A CONCEPTUAL FRAMEWORK OF VIRTUAL WORKPLACE FOR COLLABORATIVE DESIGN

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Abstract Designing is the combined efforts of various professions such as architects, clients, engineers and interior designers. Collaboration is a crucial element to the design process. We identify design activities and communication types in design processes. In accordance with these identifications, this paper discusses design of virtual workplace required for collaborative design process between various professions. In this paper, areas of the virtual workplace are divided into several territories.

1. Introduction

The virtual workplace is a new concept of distant collaborative work, across boundaries of time and geography (Crandall, 1998). Collaboration is fundamental to the design process. Virtual workplace should be designed to properly meet this collaboration. The essential elements of the virtual workplace are on-line communication, design activity and data management. We believe that design activities and communication types between team members must be classified to derive the concept of virtual workplace.

2. Design Activities and Communications Required in Design Process.

To derive theoretical background for designing virtual workplace, design activities of a design office must be identified kinds of meeting and media types.

2.1. DESIGN ACTIVITIES

The starting point for an effective communication and collaboration is to select design activities. The Figure1 shows types of design activities with a degree of percent. Design activities identified include making presentation board, drawing up reports, arranging data and etc.
2.2. MEETINGS AND MEDIA TYPES

The essence of collaboration between the architect and other engineers is the communication, sharing and refinement of design idea. The frequency of reasons why meeting is opened analyzed. Also media used during the design process are investigated. The Figure 2 shows frequency of meeting and media types used for communication.

![Figure 2. Meetings and media types (multiple response)](image)

3. Groupware

Groupware is needed which is suitable for design activities, based on the categories outlined by Coleman (1997), social presence, information richness and permanence. Groupware are required to support various design activities. Social presence implies the degree to which the technology facilitates a personal connection with others. Interactions with high social presence plays a key role for more lively, social, and intimate. Information richness has to do with the amount and variety of information. Permanence is the degree to which the technology is capable of creating a record of interactions or decisions. However, the usefulness depends on what the group is trying to accomplish in a given situation (Duarte, 1999).
Each category of design activities can be evaluated based on four factors of communication technologies. The Table 1 shows required specification for meeting design activity. From the perspective of this for categories, specification of the groupware can be derived.

**TABLE 1. Groupware suitable for design activities**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Social Presence</th>
<th>Information Richness</th>
<th>Permanence</th>
<th>Interactive</th>
<th>Groupware</th>
</tr>
</thead>
<tbody>
<tr>
<td>To make design concepts</td>
<td>marginal fit</td>
<td>good fit</td>
<td>marginal fit</td>
<td>Synchronous</td>
<td>Multimedia (chat, whiteboard, video, audio) real-time conferencing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Electronic chat with whiteboard</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Audio with electronic whiteboard</td>
</tr>
<tr>
<td>To estimate design plans</td>
<td>marginal fit</td>
<td>good fit</td>
<td>marginal fit</td>
<td>synchronous</td>
<td>Synchronous</td>
</tr>
<tr>
<td>To arrange the schedule of tasks</td>
<td>poor fit</td>
<td>good fit</td>
<td>good fit</td>
<td>asynchronous</td>
<td>Group calendar &amp; Schedule</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bulletin boards and Web pages</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Workflow application</td>
</tr>
<tr>
<td>To report general tasks</td>
<td>poor fit</td>
<td>marginal fit</td>
<td>good fit</td>
<td>asynchronous</td>
<td>E-mail</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bulletin boards and Web pages</td>
</tr>
<tr>
<td>To consult the cost of construction</td>
<td>good fit</td>
<td>good fit</td>
<td>poor fit</td>
<td>synchronous</td>
<td>Video with electronic whiteboard</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Electronic Meeting System with voice</td>
</tr>
<tr>
<td>To consult building materials</td>
<td>good fit</td>
<td>good fit</td>
<td>poor fit</td>
<td>synchronous</td>
<td>Audio conferencing</td>
</tr>
</tbody>
</table>

4. Design of the Virtual Workplace

This paper deals with the design of virtual workplace for online activities. For various participants interact in complex ways and share the information, online communication brings about security issues. To resolve this issues, we made the areas of a few of territories in the virtual workplace. At least, virtual workplace shoud include the hall and the information desk, the working room, the conference room, the library, the entertainment room and the management room.
We agree the virtual workplace is defined by the “anytime, anywhere” qualities with virtual reality (Crandall, 1998). Figure 3 shows the virtual workplace designed by us. It consists of the program list window, the working area, the collaborating window, the room list bar, the chatting room window and the communication tool bar.

![Figure 3. The virtual workplace](image)

The program list window is web-based programs which we can use for working on the web. The collaborating window displays other’s work process and enable user to share files in progress. The communication tool bar provides means to communicate with other person and to share the information between team members. The room list bar provides way of moving to the place.

5. Conclusion

We argue that virtual workplace should be designed to support collaboration of design team member. Though we recognize the shape of a virtual workplace needs to be designed in a different form of physical workplace, the analogy of physical workplace provides a good starting point for the designing virtual places. For future work to explore form of virtual workplace, cyberspace in which gravity does not work must be considered.

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References


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