

Triggering design inspiration on site – the iDesign-On-Site (iDOS) framework

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Abstract

The information collected directly from the site is often a key inspiration for the further design development. Lynch and Hack have pointed out that the design concepts are the combination of the cognitive perception of designers and the environmental information of the site. Hence, a suitable design media is needed to allow such interactive design behaviors with environment on site. We analysis design behavior on site and research a digital form which is based on a mobile design device that can represent and preserve design concepts, and also integrate design process for DOS (Design on site).

Keywords: design on-site, iPhone, mobile computing, augmented-reality, GPS.

1. Introduction

“Being there” is important for a designer to get instant feedback when he is on the spot. By “being there” (instead of remaining at the office), researchers can more easily focus their attention to relevant aspects of context that might not be available in documents (Oulasvirta, Kurvinen, & Kankainen, 2003). It is difficult for people to capture the exact ambient of the site, even they have inspected several times or done the relevant sketches of the site, due to the disadvantages of short term memory that people forget it easily. Lynch and Hack have pointed out that the design concepts are the combination of the cognitive perception of designers and the environmental information of the site. “The designer can image a while landscape by looking at its map and see the patterns of roads and buildings that might fit into it”(Lynch & Hack, 1988). Consequently, designing on-site helps designers to sense the physics of feedback such as sight views, lightness, sound insulation, and all kinds of effects in surrounding environments as soon as they are on the spot.

The design concepts = cognitive perception of designers + environmental information of the site. Designing on-site provides designers an intuitive way in

creating design. In architectural design process, we concern about the importance of contextual information, which is significant and captured as seamlessly as possible through interaction between designers and surrounding environments. Sensing the contextual information of the surrounding environment while designers are in workplace is helpful in terms of creating design ideas (CHEN & CHANG, 2006). Design process is intuitive and needs to figure out solutions for inspected problems. Embodiedness and creative problem-solving on-site will enhance understanding of the problem domain (Oulasvirta et al., 2003). The notion of bodystorming refers to the simple idea that the design team does not speculate about use situations at their office, but goes out and innovates design on site. We found that bodystorming permits instant feedback for generated design ideas, and can provide a more accurate understanding of contextual factors.

Therefore, designing on-site provides designers not only to sense the contextual information of the surrounding environment immediately but to help them in examining details and connections more intuitively. The purpose of this research is to explore an approach for intuitive and creative design process by experiencing the contextual information and problem-solving on-site.

2. Reviews

- **A Pilot Study of Interactive Design Behaviors on Site**

Consider the design behavior on-site, sketch is the most intuitive way for creating design concept, however, designers need to move and inspect each sight of the space. A mobile sketch with digital medium lets designers to have instant preview, and share information. Preserving the perception which helps designers inspire ideas is important for lasting design concepts. (Show in figure 1).

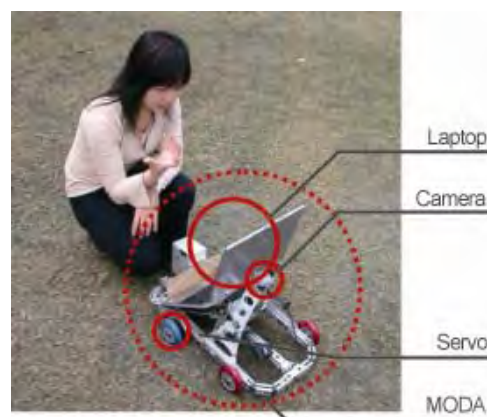


Figure 1. Mobile device with laptop (Tsai, 2005)

- **Augmented Reality with Markless Tracking Technology**

A mobile with small volume is more convenient for carrying whenever designers have to move around the space for DOS (design-on-site). Augmented reality by markless tracking with GPS helps user have preview of the design and survey design before design development. (Show in figure 2).



Figure 2. Architectural visualization with AR (Hii Jun Chung et al, 2009)

3. Methodology

- **Technologies**

Consider a mobile device, which is small and easy to handle, with sketch function is useful for designer to design on site. iDOS is implemented by iPhone, which has GPS, Wi-Fi, Accelerometer, Camera and Multi-Touch Screen, and offers 3D sketch function for DOS. Framework is as follows : Multi-Touch Screen – Display & control panel. Camera – Capture the landscape. GPS, Wi-Fi and Accelerometer – Defining the location and perspective view of 3D models. Application – 3D sketch tool for instant drawing, display, translating and preserve design process to last design concept for further design development.

- **Scenario**

A designer wanted to design a shop in a mall. First, he inspected the spot, and wanted to create a stair where he expected to display products along the wall. So on step 2, he made a 3D triangle. A builded model was able to make 2D sketch on each side of model, so he drew steps and a hole where he planned to put lights in side as decoration beside the stair. Hence, on step 4, he gave a description of the hole to remind himself the detailed design. Whenever a sketch is done, user can save the current sketch as a note to preserve the design process and information. During design process, the designer walked around the site, felt the scale of the model, inspect the environment and continued next step. Therefore, the designer is

not only able to preview/review the design by iDOS, but also preserve design concepts. After design development, the designer is able to show simulation of design to clients on site. It helps designers to get a better work done.

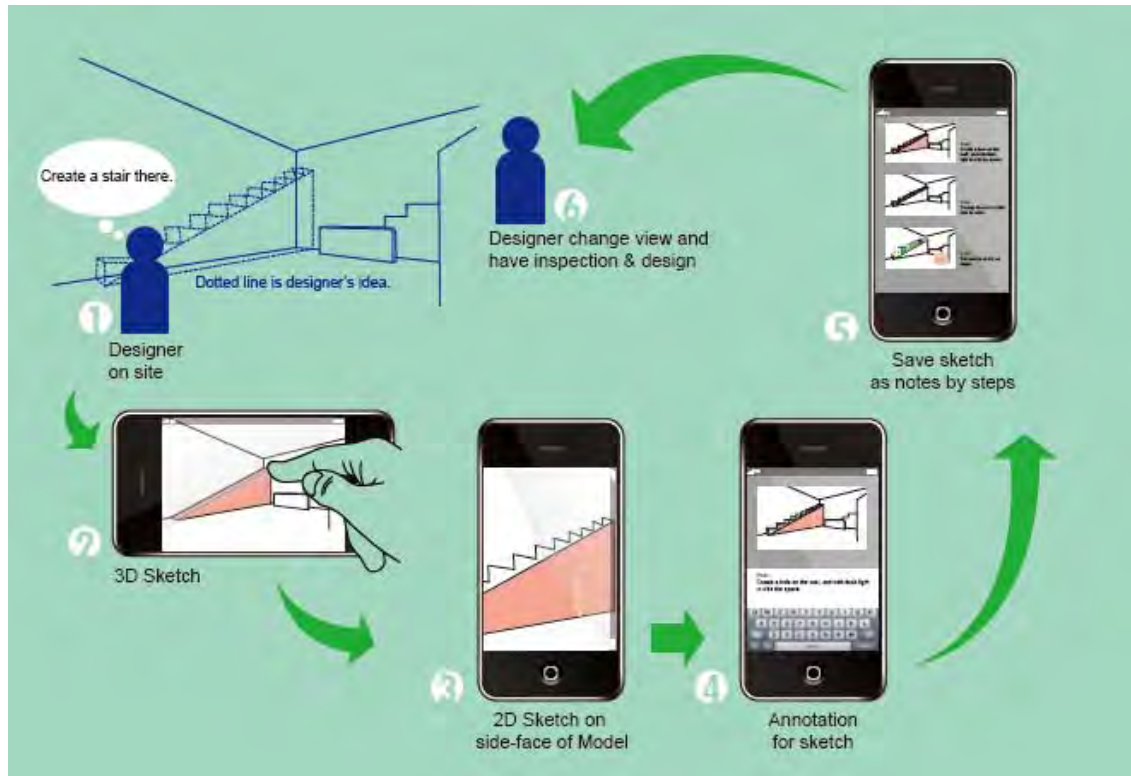


Figure 3. iDOS scenario.

4. Expected Contribution

Sketch on site, designer has more perception of environment. iDOS preserves design concept, sense and information on site more detailed, and helps designers trace back to design ideas. In communication mode, iDOS represents design concept immediately and lets designers have better discussion with each other or with clients. In future work, with cloud computing, designers will have cooperation design between site and office whenever designers sketch on site, the sketch will be further designed in office and update to the site.

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