Interaction and Interface Design Patterns for Intercultural Collaboration

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Abstract

This paper reports about on-going research into interaction design patterns in intercultural remote collaboration. It proposes that interaction and interface design patterns help to communicate and generate new design knowledge in supporting intercultural teamwork. It describes methods used to observe and develop design patterns in collocated, remote and blended collaborative learning and design contexts, and reports preliminary findings of interface and interaction design patterns, which support intercultural remote collaboration.

1 Introduction

Since the early 1990's, scholarly interest and awareness of cultural factors affecting Human Computer Interaction (HCI) has gradually increased. Research quickly spread into various directions to explore issues related to cross-cultural and intercultural communication such as discourse analysis (Herring 1999) or user-interface design (del Galdo 1996, Marcus 2004). Hofstede's (2001) work raised awareness of differences in the communication habits of people from different cultural backgrounds and has been helpful in categorizing design issues for internationalization and localization of interfaces. Not surprisingly, studies into cross-cultural and intercultural remote communication, which have been carried out separately in various disciplines like HCI, Computer Supported Collaborative Work (CSCW) or E-learning, show similar results. Several studies (Chase et al. 2002, Rutkowski et al. 2002, Denman-Maier 2004) identified emerging design issues in intercultural remote collaboration and E-learning. However, there is little attempt to study the effectiveness of collaboration support mechanisms for intercultural remote collaboration in design. Although basic principles for supporting social mechanisms in remote collaboration such as awareness, coordination and conversation content have been set out in research into remote collaboration (Vilhjalmsson 2003), no special attention has been paid to investigating how cultural values influence the design criteria for collaboration support mechanisms. There is a need to

collect and share existing design knowledge in the areas of remote collaboration and intercultural communication.

Even though design patterns and pattern languages are effective formats for collecting, structuring and communicating design knowledge, attempts to classify effective interaction support mechanisms in the form of design patterns for teamwork are rare and incomplete (Schuemer 2003, Martin et al. 2001). A pattern, which is by definition (Alexander 1979) an effective design solution to a problem in a certain context, evolves slowly over several generations. Patterns are written guidelines collected into languages. There are numerous approaches to writing, sharing and using design patterns and pattern languages in the field of interaction design (Borchers and Buschmann 2001, van Welie and van der Veer 2003, Schuemer 2003). However, no research has been carried out to define interaction and interface design patterns focusing specifically on intercultural remote collaboration.

2 Anticipated Results

The aim of this research is to identify interaction and interface design patterns in intercultural remote collaboration as means to generate and communicate effective design solutions among designers. Within the broad areas of collaboration support mechanisms Denman-Maier (2004) and Chase et al. (2002) have identified more detailed issues in intercultural remote collaboration. These issues include attitudes towards authority and time, focus on group versus individual concerns, and intellectual style of discourse, among others. Previous research has also shown that realist (e.g. Video Conferencing), mimic (e.g. Avatar and VR systems) and abstract (e.g. Visual Chat) modes can be used to support computer-mediated remote collaboration (Erickson & Kellogg 2000). Although this approach to collaboration support offers detailed results in regard to design, its does not consider which mechanisms are more effective in intercultural settings. The design issues put forward in the first approach consider intercultural settings but do not offer concrete design solutions. Hence, I use those two approaches as frameworks to build on existing interaction design patterns and formulate new ones in order to construct a pattern language for intercultural remote collaboration.

3 Methodology

I utilized a qualitative, user-centered research approach to identify interaction design patterns in intercultural collaborative learning. I investigated the design, running and results of two international design summer academies in which I participated in Japan and Croatia, as well as a collaborative design studio

subject, which I observed over a period of 2 years at the Hong Kong Polytechnic University. In these various contexts, I noticed reoccurring practices and teamwork solutions for building up shared understandings and overcoming miscommunication and breakdowns in collaboration. I used the previously mentioned categories of collaboration support techniques to analyze the data gained from the observations and contextual interviews. However, since this one-dimensional structure proved to be of limited help to clearly identify connections between single patterns, a hierarchical pattern language format of interaction goal, experience and action components was introduced to analyze the data. I used the same categorization scheme to analyze observations, interviews and written discourse. However, no computer-assisted qualitative data analysis software was utilized.

I will demonstrate my method by considering the pattern titled "SAVE & REUSE KEYWORDS" as example. The use of keywords as means to build and reuse shared understandings became apparent as a reoccurring pattern during my observations. In the conversation analysis I discovered that keywords where negotiated among team members but not always properly used in subsequent remote synchronous communication. The communication tool used by the teams provided no interaction support for using keywords. Nevertheless, the emergent pattern presented a clear problem. Related research into collaboration support (Haake et all. 2003) suggested that this problem could be overcome by saving words into a list in order to reuse them. An interaction scenario was generated using MSN Messenger as a basis and introducing a new function to save and reuse keywords from a list. In the next steps, the scenario will be tested with users, the pattern will be rewritten and tested for understandability and applicability with designers of collaboration support systems. A limitation of the method described is the time-consuming iterative process of observing, writing, testing and rewriting a pattern.

4 Preliminary Results and Discussion

So far, my findings confirm the validity of the design issues in intercultural collaboration support that have been identified in previous research. In order to build up on those findings, I adapted a hierarchical design pattern network model proposed by Welie and van der Veer (2002). As I have discussed in detail elsewhere (Schadewitz 2004), evolving design patterns can be effectively structured and developed in a hierarchical pattern network model. Figure 1 shows a network of emerging interaction design patterns and potential connections between those single patterns. The x-axis of the network model captures the 3 areas in which collaboration support mechanisms can be applied. The y-axis sets out the range of patterns. Patterns in the upper part of the figure describe the overall interaction process. Patterns in the lower part show subordinate patterns such as interface elements.

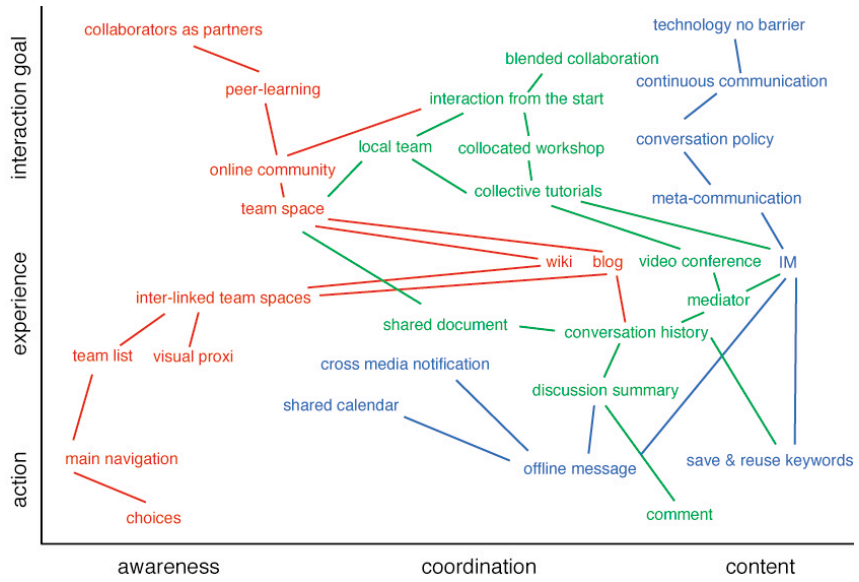

Figure 1. A Pattern Network Model.

Next, I am going to introduce several design patterns. However, due to the limited space in this paper I am not going to present them in the original pattern format, but I focus on describing the linkages between these patterns as shown in Figure 1. Many CSCW and groupware applications are cumbersome to use, hard to learn, expensive and difficult to adapt to various collaboration situations. However, especially in intercultural settings, designers should ensure that technology does not become an additional barrier to communication - TECHNOLOGY NO BARRIER. The collaboration project should utilize existing remote communication tools with which all team members are familiar. Familiarity with a communication medium ensures CONTINUOUS COMMUNICATION. In addition, it does not disturb the team members' usual social communication patterns. Team members are likely to encounter breakdowns and misunderstandings in an IM (INSTANT MESSAGING) conversation. In addition to negotiating an explicit CONVERSATION POLICY, some communication guidelines can be implicitly implemented in the design of the interface. When typing, team members can SAVE & REUSE KEYWORDS simply by adding opening and closing tags to an important term or phrase. Those words are added to a list in order to reuse them while conversing or when searching the CONVERSATION HISTORY. A SHARED DOCUMENT, which can function as a central team management tool, can

contain DISCUSSION SUMMARIES based on those keywords and additions team members make later on. My observations indicate that a team member's role as MEDIATOR positively addresses the problem of trust, which is reoccurring in intercultural communication. The MEDIATOR could also substitute a machine-guided content analysis of the CONVERSATION HISTORY, which might be irritated by spelling mistakes or slips generally occurring in online communication situations and often made by non-native English speakers.

In remote collaboration projects, the actual design work is usually carried out in LOCAL TEAMS, but there is a need to support sharing, discussing and coordinating of the results of the work online. Ideally the collaboration process blends collocated and remote teamwork - BLENDED COLLABORATION. A COLLOCATED WORKSHOP involving all team members should ideally be held in the beginning of the project. Teams establish a community, gain trust and eradicate uncertainty and anonymity. However, my findings indicate that team members need to maintain the abovementioned achievements in an ONLINE COMMUNITY. Various intercultural communication issues should be considered in the design of individual TEAM SPACES within communities like BLOGs or WIKIs. The pattern INTER-LINKED TEAM SPACES helps intercultural teams to monitor and exchange opinions about the collaboration progress with other teams. The lower ranking patterns TEAM LIST and VISUAL PROXI provide a shared context for the community, which can support awareness and coordination among the teams. Intercultural differences in attitudes towards authority greatly vary. A DISCUSSION SUMMARY can sustain ONLINE TUTORIALS once the group presents their results collectively in a VIDEO CONFERENCE. However, I discovered that video conferencing, which simply imitates a face-to-face conversation, often does not facilitate the intercultural collaboration process satisfactorily. Clear still pictures of the tangible results of the teamwork provide better feedback than tilting camera views of blurry faces, which simply irritate the discussion flow.

5 Conclusion and Further Research

This paper has presented an approach and method to collecting and writing interaction and interface design patterns. Single patterns are identified using ethnographic techniques and developed using an interaction goal and process-oriented hierarchical network model. In my further work I will test the interaction and interface design patterns using scenarios and low fidelity interactive prototypes. Aim of my research is the completion of an interaction design pattern language for intercultural collaboration, which can be used as a model and tool for designers to communicate design knowledge and generate new designs supporting intercultural collaboration projects.

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