and self-esteem, *emotional values* of fun, worry and indecision, *epistemic values* of variety and coordination, through empathy research of consumers and service providers as well as mystery shoppers. The PSS for glasses purchase was composed of 6 service concepts: *Shop Visual*, *Vision Systems Renewal*, *Style Supporters*, *Style Coordinator*, *Concierge Service*, and *Waiting Café*. With new service concepts, several new stakeholders like style supporters, style coordinators and concierge had been created with specific new service roles as shown in Figure 2.

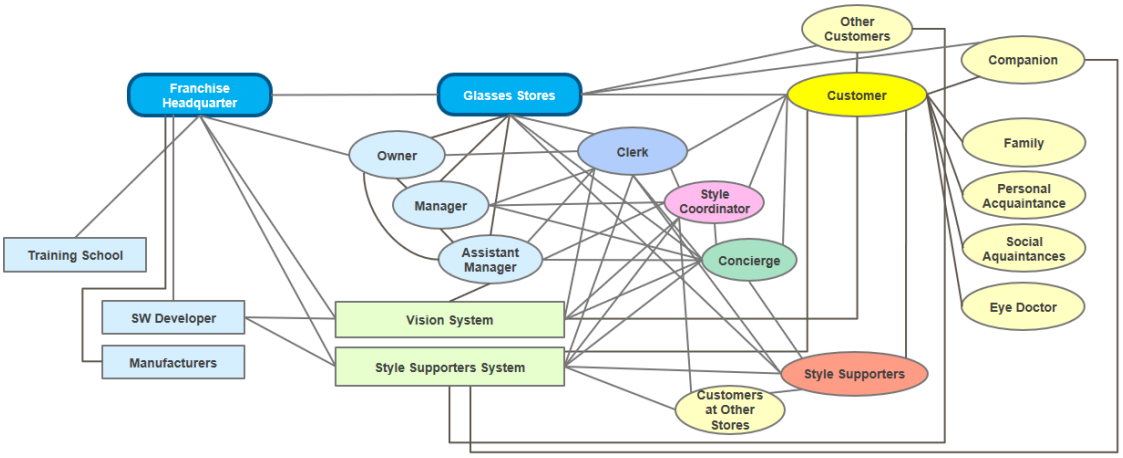



*Figure 2. Stakeholder map of the resulting glasses purchase product-service system*

The *Style Supporter* service was to provide some support in purchase decision making in real-time using the intranet and other customers who would be waiting for their glasses to be prepared in the store and in other stores of the franchise. The headquarters of the franchise demanded the clerks in the stores would not make any premature suggestions in choosing glasses frames as not all the clerks would be qualified to give such suggestions. But customers needed some suggestions in making their selection of frames. Particularly customers wanted light suggestions which they could take or reject. On the other hand, there were a lot of customers waiting in the café after going through their own decision makings in selecting frames. The Style Supporter service was to get votes from the waiting customers through intranet if a customer would like to seek some opinion on her choices of several frames using photos as shown in Figure 3, where a man in café participated in the vote as a style supporter and the buying customer received vote results obtained from eight style supports for her trials with 6 frames.

Some experienced clerks could provide proactive style guide services as shown in Figure 4. But the number of such qualified clerks were very small and not all stores could have such clerks. The *Style Coordinator* service was to provide such proactive style guides to customers by qualified clerks in other stores through intranet.

While the project team of two master students and the advisor collectively designed these 6 service concepts and conducted extensive prototyping, two master students conducted specific individual tasks respectively so that these design tasks were used in evaluating their individual contribution and level of mastery for the degree.

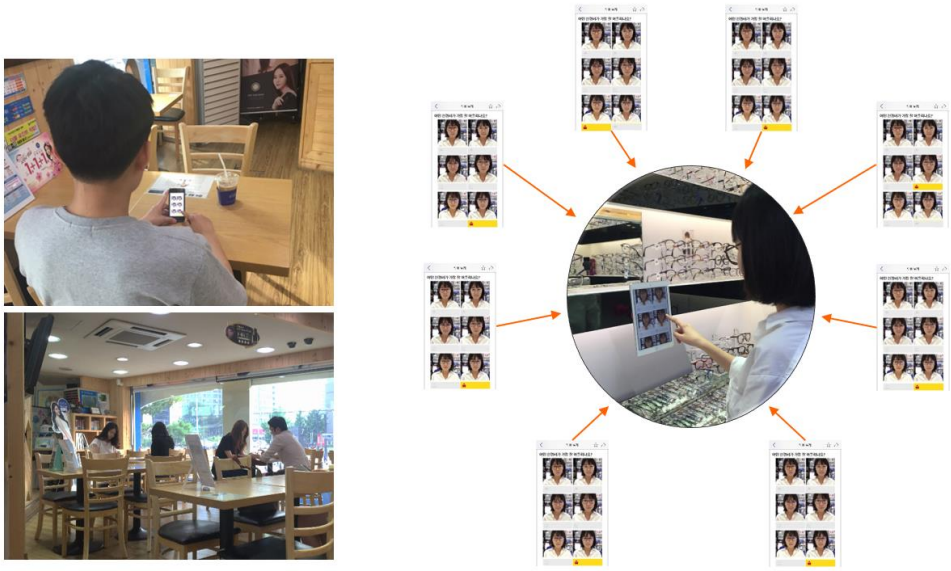


*Figure 3. In-store prototyping for the style supporter service*

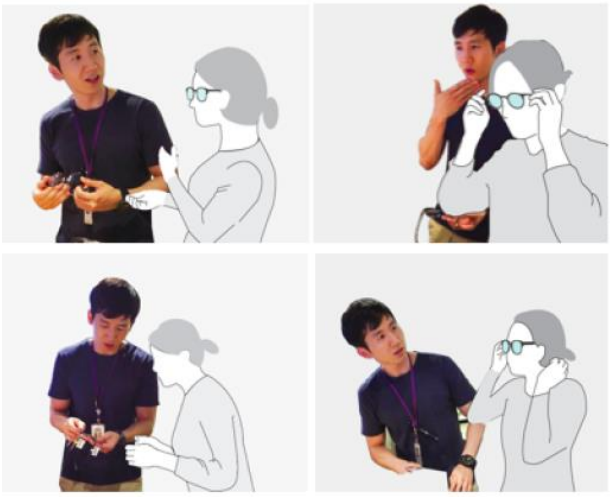


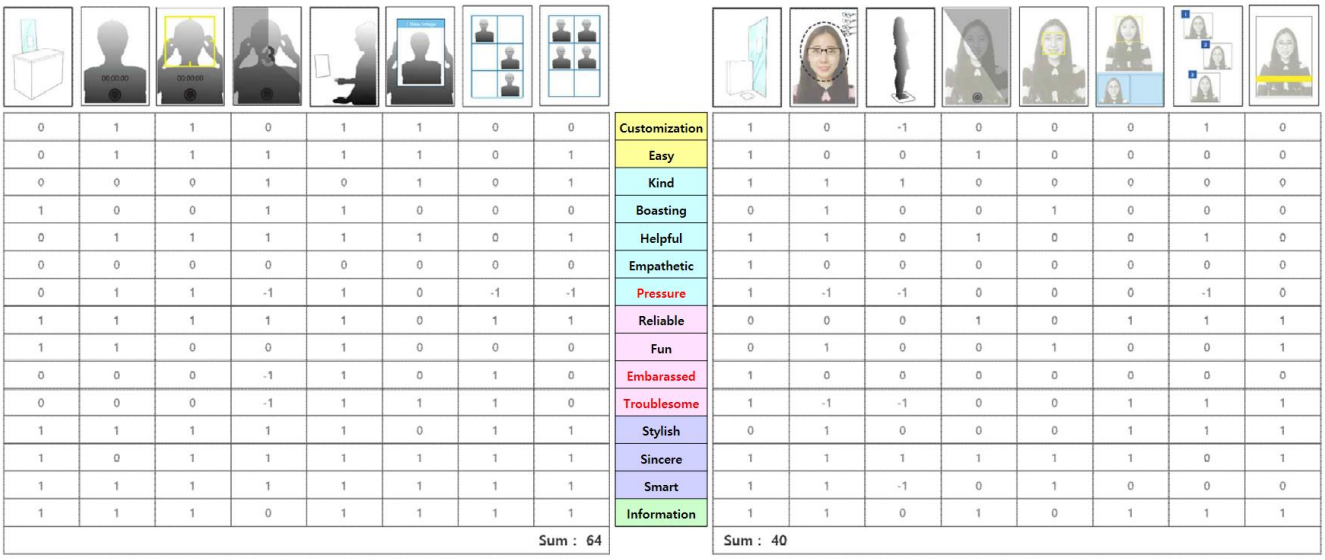
*Figure 4. Style coordinator service*

### 3.2 Individual Component of Student A

For the Style Supporters service, new product-element needed to be designed so that the activity of taking photos to be used for voting can be supported. Various user activities and functions of such a product-element were investigated to design affordance features to smoothly induce user activities in photo taking while trying several glasses frames. Specific design for affordance method [7] had been used in the design of the new product-element. This task was conducted by Student A individually. The evaluation of two designs of product-element for taking photos (Glasses Trial Station) was made with specific value themes as evaluating criteria using a morphological chart approach as shown in Figure 5.

### 3.3 Individual Component of Student B

Student B individually developed intensive instructions to train style coordinators including developing video guides in interacting with customers as shown in Figure 6.



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| 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | Kind | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | Boasting | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | Helpful | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Empathetic | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 1 | -1 | 1 | 0 | -1 | -1 | Pressure | 1 | -1 | -1 | 0 | 0 | 0 | -1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | Reliable | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 |
| 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | Fun | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
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| 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | Stylish | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
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*Figure 5. P-Element design comparison for glasses trial station of the style supporter service*

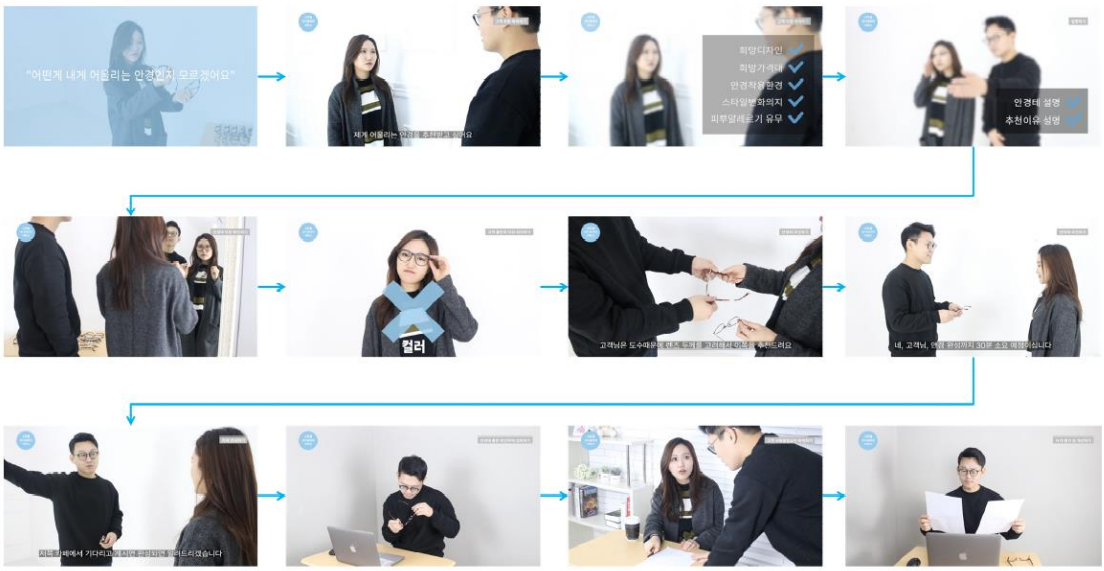


*Figure 6. Guide video for style coordinator training*

## 4 DISCUSSIONS AND CONCLUSION

In this paper, how team-based design projects for thesis projects of masters degree can be conducted has been discussed so that the required breadth and depth of industry-sponsored project culminating the master-level project-based design education are fulfilled and the thesis requirement at the university level are also satisfied. The comprehensive report of the project is also important to report the overall and detailed description of the project with proper recognition of all the people involved in the final project of the team-based project-based education. Some overlap of contents in the comprehensive report and student theses must be tolerated, rather than criticized, as these represent the fact and the reality in this kind of design education.

Please note that some master-degree programmes do not require a thesis. A typical example is MS degree programme of Stanford University where a most successful design education at master-level with industry-sponsored, team-based design projects have been conducted [1]. The student teams would prepare comprehensive design project report to be provided to sponsoring industry partners. For some master-degree programmes requiring a thesis, students can select individual design projects or team-based design projects. In the case of team-based design projects, the student team can prepare a collective report to satisfy thesis requirement. In programmes where individual thesis is required, as

shown in the illustrative project of this paper, theses with some common contents describing overall project design and with some individual design tasks would be desirable as long as these include specific statement that the design project was conducted by a team. What is more important is that design education ensures industry-relevance with enough breadth and depth for masters degree.

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