

# Design Subject Setting and Design Competition Practice

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Many studies have pointed out the importance of design resources for innovation. For example, design competitions are held by companies to introduce external design resources to accelerate innovation and development. However, are competition subjects setting and governance aligned with organizers' expectations regarding innovation? By studying the Thermaltake Creative Design Competition for eight years and combining literature reviews, empirical research, and expert interviews, the authors of this paper explore how to set subjects and discipline to make competitions as innovative method that companies need. The findings indicate that: 1) the subjects (i.e. themes) of design competitions should be based on the company's expert product categories, which can be "narrowly focused" or "broad"; 2) two stages of assessment will help the company to scan and rate suitable design proposals, and the set-up of juries consisting of internal experts with industry background in the preliminary assessment stage and external experts in the final assessment stage is important to increase the feasibility and keep the diversity of design proposals; 3) communication and collaboration between the company and participants are beneficial for both parties. The technical seminars held by organizers will promote in-depth communication and improve proposals to be more in line with expectations. This study puts forward some practical and theoretical findings in the field of innovation management, which can be a reference for enterprises using design competitions as an innovation design method.

**Keywords:** *Design competition; Innovation method; Design resources; Design subject*

## 1 Introduction

Enterprises are facing the rapid development of technology and shorter product life. As organizations struggle with a persistent mismatch between the innovation resources at their disposal and the demands of a rapidly shifting environment, they increasingly turn to external resources, such as technology brokers, project promoters, and innovation intermediaries, as a way of complementing their internal innovation process (Neyer, Bullinger, & Möslein, 2009).

Chesbrough (2003) proposed the concept of Open Innovation in 2003. He suggested that companies should not be limited to internal R&D resources, but should cooperate with external partners to innovate. Design competitions fit well into this trend, which is one reason they are being used more frequently today. According to the design competitions listed by the Ming Chuan University, there were 25 creative product design competitions sponsored by companies in Taiwan in 2015 alone (Ming Chuan University, 2015). There are many practical cases of companies holding creative design competitions as a platform for

innovation. The growing popularity of design competitions suggests that they are a firmly established innovation strategy (Lampel, Jha, & Bhalla, 2012).

Although the use of design competitions to access external innovation resources is not new, the increased power that comes with combining this approach with the rich innovation ecology has just emerged over the past several decades. An additional change in current design competitions is the emphasis on collaboration (Love & Hubbard, 2007).

There are various purposes for companies to organize design competitions, as well as different structures and governance practices. Some companies have held design competitions for many years, but some have stopped due to limited results. The serialised competitions delivered by dedicated juries give sponsors greater opportunity to learn and refine the architecture of such competitions, while also improving the alignment of participants' motives with the objectives and interests of the design competition, as well as the organizing and sponsoring institutions more generally (Lampel, Jha, & Bhalla, 2012).

This paper is based on design competition theories and the study of the Creative Design Competition sponsored by the Thermaltake Technology Co. Ltd (hereinafter called Tt Competition and Tt Company), a serialised competition which has been held for eight years. It is a good case to study to explore how to use a design competition as a platform to achieve creative results. Through an analysis of their results and experiences in holding design competitions, we can determine effective applications of competition architecture and governance methods and expand the current research of design competition management to the event evaluation phase.

The Tt Competition explored in this paper has been held for eight years and refined over time. The authors has been involved in all these events, beginning as an organizer in the first two years and then shifting to collaborating institutions, and has been studying it for six years. Therefore, the author is familiar with every phase of the competition and recognises it from different perspectives, from the sponsors to the jury to the participants.

### **1.1 Design Competition: Purpose and Components**

As an innovation method, a design competition is a type of "search" strategy (Banerjee & Loukaitou, 1990). Earlier in 1987, Alexander, Whittling and Casper (1987) showed that there is a clear difference in the organisation and use of "concept" versus "implementation" competitions. With demands on product innovation concepts, some companies use design competitions to convey their innovation values and policies, such as the "Great Design Competition" held by GIGABYTE since 2003, while others explore potential new product ideas in design competitions and transfer winning entries into commercial products, such as Japan's KOKUYO Design Award and Ilan Chair Design Award.

Nasar (1999) described design competitions as open competition, limited competition, invited competition and two-stage competition. Through competitions, the organized institution could identify potential designers or feasible design proposals. Paul Spreiregen (1979) listed the benefits of holding design competitions including: discovering unrecognized talent, producing new solutions and bringing attention to or publicizing architecture.

Design assessment methods can generally be divided into sequential assessment methods and quantitative assessment methods (Baxter, 1995/1998). Chen (2004) has divided design conception evaluation decisions into two stages, namely conception scanning and conception rating. Scanning is a quick and concise assessment of some feasible

applications. Rating is a more careful analysis of these shortlisted ideas to choose the most successful design solution. Banerjee (1990) has mentioned that the composition of the jury of a design competition should be diverse rather than uniform. Each jury member has his own perspective on design criticism. Therefore, the design juries should consist of multidisciplinary and unpredictable perspectives, not one “line of thought”.

## **1.2 Design Competition: Subjects and Goals**

Füller, Hutter, and Faullant (2011) introduced the “virtual design competition” as a new means of opening up the innovation process and enriching companies, and Lampel, Jha, and Bhalla (2012) have explored the competition phenomenon according to the development of open innovation, showing the relationship between innovation agendas and design competitions. The agendas rooted in immediate concerns and future aspirations shape the competitions’ goals and process. They believe that design competitions with narrowly-focused innovation agendas provide innovative solutions to business problems, and they are often applied by companies which lack resources and have an inflexible administration, or which consider the projects’ cost inside and outsourced.

At the opposite end of the spectrum, design competitions reflecting broad innovation agendas accelerate or even reshape market development. Design competitions with broad goals are more likely to motivate technical innovations and overcome the bottleneck of innovation. Innovation agendas in this case are often influenced by strong conviction that certain markets that ought to exist do not, or if they do exist they should evolve in a different direction (Lampel, Jha, & Bhalla, 2012).

## **1.3 About Thermaltake Company and its Product Innovation**

The subject of this case study is Thermaltake (Tt) and its creative design competition. Tt Company was established in 1999 and became a listed company in 2007. Since its establishment, the company strategy has been to build its own brand and keep innovating products. It has the capability and experience for innovation research and development. The company has a Creative Design Centre, Engineering Department, Marketing Department, and Business Department. Its Creative Design Centre is in charge of industry design. In addition to using its internal design department, the company also takes an active part in cooperating with external design resources on new product design concepts and new product development projects.

Tt Company’s product lines include computer chassis, CPU coolers, power supplies, and other computer accessories. Due to the wide range of products, and in order to maintain its market competitiveness, the company needs continuous innovative product development, which needs to be nourished with a steady stream of innovative product ideas and concepts. Aside from the new product proposals from internal design departments, the company began to cooperate with BMW Designworks USA in 2009 to develop the new computer chassis, Level 10 (Figure 1). Once the product launched, it received many international design awards, such as IDEA and Red Dot. Based on this good experience of collaboration with external design resources, the company started to continuously seek new product concepts from external design resources to accelerate its innovation development and show its positive image for innovation.



Figure 1: Computer Chassis Level 10. Source: Thermaltake Technology.

## 2 Research Methods

The research methods for this study are divided into two phases. The first phase is the data collection and data analysis of the Tt Competition. The second phase is the expert interviews with the relevant personnel involved in the Tt Competition. Furthermore, an analysis of the results and suggestions are presented in this case study.

### 2.1 Tt Competitions Data Collection

The data collection section includes the background of Thermaltake Technology Company and materials from the first to the 8th Tt Competition, covering the competition introduction, objectives, theme settings, entry assessment, and competition results. The collected data were then analysed to understand the company business strategy and how the Tt Competition is executed, as well as the results of the competition. Data collection items and content are presented in Table 1.

Table 1 Data Collection Items and Content.

Item	Competition related	Company related
Competition objectives	1.Competition introduction 2.Competition governance methods explanation	1.Business strategy 2.Company creative strategy
Subject setting	1.Competition subject setting process 2.Competition subjects	1.Company product lines 2.Company product development road map
Entry assessment	1.Competition judging process 2.Jury setup 3.Judging criteria 4.Quantity of competition entries	N/A
Competition outcomes	1.Creative concept application 2.Design proposal commercialisation	Feasibility evaluation process

### 2.2 Expert Interviews and Discussion

The second phase of the study was interviews with the sponsor and organisers. The interviews were conducted as “semi-structured interviews”. The goal of the interviews was to

collect the organisers' feedback and evaluation of the competition. The interviewees were required to have participated in two or more creative design competitions. The interview time set for each interviewee was 30-50 minutes. Interviewee details are listed in Table 2.

*Table 2 : Interviewees and their Positions*

Department	Position
Board of Directors	CEO
Project Team	Project Director
Creative Design Centre	Design Manager
Creative Design Centre	Senior Designer
Business Department	Marketing Manager
Business Department	Product Manager

The expert interviews were accompanied by a questionnaire, including close-ended questions and open-ended questions to state personal opinions. The content of the questionnaire is listed in Table 3.

*Table 3 : Questionnaire of Expert Interviews*

Questionnaire of expert interviews		
<b>A. Performance of design competition</b>		
A-1	What are the objectives of the competition?	Public benefit Brand promotion User comprehension New concepts Other
A-2	Have the objectives been achieved?	Public benefit Brand promotion User comprehension New concepts Other
A-3	What is your advice on how to improve the performance?	
<b>B. Competition subject setting</b>		
B-1	How is the competition subject set?	Demand on new product development Customer demands Investment cost Technical advantages in R&D Other
B-2	Does the competition result match the subject setting?	Demand on new product development Customer demands Investment cost Technical advantages in R&D Other
B-3	Achievement of broad competition subject	Innovative design proposal Reduce innovation costs New technology exploration New market direction Other
B-4	Achieving the goal of narrowly-focused competition subject	Innovative design proposal Reduce innovation costs New technology exploration New market direction Other
B-5	What is your advice on how to set the competition subjects?	
<b>C. Competition assessment</b>		
C-1	The appropriateness of the competition judging process.	
C-2	The appropriateness of the jury setup.	
C-3	The judging criteria.	Design concept Product market Feasibility Other
C-4	Do the winners meet the expectations?	
C-5	What is your suggestion for the assessment?	
<b>D. Post activities of the design competition</b>		
D-1	How to deal with winning works	New product development New product development Discover talented designer Other
D-2	Adjustment of competition principals based on competition results	Design subjects Assessment jury Judging criteria Competition governance Other
D-3	What is your suggestion for Post activities after the competition?	

The following discussion is based on understanding the collected data and comparing the feedback and suggestions from the expert interviews. Through analysing the relationships between planning and the results of the Tt competition, including theme setting, entry assessment, and how to deal with the competition outcomes, it is possible to learn lessons from Tt Company's experience in holding a design competition.

### 3 Tt Competition's Data Analysis

#### 3.1 Thermaltake Creative Design Competition Introduction

In 2012, Tt Company held the first invitational design competition, which was carried out in two universities. It was titled "The Wishful World of Computer Gamers, Creative Design Competition". The initial purpose to hold the competition was the public benefit, while also enhancing the company's brand image. The company also hoped to increase communication between industry and academia. As a public benefit of the design competition, the company provided design students with a platform to demonstrate their creativity and help them to understand industry practice through these competition activities. At the same time, with the introduction of the company and competition, the Tt Company brand and product visibility was improved.

Additionally, from the design competition entries, the company discovered that some potentially creative external proposals could be developed through the internal R&D capability and transferred to innovative products. The competition began to be used as an innovation platform, and in eight years, the competition has been held in eight universities. The data collected are outlined below in Table 4.

Table 4 : Data Collection from the Tt Competition

Session		1st		2nd		3rd		4th	
Subject		Computer peripherals		Computer peripherals		Computer peripherals		Gaming mice	
Assessment Processing		Preliminary Assessment	Final Assessment	Preliminary Assessment	Final Assessment	Preliminary Assessment	Final Assessment	Preliminary Assessment	Final Assessment
Jury		Internal Professionals	External Experts	Internal Professionals	External Experts	Internal Professionals	External Experts	Internal Professionals	External Experts
Assessment Criteria	Design Concept	40%	40%	40%	40%	40%	40%	40%	40%
	Styling Design	40%	30%	40%	30%	40%	30%	40%	30%
	Feasibility	20%	30%	20%	30%	20%	30%	20%	30%
Outcomes		One design proposal has been commercialised		One design proposal has been commercialised		No design proposal has been applied		3 design proposals are under feasibility evaluation	
Session		5th		6th		7th		8th	
Subject		Gaming mice		Gaming gear, IOT and AI concepts		Gaming chassis		Gaming chassis	
Assessment Processing		Preliminary Assessment	Final Assessment	Preliminary Assessment	Final Assessment	Preliminary Assessment	Final Assessment	Preliminary Assessment	Final Assessment
Jury		Internal Professionals	External Experts	Internal Professionals	External Experts	Internal Professionals	External Experts	Internal Professionals	External Experts
Assessment Criteria	Design Concept	40%	35%	40%	35%	30%	30%	40%	40%
	Styling Design	40%	30%	40%	30%	40%	40%	40%	40%
	Feasibility	20%	35%	20%	35%	30%	30%	20%	20%
Outcomes		No design proposal has been applied		No design proposal has been applied		No design proposal has been applied		Design competition in progress	

Source: Thermaltake Technology.

### **3.2 The Theme of the Tt Competition**

The theme of the Tt Competition has been adjusted annually. From the first year to the third year, the themes were defined as the best equipment for game players, and the design scope included computer chassis, power supply, CPU cooler, mobile device accessories, e-sports keyboard, gaming mice, and gaming headsets.

In the fourth and fifth years, for business strategies and requirements in the gaming market, the subject was defined as a single product category, a gaming mouse. In the sixth year, the subject was related to the application of innovative products and IOT (Internet of Things), which was expected to explore new inspirations for IOT concept application from the competition entries. With the 7th competition and the 8th in progress, the subjects are all set as gaming chassis design (computer case), which are decided by product market demand.

### **3.3 Tt Competition Assessment**

The Tt Competition judging process includes two stages: preliminary assessment and final assessment. The jury set-up for the preliminary assessment comes from the company's internal professionals, including the design manager, senior product designers, product manager, and R&D engineers, who are committed according to their professional backgrounds and positions within the company.

From the 100 to 200 submissions received, 15 to 16 entries will be shortlisted for final judging. Every single shortlisted entry will be presented with prototypes or models for final assessment to decide if it will place in the competition. After the preliminary assessment, Tt Company arranges for all the shortlisted winners to visit its headquarters and participate in the technical seminars, in which Tt senior designers and engineers communicate with the participants and provide suggestions on improving their entries.

In the final assessment phase, the judging objects are the prototypes of the entries. The jury set-up for the final assessment combines internal and external experts, including the CEO, design manager, and senior designers of Tt Company, as well as design professors from the Industrial Design Departments of universities and external product designers. Before the final judging, the organiser explains the value setting of the competition and the judging criteria to the jury. The final judging is conducted through participants' presentations and work demonstrations. The final statistical average scores of the jury decide the winner list.

The assessment criteria are adjusted according to the organiser's expectations regarding the competition result. From the 4th competition to the present 8th competition, with the percentage of items set in assessment criteria, the concept design and the styling design show an upward trend, while the feasibility is down from 35% to 20%. Figure 2 shows the trend of assessment criteria in Tt design competitions.



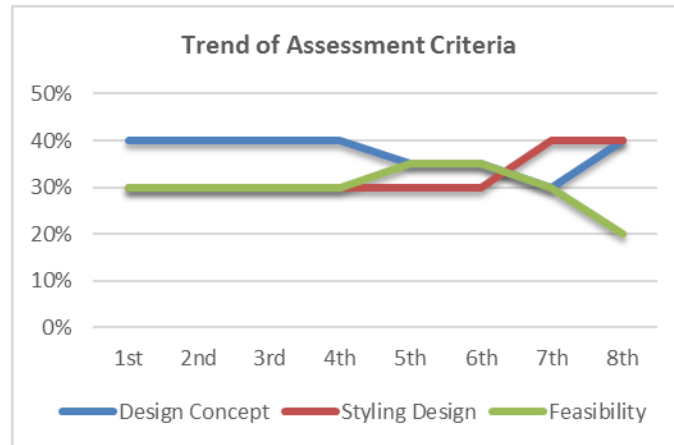


Figure 2: Trend of Assessment Criteria. Source: Thermaltake Technology.

### 3.4 The Winners of the Competition

Since the first Tt Competition, the company has launched two products which were developed from the concepts of the winners (Figure 3), and three entries are currently under market evaluation. If the entry is selected for commercialization, its entrant will be invited as an intern to participate in the whole process of the design development and the work commercialization. In order to respect the rights of authors, works selected to be commoditized will be awarded a prize.

Aside from commercialisation, the winning concepts and ideas can be transferred into innovation value in other ways. For example, the company established the IOT (Internet of Things) R&D Department in 2015, inspired by the winner's idea from the third competition, and it also motivated the sixth Tt Competition subject, which was the application of innovative products and IOT.



Figure 3: Satellite Portable Laptop Cooler. Source: Thermaltake Technology.

## 4 Interview Data Analysis

The purpose of the expert interviews was to understand the execution goals, execution methods, and implementation effectiveness of the design competition and to obtain expert advice on the design competition. Through the analysis on the interview content, the motivations to hold the Tt Competition are revealed, and the organisers' expectations and evaluation of the competition results are clearer and summarized.

### 4.1 The Competition Objectives

Through the analysis of the interview content, the initial motivation to hold the Tt Competition is to provide an innovative design platform to allow design students to participate in design practices, increase their understanding of industries, and to accumulate design experience with target-setting missions. In the meantime, the competition promotes the enterprise's

innovation value and enhances brand image through competition publicity, activities, and contestant participation.

Another public benefit of the design competition for design students is that the contestants themselves are the users of computer peripheral products and have rich user experience as e-sport players. They can use their creativity and enthusiasm and combine their own user experience in the design competition to create new product concepts or product improvement proposals, which will cultivate and nurture the product innovations in the company.

#### **4.2 Setting the Competition Theme**

In regard to the theme of the competition, the expert interview data suggest that, according to the sponsors, it should be the product category in which the company is leading and the themes should meet market demands. The experts believe that, with narrowly focused themes, the quality of design proposals submitted by the contestants is more in line with expectations. Innovation agenda in this case, participants have a defined theme direction, and their design concepts are led in deep in the designated field. Usually, it can propose new creative proposals for products, and new applications of technologies. With narrowly-focused subjects, it is easy to compare and assess the entries' innovativeness, and jury members' perspectives are more uniform. From a marketing perspective, the data suggest that by defining the framework of technical requirements and specifications of the themes, the winning concepts are more likely to be commercialised.

On the other hand, when innovation agendas have broader goals, although the proposals are diverse, due to the participants' limited understanding of products and industries, the entries lack design rationality.

From this case, it was found that with a broader theme setting, the design proposal suitable for commercialization. However, without a market and user demand survey, the actual market sales performance will not be as expected. However, a broader theme setting is to help explore new directions that differ from the existing market, and to perceive opportunities to develop a new product market.

#### **4.3 The Competition Assessment**

From the internal product development perspective, the design proposals in conformity with the themes and with a higher degree of completeness will be selected in the preliminary assessment stage, and in the final assessment stage, the ratio of rationality and technical feasibility will increase in the assessment on the design proposals.

As the creative design centre manager explained, since the 8th competition, the percentage of the concept design has increased but the feasibility has decreased, because the commercialization investment in the competition works may not be in line with the return of mass production. Therefore, if there is no definite marked demand, it is difficult to commercialize the product. If competitions focus on the innovative design concept of products, there is an opportunity to explore the possibility of application of new technology or the development of the emerging product market.

The preliminary assessment stage aims to select the design proposals not only with an innovative concept, but also considering user needs, marketability, and concept feasibility. Therefore, the jury in this stage needs a professional industry background. External experts

are invited as jury members in the final assessment stage in order to provide different perspectives to assess the entries, and to gain more design suggestions from outside.

#### **4.4 Design Competition Achievements**

The product manager said that, although there are many innovative entries in the competitions, they lack alignment with the consumer market. Most of them are just new concepts or ideas.

From the sponsor's perspective, if the winner's design is selected for feasibility evaluation, the market needs must be considered. The marketing evaluation, technology confirmation, and cost analysis all need to be carried out before the decision on the proposal's commercialisation.

From the product development perspective, the investment in mass production, such as tooling cost, is an important condition for concept commercialisation. The Tt Company CEO suggested that participants should make a preliminary analysis of their entries' market and user behaviours, and the entries submitted should comply with the company's existing product lines that have a precise marketing positioning in order to lower market risk (Lin, 2018). The marketing manager described the phenomenon of the commercialised winners gaining attention in the market due to the winners' creative concepts, but without good sales return because the products cannot meet the functional requirements.

## **5 Discussion**

### **5.1 Competition Subject Setting and Its Effect**

In the first three sessions of the Tt Competition, the themes were broader for the original goal setting of the competition, which were public benefit and brand image promotion. Two winning designs were selected to be commercialised and developed into new products to be launched on the market, resulting in attention in the market, but not a good sales return. The Gold Award in the third competition was a concept in IOT (Internet of Things), which motivated Tt Company to establish a new department in 2015, the IOT R&D Department, focusing on new IOT product research and development. Although the winning innovators under the broader themes could not be successfully developed into new products, they may be applied to a new product line or market. This is in line with the theory demonstrated by Lampel, Jha, and Bhalla (2012), that is, broader innovation agendas can reshape the market. According to the experience from Tt competitions, it seems that a broader design theme can explore new product design concepts.

While the competition was developing, it was also developed as an open innovation design resource. This change has shaped the competition subjects from a broader new concept design to narrowly-focused product design based on the company's innovative development strategies. With the subjects becoming more narrowly focused since the fourth competition, the participants are poised for in-depth exploration of user experience and behaviours. For example, there were three new concepts from the users' point of view in the fourth competition, and one of them was a woman's perspective, which enlightened the company to evaluate the market demands for this customer group. Such creativity is more likely to be feasible based on the company's existing product lines and is more likely to accelerate the company's new product and technology development. The analysis of the design subjects is outlined in Table 5 below.

Table 5 : The analysis of design subjects from the Tt Competition.

Type of subject	Process	Consequence
Narrowly-focused subject	In line with the company's innovation objectives	New design proposal
	In deep of the design concept	Accelerate technology
Broader subject	Diverse proposals	New design proposal
	Explore different market	Potential market direction

## 5.2 Competition Governance and Its Effects

The Tt Competition is a two-staged, multiple phase design competition, and the jury set up in these two stages is different. The preliminary assessment jury is comprised of internal experts from different departments, which filter the proposals using their professional background in products and industries, but from different perspectives. This stage increases the feasibility of the winning entries as creative design concepts.

In the final assessment stage, the jury includes external experts, such as professors from universities, senior designers, or research institutions. These members not only provide diverse external views on creative design, but also make sure the final winners will not be determined only by the company's new product development values.

According to the perspectives of the open innovation paradigm for managing industrial R&D, (Chesbrough, 2003) as ideas come from inside and outside, the project's value should not be bound inside either. The same is true in the design competition. It should have mixed-good internal and external benefits. If the beneficiaries only include internal members of the company, the unbalanced sharing of resources in competitions will lead to negative external perceptions. Other than copyright ownership and royalties, the chance for the entry itself to be developed is also very important. With mixed-good benefits, the promotion of innovation can be sustained, and it can increase the willingness of external resources to participate.

Differing from a general design competition, the Tt Competition provides technical seminars after preliminary assessment for top participants to get technical support and suggestions on the entries' feasibility and improvement from the company's designers and engineers. Also, the jury provides feedback on the participants' proposals in the final assessment. As a collaboration-orientated competition, the participants benefit from "education" and professional development. On the other hand, these technical seminars have another important meaning. Normally the design proposal development phase starts after the winners are revealed, but for the Tt Competition case, the development phase begins from the technical seminars, which is also beneficial to the company in terms of design proposal feasibility.

## 6 Conclusion

In summary, the design competition is an effective innovation method for companies if certain guidelines and subjects are met. Below are the highlights of the findings from this case study.

1. The subject of design competitions needs to be set according to the competition objectives of the organizer. The theme setting can be described as two types, a theme that is narrowly focused on a single product category, or a broader theme encompassing a range of product categories. The narrowly focused theme addresses new design proposals, solutions and new technologies that companies need. Under the broader subjects, besides the opportunity to find new design proposals, many of the divergent innovative ideas can provide a different or untapped product market direction from the existing products.
2. Two assessment stages and the jury set-up with internal and external experts ensure that the innovation resources scanned conform to the company's strategies and that the winners will not simply be determined by the company's values.
3. Technical seminars after the first stage provide participants with technical support, which reflects a collaboration orientation and mixed-goods benefits for public and private entities. Through the design competition, Tt Company benefits from increased brand awareness and external design resources, while the design students benefit from design practice and "education".

In line with a company's strategies and with complete planning and execution, serialized design competitions can be an effective innovation method for enterprises to search for new market directions, new concepts and solutions. In general, the Tt Creative Design Competition is a good example of open innovation reflecting its principle of integrating internal and external resources and mutual benefits, ensuring that the competition is ongoing.

From this study, it was also found that there are many points worthy of in-depth analysis in design competitions used as an innovation method. As Don Norman says, "We should have contests, but we should do them properly" (Norman, 2010).

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