Full Paper

ASSISTING DESIGN IDEAS: PTOOLKIT, A PILOT STUDY

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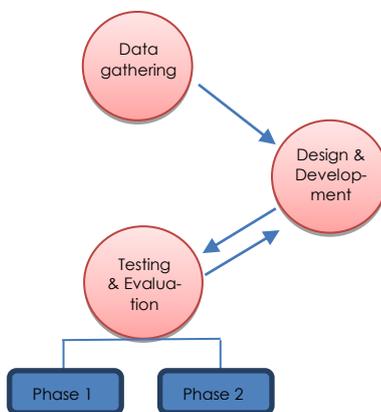
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Graphical abstract

Abstract

Design for persuasion requires the designer to understand theories, ideas and strategies of persuasion that could change, modify or adapt people's behaviour. This situation requires the designer to access appropriate persuasion knowledge by making the design suit to the persuasion intention. Therefore, a tool called as PToolkit was introduced to assist designer during the design process. Then, a pilot evaluation was conducted to evaluate PToolkit. This is to ensure that the actual evaluation phase would run smoothly, as well as having an initial understanding of the ability of PToolkit in influencing the design ideas. As a result, few evaluation procedures were amended and ways of data interpretation were suggested.

Keywords: Design ideas, toolkit, persuasive design, evaluating design, design knowledge transfer

Abstrak

Rekabentuk pembujukan memerlukan perekabentuk untuk memahami teori, idea dan strategi pembujukan yang boleh merubah, mengubah suai atau menyesuaikan tingkah laku manusia. Keadaan ini memerlukan pereka untuk mencapai pengetahuan pembujukan yang tertentu dengan membuat rekabentuk sesuai dengan niat pujukan tersebut. Oleh itu, satu aplikasi yang dikenali sebagai PToolkit telah diperkenalkan untuk membantu perekabentuk semasa proses merekabentuk. Kemudian, penilaian awal telah dijalankan untuk menilai aplikasi PToolkit. Ini adalah untuk memastikan bahawa fasa penilaian sebenar akan berjalan dengan lancar, selain mendapatkan pemahaman awal keupayaan aplikasi PToolkit dalam mempengaruhi idea-idea rekabentuk. Hasilnya, beberapa prosedur penilaian telah dipinda dan cara tafsiran data telah dicadangkan.

Kata kunci: Idea rekabentuk, alatan rekabentuk, reka bentuk pembujukan, penilaian reka bentuk, pemindahan pengetahuan rekabentuk

1.0 INTRODUCTION

There are broad definitions of design, depending on which perspective of design is viewed. Design can be a general concept or policy which may be in terms of a plan, a road map, or a strategic approach to achieve something. The design also can be viewed as a sequence of activities that aims to construct tangible objects, intangible objects, and/or systems. These two views bring the different design perspectives whereby the former focuses on the description of design, whereas the latter focuses more on the production aspects (1). The second view of design is also referred to as object design oriented, which is the mainstreams of design until now (2) (3). The products from design works can be varies depending on the different fields where the design activities take place, such as engineering drawings, business plans, tangible products, or software applications.

Before the era of industrialization, design works were mainly focused on ways to create something to solve a specific problem. This would include the creation of various objects and tools. For example, farmers were creating their own tools to make their farming activities easier. During this time around, design work was basically carried out by individuals and produced in a small volumes. When the industrialization took place, one major difference was perceived in which design work was separated into the planning activity and making activity as a result of mass production (4) (1) (5). Therefore, design work that previously was dedicated to solving a specific problem now changed into commercialised production for other people that were probably facing similar problems.

The commercialization factors has made the functions of the artifacts (which were previously important for specific problems) insufficient. Other design aspects such as materials, other desirable aspects (6) surface, look and aesthetical aspects of the products (7) are becoming important. The design work also needs to produce a unique design concept to solve the problem and at the same time needs to pay intention on commercialization aspects thus making creativity in a design work becomes an integral part (8). Creativity does not necessarily mean a totally new idea. Sometimes it is an improvement from the current situation. Cross (9) have defined creativity as the element of 'surprise' that keeps designers from being routine. Therefore, design and creative idea are now being very important in the design field to ensure designer are sustainable in the industry.

1.1 Design Used the Specialized Knowledge

Design is an interdisciplinary act thus it is difficult to claim that it solidly belongs to a specific discipline. Moreover, recently more domains have listed design as part of their knowledge. Over time the design domain seems more mature, offering theories of and about design (10). Scholars are starting to define design in much broader terms, interdisciplinary and established its ground theory for supporting related researches and practices (11) (12) which suggest that design has begun to stand out as an independent discipline that correlates with other domains. There are also various professional designing communities such as the AIGA and DBA (Design Business Association), that have established their design profession to be recognized and become the specialist for any problems related to their field (13). A survey in 2003 has found that more than twenty universities worldwide, offering doctoral programs in design, with more than 350 doctoral students enrolled in these programs (14). It seems that design which was previously rooted in various academic disciplines is now properly placing this concept up and offers services related to the appropriate domains (15). Designs are now beginning to serve other domains, for example, a product designer will focus on design-specific products for the public, whereas an interaction designer focuses his or her work in computing applications, and an automotive designer designs cars and machines for the automotive industry. Recently, debates about design thinking has taken design in the broader sense of defining the problem and its solving mechanism (16) would become a catalyst for making the move of design as a discipline by itself, smoother and applicable to various settings.

Recently, designers have started moving into a specialized area in which their work is independent of the different professional domains of the practice of design. This new establishment that creates a specialisation of design work also creates a situation whereby designers are required to have specific design knowledge (core design knowledge), and at the same time requires specialised knowledge that might be applicable and useful for specific design situations. For example, a web designer would require specific knowledge in website development, as it would be advantageous for the designer to have accessibility knowledge that would be a useful element to take into account in designing the website. The former knowledge would be his core area whereas the later would enhance his work although this specialised knowledge (accessibility) might only be required for specific circumstances. The core knowledge of design would not be a question at all, however the specialised knowledge that might be not necessary used every time during the design work, but is required in distinctive designs, should not be ignored. Therefore, in doing design, the design knowledge is necessary but designer must also aware of the availability of other knowledge that would help them design better and ultimately reach the design objective.

One of specific examples of specialised design knowledge is persuasive design knowledge. In persuasive design knowledge, the designer can use theoretical knowledge of the persuasion domain to design the interactive application in persuading people to change. Most of this specialized knowledge does not need to retain in the designer knowledge repository (as the know-how design knowledge), and can be forgotten after the design activities. Later on whenever requires, this specialized design knowledge can be referred again if necessary.

In this paper, we want to share our experience in creating a tool to assist designers in the design persuasive application. Until recently, few attempts have been made to guide designers to design with persuasion in mind, albeit with some notable exceptions (17) (18). Whilst this is a good start, the field falls significantly short of, for example, efforts to transfer highly specialised knowledge for designers who require quick and appropriate information that suit their working practices.

2.0 PTOOLKIT

Persuasion Knowledge Toolkit (PToolkit) is an attempt to transfer the persuasion knowledge to designer and assist them in the persuasive design work. In the first stage, we were investigating this knowledge to gain insight of its usage in various domains. Although, persuasion is claimed has guiding the development of various products (to persuade people in various settings), the availability and accessible resources related to this knowledge is limited and far from satisfactory. Then on second stage, we were working on ways in transferring the complex persuasion knowledge investigated earlier, to the designer community. PToolkit was created as an interactive artifact that ideally should be used by designers during the design ideation. It supposedly inspires designer in their design idea and provide them with appropriate persuasion knowledge. In this section, we will explain our journey to make PToolkit available for the designers.

2.1 Requirement Gathering

Understanding designer and design activity are very crucial in this phase. Designers are mostly live in active mode (practical) and design process usually deals with ill-structured design problems. Therefore, we decided to employ two qualitative data gathering methods to address the situations previously mentioned. We were interviewing designers to gain insight of their personality and working nature. We were also conducting series of design workshops to help us understand the design process and how the persuasion knowledge (non-design knowledge) is used and impacted overall designer's experiences.

Interview Designer. We had conducted three interview sessions with designers. The interviews were done separately and last for approximately 45 minutes for each session. We used semi structured interview format and open-ended questions. Two interview sessions were conducted in the design studio, which provided us opportunity to observe their working environment. This helped us to obtain some culturally rich data. However, for some technical reason another interview was done in researcher's meeting room. During the interviewed, we were recording the voice data and took some note.

Design Workshop. The objectives of these workshops were to understand the design process /

flows and understand the impact of persuasion knowledge (non-design knowledge) in the design process. The design workshops used the participatory design approach with some controversial issues to be applied in the design challenge. This design challenge is important in order to create an engaging, fun and lively design environment. It is so essential to ensure that the design workshop is fun and able to generate innovative ideas.

As a result of the requirement gathering tasks conducted, we gain some understanding of how design ideas are generated, the design process, designers' knowledge and how their understanding towards the specialized knowledge needed and used in the design. At the end of this phase, we were also developed the persona and scenario as a representation of designers.

2.2 Design and Development

There were few elements of software design that were emphasized in the development of PToolkit (Refer Figure 1):

i.   Information architecture. The elements were collected and arrange accordingly during in the requirement gathering phases. The model of persuasion knowledge constructed earlier was used to guide the architecture (19). The persuasion knowledge contains three important elements, namely target behavior, persuasion strategy and persuasion technique for influence purposes. The information was structured in such a way to make it more understandable.

ii. Experience design. The user experience is very important for acquiring user understanding and engagement. Therefore, elements such as navigation, interface and color coding for each knowledge element is carefully designed to provide the best experience.

iii. Navigation design. The navigation structure has to be made easy for the user not only for navigating but also to understand the structure of the persuasion knowledge.

iv. Information design. Persuasion knowledge elements are the core components of the influence factors. Therefore, these elements need to be carefully identified, obviously seen and understand. Information was designed in textual form, visual form, and extended information and explanation.
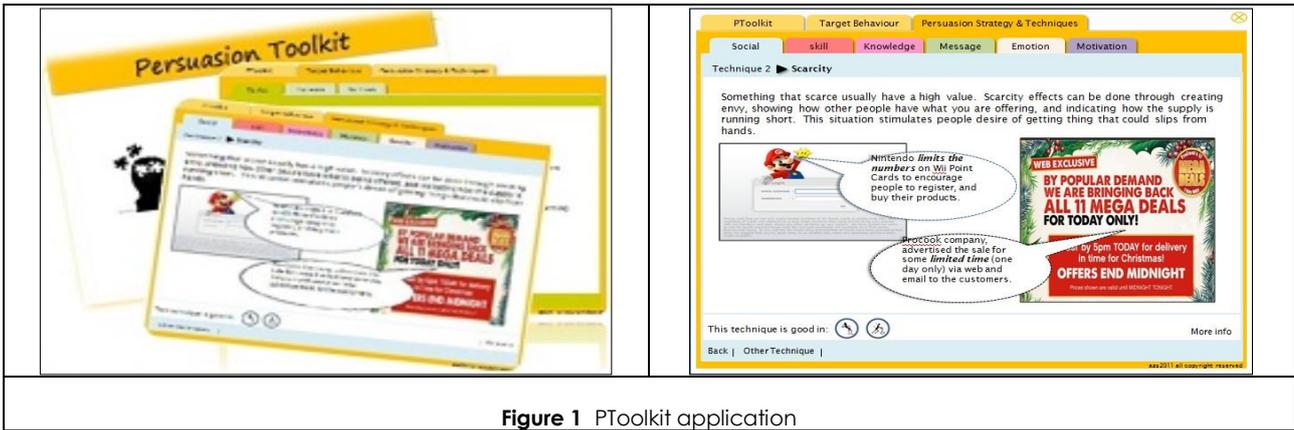
Figure 1 PToolkit application

2.3 Implementation

PToolkit prototype is published in Pdf interactive and able to be viewed in web and standalone desktop with ease. It gives several advantages such as; speeding the development time, robust and flexible, specifically involving a huge amount of graphic designs, and allows quick design iterations. The Pdf interactive can be viewed directed (within the browser) in the Safari browser. This would be the advantages of Safari Browser, which was not offered by others.   Other browsers require the user to download the PToolkit pdf interactive to their machine.

Evaluation. This evaluation is supposed to reveal the ability of the designer in designing a persuasive application assisted by PToolkit.

We have conducted pre and post evaluation activities for enabling us to claim that any results gathered in post activities were influenced by PToolkit usage. However, before the real evaluation is done, the evaluation was piloted with 4 designers to understand (i) either the procedures has any weaknesses that could be avoided (ii) understand the initial results of persuasive design ideas using the PToolkit.

Procedures. Participants are among the expert designers who have design experienced for more than 4 years. Four designers agreed to become the pilot tester for this study. This evaluation was conducted in two phases. The first phase requires an approximately one-week time, and the second phase require 4 days.

Phase 1	Phase 2
Designer 1	
Designer 2	

Figure 2 Design work of phase 1 & phase 2

Phase 1: An assignment was given that requires the designers to design a web page (sketch/wireframe) frame that encourages a healthy lifestyle among professionals. After 1 week, they need to upload the design (to the researcher email) or manually hand over the design to the researcher. Instruction for this phase is also made available online. During this phase, a design scenario is given to them which asked them to create a website that encourage professional to exercise.

Phase 2: After submitting the design, the designers will be asked to do the following tasks:
i. Explore the PToolkit (a link to PToolkit website will be provided).
ii. Redesign the earlier design proposal in phase 1. However, if the designer thinks that their proposed design does not require any modification, this stage can be omitted.
iii. Resubmit the new web design within 4 days.
iv. Answer sets of questions regarding the usage of PToolkit application. At the end of the exercise, there are 4 questions of:
   (a) After using PToolkit application, are you considering changing your design?
   (b) Does the PToolkit influenced you in changing the design?
   (c) In what way the PToolkit influenced you in revising your design.
   (d) Do the contents of PToolkit increase your persuasion knowledge? Please explain.

Results. There are two aspects that given attention during this phase. We were looking at any weakness of the procedures, and results of using the PToolkit as a tool to assist persuasive design ideas
i. Procedures weaknesses. During the pilot phase that was conducted in three months, we have found out a few problems that need some work to ensure that the real evaluation phase would not face any difficulties.
   • Recruitment of respondents. We need nearly 2 months to persuade commercial designers to become the respondent. Most of commercial designers that were contacted were busy with their dateline, and refused to accept our invitation. We need to find ways to persuade them involve in the study and provide their opinion on our work.
   • A designer has also email to us that he does not understand about the design scenario and request to withdraw.
ii. PToolkit as design assistant. Although 4 designers have agreed to involve in piloting the evaluation of PToolkit, only 3 of them went through all the procedures. 1 of the designer withdraw the task in the middle of the phase. Figure 2 shows the design work produced in phase 1 and phase 2, by designer 1, 2 and 3.

The initial results have indicated that there were some improvement of how, the design work from phase 1 to phase 2. Design work in Phase 1 was done without PToolkit assistant, however design work in phase 2 was done after the designer using PToolkit. The design improvement can be seen by observing that designers have added a few functions and making amends of the persuasive element as suggested by PToolkit that would encourage professional to exercise.

3.0 DISCUSSIONS

The results have provided us lots of helping in our work to make sure that the actual evaluation phase would be carried out smoothly. We discussed and laid out our procedures once again to make sure that everything would be ready for the real work.

As PToolkit has initially shown that the persuasive design ideas has shown some improvement, and we were also looking at the aspects of how the improvement can be clearly seen and claimed. The design work is solely based on our own interpretation and observation, therefore it might not be valid and biases in some ways. Therefore, some designs' evaluation guideline need to be followed to ensure that the interpretation is correct.

Therefore, our discussion with the experts suggested that any design changes in the second design phase would be discussed by observing and interpreting at the:
• Perceived design changes (in descriptive style)

- Changes of objectives
- Changes of design, contents including perceived of target behaviour, techniques and tactics of the persuasion
- Layout improvement

Designer expert will also verify the evaluation work to validate that our interpretation has followed the procedures that being laid out at the first phase. We believe this is going to be the challenge in our study as descriptive and qualitative work would allow and generate many interpretations before able to make any conclusion.

4.0 CONCLUSION

The previous years in making sensed of transferring design knowledge have been both very fascinating and challenging. We have more than agreed that working which involved human intervention is challenging and sometimes requires quick decision when situations were different from what we were expecting. In our case, recruiting designers to get involved during the evaluation phase was the toughest one, which resulted in having few expert designers. This challenge is faced by making some amendment of the procedures and encourage designers to involve in the study by providing them some information that their work will make some benefits towards the industry of design.

We would carry on the evaluation phase by recruiting more designer to involve in the actual evaluation phase. The difficulties of having designers have made us extended the evaluation cycle to another 3 months by contacting a few design agencies and groups to established connection and providing some monetary initiative as a token of appreciation for their involvement.

The importance of design throughout daily life these days is no longer a question.   If previously, designers may have been honored because they were able to produce beautiful artefacts, today their skills have brought more sophistication into life, such as using smartphone for shopping and using banking facilities. Therefore, we believe that our work to make persuasion knowledge as a specialized knowledge use by the designer to be acquire during the design ideation process is essential. The tool would help for guiding better-grounded design choices for the particular persuasion challenge they are addressing in creating persuasive, creative and useful product.

Acknowledgments

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