

Identifying Interaction Design Patterns in Cross-Cultural Computer-Supported Collaborative Interaction

Introduction and Description of the Problem

A growing number of design researchers and practitioners are beginning to take an interest in design patterns as a method to capture and communicate good design solutions in collaborative interactions [2], [6], [9]. The practical format of patterns enables designers to reuse and share design knowledge among various stakeholders in the design process. Since Alexander [1] introduced this format into the field of architecture and Gamma et al. [3] developed patterns to communicate reusable parts of computer code, a discussion among interaction design researchers has evolved regarding which role design patterns could take in the interaction design process [3], [7], [10]. Patterns describe “a good solution to a problem in a certain context” [1]. Patterns communicate design requirements and inspire and facilitate conversations among designers. Researchers [3], [9] have identified the importance of context descriptions in design patterns, which distinguish design patterns from design rules or principles. In view of this, the author believes that cultural context descriptions in design patterns may inform the design process of collaborative technologies.

Academics in the fields of computer-supported collaborative interactions and design patterns have successfully adapted qualitative research approaches in the past [2], [6]. However, there is a lack of detailed reports about the use of different qualitative analysis approaches and the consequences for the composition, content and structure of patterns or pattern languages. Therefore, the paper introduces a combined inductive and deductive qualitative research method for identifying, analyzing and reporting ethnographic research data from cross-cultural collaborative interactions in the format of design patterns to inform the design of collaborative technologies.

Methods

The researcher developed a qualitative and comparative analysis methodology for identifying and articulating interaction design patterns in the context of a long-term ethnographic study of cross-cultural computer-supported collaborative design learning between teams of students in Hong Kong, Austria, and Korea, Taiwan, US-America. Data from natural observation, contextual and in-depth interviews, and log data of online synchronous conversations, asynchronous message threads on community websites, e-mails and documents stored on a shared server space were collected and analysed qualitatively. The methodology employed a mixed inductive and deductive analysis method. In the first, inductive analysis recurrent design solutions were discovered in the data and mapped hierarchically in pattern diagram. Design patterns were articulated and evaluated with designers in a pattern workshop. In the second step, based on the outcomes of the workshop, a particular set of data was coded and analyzed in depth guided by scientific theories from intercultural and cross-cultural communication [5], collaborative learning and design. This deductive method was used to refine the proposed design patterns from the first analysis. Interaction design patterns of cross-cultural computer-supported collaborative design learning were identified in this process. Those

patterns were then compared to case of Hong Kong Taiwan, Austrian or US-American collaboration using truth tables [8].

In the first step the researcher discovered difficulties in identifying patterns that were specific to the observed and analysed cultural context. The researcher found that the analysis and interpretation of the data were strongly influenced by the researchers own cultural disposition. Thus, in the second step, cultural dimension theories (i.e. collectivism – individualism) were introduced as a part of the coding framework and guided the analysis. The researcher discovered an improvement in identifying and articulating cross-cultural interaction design patterns influenced by describing the cultural context in which a design solution worked well. Moreover, in the cross-cultural comparative analysis the validity of the identified design patterns could be determined.

Findings and Conclusion

In the first step, 14 interaction design patterns were identified, articulated and tested with novice and experienced designers in ‘patterns workshops’ [7]. The workshop participants saw value in using the design pattern format to inform the interaction design process but they criticised that the consequences of cultural diversity on the design of collaboration technology were not reflected in a salient manner. The titles and in part the contents were too generic and inconsistently written. After the second deductive analysis the researcher revise the patterns substantially. For example, the pattern “Community Portal” identified in the first analysis was amended slightly when examining breakdowns in communication in the context of collaboration between Hong Kong and Korea and was renamed “Community Watch”. In the comparative analysis this pattern proved to be less efficient for supporting Hong Kong Austrian or US-American students in a short-term collaboration because of an individualistic community orientation. Furthermore, in contrary to the expectations, Hong Kong Taiwanese students watched community activities through a network of inter-team relations across both nations, which did a similar outcome, but did not afford a community portal.

This examples shows, that although those patterns were identified in data of an in-depth analysis of Hong Kong Korean collaboration, a cross-cultural comparative analysis allowed evaluating the validity of those patterns across different nations. In this comparison the proposed computer-support mechanisms for intercultural collaboration were similarly effective in Hong Kong Korean and Hong Kong Taiwanese collaboration contexts. This was attributed to the similar team culture, which was identified based on cultural value orientations. Conversely, many interaction design solutions in design patterns for Hong Kong Korean or Taiwanese collaboration proved to be less effective for collaborations among Hong Kong Austrian or US-American students. Those patterns were clearly related to collective community and hierarchical authority orientations inherent in Hong Kong, Korean and Taiwanese cultures.

In the workshop, the proposed methodology as well as the interaction design patterns that derived from the first and second analysis will be presented, compared and discussed in the light of supporting the design process of cross-cultural collaboration technologies.

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