國立交通大學
應用藝術研究所
博 士 論 文

社會互動設計之整合型研究取向

An Integrated Research Approach for Social Interaction Design

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摘要

社會互動設計是當前多人使用系統、溝通平台、體驗設計以及服務設計開發中，所面臨最為困難的挑戰之一。然而，目前被應用在電腦支援協同作業(computer-supported cooperative work, CSCW)以及人機互動(human-computer interaction, HCI)的設計研究方法和社會學理論，多局限於於較為狹隘的研究範疇，並忽略巨觀層次的社會與文化面向對個人社交行為所帶來的影響。本研究藉由社會學整合性典範，討論當前應用於社會互動設計中，過於偏向微觀的理論基礎和研究取向。透過傳統質性研究和脈絡設計方法 (Contextual Design Methodology)的比較，由三個不同設計個案：台灣傳統社會活動、青少年網路社交行為以及南歐跨平台的服務開發，進一步提出一個整合型的研究取向以及多層次社會互動模型 (multi-level social activity model, MLSAM)。本研究討論與評估此社會互動模型如何補充現有的體驗設計和人機互動設計研究方法，幫助設計師、研究員和開發團隊了解社會活動中參與者的動機、觀念以及各種文化與社會脈絡影響。整合性的研究取向在跨平台服務設計、社會互動平台以及適應性系統中所帶來的優勢也將在文中討論。

Keywords – 設計研究、研究方法、服務設計、社會互動設計、文化研究、使用者經驗、人機互動、設計方法、脈絡設計

Relevance to Design Practice – 本研究針對社會互動、溝通平台、體驗設計及服務設計，提出設計研究方法和取向。本研究透過一微觀與巨觀的整合觀點，討論多層次社會互動模型如何補充當前互動設計的方法與框架，使研究結果更為完整、有深度。此外，整合型的研究取向將有助於設計師和開發團隊探討複雜、範疇較廣的社會互動議題。

Abstract

Design for social interaction is a major challenge in multi-user systems, large-scale service and social platform development. However, established user experience methodology and sociological theories applied in computer-supported cooperative work (CSCW) and human-computer interaction (HCI) currently are narrow in scope. Both researchers and designers systematically overlook macro-level socio-cultural issues that may have significant implications for how well a system is received by its final users. I argue for the necessity of an integrated viewpoint, which considers both micro-level and macro-level phenomena in design research. Through three case studies covering different cultures and topics, this work presents what benefits can be gained from having an integrated viewpoint in social interaction and service design, and also shows that the multi-level social activity model (MLSAM) is capable of complementing the established methods with such a viewpoint. The improvements to the model to increase its utility are also discussed. In addition, based on reflections of three cases, a more effective approach for identifying use types and portraying users in iterative design cycles is discussed in this study.

Keywords - Design Studies, Research Methods, Service Design, Social Interaction Design, Studies of Culture, User Experience, Human Computer Interaction, Design Methodology, Contextual Design

Relevance to Design Practice - This research primarily has methodological implications for social interaction design practices. It evaluates how an integrated viewpoint of micro- and macro-level information benefits experience and service design. It shows that the scope of the Multi-Level Social Activity Model (MLSAM) can complement established design methods with information needed for an integrated viewpoint.

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PART I

INTRODUCTION

Chapter 1

THE NEW DESIGN CHALENGE

Rapid advancements in information technologies and the emergence of new communication media have changed the way people live their lives, with dramatic effects not only on people's cultural and local living contexts, but also their interpersonal relationships (Huang & Deng, 2006). Supported by technology, people now increasingly interact with others across boundaries previously imposed by location, society and culture. However, social interaction remains a subtle and complicated topic also in the online world (Berners-Lee & Fischetti, 2000; Erickson Kellogg, 2000; Dourish, 2001).

In the fields of Human-Computer Interaction (HCI) and Computer-Supported Cooperative Work (CSCW), both related to social computing, traditional task-oriented analysis and usability evaluation are considered insufficient for gaining a good understanding of users' needs and life contexts. A significant body of work has argued a need for more comprehensive methods to conduct design research with real users and with cross-discipline experts, such as cooperative design, contextual design, and the Scandinavian approach (Grudin, 1988; Greenbaum & Kyng, 1991; Beyer & Holtzblatt, 1998). Other researchers and developers have borrowed methods from anthropology and social science, e.g. shadowing, focus groups, in-depth interviews and grounded theory, and many different types of user-, context- and activity-centered research methods have been developed for supporting rapid design cycles (Anderson, 1994; Durish & Button, 1998; Preece, Rogers, & Sharp, 2002). Typically all these methods are focused on user requirements and usage contexts. For IT products or task-oriented systems development, they provide either concise guidelines or explicit frameworks to help researchers capture important task-related information to facilitate the design of effective and efficient tools. However, for the emerging domains of experience and service design (Shedroff, 2001; Aarts & Marzano, 2003; Laurel, 2003), these methods are not capable enough of explaining inherent cultural effects, nor the meanings and values behind actions and behaviors. Although many scholars have begun applying sociological theories to account for complex online social behaviors, the research scopes have generally been limited to micro-level person-to-person or human-computer interactions.

In addition, in connection with increasing globalization and presence of cross-cultural services, many challenges related to cultural differences have been found and need to be confronted (Marcus & Gould, 2000). Based on theories in sociology, cognitive psychology, and content analysis, much work has pointed to the neglect of cultural preferences in the design of existing software, including use and perception of colors, metaphors, and narrative layout (Yeo, 1996; Marcus & Gould, 2000; Okazaki & Rivas, 2002). Moreover, it has been observed that in different cultures and societies, personal social needs and behaviors differ (Gudykunst & Ting- Toomey, 1988; Ji, Peng, & Nisbett, 2000). Individual social attitudes, such as those related to a sense of belonging and identification, personal distance, emotional connections and a sense of community, have strong connections with one's social and cultural background (Hall, 1969/1990; Markus & Kitayama, 1991; Hofstede, 2001).

With the consideration that social behaviors are localized and inherently embodied in a cultural and historical context, the *Multi-Level Social Activity Model* (MLSAM) was proposed to provide better guidelines for collecting and highlighting subjective issues within social activities (Huang & Deng, 2008). Different from the HCI concerns in globalization and internationalization (Barber & Badre, 1998; Marcus & Gould, 2000; Okayazaki & Rivas, 2002), MLSAM is developed for experience and social interaction design, which focuses on users' perceptions, motives and cultural contexts (Chau et al., 2002; Li, Sun, & Zhang, 2007; Huang & Deng, 2008). The model declares that individuals' behaviors are embedded and restricted by social and cultural contexts, which emerge from individuals' collective and aggregated actions. Instead of studying how people interact with each other through a certain technical platform or explaining how accountability works within a community, MLSAM tries to identify people's motives, attitudes and values behind actions, by gaining insight into their social and cultural backgrounds.

In this work, I argue that it is a must to identify both micro-level phenomena (e.g. individuals' perceptions and actions) and macro-level phenomena (e.g. social trends and cultural contexts) in social interaction design, especially for experience and complex service design with social purposes. In addition, to help both designers and researchers efficiently gain this two-level information in a rapid development process, a new integrated framework of design methodology for social interaction is needed. Therefore, this work has two major goals: to show the importance of both micro- and macro-level phenomena in social interaction design, and to develop an integrated framework that helps researchers and designers extract and apply such information in their work.

Current microscopic sociological theories applied in IT development will be discussed, including their concepts and impact on design strategies and research approaches. In addition, an integrated paradigm from sociology, which emphasizes both micro- and macro-phenomena of social studies, is applied to locate and compare several popular design research methods and frameworks. As MLSAM may offer a missing linkage between macro- and micro- level, two design studies and one evaluation workshop are conducted, which focus on different social activities, platforms and cultural contexts. The three cases help identify if MLSAM is capable of complementing current research methods, by offering new insights into social and cultural contexts and individuals' attitudes. In addition, the cases evaluate how well the model manages to link together a socio-cultural context with individual attitudes and low-level interaction. Based on the results of the three studies, benefits, drawbacks and usage problems of MLSAM are discussed from both researchers' and designers' perspectives and improvements to the model are suggested.

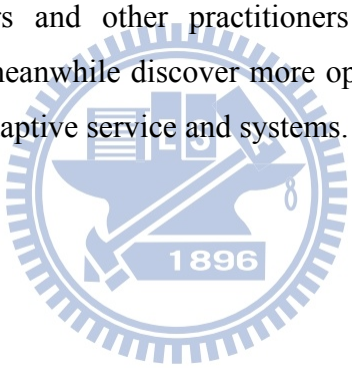
This work is organized in four parts. The first, Chapter 2, presents social issues related to IT products and details challenges in social computing, such as emerging online social behaviors and virtual communities. It introduces several influential theories, design patterns and strategies that have been developed and applied for computer-mediated communication and groupware.

The second part, Chapters 3-5, highlights the current focus on either microscopic or macroscopic research in IT development and argues the importance of an integrated framework for social interaction design. Chapter 3 focuses on micro-sociological theories applied in HCI and CSCW, including how these theories affect social interaction design and how they are located in relation to other sociological theories; Chapter 4 presents approaches, interests and strategies of macro-level cultural studies conducted in IT development. Several popular frameworks and models for studies of culture in management and psychology are also introduced to later support of studying cultural contexts in rapid design cycles. Chapter 5 then highlights the importance of considering both micro- and macro-level phenomena in social interaction design. An integrated research paradigm from sociology is applied to locate and compare several popular design research frameworks and methods.

In the third part, an integrated research approach is proposed to help designers, researchers and other practitioners take into account both micro- and macro-phenomena. The approach focuses on identifying the missing social and cultural components that are not covered by current design methods, and establishes a meta-schema, Multi-Level Social

Activity Model (MLSAM), to help researchers and designers collect and analyze context information and account for socio-cultural influences on interactions. Chapter 6 presents the development of the MLSAM, which is then evaluated in Chapter 7. Examples are presented from two design projects that illustrate how MLSAM can be used to collect and analyze social interaction information, and what insights can be derived. In addition, results are presented from a workshop that evaluated how well user-experience designers and researchers could represent raw research data in MLSAM. Comparing the results of the workshop and design projects, an assessment is made of how well MLSAM can complement current design methods and how it can be improved.

The final part, Chapters 8, presents my reflections from the design projects in which MLSAM has been applied, and discusses the benefits gained from applying MLSAM within an integrated design approach; primarily detecting potential target audiences and invisible users early in the design process. Chapter 9 summarizes how an integrated research approach can help designers, researchers and other practitioners take both micro- and macro-phenomenon into account and meanwhile discover more opportunities for extending product lines and for developing more adaptive service and systems.



Chapter 2

SOCIAL INTERACTION AND DESIGN

This chapter details the crucial issues and challenges in design for social interaction, which includes the emergence of virtual community, online social interaction and unexpected social phenomenon. Several influential theories and strategies that have been developed for collaborative work, computer-mediated communication, groupware and social media will be discussed.

2.1 Social Issues in Technology Usage and Development

In the early years, the systems for computer-supported cooperative work (CSCW) were basically developed by explicit task-oriented and goal-oriented approaches. In the late-80s, some social issues emerging in multi-user computing have been noticed, and communication and collaboration gradually has become one of the most important topics in CSCW. Due to constant inspecting and revising, the task-oriented applications are generally considered lacking for individuals' preferences, working sphere and social interactions in practice (Greenberg & Marwood, 1994; Grudin & Palen, 1995; Ackerman, 2000).

Grudin (1988) has pointed out that most CSCW applications are constructed clearly by task analysis but lack consideration of people's original working context and actual social interactions. Multi-user implies there could be potential differences between individuals' knowledge backgrounds, customs, and preferences. In addition, cooperative work is highly involved in the whole organization structure, policies, and the forms of communication and interactions among colleagues, which make system design more complex and challenging. To develop better applications for cooperative work, Grudin has suggested that system developers have to deal properly with personal requirements in the whole social context, including personal relationships and roles in a certain community. Later, Greenberg and Marwood (1994) have shown that similar social issues emerged from groupware design, and have argued that what a user actually needs is being well aware of closeness with others in a computerized shared workspace, instead of taking full control of a cooperative work process. Therefore, developers of groupware have to take account of all group members' behaviors,

perceptions, and social expectations.

From the viewpoint of social requirements, Ackerman (2000) has highlighted that the main problem of both HCI and CSCW fields is a social-technical gap between what we know we must support socially, and what we can support technically. Based on sociological theories, he has highlighted that social activities are fluid and nuanced (Garfinkel, 1967; Strauss, 1993; Ackerman, 2000). People have a great ability to be aware of the details and nuances in social interactions, and their behavior would be strongly determined by situations (Goffman, 1959; Strauss, 1993). For instance, people might use different expressions in communication and release different information to others according to the acquaintance. In addition, some subtle signs and visible facial expressions in face-to-face contact can actually facilitate communication. Therefore, Ackerman has argued that a single theory is not adequate to make up for the social-technical gap, and system designs should be done as a study process to match the nuance and social context in people's real lives.

On the other hand, some specific social phenomenon and issues arise from the widespread usage of the Internet and mobile technology (Ranson et al., 1996; Preece & Maloney-Krichmar, 2002). The Internet plays a great part in most people's daily lives, and influences the way people act, think, and communicate with others. With similar goals of entertainment, information seeking or social gathering, people group together online and form a variety of communities spontaneously in the virtual world. However, in such online communities, people's social requirements are still similar to what they have in the real world (Preece & Maloney-Krichmar, 2002). Through the Internet, people still seek for a sense of belonging, try to share their experiences and maintain social relationships with others. However, there is a significant difference between online social interactions and face-to-face communicating: the subtle social information in reality, including one's facial expression, body language, and communicating context, is hardly translated or reproduced in the Internet.

The shortage of social information would straightforwardly impact on communicating (Sproull & Keisler, 1986; Sproull & Keisler, 1991). People interact with others through lots of social cues, like one's facial expression, eye contact, gestures, tones, and temperament. In common ground theory, it states that people will constantly check these social cues to make certain of attaining mutual understanding. Besides, people can determine their reaction and attitudes toward others according to such social nuances (Preece & Maloney-Krichmar, 2002; Strauss, 1993). However, it is difficult to represent all of these social cues in computer-mediated communication. Sproull and Kiesler (1991) have argued that online communication

is lacking in social context cues. Social order, norms, social conscience and accountability of behaviors in the real world become uncertain and frail on the Internet. Similar to Sproull and Kiesler's argument, many researchers also highlight the importance of social context from the viewpoint of social psychology (Horton, & Wohl, 1956; Short, Williams, & Christie, 1976). For instance, some scholars have suggested that social presence and social context should be presented in social media to convey profound emotions, such as empathy, trust and intimacy (Moore, 1988; Fels, 2004; Kaye & Goulding, 2004; Vetere et al., 2005).

Design challenges in HCI and CSCW today are not only to meet usability requirements, but also to fulfill people's social needs and to support daily communication in more suitable ways. Since social interaction is generally nuanced and situated, how to observe and account for people's social behaviors and how to enhance the social context with significant social cues in hypermedia become crucial topics in IT development. In the next section, various arguments and strategies for social interaction design will be presented.

2.2 Social Applications and Design Strategies

The usage and dependence of hypermedia, mobile communication devices and the Internet has dramatically increased in the past decade. However, the profound meanings and emotions, which are normally conveyed by intimate and nuanced interactions in person-to-person communication, such as eye contact, body language, gestures and facial expressions, are still absent in computer-mediated social platforms (Donath, 2001). In the beginning, many communication platforms and devices were developed for increasing work efficiency, instead of supporting original social contexts, and are often driven by technologies instead of by needs. This unavoidably changes the society and people's daily life in considerable ways, including customs, traditions, local culture and values. Moreover, individuals' preferences, choices and dependence on certain media also affect their interpersonal relationships. For instance, the Internet provides greater opportunities for one to make new friends in multiple ways and to maintain his/her relationships with remote friends. However, since people become over-dependent on the specific communication devices or online applications, they also drift apart from their daily-contact friends, physical groups and communities (Diani, 1986; Tang, 2001; Huang & Deng, 2006).

It is a common agreement that social interactions are fundamental requirements of human beings, and people's lives could be more colorful and abundant by these emotional and devout contacts with each other. However, the focus of technology development was not

socially oriented until recent years. Researchers began noticing that computer-mediated applications would not be adequate to support entire activities embedded in the real world if they did not concern the related environment and the whole context (Grudin, 1988; Hughes, Randall, & Shapiro, 1993; Ackerma, 2000). In addition, the applications that are involved in communities are tied up with one's social activities, reactions, and cognition. In opposition to design guidelines of web 2.0 induced from online software and services, the researchers of HCI and CSCW fields began to debate on issues such as social interactions, sociable media, social identity, and social visualization (Donath, Karahalios, & Viégas, 1999; Erickson & Kellogg, 2000).

Sociable Media Group focuses on the issues concerning society and identity in the virtual world, including individual's perceptions of other members, contour of such a virtual community, and the development of social conventions in the virtual world. They have investigated these issues through designing experimental interfaces and installations to explore new forms of online social interactions (Donath, 1995; Borovoy et al., 1998). Donath et al. have tried to combined different knowledge from different domains, including urban studies, graphic design, cognitive science and social computing, to develop innovative interfaces and interactions for supporting online communities, virtual identity, or computer-mediated collaborations in the future (Viégas et al., 2004).

The research team has highlighted that the number of Internet users is enormous and rapidly growing. However, it is difficult for people to perceive the immense virtual crowd that they are interacting with and to observe the social behaviors and norms behind the virtual interactions and conversation. In addition, individuals' social identities, community and the whole structure of social network are indistinct and abstract. Such ambiguity and uncertainty of the virtual world directly affects people's communicating behaviors. Therefore, the group has brought up a concept: social visualization. More concrete and intuitive information of a community and social relationships can be gained by visualizing people's identities, interactions and social activities (Donath, 1995; Donath, 2002). The group members have tried to analyze and to account for the conversation rhythms and interactions within a community, and then applied different types of approaches, including graphic design, colors, sound effects or interactions, to depict the characteristics of different types of online social activities (Viégas & Donath, 1999; Rodenstein & Donath, 2000; Viégas et al., 2004).

In addition, the group has argued that making people's online activities, experiences, and even one's historic records tangible with more narrative features would help people be aware

of the contexts, relationships between members and communities. For this purpose, Donath et al. have highlighted the importance of social identity, by which people perceive and make sense of each other. In the real world, people perceive, interpret, and identify others by some pre-existing social prototypes and experiences. These social prototypes would become essential cues for people to comprehend and interact with others, hence, the identity, which plays an important role in modifying and developing the prototypes, needs significant concern in visualizing online social activities (Dale, 2001; Donath, 2007). The components of a personal portrait in the real world, such as one's appearance, facial expressions, and ways of talking, could help people gain a stronger sense of the community and construct a mature social context. However, they also imply other social cues, like one's cultural background, race, attitude, philosophy, or religion, which might not be necessary or appropriate to reveal in cyberspace. Therefore, it is too complicated to depict personal identity in an online community and issues like privacy, validity, and choosing what social cues are ignored or manifested, would be chief considerations in the future (Donath, 2001).

Erickson also presents a similar idea, social translucence, which is a system that enables people to draw upon their social experience and expertise to structure their interactions with each other. He argues that the user interface designer might visualize the social interactions and social information, which make people aware of the social context and then make their own behaviors accountable, and the social information people shared would transform into an organizational knowledge that could be reusable for other participants in the community (Erickson & Kellogg, 2000).

Agamanolis et al. focus on the social interactions and personal relationships, which are expected not only to make humans feel consoled and satisfied but enrich humans' lives. Via exploring the human inherent needs in communication, they are devoted to enlarging the technological possibilities to pursue human connectedness with subtle perceptions (Agamanolis, 2002). In a succession of their research, they have an insight into the nuanced perception of communicating activities, such as presence or a sense of intimacy and closeness (Auger, Loizeau, & Agamanolis, 2003; Cullinan, Agamanolis, Roche, & Hegarty, 2004). In addition, they also seek to support connections among different groups of people based on the concerns of shared experiences or cultural context (Cullinan & Agamanolis, 2003; Bitton, Agamanolis, & Karau, 2004). Since the traditional customs and trends at a societal level have changed by the widespread use of technologies, Agamanolis et al. indicate that these new problems in social relations might jeopardize a human's mental and physical well-being, and

the health of the communities and civilizations as well. The significant themes discussed in their research, which include background awareness, social networking, cultural exchange, slow communication, wearable computing, and intimate interfaces, seem to be all towards the purpose of enriching people's social interactions, and promoting their personal relationships.

These researchers mentioned above have presented lots of strategies to make more social interactions in the virtual world make sense and match people's living context. However, there still exist a lot of problems in visualizing those online activities. The issues of personal privacy, representativeness, and deciding what social cues to be portrayed or produced, must be tackled considerately while applying the realist, the mimetic, or the abstract approaches (Erickson & Kellogg, 2000; Donath, 2002). In addition, some researchers have sought to enhance interpersonal relationships by applying background awareness, and tried to convey presence, a sense of togetherness, and a sense of intimacy and closeness. They have even borrowed the findings of western sociology and psychology research to develop new forms and visions of interactions to fulfill the users' requirements and expectations (Xiong & Donath, 1999; Rettie, 2003). However, a few guidelines and design concepts based on western cognitive psychology or sociology are not sufficient enough to be applied in worldwide technology application development. The social issues in application design are much complicated, involving the social contexts and cultures, which are quite diverse in different areas, nations, and even lifestyles (Bourges-Waldegg & Scrivener, 1998; Strøm, 2006; Li, Sun, & Zhang, 2007). For example, although the design projects of Patel et al. show pleasant works that convey the intimate sense of togetherness, it would not be so effectual in Taiwan, due to different cultures and customs in terms of emotional expressions, personal space, and private concerns (Patel & Agamanolis, 2003; Kaye & Gouldin, 2004; Agamanolis, 2005; Huang & Deng, 2006).

Based on the fundamental diversity of thoughts and values in different social and cultural contexts, there would be a gap between the expectations and actual consequences of applying western design concepts directly to technological applications in Asian countries. In the next section, there is a brief discussion on the cultural effects in design development circles.

2.3 Towards Cultural and Social Context Design

Social issues are fundamentally related to cultural dimensions. A large body of research has concluded that the primary function of online community applications and social communication design is to establish shared understandings among users and to fulfill

people's social requirements in the offline world. However, in different cultures, people's social activities, common understanding and needs differ (Barber & Badre, 1998; Chau et al., 2002; Li, 2007). In addition, new issues emerged from interaction and interface design also reflect the cultural differences (Yeo, 1998; Marcus & Gould, 2000; Okazaki & Rivas, 2002).

By referring to sociological theories, several researchers argue the importance of supporting suitable social contexts and awareness in technology development. For instance, common ground theory considers that people's actions and social interactions depend on their shared understanding, which requires adequate support of a social context. This argument is later applied to guide communication systems design (Preece & Maloney-Krichmar, 2002). Some work tries to explain online behavior through Goffman's dramaturgy, in which people's actions are seen as theatrical performances that are dependent upon time, place, audience and circumstances (Goffman, 1959, Tu & Corry, 2001; Tu & McIsaac, 2002). In addition, Sproull and Kiesler (1986) point out that social cues, social context, and participant's social identity are the most important foundation of communication and social contact.

Since social context becomes one of the most important issues, culture, which sustains the whole society, is a must for interaction design. Most of the studies, whether of usability problems or commercial issues of localization, all reveal cultural effects by inducting and categorizing interfaces of the existent online applications which show the usage bias. The usage bias is strongly related to cultures or reflects the regionalism. Therefore, the concepts of the cultural markers and cultural user interface (CUI) are developed to help designers understand users' cultural requirements for interface use (Barber & Badre, 1998; Yeo, 1998). However, this type of design strategies does not take into account issues such as the nature of media and therefore the results of this research could be merely applied to redesigning or amending the existing ones. In other words, methods like inducting web pages could sift the diverse cultural preferences of these existing media but have no capacity for developing new interaction forms or for evaluating oncoming technology. In addition, for a long while, the interfaces of communication media and online applications around the world have been influenced and arranged by design guidelines and evaluation methods, which have been maturely developed and applied in western countries. It means that a genre of web pages in a country might reflect multicultural characteristics and experiences, and might also be too complicated to recognize the distinguishing features of a certain culture.

As social issues arise in science and technology development, cultural influences and effects are discussed extensively in different fields and some researchers have tried to apply

traditional ethnographic appraoches to the design process. However, these theories and findings sometimes range over many complex categories and are too detailed to translate into design guidelines. Nevertheless, the qualitative research methods in social science such as ethnomethodology are still very essential to investigate the obscure connotation and inherent motivations behind users' behaviors, and help the designers to comprehend the cultural context.

Not only functionality and usability, but also users' attitudes toward technology should be deliberated in the technology design process. In addition, people's behaviors, customs, motivations of usage and perceptions are all strongly involved in their social and cultural context. To inspect whether services and interactions provided by science and technology truly match users' social requirements, expectations and cultural context, it is necessary to examine what emerging technology might participate in and have an effect upon in different cultures. Then technology could be developed to enrich and fulfill people's lives. In the next part, the current bias towards microscopic approaches in design research; arguments and approaches for cultural studies and the concept of an integrated perspective on social interaction design will be presented.

PART II

MICRO- AND MACRO- PERSPECTIVES IN DESIGN STUDIES

Chapter 3

MICRO-SOCIOLOGY: CONCERNS AND IMPACT

The scope of research in HCI and other related fields has expanded from functionality and usability into supporting collaborative work and social activities. More and more methodologies and theories from sociology and psychology have been introduced and used in IT development. For instance, patterns of reciprocity and behaviors due to social dilemmas or endeavors have been discussed in numerous works, to gain a deeper understanding of the relationships between individuals and communities and their expectations (Kollock, 1999; Preece & Maloney-Krichmar, 2003; Parameswaran & Whinston, 2007).

In addition, cultural issues have appeared in both interface and interaction design, as many technology products, services and online applications have begun targeting global markets and have had to face intercultural conflicts and localization (Marcus, 2002). Moreover, manners, sense of privacy, personal distance and the way people convey their own feelings and emotions also differ from one culture to another, which can determine if a service or a product can be accepted and accessed (Huang & Deng, 2006). However, such macro-level cultural issues are typically not considered in design research. Therefore, I argue that to deal with service design and experience design for social interaction purposes, it is crucial to accurately understand both the activities' cultural context and individuals' attitudes and motives, which means the research scope should cover both macro-and micro-level phenomena.

To support my arguments, this section will first introduce several important sociological theories that heavily influence social interaction design today, and highlight critique from scholars outside the design community regarding how the theories overlook important macroscopic phenomena. The discussion is followed by an argument in favor of an integrated viewpoint that combines micro-level details with macro-level context, and a comparison of current design research methods in terms of how well they support such a viewpoint.

The past decade in CSCW and HCI has been characterized by a discussion of how new services and functionality supported by emerging technologies have failed to match the social

world. Researchers have argued both that social activities are highly situated and nuanced, and that it is a must to bridge across the gaps between social needs and technical feasibility (Ackerman, 2000). The same argument has been made in social software development, where the introduction of new technologies has created new forms of social interaction, such as online communities (Acquisti & Gross, 2006; Boyd, 2007). Therefore, many sociological theories and concepts, such as accountability, social order and dramaturgy have been introduced in IT development, to offer explanations of how people interpret subtle details of interactions and respond with considerable agility and situated concerns (Goffman, 1959; Garfinkel, 1967; Suchman, 1987; Stauss, 1993). These theories have brought up new topics in computer-mediated communication, such as common ground theory, the lack of social context cues hypothesis and social dilemma (Olson & Olson, 1997; Sproull & Keisler, 1986; Wellman & Gulia, 1999). To better support social activities, design strategies like social translucence and social visualization have been introduced, both of which aim to enhance users' awareness of social contexts by revealing more detailed information of behavior patterns and social cues (Donath, 1995; Viégas & Donath, 1999; Erickson & Kellogg, 2000). Moreover, new genres such as embodied interaction even propose to apply the concepts of intentionality and intersubjectivity from phenomenology into design practice (Dourish, 2001; Fernaeus, Tholander & Jonsson, 2008).

The above-mentioned theories are often considered as microscopic theories, including symbolic interactionism, phenomenological sociology, ethnomethodology and dramaturgy (Ritzer & Goodman, 2004; Smith & Riley, 2009). All of them share the goal of understanding social encounters and the abilities that people have to perceive and to interact with the social world. There are several important shared interests among these theories, which have deeply influenced today's design approaches. First, micro theories consider that interpersonal encounters are essential to social life, which has motivated the focus on social cues and contexts in communication platforms in some work. Second, most micro theories assume that people are creative and knowledgeable and therefore that they are capable of handling interpersonal encounters by making themselves predictable, mature and understandable, and that social order and norms slowly emerge from these interaction patterns. Current CSCW and HCI research focuses on understanding the way that people interpret and respond to communities; a process that is very close to the interests of the micro theories. By studying individuals' social activities in daily life, these theories provide rich clues and theoretical frameworks to explain social order, and therefore have been well accepted and applied in IT

development (Erickson & Kellogg, 2000; Eriksén, 2002; Chen & Duh, 2007; Robinson, 2007).

Most micro-sociological theories emerged from arguments against functionalism, in which social behaviors are described as passive mechanical operations under social settings. In opposition to assuming that people's behaviors are determined by social structures, microscopic works consider that social order arises as a product of concrete interactions, achieved by the actor's reflexivity, creativity and agency (Ritzer & Goodman, 2004; Barker, 2000). However, this position unavoidably underestimates and ignores the impact of the existent society and culture upon actors and their actions. For instance, symbolic interactionism considered that people relate to each other and to objects on the basis of shared meanings, which are derived from social interactions. From this viewpoint, the discussion of meanings has been confined to understanding how people create and share the meanings, without considering if they could be explained by culture. Similarly, Goffman's (1959) theory of dramaturgy accentuated people's reflexivity and ability to manipulate objects, space and the encounters of daily life. However, many sociologists have argued that both symbolic interactionism and dramaturgy ignore issues of power, norms and culture, and oversimplify people's attitudes and motives behind actions. In addition, many psychological factors such as emotion and aspirations, which might drive one's behaviors, are missing (Meltzer, Petras, & Reynolds, 1975; Ritzer & Goodman, 2004; Smith & Riley, 2009).

Other microscopic works widely discussed in HCI and CSCW are Schütz's explanation of lifeworld and phenomenology and Garfinkel's ethnomethodology (Dourish, 2001; Suchman, 2002; Eriksén, 2002; Chalmers, 2004). Schütz took a very different approach to analyze and explain an individual's world of everyday life by applying phenomenological approaches and concepts, including Husserl's reduction and Scheler's intersubjectivity (Schütz, 1962; Schütz, 1967). He detailed the way that a person experiences, interprets, conducts and interacts with the social world, physically or ideally. These works provide rich explanations about how people compile *a stock of experience* to define life situations, and by *knowledge* and *intersubjectivity*, people in contact with one another can understand each other and are able to deal successfully with one another under normal circumstances (Schütz, 1962; Schütz, 1967). Following Schütz, Garfinkel considered the objectivity of social facts as an ongoing accomplishment of people's practical and rational activities in everyday life. In his ethnomethodology, social order is considered as emerging from specific settings, in which members make their own context-specific actions understandable to others and strive to comprehend others' actions (Garfinkel, 1967; Heritage, 1984). For that reason,

ethnomethodologists tend to conduct empirical investigations of particular contexts and settings, and are primarily concerned with the way that people actually perform activities. They study methods, procedures and considerations, which people utilize to make sense of the world and each other, as well as to act on the circumstances (Heritage, 1984; Ritzer & Goodman, 2004). However, social order and the achievement of shared understanding and common sense are not accomplished only by society members' concrete interactions and involvement. Things like appropriate manners and norms are developed by long-term processes, in which there exists an external social structure and culture enabling and constraining people's behaviors (Elias, 1939/1994; Bourdieu, 1990). Hence, some scholars have criticized ethnomethodology like other microsociological theories, as avoiding power issues, the effects of culture and preexisting social structures (Alexander, 1987; Pollner, 1991; Smith & Riley, 2009).

The above-mentioned theories and approaches have had enormous impact on HCI and CSCW design research. Dourish (2001) has addressed a concept of embodied interaction, which interconnects social computing, context-aware and tangible design by introducing phenomenology, including *intersubjectivity* and Merleau-Ponty's idea of *bodily perception* (Merleau-Ponty, 1964; Dourish, 2001). Furthermore, for dealing with social interactions and larger-scale issues, there are numerous works also influenced by ethnography and ethnomethodological approaches, including Suchman's discussions for *Situated Actions*, Fitzpatrick's *Locale Framework*, Gaver's *cultural probe* and accountability design for communication (Button & Dourish, 1996; Gaver, Dunne, & Pacenti, 1999; Eriksén, 2002; Suchman, 2002; Fitzpatrick, 2003; Crabtree, Nichols, O'Brien, Rouncefield, & Twidale, 2000). Current well-accepted design methods, such as traditional field studies, contextual design and participatory design, focus on users, contexts, objective behaviors and sometimes users' requirements. Compared to traditional task analysis and experimental evaluations, they reveal rich information and hidden meanings within the activities (Ackerman, 2000; Preece & Maloney-Krichmar, 2002). Most of these studies conducted in IT development mainly emphasize particular settings and work flows, and the way that researchers interpret and manipulate field data are close to empirical and behaviorists' analysis. According to Schütz's works, both meanings and motivations for an action, including *in-order-to motives* and *because motives*, which refer to one's experiences and environmental backgrounds, should be identified (Schütz, 1967). Based on this concise statement, to account for social activities is to look into people's everyday lives, including their perceptions, experiences, knowledge and

background. However, current design studies have narrowed down the scope of research contexts, which barely refer to usage, artifact, detailed interactions and physical environments. Concerns like individual's attitudes, social positions, power structure and culture are absent.

From the feminist sociological viewpoint, Suchman applied Haraway's *situated knowledge* into technology development and highlighted the social issues of individual differences and effects of political and organizational positions in design practices (Suchman, 1987; Haraway, 1988; Suchman, 2002). Eriksén (2001) had similar arguments about the limited use of ethnomethodological approaches and ethnography in IT development. She pointed out that both use- and action-oriented design topics such as usability and actability, were discussed from a mechanistic view of users, and fell back to traditional task-oriented perspectives. For instance, she regarded the notion of Dourish's *system transparency* for accountability as in-depth but narrow, which refers to mainly human-computer interaction instead of social encounters. Although some design research methods have taken social behaviors into consideration, most still ignore large-scale cultural and social contexts. Like the microscopic theories, these methods do not consider culture to be an inherent, deep and motivating force for actions.

> [...] However, it does lead to a culturally denuded understanding of action. Motivations can appear shallow and material rather than complex and ideal. [...] Clearly something is missing here. This is an understanding of the power of culture to motivate actors and to establish passionate structure of internalized emotion and commitment (Smith & Riley, 2009:pp. 60-61).

New genres in IT development, like social media, service design and e-government, have to be concerned with diverse communities and generations, and inevitably need to support more complex social activities in the coming future. According to the central concept of ethnomethodology, people are intelligent and creative, and with ad hoc practices they can apply their knowledge across domains and act in different contexts. It is people's background knowledge, values and attitudes that matter and can help researchers to predict their further actions. Therefore, understanding the background motives and reasons and the whole social and cultural context is essential to develop more flexible and thoughtful services for social purposes in the future. Dealing with large-scale or international issues, it is necessary to have a thorough and integrated research framework to link from individual's perspectives to cultural and social matters.

Chapter 4

STUDIES OF CULTURE

Today, innovative technology, mobile communication, and the Internet, participate in most people's daily lives in diverse directions. Social activities, social fabric and cultural values, have been unavoidably influenced, and local culture and native tradition have been slowly fading away. In addition, cultural differences directly influence decision-making in an ambitious target for globalization of many commercial software and online applications (Marcus, 1993; Marcus & Gould, 2000). Customers' cultural preferences have become one of the most significant subjects, and the foci of technology development have slowly turned from usability into fulfilling users' cultural and social needs. How to comprehend all users around the world that differ in languages, customs, behaviors and needs, becomes the most essential issue in the next stage of technology development. In this section, several different aspects of cultural issues will be discussed separately.

This chapter will first present a brief overview of culture-related studies in IT development, including their focus and research approaches. Different models and research frameworks developed for cultural studies in management will also be introduced, which I consider will later contribute to the development of a more integrated research framework.

4.1 Cultural Aspects in Globalization

In the past decade, user-centered design has become the pith and marrow of human-computer interface design, interactions, and industrial design. In these domains, designers or system developers focus highly on comprehending and fulfilling people's specific requirements. However, for globalization purposes, online application design of most commercial pursuits was forced to confront the serious effects of cultural differences, since users' preferences, motivations of accessing such media, personal perceptions and values, are quite different from one culture to another.

Marcus (2002) has addressed that internationalization, intercultural and local issues could not be ignored in the goal of globalization for worldwide production or consumption. While intercultural issues of user interface design would refer to the religious, historical,

linguistic, or aesthetic aspects, localization in design might refer to the different requirements of specific local scales. To examine the cultural effects on interface comprehension, Marcus and Gould then applied Hofstede's five Cultural Dimensions to consider the usage requirements, preferences, metaphors, appearance, mental models and navigation of different user interface designs (Hofstede, 1984; Hofstede, 2001; Marcus & Gould, 2000). In fact, Hofstede's cross-cultural theory has been applied for globalization strategies in several fields. It includes international commerce, marketing management and e-commerce, and here, Marcus and Gould used them to identify the cultural preferences in user interfaces. However, the inherent concerns, expectations, values and perceptions behind the bias are difficult to reveal. The five dimensions are useful to inspire profound consideration and design concepts for cultural diversity, but they are too conceptual and general to deliberate the specific cultural characteristics in actual design practices.

Following the essentiality of localization Marcus presented, Yeo (1996) has argued that user interface design should be considered extensively with cultural aspects. He presents a concept of cultural user interface (CUI), in which all covert factors and the elements displayed in the interface will be localized for particular cultures. Such factors as people's background, education levels and social aspects, decide the way they interact with others and with environments. In one culture, there would be a shared understanding among people, which makes them have similar attitudes, behaviors or reactions in specific circumstances. On the contrary, people's perceptions and customs would vary in light of culture. Such differences could reflect on the understanding and reception of visual graphics, colors, functionality, information architecture and metaphors. Hence, the researchers or system developers have to comprehend exactly the accurate shared knowledge of target groups to predict the users' perceptions and behaviors. By analyzing and comparing the differences of hobbies that strongly depend on culture, Yeo deliberates the possible differentiation and emphasis of interface design for several cultures. He addresses a simple principle for system development, that the functionality components and interface components of the application should be separated so that they could be replaced and tailored for different cultural requirements, and the system applications could be more adaptable and conformable to the specific local characteristics (Yeo, 1996; Yeo, 1998).

Okazaki and Rivas (2002) have highlighted that consumers' online behaviors might be different, relating to their different cultural backgrounds by applying content analysis of multinationals' web communication strategies. They argue that the multinational corporations'

online communication strategies, like web-based advertising and promotional campaign, are lacking in standards of matching different cultural contexts. With the cross-cultural comparison of web pages, they point out there are three essential variables, including information context, cultural values, and creative strategies, which seem unavoidably related to cultural contexts, and determine if the web pages could be accepted and accessed by target consumers. Information content should reflect the extent of information requirements, thus webpage communication strategies would be varied among countries. Like most social science findings, social values of western cultures and eastern cultures are quite diverse. Individualism, for example, is regarded as the main philosophy of the Western Culture, on the contrary, the Confucianism in the East seeks stable and tight hierarchies in personal relationships. These inherent cultural differences directly determine users' motivation of online behavior and attitudes toward communication media, and make a great impact on design strategies.

The Internet does break the physical boundaries between different countries and cultures, and the users of online services, web pages of commercial advertising, or communicating platforms, are very different. To satisfy global users, these system and application developers have to confront the cultural differences that emerge from interface preference, cognition and attitudes. In addition to commercial purpose, the human computer interaction designers and researchers also notice that design research processes and evaluation of usability in the past years are lacking in cultural aspects, which are discussed in the following paragraphs.

4.2 Cultural Aspects in IT Development

Back to the core of HCI design, lots of researchers have revealed the significance of social considerations. However, these social issues such as online communities, social interactions and social cues, could not be separated definitely from the whole cultural context. The research mentioned above accentuates the importance of localization under the aspiring destination for global use, and presents the cultural effects on interface design. Marcus discusses the interface could be designed with the thoughts of cultural dimensions (Marcus & Gould, 2000; Marcus, 2002). Yeo, Okazaki, and Rivas in their research assort and analyze a variety of web pages to induct the cultural features of interfaces as further reference resources (Yeo, 1998; Okazaki & Rivas, 2002). However, these results are confined to users' external behaviors and preferences under the scope of economical interests. In the following text, several discussions of design research and evaluation on the threshold of cultural aspects will

be briefly introduced.

Barber and Badre (1998) have introduced a term of culturability. They argue that usability tests of technology media need to confront the cultural effects, and reflect the nuances of cultural context in accordance with target groups. In the past years, usability was defined as easy to learn and easy to use. With the improvement of information science, the spread of application usage is across the boundaries of countries. Presently, system developers and designers are figuring out that there might be no design standards if users' cognition which system information architecture rests on, is diverse in different cultures. The upbringing, education levels, social attitudes and cultural background determine the way people perceive and interpret the world. In other words, cultural context must influence peoples' behaviors and usage of such technology applications. Hence, Barber and Badre argue that interfaces, interactions, and media content not only all have to reflect the understanding of the cultures of target groups, but also all design components of these media should be reconsidered with cultural dimensions. They propose to identify all design elements with localization features and then to redefine them as cultural markers. With specific characteristics for target cultures, applying these cultural markers could improve the usability and efficiency of systems. In addition, similar to what Yeo's CUIs argue, Barber and Badre believe that the apparent cultural markers could speed up the globalization process in the future (Barber & Badre, 1998; Yeo, 1998).

Not only would usage requirements vary with different lifestyles and cultures, but users' attitudes, perception and cognition, and purpose of usage need to be tackled thoroughly for the whole cultural context. Chau et al. (2002) present that the cultural differences apparently emerge from consumers' online behaviors, and show the internal difference in users' attitudes toward technology between the East and the West. In their study, most Hong Kong subjects used Internet applications for the purposes of social contact, communication and maintaining personal relationships, and contrarily the U.S. subjects' purposes of the Internet use are most possibly gaining information. Hence, they argue that users' cultural context needs to be taken into account and then their behaviors could be more understandable and predictable.

Considering the usability problems for multi-cultural users, Li et al. (2007) address culture-centered design issues based on the findings of psychological research of cultural differences. They argue that the main strategy of individualization or customization under the globalizing scope is merely offering choices of preference settings. And such limitation of interface design would make some significant cultural values and inestimable quality lost.

More than that, with the great progress of science and technology, human needs in a higher level of Maslow's hierarchy should be fulfilled, such as emotional, social or cultural requirements. Moreover, they also present the remarkable hazards in applying the western design principles and usability evaluation methods directly to Asia. Most traditional usability evaluation methods are not internationally practicable and lack concern of distinctive national features. Hence, they argue that both design principles and usability test methods should be accommodated to different cultures.

4.3 Models and Frameworks for Studies of Culture

In social science, the strategies to study a culture include traditional anthropological approaches, such as participant observations with long-term involvement of the fields and interpretative approaches, in which researchers collect, conceptualize and induce the concepts through diverse methods. For years, numerous discussions and debates have been held about ways to generate more solid and scientific results while applying these methods and approaches. Many researchers have focused on measurements and standards for improving the validity and reliability of qualitative research (LeCompte & Goetz, 1982; Lincoln & Guba, 1985; Creswell & Miller, 2000). For instance, Barney Glaser and Anselm Strauss brought up the concept of grounded theory, in which researchers analyze data and generate a theory repeatedly until they can thoroughly explain and describe the phenomenon. In this iterative process, Strauss placed emphasis on improving reliability and validation criteria in a systematic way (Glaser & Strauss, 1967; Strauss, 1987; Strauss & Corbin, 1990). However, in IT and product design practices, while designers and developers apply qualitative approaches, they tend to analyze and portray the situations by models, guidelines and check lists, instead of fully grasping the grounded, social and cultural essence. Since the goals of most design studies are not to build knowledge or to develop reliability and validity, these research results generally only support short-term and inner group usages and have no impact on further related studies.

Applying above-mentioned positivist or interpretivist approaches to gain knowledge about society and culture is very time-consuming and needs experienced researchers to collect and analyze raw data. Therefore, to reduce the cost and to get insights more efficiently, there are numerous theoretical frameworks and models developed in different domains. For instance, since the 80s, many works of management and leadership have discussed numerous models for understanding organizational culture (Smircich, 1985; Quinn & McGrath, 1985;

Rousseau, 1990; Schein, 1992; Erez & Gati, 2004). Most of these works have the same purposes, either to optimize organizational process or to reduce cultural conflicts within organizations.

In the fields of management and leadership, many scholars have taken similar approaches to identify cultures - firstly recognizing a culture's representative characteristics and then categorizing them into types. Different from micro-sociological concerns, these researchers generally take an organizational point of view and focus on structures, power distribution and divisions of labor (Handy, 1976; Quinn & McGrath, 1985; Hellriegel & Slocum, 2007). The earliest work is Harrison's Organization ideologies, in which there are four types of cultures highlighted by their typical features (Harrison, 1972; Handy, 1976). As shown in Figure 1, this classification refers to power-, role-, task- and person-oriented cultures, respectively standing for centralized power, hierarchical structure, team support and individual achievement (Handy, 1976; Goodstein, Nolan & Pfeiffer, 1993; Handy, 1995; Brown, 1998). Harrison's work has had great impact on later studies of organizational culture, in which the power distribution and organizational formalization have become the basic criteria to locate a culture (Handy, 1995). Furthermore, the ways that an organization or a community responds toward outside environments and different situations, the flexibility and stability of organizational structures and the forms of attention have also been discussed in many works (Deal & Kennedy, 1982; Quinn & McGrath, 1985; Hellriegel & Slocum, 2007).

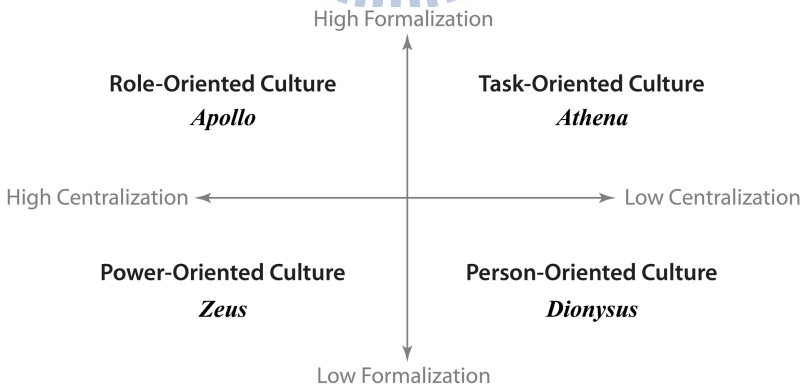


Figure 1. Four types of cultural characteristics. Handy used Greek gods to describe Harrison's four cultural types.

In contrast to categorizing cultures into types, many scholars focus on finding cultural concepts and patterns for intercultural studies. The earliest works are Edward T. Hall's books, in which he identified two dimensions of culture, including the high-, low- or middle-context dimensions, and polychromic versus monochromic time orientation (Hall, 1959; Hall, 1969/1990). The high-low context concept is used to characterize information transaction and

interpersonal communication of cultures, and the second concept is concerned with the ways people structure their time, tasks and schedules. Moreover, to deal with cross-national issues in the functioning of organizations, Geert Hofstede (2001) indicated the differences between studying national cultures and studying organizational cultures, where national cultures differ primarily in their values but organizational cultures turn out to differ mainly in their practices. Based on his global scale surveys among employees of IBM, he identified six different dimensions of organizational cultures, such as process- versus result-oriented, parochial- versus professional-dependent, normative versus pragmatic organizations, and so on. For the national cultural dimensions, he claims five other dimensions, including power distance, uncertainty avoidance, individualism versus collectivism, masculinity versus femininity, and long- versus short-term orientation (Hofstede, 1991; Hofstede, 2001).

For understanding cultural diversity in global business, Trompenaars and Hampden-Turner (1997) also developed a model of culture with seven dimensions, including universalism versus particularism, individualism versus collectivism, neutral versus emotional, specific versus diffuse, achievement versus ascription, attitude toward time and attitude toward the environment. Different from Hofstede's work, Trompenaars and Hampden-Turner surveyed numerous organizations all around the world and their results showed additional concerns of people's commitment to work and Hall's concept of time management.

Instead of classifying existent international or organizational cultures into types, some researchers put emphasis on developing frameworks and models for analyzing and understanding the culture of a particular group or organization. For instance, Schein (1990) identified three fundamental levels at which culture manifests itself: observable artifacts, values and basic underlying assumptions. Here, artifacts refer to physical layouts, manners, atmosphere and phenomena that people can directly feel and observe, and values refer to members' norms, ideologies, charters and philosophies. The basic assumptions are those taken-for-granted, underlying and usually unconscious aspects that people have and share within the groups, and they normally can determine people's perceptions, thought processes and behaviors (Martin & Meyerson, 1988; Schein, 1990). Slightly different to Schein's three levels, Hofstede (2001) placed four manifestations of cultures at different levels of depth (Figure 2a), including symbols, heroes, rituals and values.

> Symbols, heroes and rituals are subsumed under the term practices. As such, they are visible to an outside observer; their cultural meanings, however, are invisible and lie precisely and only in the ways their practices are interpreted by insiders (Hofstede, 2001:p.10)

Moreover, to discuss the strengths and weaknesses of both the qualitative and quantitative methods for studying cultures, Rousseau (1990) also detailed the nature of the culture construct and its theoretical roots, and layered these cultural elements according to subjectivity and accessibility. His five layers of culture, from outside in, include artifacts, patterns of behavior, behavioral norms, values and unconscious fundamental assumptions. As shown in Figure 2b, Rousseau's model is very similar to Schein and Hotstede's levels, identifying culture components by two major parts: concrete, symbolic and obvious forms versus intangible values and underlying assumptions. This type of layered cultural models also appear in many other researchers' works, in which basic assumptions and values generally are placed at the core layer(s), and then encircled by beliefs, attitudes, ritual, behaviors and then artifacts (Deal & Kennedy, 1982; Trompenaars & Hampden-Turner, 1997; Spencer-Oatey, 2000). As shown in Figure 2, the models' grey inner rings present the hidden and invisible parts of culture, which require more expensive research techniques and long-term involvements to identify.

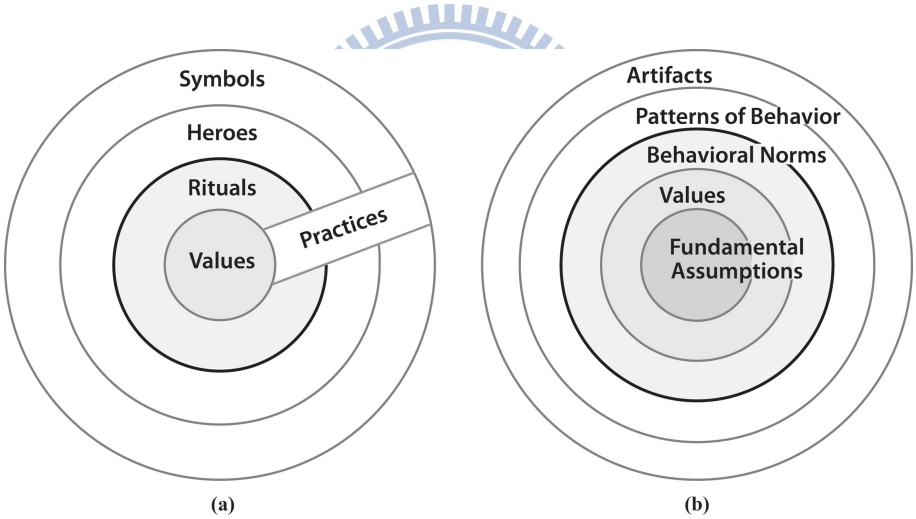


Figure 2. (a) Hofstede's manifestations of culture at different levels of depth (redrawn from Hofstede, 2001). (b) Rousseau's layers of culture (redrawn from Rousseau, 1990).

There is one extreme example of the ambitious objective to combine all aforesaid concepts into one single model. Considering cultural impact on the implementation of enterprise resource planning (ERP), Krumbholz and Maiden (2000) bought up a meta-schema for modeling culture. They integrated the surface and the deeper manifestations of culture into common business concepts such as processes, events and information flows, and then developed a systematic research framework to analyze culture for further explanation, prediction and re-planning of different corporate and national cultures. Their framework is basically based on Schein's three levels of culture and other social concerns, including

personal interaction, group norms, formal philosophy, people's mental models and linguistic paradigms. In addition, influenced by the globalization trends and comparative studies, they considered both Hofstede's and Trompenaars and Hampden-Turner's cultural dimensions in their work (Schein, 1992; Hofstede, 1991; Trompenaars & Hampden-Turner, 1997).

Krumbholz and Maiden considered that the most significant parts to understand a culture are both people's values and norms, instead of emphasizing either beliefs or behaviors (Deal & Kennedy, 1982; Smircich, 1983; Thompson & Luthans, 1990). In the end, the enormous framework had more than twenty components with three different phases. The first phase covers common elements in business processes and social activity theories, such as agent, role, responsibility, action and goal. The second part describes the core levels of culture, including hidden assumptions, beliefs, values and norms. The last part focuses on obvious characteristics, including customs, rituals, symbols and environments, which are directly or indirectly determined by the core levels.

It is obvious that Krumbholz and Maiden have tried to cover all the important elements discussed in organizational and national cultural studies with more social science aspects. However, there are many unclear definitions and assumptions in this meta-schema. For instance, social interaction is a significant part in the model, which influences and reflects one's beliefs, and also represents the types and ways people interact with each other. However, the clear arguments to explain the relationship between social actions, values and beliefs, and potential methods to reach this understanding are absent in this work. In addition, their meta-schema has more than twenty different components (e.g. values, norms, myths, symbols, action and agent) and numerous relationships among components (e.g. social environment determines hidden assumptions, symbols make up styles and myths influence beliefs), which makes the model extremely complicated and difficult to use and to read.

Instead of identifying the essentials of culture, Erez and Gati (2004) developed a dynamic, multi-level model of culture to account for work behavior (Figure 3). The structural dimension of the model represents the nested hierarchy of culture, from the micro level of the individual to the macro level of a global culture. The dynamic nature of culture shows the top-down-bottom-up processes where one cultural level affects changes in other levels of culture. Different from Schein's and Hofstede's cultural levels, Erez and Gati's model is based on an ecological viewpoint, in which culture is considered as evolving adaptations to ecological and sociopolitical influences and individual psychological characteristics in a population are adaptive to their cultural contexts (Triandis, 1972; Berry et al., 1992; Erez & Gati, 2004).

> Ecology, historical events and cultural diffusion through globalization, migration, and technological advances shape culture by top-down process. […] Bottom-up processes describe phenomena that have their origins at a lower level but they emerge to become a higher-level property. They originate in cognition, affect, behavior, or other characteristics of individuals, and through interactions with others, transform into a higher-level, collective phenomenon. (Erez & Gait, 2004:p.590)

Erez and Gati's further identified several levels of cultures, including groups, organizations, nations and the global culture. They considered culture as a shared meaning system that can be formed at each one of these levels, and put emphasis on the analysis of bidirectional relationships between organizational culture and individual work behavior. Their arguments and concerns are very similar to the integrated viewpoint in sociology, which highlights the influences among individuals' actions, beliefs and the whole context (more details will be discussed in the next chapter). However, as a research approach, the model did not provide a clear guideline to help researchers identify different types of cross-level influences. For instance, each culture level has its own representative symbols, norms and values. It is very difficult to analyze how these entities are influenced and changed by other levels' entities.

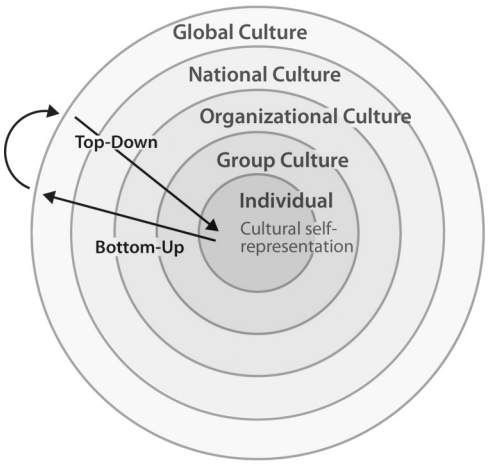


Figure 3. Erez and Gati's dynamic, multi-level model of culture (redrawn from Erez and Gati, 2004).

The above-mentioned quadrant models of cultural types provide several ways to identify national or organizational cultures, and have indicated the significant relationships between power structure and personal behaviors (Harrison, 1972; Handy, 1976; Quinn & McGrath; 1985; Hellriegel & Slocum, 2007). However, there are two major reasons why it is difficult to apply these models directly as research frameworks in other domains. Firstly, the limited dimensions of quadrant models oversimplify the cultural issues and avoid the level of depth in cultural and social significance. In management and leadership cases, the classification

approach provides a simple and quick way to distinguish the types of culture with specific conditions, but due to a lack of clear definitions of cultural essence, these models are incapable of revealing the subtle relationships and influences among the cultural components.

Second, most human behaviors, especially social activities, are not like tasks, which have a clear objective and can be analyzed into steps and processes. With a strong management and leadership purpose, these models purely focus on work processes and the ways that people achieve their goals, and seldom take individuals' motives, attitudes and perspectives into account. The similar tendency of work and goal orientation also appealed in Hofstede's global-scale survey, which he conducted to evaluate the work values of a specific company. Although Trompenaars and Hampden-Turner's work covered personal attitudes towards both leisure and work situations, their results that reflect underlying assumptions, values and beliefs are still limited.

To develop a more complete framework for understanding culture, Krumbholz and Maiden have tried to combine both social science theories and psychological concepts into their meta-schema. They argued the importance of considering five levels of culture: symbols and styles, heroes and myths, customs and rituals, beliefs, and norm and values. However, it is argued that their interview results did not reflect the richness and interaction among these cultural levels and components, but only roughly revealed the influence of norms and values on one's belief and action. In addition, the numerous components involved in different perspectives and cultural layers are all compressed into a single model, which also makes this meta-schema difficult to use as a research framework, or as a format for representing the final output of the research.

The cultural issues from technologies, social interaction and service design perspectives are concerned with a person's attitudes and values, which are very different from investigating a culture itself. Most of the above-mentioned models and measurements of culture focus purely on work, and their purposes are either to enhance organizational performance or to improve management and leadership. Since these studies were not conducted for human activities in general, the simple questions, such as people's motives for an action and emotional needs, have been ignored. In addition, most of these scholars emphasized practical and behavioral views, environment, symbols and rituals, and only a few highlighted the importance of studying values and beliefs to understand a culture.

Chapter 5

AN INTEGRATED VIEWPOINT

The theories and research approaches in microscopic sociology, in which emphasis is placed on agency and social encounters of daily life, have been well accepted in different domains. In contrast to macro theories such as structural functionalism, conflict theory and some of neo-Marxian theory, most of the micro theories refuse to consider people's behaviors as products determined by the external social or economic structures and consequentially avoid the concerns of cultural, long-term and historical social issues.

On the other hand, cultural models developed for management have been used to describe and identify collective characteristics of an organization or a group, but have at the same time generally ignored the differences, needs and emotions of individuals. Hence, it is very difficult to apply these macro-level models to deal with low-level and subtle social activities. This chapter will first present the integrated viewpoint in Sociology and compare the scopes and foci of well-accepted design frameworks in IT development. In addition, the missing part in design research to support social interaction design will be discussed.

5.1 An Integrated Viewpoint in Sociology

Sociologists have in the past decades begun discussing the complementary relationship of the two extremes and argued the necessity of having an integrated micro-macro viewpoint when dealing with social issues (Coleman, 1986, 1987; Alexander, 1987). Some sociologists have considered individuals' actions and social facts as the whole, and some have tried to bring up new concepts to account for the interactions and influences between individuals and socio-cultural systems (Collins, 1981; Coleman, 1986, 1987; Liska, 1990). In addition, multiple theories were developed from historical viewpoints to explain the development and forming processes of daily practices, manners and social order (Elias, 1939/1994; Bourdieu, 1989; Bourdieu, 1990).

The linkage between the socio-cultural (macro) level and the individual actions (micro) level has been discussed extensively in literature. For instance, Coleman (1986, 1987) used Weber's analysis of the effects of religious doctrine on the economic system to demonstrate

the bidirectional influences between macro and micro levels. As illustrated in Figure 4, Coleman argued that Weber's work could be seen as a macro-to-micro analysis; highlighting the effects of how Protestant doctrine has affected individual values (the type-2 relation) and the effects these values have had on individual orientations to economic behavior (the type-1 relation). Coleman also identified another relation of the opposite direction, micro-to-macro (the type-3 relation), showing how the individual orientations combine to produce the structure of economic organization.

Based on Coleman's model, Liska (1990) put emphasis on two topics: how micro actions combine to yield macro characteristics, and how micro actions are shaped and constrained by macro characteristics (Figure 4b). Liska applied Lazarsfeld and Menzel's schema, which described social units in terms of analytical (aggregate), structural and global (emergent) properties, to analyze the characteristics of social groups and collectives. The analytical property refers to the statistical aggregation of individual properties, such as the mean income and education level of a group. The structural property refers to relationships between individuals within a group, such as power and communication, and finally the global property refers to emergent social products, such as market prices, laws and language. Through these three phases, Liska highlighted the difficulty in explaining social behavior purely based on the actions of individuals, and the important role that aggregation and systematic approaches play when attempting to consider micro-to-macro effects. On the other hand, from a micro-theoretical viewpoint it is easy to put too much focus on the individual level, thereby overlooking independent contextual effects (aggregates, structural relations and global products), which explain a significant portion of the variance in a wide range of research areas.

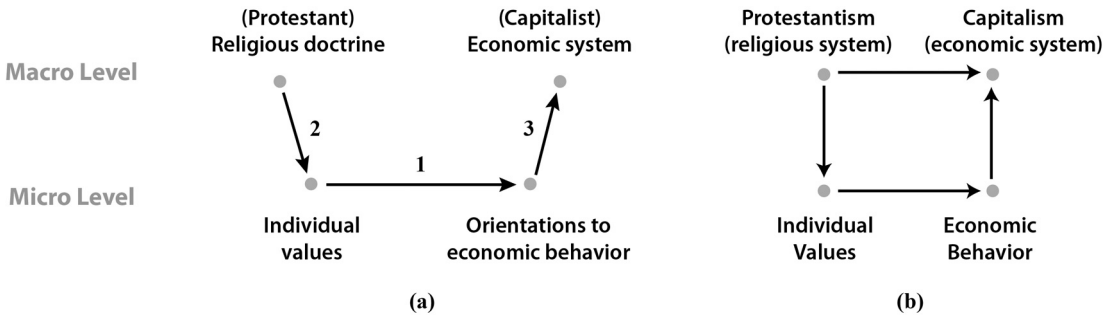


Figure 4. (a) Coleman's integrative model (redrawn from Coleman, 1987; Ritzer and Goodman, 2004). (b) Liska's macro-to-micro and micro-to-macro linkage (redrawn from Liska, 1990).

Like the linkage of the micro and macro levels, much research has worked towards unifying diverse social theories. For instance, Gurvitch (1964) has argued that social reality is concerned in numerous micro and macro levels (e.g. the particular groupings, social classes

and global society) and is involved in both mental and physical phases, such as values, consciousness, ecological surface, technical patterns and objects. Alexander (1982) developed a theory called multidimensional sociology, in which he considered both individual and collective levels, and instrumental and normative forms, to discuss social order and action problems in traditional sociological theories. Furthermore, to deal with the cultural issues in organizational studies, Morgan and Smircich (1980) compared diverse qualitative research approaches within social science, identifying their theories and ontological assumptions about human beings and their world, from subjective extreme to objective extreme.

Primarily influenced by the work by Gurvitch (1964), Ritzer (1981) developed a micro-macro integrative paradigm for social analysis, in which social phenomena are classified along two continuous dimensions: objective-subjective and microscopic-macroscopic. The objective-subjective dimension ranges from material phenomena such as behavior patterns and law, to nonmaterial phenomena such as individuals' perceptions and culture, while the micro-macro dimension ranges from individual thought and action to world-systems. As shown in Figure 5a, the macro-objective level (type I) covers large-scale material reality such as bureaucracy and technology, and the macro-subjective level (type II) represents collective nonmaterial phenomena such as culture and values. On the micro side, the micro-objective level (type III) shows small-scale, individual actions and behavior patterns, while the micro-subjective level (type IV) involves individuals' mental processes, including perceptions, beliefs and the facets of the social construction of reality (Ritzer & Goodman, 2004).

> The key to an integrated paradigm is the notion of levels of social analysis. As the reader is well aware, the social world is not really divided into levels. In fact, social reality is best viewed as an enormous variety of social phenomena that are involved in continuing interaction and change. [...] The idea of levels of social analysis employed here should be seen as but one of a large number of such schemas that can be, and have been, used for dealing with the complexities of the social world (Ritzer & Goodman, 2004:p. A-12).

Ritzer avoided favoring specific levels of social analysis. Following Gurvitch, Ritzer argued that social studies should focus on the influence between different levels, including both macro large-scale structural issues and individual behavioral studies. The integrative paradigm does not actually divide social reality into four quadrants, but reflects the complexities of the social world and theoretical diversity. The remainder of this section will attempt to evaluate the coverage of current design research methodology for IT development using this paradigm.

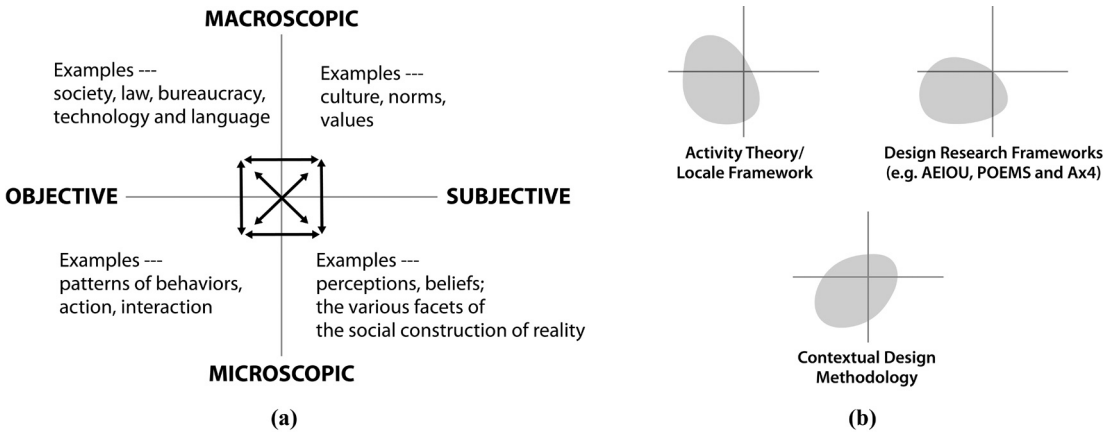


Figure 5. (a) Ritzer's major levels of social analysis (redrawn from Ritzer and Goodman, 2004). (b) Scopes of design research frameworks in IT development.

5.2 User-, Usage- and Activity-centered Design Frameworks

In the past decades, design research of information and system development has focused on interactions between human and machines. Based on the introduction of cognitive psychology, most studies have concentrated on mental processes and information flows, with the scope being achieving a task or solving a problem. Taking an example of Donald Norman's seven stages of action, which have had a lasting impact on usability engineering and industrial design, the analysis of human action is concerned in a loop of forming the goal, forming the intention, specifying an action, executing the action, perceiving the state of the world, interpreting the state of the world and evaluating the outcome (Norman, 1988).

Comparing this type of study, such as modeling cognitive and behavioral responses in HCI, with microsociological theories, they all focus on the interaction between individuals and environments (the interaction between Ritzer's type III and IV levels), and discuss how people perceive and interpret the outside signals and symbols and then take an action. However, there is a significant difference between social studies and design research. Although microsociological studies focus on individuals' actions, knowledge and experiences, they still mainly discuss social structures and shared meanings, which influence one's motives and intentions, and help people interpret the world. However, in technology development cycles, the concerns of social structures and cultural matters are extremely limited, and there is almost no consideration for the relations between macro level (e.g. social facts and religion in Ritzer's type I and II levels) and micro level (e.g. conditions of individual's action and personal attitudes).

The scope of design research in technology development expanded during the 90s from task analysis to more complex activity analysis. For understanding usage, many ethnographical research methods were borrowed from anthropology and sociology, such as interviews and long-term observation (Whiteside, Bennet & Holtzblatt, 1988; Wixon, Holtzblatt & Knox, 1990; Wasson, 2000). In addition, to support rapid design cycles, many analytic frameworks and models were developed to make user research more efficient, cheaper and deeper. These frameworks, such as *AEIOU* (activity, environment, interaction, object and user), *POEMS* (people, objects, environments, message and services), *Ax4* (atmosphere, actors, activities and artifacts), *Activity Theory* and *Contextual Design Methodology*, have been discussed and applied in various domains with great success (Beyer & Holtzblatt, 1997; Engeström, 2000; Wasson, 2000; Rothstein, 2001; Kumar & Whitney, 2003). Most of the frameworks provide clear guidelines and dimensions for investigating the entire activity context, including practical behaviors and actions, related objects, environment settings and information content, as well as taking account of relations among people. Therefore, they are located in the micro-objective quadrant of Ritzer's schema (shown in Figure 5b).

Among these research frameworks, contextual design methodology (Beyer & Holtzblatt, 1997) and Activity Theory have their specific advantages for both system development and other design practices. Contextual design methodology was developed based on research techniques of ethnography and was influenced by the development of participatory design techniques in the 1980's and 1990's (Garfinkel, 1967; Schuler & Namioka, 1993). It has a special purpose to help researchers and designers identify domain problems in rapid design cycles, especially for software and hardware redesign and usability evaluation (Curtis et al., 1999; Rockwell, 1999; McDonald et al., 2006). To help researchers and designers convey their domain knowledge, thoughts and ideas, Beyer and Holtzblatt developed five work models as a tangible representation for issues in different dimensions, including the flow model, cultural model, sequence model, artifact model and physical model.

> Contextual Design supports this need for a physical representation throughout the design process. Work models make work practice - how users approach their work - explicit, public, and sharable. The User Environment Design shows the structure of the system as experienced by the user. Each technique in Contextual Design has its own tangible representation that supports doing the work, capturing the result, and sharing it with others (Holtzblatt and Beyer, 2011).

The work models in contextual design highlight information flows, constraints and interactions among individuals, groups, objects and environments. Therefore, the models are positioned on the objective end along Ritzer's objective-subjective dimension; for instance, they describe macro-objective phenomena such as responsibilities of group members and micro-objective phenomena such as interactions between people and objects.

In addition, for developing a successful system, which can 'fit with the customer's culture, make conforming to policy easy and reduce friction and irritation in the workplace,' Beyer and Holtzblatt specially addressed the importance of understanding organizational culture. Their cultural model is similar to Erez and Gati's dynamic, multi-level model of culture, but concentrates on the inner levels, from individuals to organizational culture. However, as with the other cultural models developed for management and leadership, the scope of this model is limited to work-related influences, such as work pressure and requirements from one group to another. In addition, it does not reflect the depth of culture (Schein, 1990; Rousseau, 1990; Hofstede, 2001), such as how the activity context and culture influence individuals' values and norms. Despite its name, this cultural model is thus classified in the macro-objective quadrant of Ritzer's paradigm (Figure 5b).

Activity Theory, with its roots in 1930s Soviet cultural-historical psychology, was introduced and adapted into HCI and CSCW as a lens in ethnographic research (Nardi, 1996; Jonassen & Rohrer-Murphy, 1999; Engeström, 2000). To understand the mental capability of a single individual, Activity Theory considers a "goal-directed" activity as the unit of analysis, and provides an analytical framework to describe activities with three hierarchical constructs: subject, object and tool. In the theory, activities are described by how a single individual (subject) achieves a goal (object) through tools, and the use of tools reveals the details of both physical interactions and mental processes. Under this framework, a complex activity can be broken down into action or operation levels, and be analyzed from both behavioral and psychological viewpoints.

To deal with multi-user systems and collaborative work, Engeström (2000) later proposed an extended schema for Activity Theory with additional constructs of community (people who share the same goal), rules and division of labor. Engeström's schema (Figure 6) makes Activity Theory very useful in groupware and CSCW system design (Fjeld, et al., 2002; Bryant, Forte & Bruckman, 2005).

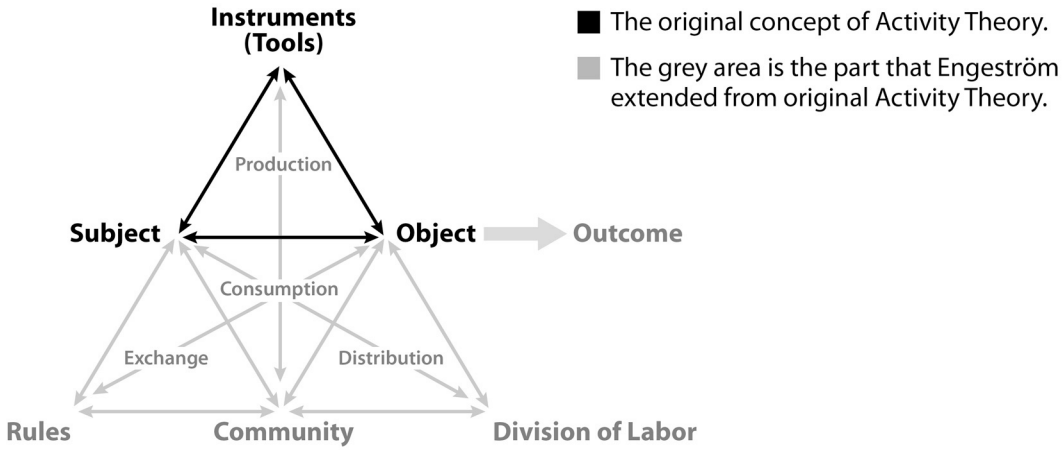


Figure 6. Engeström's structure of human activity (redrawn from Engeström, 2000).

Compared to Ritzer's integrative paradigm, the extended schema of Activity Theory details the relations between the micro-subjective level (individual's cognitive process and agency), the macro-objective level (social structure and rules) and the micro-objective level (tools and interactions), as shown in Figure 5b. However, the original theory was developed to analyze goal-directed activities, in which the community is defined as a group that shares a common motive (goal) and the context has to be work-related. In addition, it is still disputed whether or not Activity Theory is suitable for being directly applied to deal with multiple activities in the workplace (e.g. Strauss and Corbin's concept of working spheres) and people with different goals or other casual informal activities (Strauss & Corbin, 1998; Kaptelinin & Nardi, 2006; González & Mark, 2006). While considering the historical and philosophical background of the development of the theory, Diaper and Lindgaard (2008) have brought up several major issues of adapting and migrating Activity Theory from the Eastern communist society into Western CSCW and HCI contexts.

> [...] if Activity Theory is tied to a societal model that reflects the practices of a repressive police state, or a customer model of limited choice in command economy, then it may be completely unsuitable for application to private and public systems in a liberal Western democracy, no matter how flawed the latter (Diaper & Lindgaard, 2008).

With concerns similar to Activity Theory, Fitzpatrick (2003) has proposed the locale framework to bridge the social world and the technology supports. Fitzpatrick argued that researchers could account for social, locale and flexible actions and complex situations by analyzing different levels of scale and different types of space. For instance, she considered that a rich unit of analysis can provide contextual connections even with a narrow focus; the focus might be on a particular artifact but the artifact is necessarily understood within its

broader locale context. Although the locale framework details the important data that researchers should collect, what kind of methods and techniques should be applied to gain this information is not detailed.

5.3 Macro- and Micro-level Concerns for Social Interaction

Although the above-mentioned research frameworks, contextual design methodology and Activity Theory all provide clear guidelines for understanding users and usage contexts in rapid design cycles, I argue that there are several problems associated with directly applying them to deal with design for social interaction.

First of all, these frameworks are all developed for goal-oriented work-related activities. Although Activity Theory's extended schema takes social structures like community and rules into account, its primary focus is still on how individuals achieve goals. Similarly, in the flow model of contextual design methodology, actors are grouped by their responsibilities and functions in particular work practices, and the cultural model mainly represents influences and pressures in the work environment. In contrast, social activities such as family gatherings and maintaining contact with friends are not goal oriented and cannot be deconstructed into absolute procedures or sequential tasks.

Secondly, with the exception of contextual inquiry, none of these frameworks put any emphasis on identifying culture or social contexts (macro level). Design research frameworks like AEIOU focus only on a certain practice and activity: people, interactions, objects and environmental settings. In Activity Theory, culture is only concerned and represented as results and forms of practices. Like most microscopic theories, it avoids the concept that there is a preexistent social and cultural context that supports and constrains individuals' motives and behaviors. Contextual design attempts to highlight the importance of understanding organizational culture, but the model mainly represents influences and pressures in the work environments, without explaining how greater cultural contexts affect specific actions and interactions.

Third, current design methods do not seek out users' motives behind actions, hidden attitudes or values (micro-subjective level). Questions such as how people's social needs and requirements emerge from their social and cultural background are absent. In work-related or problem-solving system development, people's intentions are very clear, while in casual social activities they are far subtler and loosely defined. However, intentions and motives in casual

social interactions are contrarily elaborate and complicated, and the analysis of activities cannot be directed by specific goals. Therefore, understanding cultural and social backgrounds, which have long-term influences on people's motives, values and attitudes, becomes significant in service and experience design cycles.

From a micro-macro integrated viewpoint, individuals' social behaviors are largely governed by norms, religions and social and cultural contexts. In addition, the actions and interests of many will together form social agreement and macro phenomena like social trends. As Ritzer notes in regard to his four-level research paradigm, the relations between phenomena on both micro- and macro-levels are dynamic and mutually influential. To well support social interaction, service and experience design in the future, research scopes need to extend from traditional usability evaluation and user- or activity-centered studies, to larger-scale social and cultural issues. In other words, a micro-macro integrated research concern is needed to reflect the complexity of social interactions.

Most usability evaluation and usage-centered studies are highly capable of representing detailed micro-level interactions (e.g. how an individual interacts with objects and tools), and that context-based and activity-based design frameworks provide very efficient ways to capture the objective-level interactions (e.g. people's activities and relationships within a community and contexts). However, the social and cultural level and its bi-directional influences toward other levels are missing in these design frameworks. The following chapter will present the development of the *Multi-Level Social Activity Model* (MLSAM), which has a clear goal of identifying the social and cultural contexts and their influences on people's attitudes and behaviors. The strengths and limitations of applying MLSAM to bridge the gap between subjective-to-objective and macro-to-micro levels and to complement other design methods will later be discussed in Chapter 7.

PART III

AN INTERGRATED RESEARCH APPROACH

Chapter 6

DEVELOPMENT OF MULTI-LEVEL SOCIAL ACTIVITY MODEL

Part two showed the importance of an integrated view in social interaction design of micro-level phenomena (e.g. individuals' perceptions and actions) and macro-level phenomena (e.g. social trends and cultural contexts). This chapter proposes such an integrated approach which helps designers and researchers collect multi-level information in design research. This chapter also presents the development of a tool, the Multi-Level Social Activity Model (MLSAM), which is a central tool in this approach.

6.1 An Integrated Design Research Approach

Most of the methods, frameworks and models in user experience and service design were developed to support rapid design in IT development and to help development teams generate, convey and even evaluate design concepts. As mentioned in Section 5.2, these methods focus on solving domain-specific problems and on supporting and designing for work-related tasks. They are not sufficient to account for complex motives and reasons behind social activities and to help researchers understand how people's behaviors and attitudes are influenced by social trends and cultural backgrounds. For user experience, large-scale service, complex social media and adaptive system development, I argue that it is crucial to combine well-accepted design research frameworks with the Multi-Level Social Activity Model and other qualitative approaches, to gain deeper insights of larger contexts and usage situations. Therefore, an integrated process is proposed as follows:

Focus on a Certain Activity

The first stage is to understand the related micro-objective phenomena of studied social activities. As a pilot study, researchers can choose a representative activity, and apply common context-, user- or usage-centered research methods, such as contextual inquiry and activity theory, to capture events in great detail. In this stage, people who actually participated in the activity, objects, media, environmental circumstances and interactions are identified.

Extend a Contextual Scope

The second stage focuses on understanding the macro-objective phenomena, such as structure, cooperation and organization. The goal of this stage is to identify the flow of information and find the social network that is related to the activity in the pilot study. Through an iterative process, researchers can identify how both central and peripheral events, facts, and people are connected with each other and associated with the main activity. To avoid missing important details, I suggest applying traditional ethnographic approaches, such as interviews, shadowing, behavior tracing and self-documents in this stage. For social interaction and cross-cultural design, it is also a stage to observe people's social behavior patterns, norms and related cultural features.

Recognize all Participants

In this stage, people's goals, roles, interests and participation in the target activity should be clarified. This information can help researchers to further identify different participant types and identify potential users (the details will be presented in chapter 8). In this stage, it is recommended to conduct extended contextual inquiries, quick surveys and interviews. Graphs such as the contextual design flow model, are very useful to represent information flow, related participants and their behaviors.

Select and Focus

A workshop or a focus group in this stage can help development teams decide which types of participants should be considered as the target audience and to set clear priorities for design development. Once the user types are selected, traditional in-depth interviews and the multi-level social activity model (detailed in 6.3) can be used to capture deeper insights, including their expectations, motives and other socio-cultural concerns. In this stage, the detailed information in micro-subjective and macro-subjective levels should be identified. In addition, the multi-level social activity model can also help researchers understand the influences among different levels.

Portray Users

Several types of information revealed from the above-mentioned four stages need to be highlighted while portraying users. This information not only makes portraits serve the same purpose as user models and personas, but also make them include both macro- and micro-level socio-cultural information which can be reused in concept development and evaluation phases:

- Dynamic and micro-level demographic information: A portrait (it can be presented as a model or a document) should contain basic demographic information, such as age, gender, interests and income, which can represent a certain type of group and outline the user's image. However, different from the normal user profiling, I recommend that researchers emphasize information that help predict how attitudes and behaviors will change with shifts in the users' demographic data, such as the changing of IT consumption associated with increased income that follows naturally with increased age.
- Permanent and macro-level demographic information: The second type of information is about higher-level concerns, including users' attitudes, motives, beliefs and their socio-cultural background. This information is permanent and can enrich the design solutions and can help evaluate designs in different phases of design cycles and in different products development projects.
- Roles and interactions within networks: The information about the user's role, interactions, responsibility and purpose within the activity should be given. If there is a complex community and social network involved in the activities, both relationship and behavior patterns should be demonstrated.

Apply User Portraits in Iterative Design Cycles

User portraits can provide all members of a development team a thorough picture of different user types, their diverse perspectives and behaviors. Due to the information includes both high-level socio-cultural concerns and concrete interaction details, the portraits can help development teams generate more thoughtful ideas, brainstorm solutions and make better design decisions. In the following phases of presenting design concepts, including prototyping, developing scenarios and storyboard, user portraits serves as personas, reflecting real users' lifestyles and usage situations. They also help engineers and developers consider most likely use cases and prioritize important features, and reduce the complexity while supporting cross-platform interactions and adaptive systems. In the end, portraits can be used to plan rapid user testing and design evaluation.

To support the argument that design for social purpose needs both macro- and micro-perspective and understanding of social phenomena and to develop a necessary tool for the proposed integrated approach, a field study looking at traditional social activities in East Asia was conducted using multiple user experience research methods, including practical observations and in-depth interviews by undertaking contextual design methodology and

grounded theory analysis. Through the expensive and iterative ethnographic approach with long-term involvement, the abundant cultural features involving and influencing people's social lives are revealed in the case study, which also reflects and matches Ritzer's four types of social phenomena.

Comparing the contents of contextual design work models and thick description (Geertz, 1973; Myers, 2000), what type of information is not covered and highlighted in current design frameworks will be discussed, and a design research tool, multi-level social activity model, is developed to help researchers and designers collect and present this information. In the summary of this chapter, the potentiality to use this model to complement the other research methods for social interaction design will be presented.

6.2 A Case Study of a Traditional Social Event

With the hypothesis that social activities are inherently embedded in a socio-cultural context, a field study of one of Taiwan's most traditional social activities, the tea ceremony, is presented in this section. Through understanding of this typical local custom, I try to identify the abundant cultural components that influence people's social lives, attitudes and behaviors, and to show how a social event is inherently grounded in a historical cultural context and modified by social trends.

The tea ceremony in Taiwan was once a striking local activity that was considered important for social contact and that represented a sense of leisure and affluence. It also connoted a particular philosophy of life, one that emphasized such qualities as propriety, refinement, and grace. However, tea ceremonies, like traditional customs of most Asian countries, have been dramatically impacted by industrialization, urban modernization, globalization, and the widespread adoption of emerging technologies. As discussed in Chapter 2, technologies designed for social interaction and communication are rarely adapted to local and cultural values and norms.

This section presents a study, in which we apply user experience design research methods with a traditional ethnographic approach to reveal individuals' diverse perspectives and attitudes toward Taiwanese customs of making and drinking tea, and show the ceremony's historical roots in social and cultural contexts. In adherence with contextual design methodology, five consolidated work models are developed to capture the details of the activities surrounding a tea ceremony, such as how people behave and interact in various

situations and how current information technology affects this type of local tradition. In addition, through in-depth interviews, observations and grounded theory approach, significant cultural features behind the social activity are identified. In section 6.3, I propose a multi-level social activity model, which is a meta schema developed through comparison of the contents of the five work models and the complete information gained by the traditional ethnographic approach. In addition, how the model can help researchers and designers identify cultural issues and gain incentives in design practices will be presented.

6.2.1 Background

As per the discussion in chapter 4, the cultural rituals and local traditions of most Asian countries, including Taiwan, have been slowly disappearing due to the introduction of the Internet and communication technologies (ICT) and globalization. However, people's daily behaviors and norms are deeply rooted in inherent and cultural connotations. For instance, politeness and manners are different from one culture to another but are easily overlooked in IT product development. The aim of this study is to try to highlight the inherent and substantial values of traditional folkways so that they can be used to enhance both traditional customs and social technology design in the future.

In the past, many traditional customs enhanced interpersonal relationships in various phases. People became acquainted with each other and cherished each other through the conversations and face-to-face interactions during these activities. For instance, in China, people could easily make new friends or meet with acquaintances in teahouses. They appreciated the fresh taste, pleasant aroma and mental alertness that tea provided, and they also enjoyed comparing their tea collections and practicing the artistry of making tea. Hence, tea ceremonies in China and some eastern Asian countries have always been thought of in relation to art and traditional conventions, as well as in relation to social events (Kumakura, 2002).

In the 1970s, tea ceremonies in Taiwan again became popular. It represented the leisure and prosperity of Taiwanese society. Middle-aged and elderly Taiwanese would have their teatime as a leisure social activity at parks or temples where they were able to make new friends or chat with acquaintances. At the time, Taiwanese unique tea ceremonies had started being developed. It reflects a philosophy that seems to place value on refinement and elegance, social life and one's relationships with his/her natural environments (Wicentowski, 2000).

Recently, with the reports on the medical benefits of green tea, tea drinking is considered as a healthy habit and has become attractive to people of different ages (Blofeld, 1985; Song, 1994). Many people try to relieve their work stress, tension and anxiety through participating in tea ceremonies, having slow communication and developing a new lifestyle. In addition, many people consider that the revival of tea ceremonies reflects a local reaction against the dramatic influence of Westernization and globalization. It contains both tangible and intangible cultural properties that should be protected and maintained (Gang, 2007). In this study, the details of Taiwanese tea ceremony phenomena, including its procedure, tools and participants' perspectives and expectations on the activity will be revealed.

6.2.2 Method

This research aims to comprehend the thorough context of the tea ceremony, including individuals' behaviors, perspectives, overall activity circumstances and its social background. Since the research has the purpose of revealing the hidden information that current design frameworks do not cover, we apply multiple user experience research techniques, which include practical observations and contextual inquiries (Holtzblatt & Jones, 1993; Kuniavsky, 2003). In addition, the literature review of online documents, newspaper and academic publications and the in-depth interviews are collected and encoded by following grounded theory, a systematical qualitative approach (Strauss, 1987; Strauss & Corbin, 1990).

In order to identify the significant meanings of the tea ceremony for different generations, three subjects of different ages were recruited for the study. The subjects were a retired senior citizen, a middle-aged parent and a master's student. Each had more than ten years of experience taking part in the Taiwanese tea ceremonies and each had made tea at least once a week in recent months (Appendix I). To observe the detailed social interaction within the activity, the subjects' family members and friends, who often have a tea ceremony with the subjects, were also asked to participate in the sessions of observations and contextual inquiries (Huang & Deng, 2007).

Contextual design methodology was applied as guidelines to observe and analyze the entire process of a tea ceremony, including detailed interactions, information flows, objects and physical space (Beyer & Holtzblatt, 1998). As the introduction in chapter 5, contextual design methodology is prompt and efficient in studying work practices. It provides researchers a clear framework to investigate an activity; for example, some social interactions can be discovered through developing the flow model, and social influences among

participants can easily be presented by using the cultural model. In addition, these models provide a concise image for both researchers and designers that help them understand the overall activity and identify enormous problems within the context.

On the other hand, to attain a thorough understanding of the different generations' perspectives and attitudes toward Taiwan's tea ceremony circumstances and customs, the in-depth, open-structured interviews with our three informants have been conducted. The discussion issues included the informants' motives to participate in a tea ceremony, emotional perceptions and the experiences that they have had in relation to special companies, space and tea drinking/brewing tools. The interviews were also made into meanings of tea drinking customs, particular impressions of others in a tea ceremony and reflections on the literature review results (e.g. Chinese philosophy and Zen Buddhism).

An affinity diagram and five consolidated work models were developed to show overall context, different types of usage problems and design issues in tea drinking/making activities. All the data, especially derived from in-depth interviews, were interpreted and encoded with Nvivo (Gibbs, 2002; Bazeley, 2007), following the iterative qualitative research process of grounded theory. The findings are presented into two parts: Section 6.2.3 highlights usage problems and issues in a tea ceremony through the five consolidated work models. Several issues of applying these models directly to investigate social activities will also be discussed. Section 6.2.4 offers a thorough explanation of current tea drinking/making phenomenon in Taiwan.

6.2.3 Contextual Inquiry: Problems and Concerns

In the contextual inquiries, significant findings have been found for each case with regard to social communication, relationships, personal perspectives on tea making/drinking culture and diverse circumstances of tea ceremonies. The results present an overall portrait of the tea ceremony in Taiwan. The consolidated work models have been integrated from the five work models of each informant.

Consolidated Flow Model

The flow model (Figure 7) presents people's formal and informal roles and responsibilities in the activity and their communication ways. The roles involved in the overall tea ceremony activity include the host, family members, colleagues, friends, hobbyists, tea sellers, tea producers, and tea connoisseurs. The information center is identified as correlative books,

newspapers, magazines and teaware. In most cases, only one person plays the role as the host, who is in charge of making tea and serving it to all other participants (the detailed procedure of making and serving tea will be presented in the consolidated sequence model). In the study, it is also noticed that the head of the household often plays the role of the host. The major activities of the other participants are drinking tea, chatting with others and livening things up.

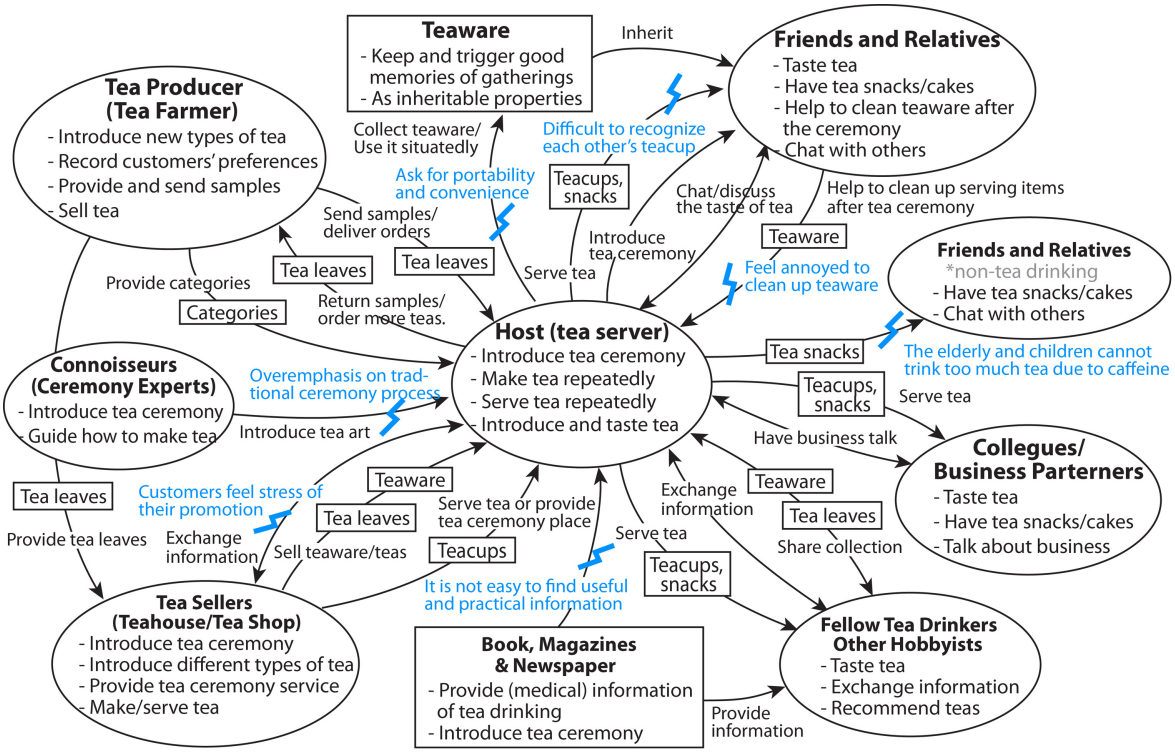


Figure 7. Consolidated flow model

In the model, the arrows explicate the communication patterns between participants; the problems emerging in the activity are highlighted with a thunderbolt symbol. What younger family members mostly dislike is that they are often asked to do dishes and cleaning up after tea ceremonies. While drinking tea, the main problem for participants is the difficulty recognizing their own teacup since the host has to repeatedly retrieve all the cups and to pour anew for everyone at the same time.

Within an extended context (before and after a tea ceremony actually takes place), hobbyists and tea producers tend to exchange information and sentiments with the host about the new types of tea leaves and techniques of making tea. Although books and magazines also contain enormous information about tea ceremonies, the informants in the study have expressed that this type of knowledge is often limited and impractical due to the fact that making tea itself is a very situated procedure. For instance, the best water temperature for brewing different types of tea leaves is different and often depends on individual preference

of the taste. Moreover, the informants have shown that they would not consult any professional tea-related knowledge with tea sellers because of the pressure to purchase the goods. Some informants have also shared their unpleasant experiences with tea connoisseurs, who often overemphasize tradition and insist on undertaking a formal and complicated tea making ceremony.

As shown in Figure 7, the flow model highlights the problems associated with interactions and communication among entities, participants and information exchange. These types of problems are very clear and applicable for redesigning and improving current activity contexts, since they directly emerge from interactions and communication flows. However, it is difficult for researchers and designers to identify the problems that appear due to the lack of an interaction and communication channel. For instance, we have noticed that young participants of ages below 30 do not receive tea-related information from newspapers and magazines since they have a different media usage and dependence. Although they have interest in learning the ceremony and exploring different types of tea leaves, they have no contacts with tea producers and sellers. This type of problem is not about usability within the activity but is still related to communication and information accessibility (the detailed discussions of identifying this type of problem will be presented in Chapter 8).

Consolidated Sequence Model

Table 1 shows the consolidated sequence model, which presents the typical process of the Taiwanese tea ceremony. The primary actions include arranging the teaware (set), boiling water, controlling the temperature of hot water, warming the teaware, scooping tea leaves, rinsing tea leaves, brewing tea, pouring and serving, smelling and tasting the tea. According to the interviews, people do not always follow the formal process and use the whole teaware to make tea. For instance, two of our informants have mentioned that sometimes they do use mugs instead of the tasting cup (sipping cup) to drink tea. In many cases, they tend to smell the tea fragrance directly from the tasting cup instead of using the aroma cup (fragrance cup). Table 2 shows that most problems take place in the steps of controlling the temperature of hot water and controlling the brewing time, which require considerable experience in brewing tea and familiarity with different types of tea leaves.

Table 1. Consolidated sequence model

Activity	*Intent*	*Abstract Step*
Arranging the teaware	• Smooth the process of tea ceremony	~ Arrange teaware • Place the tea tray, teakettle, hotplate and teaware.
Boiling water	• Prepare for brewing tea	• Fill teakettle with water • Use a hotplate to boil water
Pouring boiled water into a thermos	• Control temperature of boiled water	~ Pour boiled water into a thermos • Wait for boiled water to cool down
Warming the teaware	• Warm and sterilize the tea vessel, aroma and tasting cups • Keep teaware sanitary	~ Pour hot water from a thermos into the tea vessel • Pour hot water from the tea vessel into each tea cup in order • Empty the cups onto the tea tray
Scooping tea leaves with a tea-ladle	• Attain proper amount of tea leaves • Keep the tea caddy dry • Observe the hue of tea	~ Scoop out proper amount of tea with a tea-ladle • Put tea leaves on a small dish • Observe the hue of tea leaves • Put tea leaves from a small dish into the tea vessel
Rinsing tea	• Remove impurities from tea leaves • Heat the tea vessel • Keep the vessel sanitary	~ Pour hot water from thermos into the tea vessel ~ Wait for the first steeping • Stir tea leaves in the tea vessel with a stirrer • Empty the tea vessel onto the tea tray
Brewing tea	• Control the strength and the taste of the tea	~ Pour hot water from a thermos into the tea vessel ~ Wait for the second steeping
First serving	• Make sure each cup of tea is of the same taste quality	• Pour the tea from the tea vessel into each aroma cup (fragrance cup) in order • Pour rest of tea into a tea pitcher • Serve the tea to all participants
Initial tasting	• Ascertain the taste	~ Smell and taste the tea • Cover the aroma cup with a inverted tasting cup (sipping cup) • Hold the pair of cups together with thumb, forefinger and middle finger • Flip over the pair of cups (let the aroma cup face down inside of the tasting cup) • Lift the aroma cup vertically and leave the tea in the tasting cup • Waft the aroma cup to give it some air • Smell the tea fragrance from the aroma cup • Sip a little of the tea from the tasting cup
Repeatedly brewing tea and serving	• Control the strength and the taste of the tea • Make sure each cup of tea is of the same taste quality	• Boil water • Pour boiled water into a thermos • Wait for boiled water to cool down ~ Pour hot water from a thermos into the tea vessel ~ Wait for the steeping ~ Retrieve all the tasting cups and to pour anew for everyone at the same time • Serve the tea to all participants

Table 2. Problem breakdown using consolidated sequence model

Activity	*Step*	*Problem (Breakdown)*
Arranging the teaware	• Place the tea trolley, teakettle, hotplate and teaware	A high-quality wooden tea tray is suitable for a pottery (or porcelain) teaware in terms of Chinese aesthetics and the nostalgic and traditional style. However, the informants have mentioned that the wooden tea tray is generally too heavy to use, to clean up and to move around. A stainless-steel tray is more functional, convenient and practical, but unsightly and unsuitable for the rest of the teaware.
Pouring boiled water into a thermos	• Wait for boiled water to cool down	It is very difficult to know the actual temperature of water in the thermos and to know what is the best water temperature to steep certain types of tea leaves.
Warming the teaware	• Pour hot water from the tea vessel into each tea cup in order	It is difficult to hold the tea vessel when it is filled with hot water.
Scooping tea with a tea-ladle	• Scoop proper amount of tea with tea-ladle	It takes experience to know how much of the tea leaves to scoop out of the caddy.
Brewing tea	• Wait for the steeping	It is very difficult to control the brewing time. It takes experience and concentration to ensure proper and consistent quality for each round of brewing tea.
Repeatedly brewing tea and serving	• Retrieve all the tasting cups and to pour anew for everyone at the same time • Serve the tea (cups) to all participants	It is difficult for participants to recognize their own teacup after the host retrieves all the cups to pour anew for everyone at the same time.

Consolidated Cultural Model

The cultural model presents the different types of influences between participants and community; the arrows represent the directions of influence and how pervasive each influence is. As shown in Figure 8, the consolidated model shows how traditional Chinese tea culture and social phenomenon affects the development of the *lao-ren-cha* custom in Taiwan. The model also illustrates how the tea making custom spreads from countryside to the city and into people's daily lives, and how the custom is passed down from one generation to another. People who are fond of tea ceremonies may influence and convince their friends or family members to form a tea drinking habit, and it is expected that more and more people will start becoming interested in tea ceremonies. Furthermore, there are some features that make tea drinking attractive to people, such as the health benefits of green tea, the promotion of mental alertness that it offers and the physical relaxation of the tea ceremony activity. Based on the interviews, some families continue this tradition due to it providing an intimate social context, in which family members have chances to talk and share their feelings.

While consolidating the cultural models of each informant's case, it is noticed that when researchers are building cultural models for a complex social activity, they tend to add all types of influences to the model. According to contextual design methodology, the cultural model captures culture and policy that constrain how work is done. It shows how people are constrained and how they work around those constraints to make sure the work is done. However, the consolidated cultural model of the Taiwanese tea ceremony is not completely developed by following the instructions of contextual design methodology. Instead of emphasizing the constraints and influences between people, groups and organizations, the researchers have focused on highlighting the historical transition and how the social and cultural contexts influence people's attitudes and behaviors. The detailed discussion of the content and presentation of a cultural model will be discussed in the section 6.3.

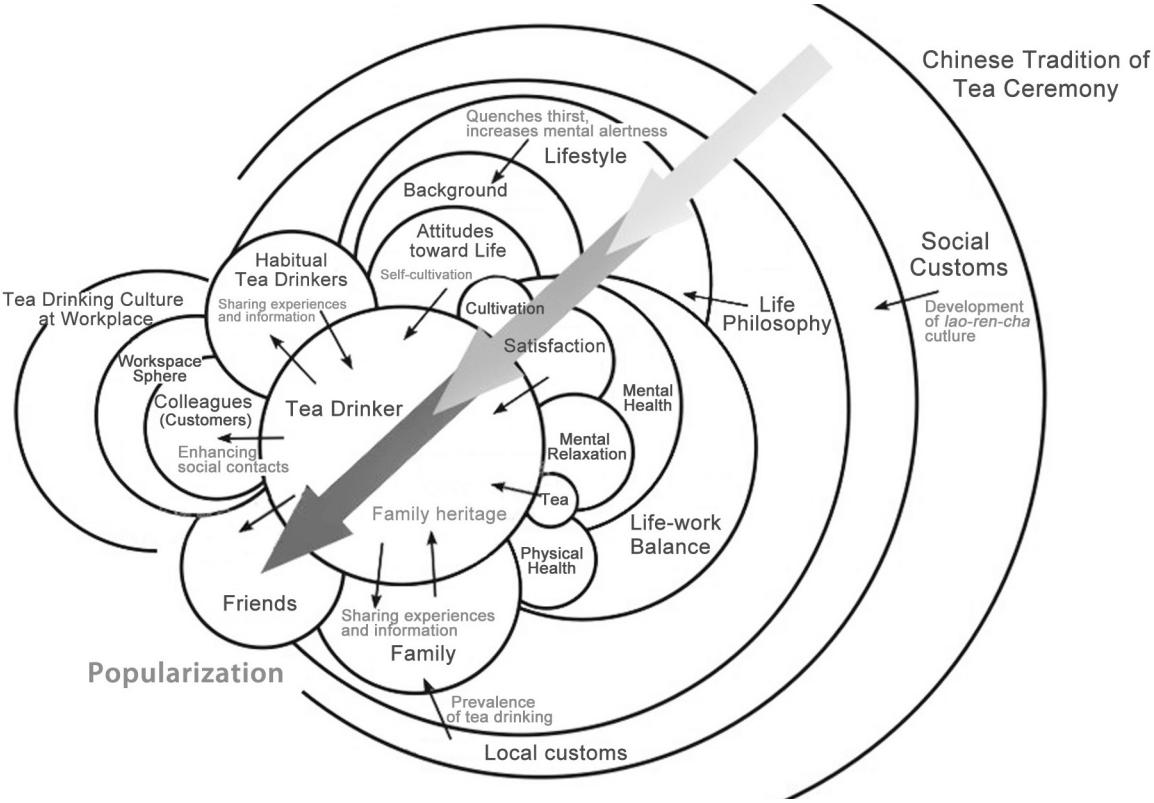


Figure 8. Consolidated cultural model

Consolidated Artifact Model

The artifact model presents how artifacts are created and used in an activity, which can reveal how people think about their work, the concepts they use and how they organize them to get the work done (Beyer & Holtzblatt, 1988). In our case, the consolidated artifact model represents the trace of a tea ceremony: people's needs and expectations of the activity, and meanings and usage problems of each object.

There are some unique artifacts that are only used in the Taiwanese tea ceremony (Figure 9). Each participant is normally given a pair of teacups, a *tasting cup* (as known as a sipping cup or tea bowl) and an *aroma cup*. A tasting cup is a small bowl without a handle, which is used to drink the tea. Compared to a tasting cup, an aroma cup has a deep, thin and cylindrical shape. An aroma cup is also called a fragrance cup, scent cup, or sniffer cup, and it is used to keep the fragrance of tea and allow people to enjoy the scent. A *Tea draining tray*, also known as *Tea Tray* and *Tea Sea*, is a tray used to contain the wastewater and excess tea. As in the above-mentioned process of brewing tea, the host has to warm the tea vessel and cups in hot water for preparation, and the first steeping is used to rinse tea leaves only. The tea draining tray therefore is used to contain the wastewater and tea. Sometimes it has a grate in the top and a hose linking to another bucket, which allows waste liquids to be drained away. Due to the difficulty controlling the temperature of water and the duration for brewing tea, many objects have been observed in the study, which are not part of traditional tea ceremonies, such as a timer, electric kettle, hotplate and thermometer.

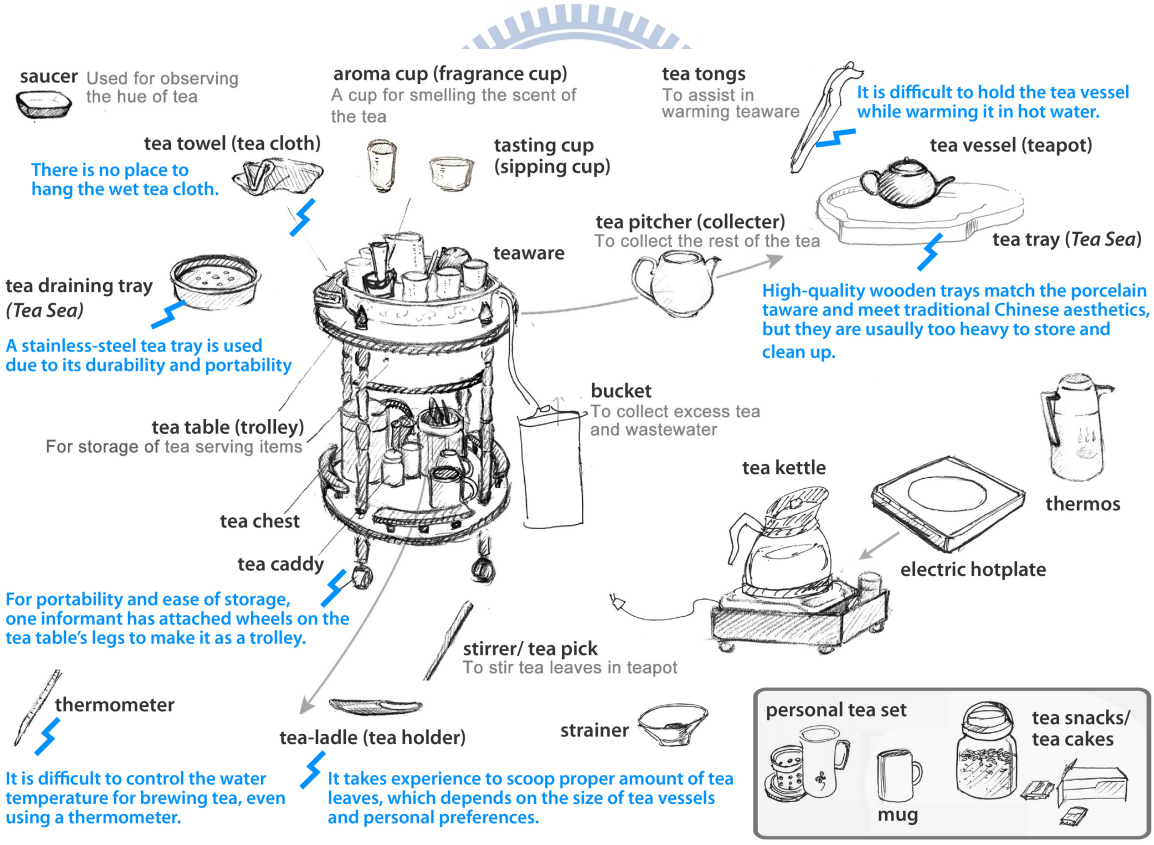


Figure 9. Consolidated artifact model

It is also noticed that tea vessels normally mean a lot to people. Some people tend to collect tea vessels, and even give each of them different name. The younger informant has mentioned that she was promised and looking forward to inheriting some antique and fine teaware from

her father. According to all the interviews, tea vessels often play important roles as memory keepers and memory triggers in the social gatherings. For instance, one informant likes to travel with friends and always brings a set of teaware. He has mentioned the teaware as souvenirs; by looking at these vessels on exhibit in the cupboard, he is able to recall the details of each trip.

People meet particular and manifold problems during a tea ceremony, and the artifacts that they create and use to facilitate the process of brewing tea are varied. For instance, one of the informants uses a stainless-steel tea tray instead of traditional wooden ones due to its durability and portability, although he has also mentioned that a high-quality wooden tray would match his porcelain teaware more and meet traditional Chinese aesthetics. For higher portability and ease of storage, one informant has attached wheels on his tea table's legs to make it a trolley. Another informant uses a storage cart to carry the tea tray and other teaware. In the inquiries, the informants have mentioned that tea drinkers are not always fastidious about the art of tea but look for practicality and durability.

Consolidated Physical Model

The arrangement of an appropriate physical environment assures a smooth proceeding of a tea ceremony. As the detailed activities listed in the consolidated sequence model, the first preparation of a tea ceremony is to place the tea tray, teakettle, hotplate and teaware in the right place. Since the whole ceremony involves a great number of items and a complicated, iterative process, it becomes important for the host to locate all items within a hand-reachable distance and to avoid these items obstructing the tea serving routines.

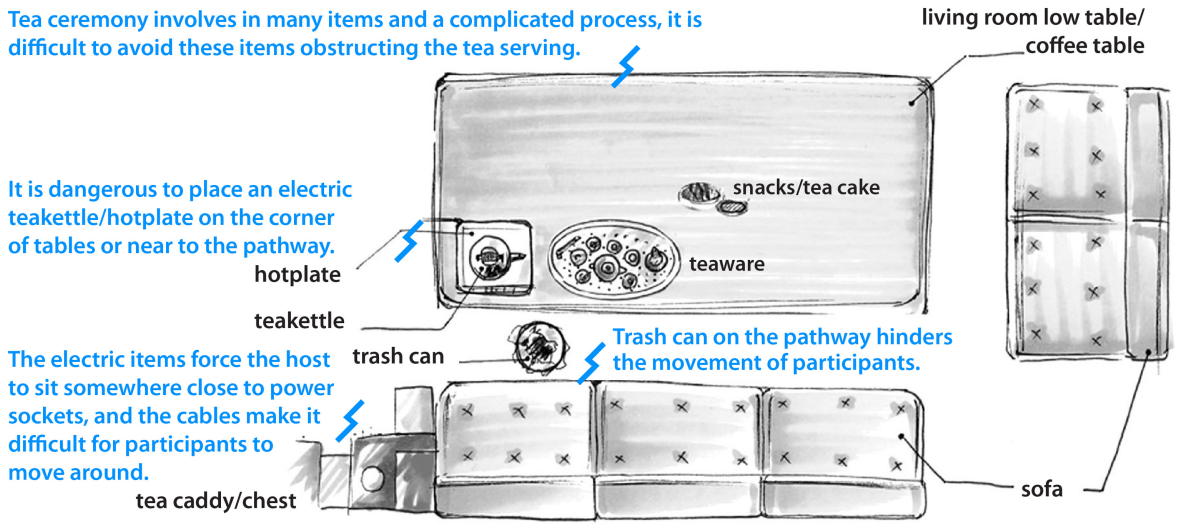


Figure 10. Consolidated physical model

As shown in the physical model (Figure 10), all informants use either an electric hotplate or an electric teakettle to boil water, so that they do not need to go to the kitchen and use the stove repeatedly. However, these electric items force the host to sit somewhere close to power sockets, and the cables make it difficult for participants to move around. In addition, the middle-aged informant has pointed out that boiling water directly on a living room low table or on an end table could be dangerous since his young children often play around during the tea ceremony. In addition, all informants have mentioned that they prefer to have the tea ceremony in traditional, nostalgic and Chinese style environments or even in nature. One of the informants makes his roof garden specified and equipped for tea ceremonies and has furnished it with wood and bamboo. Two informants go to the teahouses with friends and family, and sometimes picnic and have a tea ceremony in the countryside.

6.2.4 Today's Tea ceremony Phenomenon in Taiwan

The qualitative data gained from both the contextual inquiries and in-depth interviews were firstly debriefed in an affinity diagram (Beyer& Holtzblatt, 1999) and then encoded and interpreted, word by word with Nvivo, a qualitative data analysis computer software application (Gibbs, 2002; Bazeley, 2007). The whole analytic process follows the systematic iterative process proposed in grounded theory (Strauss, 1987; Strauss & Corbin, 1990). The results and main issues of the tea ceremony phenomenon are summarized in the following text. At present, tea drinking/making gradually has become a widespread leisure activity among people of different ages in Taiwan. In this study, we have found that the ceremony serves two purposes; the first is that it represents a traditional Chinese lifestyle, *Zen Buddhism* or philosophic *Taoism*, which looks for the essence of nature, balance and individualism. Secondly, tea ceremonies have a social purpose to enhance personal relationships, including both uniting family members and enhancing business partnerships.

Attitudes toward the Tea Ceremony

In China, the custom of tea drinking began 2000 years ago. Due to its sweet and fresh taste, elegant aroma, thirst-quenching properties and the medical fact that it can increase mental alertness, tea was the most common drink around the 8th century in China. Many teahouses were built for people to taste tea, meet with friends, socialize, listen to music, appreciate poems and drawings, or enjoy the natural beauty (Wicentowski, 2000; Kumakura, 2002).

In the 1970s in Taiwan, tea ceremonies became common activities of the elderly for healthy and social relaxation. In the countryside, senior citizens shared tea leisurely at parks,

under trees, or in front of temples, repeatedly pouring the steeped tea for each other from a small tea vessel into small pottery cups, chatting and whiling away the whole afternoon. The tea drinking/making activity was a long drawn out and time-consuming affair. This particular way of making tea is called *gong-fu-cha* in Chinese, "tedious and time-consuming tea," or *lao-ren-cha*, "tea of the elderly," which infers its long and complicated process and that only the retired people will have enough time to enjoy tea in this way. During this period, the specific procedure, equipment and unique teaware for making/appreciating tea were developed in Taiwan, which are significantly different from tea ceremonies in Mainland China and in Japan. Some significant activities of the art of tea have been formed, such as examining and appreciating different types of tea vessels and competing for teas.

On the other hand, for the elderly, a tea ceremony functions as a way to enhance and to maintain their social relationships with friends and neighbors. In the 1980s, tea drinking started being popular among different age groups and the ceremony itself became a part of common practices in many people's daily lives. While having a meal, tea is served with multiple purposes: helping digestion, enhancing social interaction and relations, and relieving stress. The Taiwanese tea ceremony therefore is no longer an activity that concerns mainly the art, but also presents a social, casual and balanced lifestyle. Although the ceremony has been a tradition passed on from one generation to another, it is noticed that different generations have very different expectations and attitudes today. For the elderly, *lao-ren-cha* culture still represents a rich and fertile agricultural era in Taiwan, but for the middle and young generations, the ceremony is an activity to escape from the anxiety, worry and stress of modern life:

> …Certainly we have knowledge to master the best temperature for brewing tea, to identify different types of teas, or to treasure the teaware. However, we are seldom fastidious about this… What we appreciate and love in tea sharing are the interactions among friends and family members, enjoyable gatherings, and a genial ambiance (Quote from in-depth interview, subject B, translated from Chinese)

> Tea ceremonies are such an important part of my daily life and one of my routine family activities…my parents are not particularly concerned about the brewing of the tea itself as I serve it to them. In my opinion, the purpose of tea ceremonies for my mother is to get the whole family together and make small talk to keep very close relationships among family members (Quote from in-depth interview, subject C, translated from Chinese).

The formal method for brewing tea is not always followed by Taiwanese today, and a lot of details are left out. As above-mentioned, aroma cups and heavy-solid tea trays made by phoebe woods are no longer popular. When it comes to teaware, people look for one that is functional, practical and suitable instead of something that reflects traditional Chinese aesthetics. In addition, because of rapid social change, people live at a fast pace, and the meaning of having a cup of tea casually becomes very different from what it was in the past. Tea ceremonies represent the concepts of work-life balance; they help people relieve work stress and enrich daily life by shifting attention from work to natural beauty, relaxation, and physical and mental health.

> …Sometimes we have a family travel to the west coast by car. Once we find a nice scenic place, we'd park the car, bring the teaware and picnic on the spot. It is very leisurely, comfortable and far from madding crowd. […] To share a pot of tea with family in nature is so lovely. We'll just sit on the bast-mat and start making tea. You can smell the fresh air and easily escape from the hustle and bustle of urban life (Quote from in-depth interview, subject C, translated from Chinese).

> The tea ceremony for me is just like playing tennis, hiking, or doing some exercise. It is a break, which improves my health and mood. […] Therefore, I strongly encourage people to have a tea ceremony in their casual time. Since it requires full concentration, you will feel calm, vital and peaceful after a while. (Quote from in-depth interview, subject A, translated from Chinese).

In the past thousand years, the Chinese tea ceremony has emphasized the art of tea, including the performance and style. However, people participating in the Taiwanese tea ceremony today have focused more on inner serenity and balance. Most participants in the study considered that making tea and chatting with friends in a slow pace brings physical and mental relaxation and makes them more concentrated, patient and perseverant. It is a regime to learn an earnest attitude toward life.

Social Interactions and Relationships

Tea ceremonies always go along with other social activities. Friendly and frequent social interactions are undertaken during the process of serving and tasting tea in very natural ways. According to the interviews, different types of social gatherings and even business meetings can be improved by performing a tea ceremony. It has been found that doing tea ceremonies can enhance people's social relationships in three different phases: it helps a person expand his/her social relationships, it maintains social ties with both work partners and close friends and it enhances the cohesion and identification among family members.

In the interviews, the informants have mentioned that many Taiwanese truly enjoy entertaining their friends by serving tea. If the host's brewing skills can gain guests' praises, it will be a great honor. In addition, there is a concept, a type of courtesy, of making new friends through serving good tea and through introducing each other's tea and teaware collection. For instance, one of the informants has mentioned that he enjoys serving his collected, precious tea to his clients and partners. It not only brings him great success in business but also allows him to make more friends: people who are getting interested in tea ceremonies.

Tea ceremonies also increase more intimate interactions among people. Many interactions between guests and hosts take place in the process of making, brewing, serving and tasting tea, passing and sharing tea snacks. Participants can express their cares and concerns for friends through conversation, slight gestures, or facial expressions during the ceremony. These well-meaning actions also make people more open-minded and enhance the friendships. In addition, all informants in the study have emphasized that tea ceremonies strengthen the identification and connections within their family and provide a proper way for people to show regard to their family members. Due to rapid social change in Taiwan, people are struggling with the hustle and bustle of modern society and have begun to cherish any opportunity to spend time with family members.

> I can relax my mind by having a cup of tea and chatting with my parents. It's such a leisurely activity. As time passes, having tea with my family has become a lovely routine. I can have some small talk with my family member. […] It's quite different from other family activities. If you're just sitting next to your parents and watching television, you might have no conversation with each other at all. But we are always bound to have an intimate talk when we are sharing a pot of tea (Quote from in-depth interview, subject C, translated from Chinese).

> I invite friends to have tea ceremonies at my place about three to four times per week, and my neighbors also come here to have a cup of tea after lunch, almost everyday. It has become a routine, to have tea ceremonies together. […] Sometimes if we (the informant and her parents) feel that the people at the table are not enough, we will make phone calls to see if anyone wants to join us. (Quote from in-depth interview, subject C, translated from Chinese)

Today, tea ceremonies play different roles among people of different ages, and they reflect the changes of social phenomena and values. This thousand years old traditional custom is now enjoying a revival. In terms of people's varied needs and new expectations, designers clearly have a chance to rethink the meanings of these different types of traditional social activities.

In conclusion, the overall activity context of tea ceremonies and the participant's

perspectives are explored in this study. However, comparing the contents of contextual inquiries and in-depth interviews, the five consolidated work models do not go far enough in pointing out the significant cultural and social features within tea ceremonies, and do not provide a clear guideline for researchers and designers to obtain the knowledge and then to apply it in design practices. In the next section, to take account of both social and cultural context and individual's perspectives in design research, an multi-level model is introduced.

6.3 A Multi-Level Social Activity Model

A brief introduction of tea ceremonies in Taiwan and many significant features and central values of this activity are presented in the previous section. Through the thorough investigation of this traditional social ritual, some social and cultural phenomena within the activities have been identified, and the five consolidated work models illustrate the detailed tea ceremony context, including information flow, interactions among participants, tools, artifacts, surrounding environments, as well as the potential problems that can occur during the course of the activity.

As mentioned in 6.2.3, while our researchers developed the cultural models for each informant in adherence with contextual design methodology, it has been noticed that they tended to add additional information and notations to enrich the model's contents, such as how the cultural background influences people's attitudes and life philosophy, and how the social trends and media encourage people to drink tea (highlighted in blue in Figure 11). As per the discussion in Chapter 5, contextual design methodology has its roots in analyzing and supporting work-related activities, and the cultural model was developed for representing organizational culture and work-related influences among people and management. Therefore, the extensional notations made by field researchers will be continuously found whenever they apply the method to analyze social or non-goal oriented activities.

Although the extended consolidated cultural model for tea ceremonies (Figure 8) has shown more historical influences among entities, through comparison between its contents and the results of in-depth interviews, some social and cultural issues are still missing. For instance, there is no information about how people behave properly and politely according to the culture and existent social norms. In addition, most influences and problems presented in the cultural model are not specific enough to be taken into account in design practices.

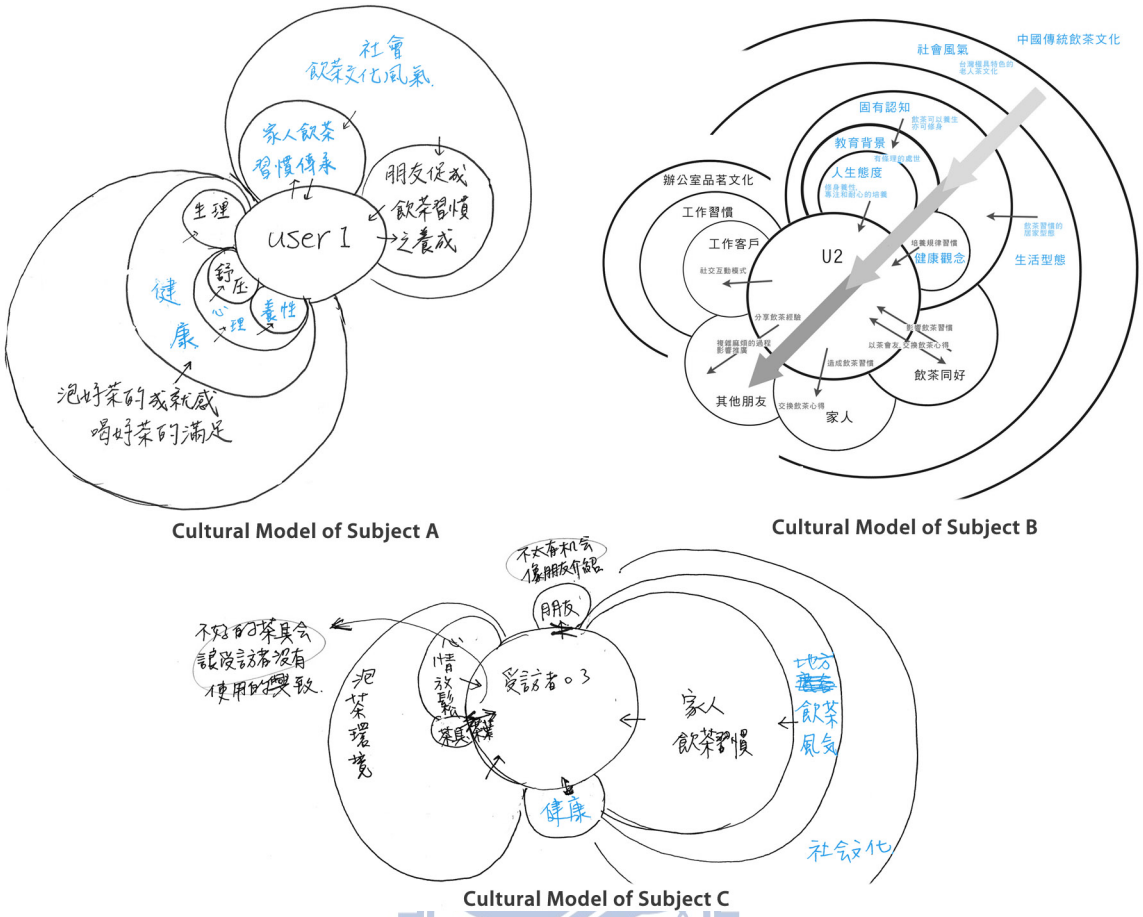


Figure 11. The cultural models for each informant with the additional notations.

To complement current design research frameworks, especially the five work models in contextual design methodology, a meta schema, multi-level social activity model (MLSAM), for presenting socio-cultural contexts in relation to interactions is proposed in Figure 12. The model is developed by integrating the findings of the case study and other cultural features highlighted by Yeo (1996), Okayazaki and Rivas (2002), Chau et al. (2002) and Li et al. (2007) in the domains of interface design and system development.

This multi-level model includes several components in three different information levels, with the key issue being how socio-cultural contexts influence the overall social activity. The first level is visible phenomena, including signs, layouts, roles and interactions. The second level reveals the reasons behind the activity, including peoples' motives and perspectives. The third level information presents a general socio-cultural background and how this context influences the first and second level phenomena.

As illustrated in Figure 12, *Participant*(s) indicates those involved in the activity, representing either a single person or a group of people with similar *Motives* and *Attitudes* toward the activity. The distinctions of different participants might be in relation to age,

gender, behavior, needs, and so on. *Social Interaction* represents interpersonal contact and communication, and *Physical Interaction* indicates people's visible actions upon the artifacts (objects) and environments. *Socio-Cultural Context* refers to a larger-scale historical background, including both macro-objective phenomena (e.g. organizational rules and technology use) and macro-subjective phenomena (e.g. norms and beliefs). The blue arrows indicate the *Influences* among above-mentioned components.

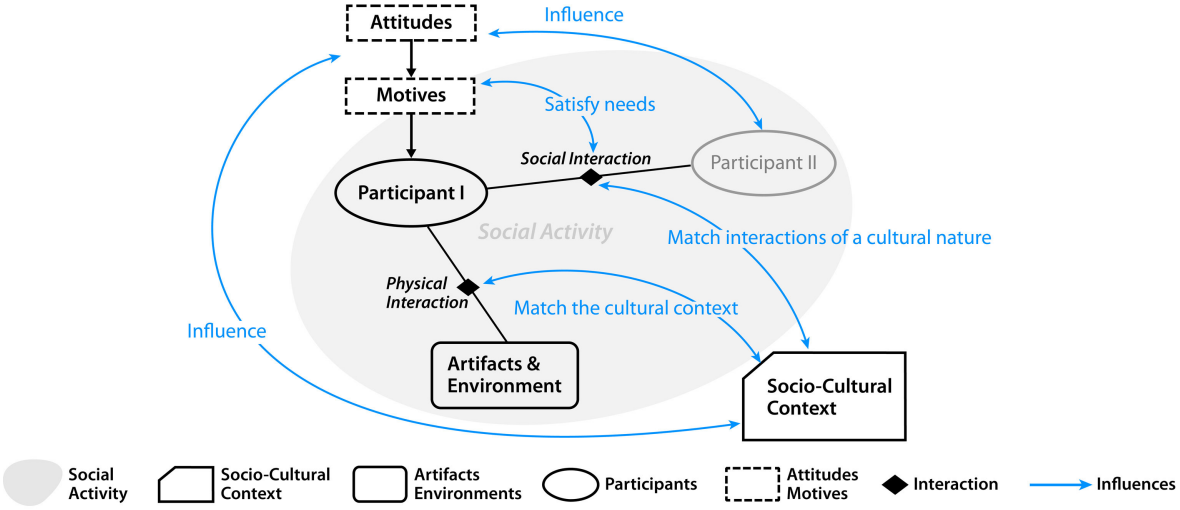


Figure 12. A multi-level social activity model for social interaction design.

In MLSAM, it is considered that a social activity is triggered and influenced by participants' present motives, cognition and permanent attitudes toward the activity. Therefore, to account for an individual's social behavior or a social event, it is a must to identify the participants' socio-cultural background, as it may directly or indirectly determine, influence and constrain people's actions, perspectives and values.

To summarize, in MLSAM, the components of the second and third levels are significant to account for a social activity but not covered by any design research framework. For instance, the model highlights that people may have varied perspectives and purposes within a single social event, which are significantly different from work-related and goal-oriented activities. In the case of the Taiwanese tea ceremony, the model (Figure 13) shows that participants' motives and attitudes toward tea ceremonies are different among generations. The middle-aged and elderly may participate in the ceremonies for maintaining social relations, improving mental health, expressing their philosophy, or considering it as a good local ritual to carry on. For the young generation, tea ceremonies are more about enhancing their family relationships. In addition, the model shows that participants' attitudes, behaviors, tools and space usage are all strongly influenced by the socio-cultural context. In tea

ceremonies, there are some norms and etiquette involved, which reflect social hierarchy and positions. For instance, the ways that people serve tea, taste tea, toast and show their regards to each other need to follow cultural manners and local customs.

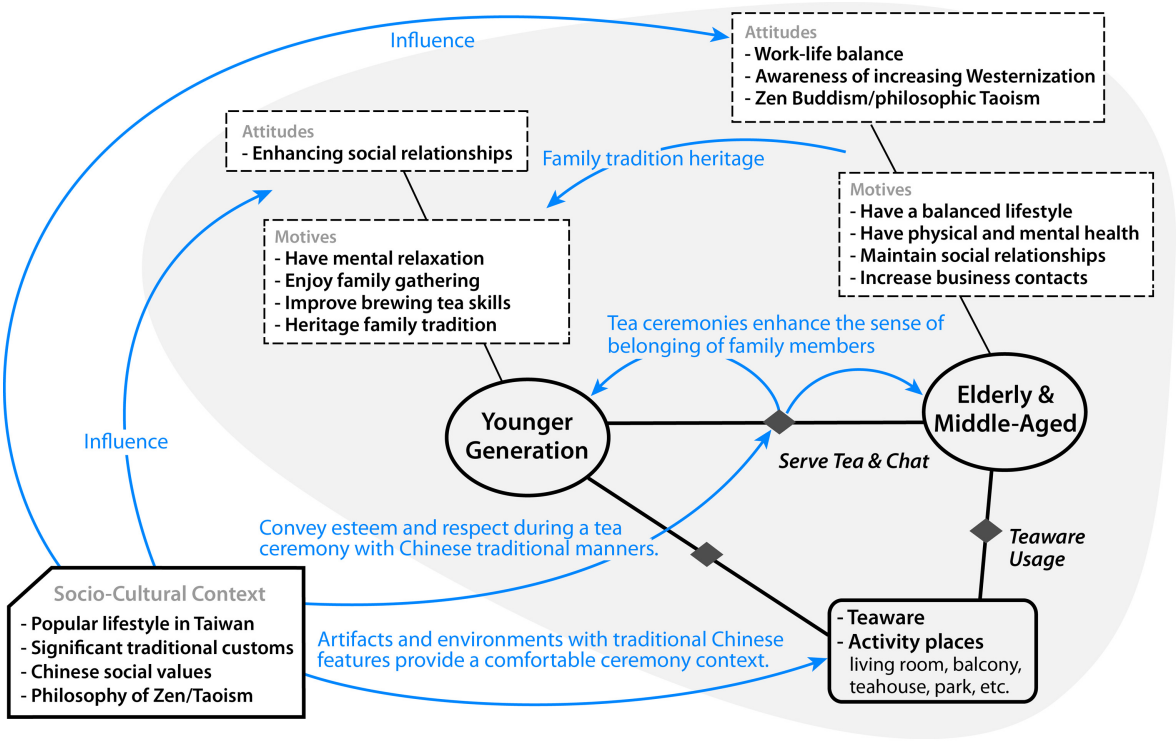


Figure 13. A multi-level social activity model of Taiwanese tea ceremonies.

Taking the example of Taiwanese tea ceremonies, the information revealed by MLSAM that indicates the influences among participants' perspectives, interactions and socio-cultural background and emerged design issues are addressed below. (The evaluation of using this model as a design research tool will be discussed in Chapter 7, and the additional benefits of applying the model in the design process will be presented in Chapter 8.)

Perspectives of Participants

- **Motives in the foreground:** Both to maintain one's social relationships and to be in contact with one's friends/relatives are the main purposes for most social activities. Moreover, these activities will be more attractive and valuable if they can also fulfill either people's emotional or physical needs. With regard to emotional needs, the tea ceremony, as a leisure activity, can help people relieve stress, find work-life balance and have more interpersonal contact with friends and family. In view of physical needs, some informants have mentioned that the medical reports related to tea drinking as a way to improve the digestive system have also encouraged them to form the tea drinking habit.

- **Attitudes in the background:** In addition to people's motives and specific needs, there will be some hidden and inherent reasons for people to engage in a social activity. These reasons are invisible on the surface and difficult to inspect, but they may account for why an activity has been a social custom for such a long period of time and has been passed on from one generation to another. For instance, the informants' values and positive attitudes toward the tea ceremony are influenced by the philosophy of Zen Buddhism and Taoism, but also reflect their awareness of increasing Westernization. Therefore, to better account for a social event, I consider that it is very important to understand people's perspectives from a more historical and cultural viewpoint.

Cultural Features of a Social Activity

- **Matches the cultural context:** A cordial, intimate and culturally oriented environment can pave the way for natural social interactions. In the study, the informants regularly go to ancient style teahouses for tea ceremonies, because they consider that traditional Chinese architecture and artifacts form a scenario for a comfortable social gathering and match Zen philosophy. Therefore, to support a traditional or local social gathering, it might be an advantage to provide people a cultural and natural context with familiar objects. For instance, in high-context cultures (Hall, 1976), such as Japanese, Chinese, Indian and other Asian cultures, people rely on their common background, similar experiences and expectations to explain the situation and to communicate with each other, rather than words. Many things are left unsaid, and the usage and choosing of words therefore become extremely important.
- **Supports interactions of a cultural nature:** In Chinese culture, serving drinks is an extremely important means of expression to show one's respect and regards toward others. In many Eastern Asian social events, such as tea ceremonies and wedding ceremonies, one could simply show his/ her concern and respect toward others via pouring and serving a cup of tea or a cup of wine. This type of subtle but meaningful social behavior seems to not be supported in today's computer-mediated communication platforms. In cultures with high social hierarchy (Hofstede, 1991; Hofstede, 2001), such as Latin and Asian countries, more complicated norms and politeness may reflect on language use in daily life. However, current development of social media and other cross-cultural IT products do not take these fundamental differences into account.

- **Satisfies emotional needs:** One of the main purposes of social activities is that they fulfill people's emotional needs and help people maintain their social relationships. In this case study, the Taiwanese tea ceremony is a typical type of traditional, local and interpersonal social activity, which allows people to sustain their contacts with friends and colleagues. We have found that the custom also enhances participants' awareness of belonging to their family and even strengthens self-identities (e.g. one informant has mentioned that the custom reflects his awareness of nationalism and Chinese patriotism). Based on our understanding that people engage in social activities with their own unique and diverse motives, how the activity actually functions and satisfies people has to be identified. Currently the social media industry is still pointing towards technology-driven processes, but I believe that it is a must to understand both users' socio-cultural context and their higher level emotional needs for developing more appropriate and reasonable IT products.
- **Supports cultural practices:** Traditional social activities, as the term implies, are long lasting. Through the literature reviews of the tea ceremony history, the reasons for such permanence are that the activities are always a part of people's daily lives and grounded in a larger cultural context. As above-mentioned, people's motives and needs change by time and by social trends, and the meaning and performance of tea ceremonies has shifted from a symbol of the fertile agricultural era to a representation of a new balanced lifestyle. However, people's inherent and positive attitudes towards tea drinking have not been changed. I consider that the IT industry has great responsibilities to take into account these long-term and meaningful cultural features, which are embedded in people's lives with purposes. Instead of forcing people to adapt to new technologies or changing people's original behaviors, IT product design could be more thoughtful in terms of users' different socio-cultural values.

By means of this multi-level social activity model, the socio-cultural context of an activity can be revealed. In design research, both designers and domain experts can apply the model to get comprehensive understanding of participants' or end users' perspectives, including their attitudes toward lives and technologies, values and emotional needs. In addition, the model may help researchers and designers identify how the culture and social trends influence people's social behaviors and motives.

6.4 Design with Cultural Dimensions

To see if the thorough understanding of socio-cultural contexts and people's perspectives can enrich design concepts, a co-design (Sanders, 2000; Westerlund et al., 2003) workshop with our target users and experts from different disciplines was conducted. This section presents several design implications discussed in the workshop, which are all based on the findings from the case study and MLSAM.

6.4.1 Participatory Design Workshop

Following the concept of participatory design (Schuler & Namioka, 1993; Holtzblatt and Jones, 1993; Kensing and Blomberg, 1998), a workshop was held with prior interviewees and five researchers from different disciplines, including industrial design, computer science, information engineering and civil engineering. The affinity diagram and five work models were rendered to delineate the different phases of tea ceremonies and to highlight the problems that we have found in contextual inquiries. In addition, the multi-level social activity model of tea ceremonies was presented, which helped us explain the detailed socio-cultural features that we identified in the study.

There are two purposes of this workshop. First, we would like to know if the understanding of socio-cultural contexts could enrich design concepts. For instance, whether an artifact can be used frequently, fit existing environments, or trigger other memorable experiences will be discussed. Secondly, in participatory design, we would like to see if the five consolidated work models and MLSAM could help users and experts from different disciplines communicate better with each other and understand the specific problems that we found in the study quickly. All of the participants in the workshop brainstormed for more than two and half hours to develop new design concepts through notes, sketches and paper prototypes (Buchenau & Fulton Suri, 2000). They tried to explore appropriate solutions for enhancing tea ceremony activities and to meet different requirements.

6.4.2 Design Implications

The findings of research on cultural activities indicate the importance of inner values and the expectations of interpersonal relationships. To develop social media and related IT products and applications in the future, the design implications suggested here include three dimensions: enhancing and enriching general social interactions in a cultural context; supporting cultural inheritance through technologies; and supporting traditional rituals – an

example is the facilitation of tea ceremonies. The main aspects of the design implications are as follows:

Enhancement of Social Interactions in a Cultural Context

The concepts of filial piety, courtesy, and respect are at the core of traditional Eastern Asian social relationships. These types of cultural values and attitudes are embedded in traditional rituals and customs. Based on the workshop discussions, we considered that it is crucial to identify traditional socio-cultural contexts and values attached to them in order to develop appropriate and adaptive systems and products for social interaction.

- **Identifying cultural values behind actions**: As per the discussion in Chapter 2, current design for web-based social interaction platforms is still mechanical and lacks social context due to its limited interaction space (e.g. click and text). In the case of tea ceremonies, the act of pouring a cup of tea represents a way to express one's concerns and regards, and, in this light, it allows people to show reverence to others without saying a word. Due to cultural differences (e.g. East Asians value introverts while Americans marginalize them), the ways that people convey their feelings, esteem, or respect are varied, from speaking out, giving subtle facial expressions to using simple gestures. Therefore, it is crucial to identify different styles and covert meanings behind social interactions in a certain culture, and develop more comprehensive space to match original cultural values and the whole context.
- **Providing a host to manage the social activity**: In a real social context, it is often found that there is a person or a group taking the role of a host, to look after all participants and to conduct overall events (Huang, You & Deng, 2009). Based on the field study, we consider that such a model of organization is simple but necessary to ensure the success of a social event. Many studies of online communities have emphasized that the role of a manager is significant in groupware or CSCW systems. However, it is proposed that the simple organizational model should be also applied in computer-mediated applications to support virtual social gathering.
- **Supporting norms and extending customs:** In high power distance cultures, such as Asian and Latin cultures, social hierarchy within a group decides the ways that people interact with each other (Hofstede, 2001). Even within a family, siblings of different ages may have different positions inside the family and need to call each other by different titles (e.g. honorific suffixes in Japanese language and complicated titles for every family

relationship in Chinese). However, in the case study, Taiwanese tea ceremonies create a unique atmosphere that encourages introverted people to talk and open up in a natural and pleasant way and pulls the family together. Therefore, in social interaction design for high-context and hierarchical cultures, it is very important to understand existent social norms and popular social activities, which provide guidelines for appropriate interactions and reveal the meanings and values behind events.

- **Enhancing experiences:** During the workshop, most participants agreed that technologies could maintain cultural traditions and values by enhancing experiences of participating in local customs or social activities. It is suggested that joyful experiences can be kept as unfading memories. For instance, using multimedia recorders collects more vivid and detailed information than a picture does, or applying multi-model techniques makes intangible memories and experiences tangible. In addition, some innovative design concepts, such as intimate interface and slow communication, also provide opportunities to enhance social gathering, including both virtual and face-to-face social activities (Kaye & Goulding, 2004; Fels, 2004; Huang & Deng, 2006).

Cultural Inheritance

In Chapter 4, I have shown the importance of identifying significant characteristics of each culture for cross-cultural design. In addition to making technologies match socio-cultural contexts, individuals' diverse preferences and lifestyles, the workshop participants also discussed the ways that technologies could promote cultural inheritance and maintain local traditions.

- **Applications of traditional cultural metaphors:** The richness of a culture can be experienced through technologies. The workshop participants considered that additional cultural and historical metaphors could make overall contexts of traditional activities more fascinating and attractive. As shown in Figure 14, the design of a rotatable tea tray was inspired by the *Lazy Susan,* a special rotating tray commonly used in Chinese restaurants to facilitate dishes being shared on circular tables. The participant mentioned that the idea is to offer the host a fun and convenient way of pouring tea into all teacups and serving people snacks without anyone having to get up from their chair or to reach over someone else. In addition, it is considered that applying narrative and experience design strategies, such as giving background stories for activities, can make a common local tradition more memorable and desirable.

Figure 14. A rotatable tea tray, sketched by a workshop participant.

- **Increasing accessibility of cultural customs:** The Internet, newspapers and magazines provide detailed information of the history and art of tea and the procedure of tea ceremonies. However, according to the interviewees, such information is irrelevant to their daily lives. As shown in the consolidated flow model and the multi-level social activity model (Figure 7 and Figure 13), there is an information gap between tea producers and the young generation, where the producers mainly promote teas through newspaper advertisements and yellow pages and young Taiwanese heavily rely on the Internet for the information that they need (more details will be discussed in Chapter 8). To ensure that culture can be passed on, it is important to understand the media preferences and usage of different generations so that technology can later integrate the information and bridge the gaps.

Facilitation of Tea Ceremonies

In the workshop, due to the specific problems revealed by the five consolidated models, there has been a great amount of discussion of the ways to facilitate tea ceremonies. All participants considered that the models helped them understand the overall contexts quickly. The artifact model and sequence model encouraged them to concentrate on developing design solutions for brewing tea.

- **Wizard (guidance for brewing tea):** The major problems revealed in tea ceremonies are that the artifacts are too numerous to handle and that the process of brewing tea requires a high degree of concentration and experience. Most participants considered that if the complicated procedure is a barrier for people to access such tradition, then it is a top priority to simplify and reduce the complexity of tea ceremonies. The concepts of tangible design, affordance and intuitive design (Norman, 1999; Mazalek, Davenport, & Ishii, 2002; Hara, 2004; Djajadiningrat et al., 2004) may be a chief consideration in redesigning teaware, which can guide people step by step and make the process successful.

- **Tips (additional information):** It is helpful to provide people with adequate information, such as proper water temperature and time duration for brewing tea. Many workshop participants showed their ideas of providing detailed information of tea quality and tea-making tips, and some of them shared design solutions to help people recognize their own teacups during the ceremonies (Figure 15).
- **Mobility, durability, and portability:** According to the study, most tea drinkers are not particular about external appearances of tea vessels, but value the functionality they can offer. Since today's tea ceremonies may take place in varied locations, including living rooms, studies and parks, most people considered that portable teaware, which is easy to store and carry, would be more appropriate than a traditional heavy tea set (Figure 16).

As these design suggestions reveal, it is considered that applying cultural features and values can enrich design concepts and make products, systems or services more reasonable and desirable. In addition, it is believed that the design for computer-mediated communication and social interaction, or further international and cross-cultural services, can follow these design implications to fulfill people's needs.

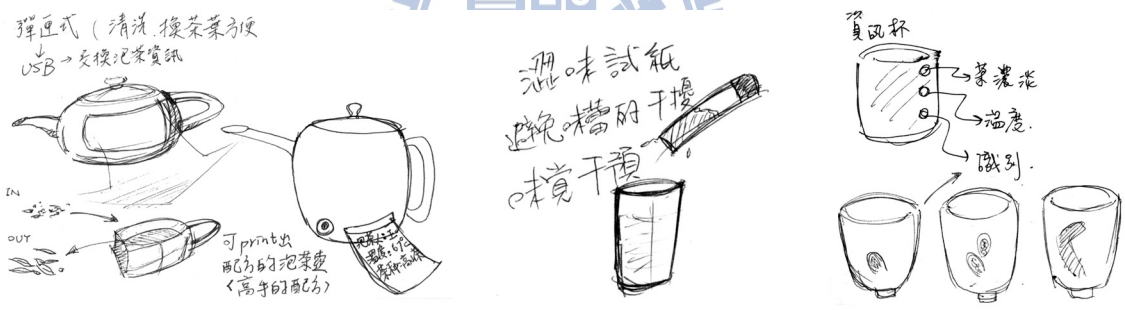


Figure 15. Teaware with additional information for brewing tea. (a) Tea vessels with experts' tips. (b) A test strip for tea taste. (c) Teacups with information on tea quality, temperature and personal identity.

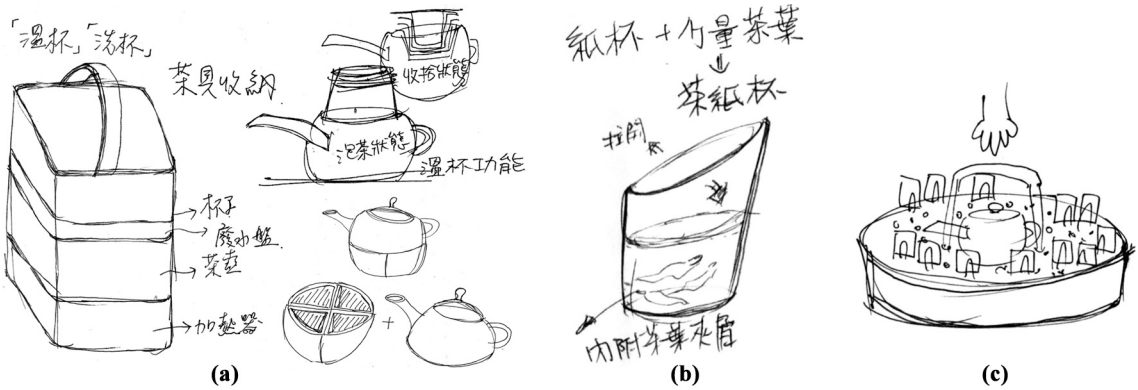


Figure 16. Teaware designs for storage and transport. (a) An all-in-one picnic tea box. (b) A paper cup with a tea bag embedded inside. (c) A portable tea tray.

6.5 Summary

In the case of the Taiwanese tea ceremony, the activity performs a social function by increasing interpersonal contacts, creating cohesiveness in families and offering a habitual practice that can be passed on from one generation to another. In summary, tea ceremonies improve people's social life in three different phases: they expand people's social awareness and interpersonal relationships, help people maintain existent social ties and enhance ones' self-identity. Through the study, many subtle interactions, social nuances and cultural values are revealed within the traditional social activity, which also indicate that most social software development seems to fall short when it comes to socio-cultural issues.

Based on the thorough understanding of one traditional East Asian custom with its deep cultural roots, I argued that many physical and social interactions (e.g. manipulating tools, choosing environments, politeness and manners) are deeply rooted in culture. In addition, individuals' motives and attitudes towards social activities are diverse and influenced by social trends and cultural backgrounds, such as perspectives on health benefits and particular norms that are associated with one's social position. Therefore, I proposed an integrated design approach and the multi-level social activity model (MLSAM) to better capture significant socio-cultural insights for IT design research. The model consists of information of three different levels: visible physical and social interactions, individual perspectives, a socio-cultural context in which the social activity takes place and its influences on attitudes, motives and behaviors. Based on these three parts, researchers, designers and practitioners can examine if design concepts match cultural contexts and support both social and physical interactions appropriately.

The following chapter presents two case studies and one evaluation workshop where MLSAM is applied in different types of design practices, to identify the strengths and limitations of the model. The improvements to the model and suggestions for further integrated design research will be discussed.

Chapter 7

DESIGN PRACTICES AND EVALUATION

From a micro-macro integrated viewpoint, individuals' social behaviors are largely governed by norms, religions and socio-cultural contexts. Relatively, the actions and interests of many, will together form social agreement and other macro phenomena like social trends. As Ritzer remarked in regard to his four-level research paradigm, the relations between phenomena on both micro- and macro-levels are dynamic and mutually influential. To well support social interaction, the research scopes of service and experience design in the future need to extend from the traditional usability evaluation, user- and activity-centered focus, to larger-scale social and cultural contexts. In other words, a micro-macro integrated perspective is needed to reflect the complexity of social interactions. It is considered that current context-based design methods and microscopic theories are highly capable of representing detailed micro-level interactions. On the other hand, MLSAM covers the missing social and cultural concerns, and possibly bridges the gap between subjective-to-objective and macro-to-micro levels in Ritzers' integrative diagram.

Extending the discussion of Chapter 5, I argued the significance of having an integrated viewpoint for social interaction design, and considered that MLSAM can offer a linkage between the micro- and macroscopic levels. To evaluate these two hypotheses, we conduct two case studies in which MLSAM is applied in actual design practices. First, we apply multiple user experience research methods in a social interaction design project, to validate that MLSAM can complement contextual design with an integrated perspective, and to reveal how such a perspective can enrich design concepts. Second, we include MLSAM in a complex service design project to identify the model's role in the different phases of iterative design. Finally, we evaluate the reliability of the approach by letting researchers and designers who were familiar with other design methods use MLSAM in a workshop, to study its ease of application and its capability of representing social activities.

7.1 Social Media Development

CrazyVote was a social website in Taiwan, providing users with personal web space, such as diaries (weblogs) and a message board (Huang, You & Deng, 2009). Due to its unique interface and voting rules for users' portraits, it became the biggest social website for Taiwanese teenagers in 2008, with more than 20,000 users of ages 15 to 19. To guide future application development, the company supported a two-month research project to fully understand their users' online activities and expectations of social media. In the study, seven highly active users and two regular users participated in both the sessions of in-depth interviews and contextual inquiries, and the online activity logs of another 40 highly active users and 40 regular users were sampled at random to understand behavioral patterns in the platform. All the qualitative data were analyzed by following grounded theory with Nvivo. At the same time, contextual design work models and MLSAM were used as design research guidelines to capture information and present results (Huang, You & Deng, 2009).

The study shows that teenagers' common processes of making friends are complex but flexible. They first use the voting system in the CrazyVote platform to introduce themselves and initiate communication with other users, followed by an exchange of online contact information (typically instant messenger accounts) through guest books. Later they start personal conversation by chatting through Yahoo! Messenger, chat on mobile phones and finally meet up face-to-face. This common process of making friends among teenagers reveals their great adaptability in an online environment, but also shows their goal is not to engage in a virtual community. The boundary between on-line social interaction and actual relationships is very blurred to Taiwanese teenaged online users. Their motive of making new friends on the Internet is straightforward and simply to expand interpersonal relationships in the real world.

Similar to the case study of tea ceremonies, I compared the qualitative results with the information that the contextual design work models and MLSAM contained. I found that the use of MLSAM in this complementary way offered the same insights as those derived using the more resource-intensive in-depth interviews and grounded theory process. First of all, the model (Figure 17) highlights macro-level social trends, cultural backgrounds and common use of complementary technologies; it shows that social manners and norms still decide teenagers' online behaviors and guide appropriate procedures of friend making. Secondly, the model presents micro-subjective level details; it identifies users' motives and attitudes, which directly explain why users come to use the media and interact socially using the platform. For

instance, today's society and media encourage young people to be extroverted, share opinions and display their advantages, which make them feel comfortable to maintain personal blogs and meet new people online. Third, the model shows that different social media, communication platforms and devices, and varied physical and virtual environments are complexly involved in Taiwanese teenagers' social activities. The interviewees mentioned that they would use different communication media based on the acquaintance and relationship with others.

In addition, the interviewees mentioned that they preferred to make friends who live nearby to increase the chances to meet up, because the society does not encourage teenagers to travel alone. Social issues that are associated with meeting online friends also make teenagers form unique networks, to ensure that all members are using their real identities and to later develop real-life confidence in each other. Based on the interviews, it is noticed no clear boundary between teenagers' on-line social interactions and physical face-to-face relationships. They tried to organize themselves through forming clubs and later brought their online communities into reality to have face-to-face gatherings (Huang, You & Deng, 2009).

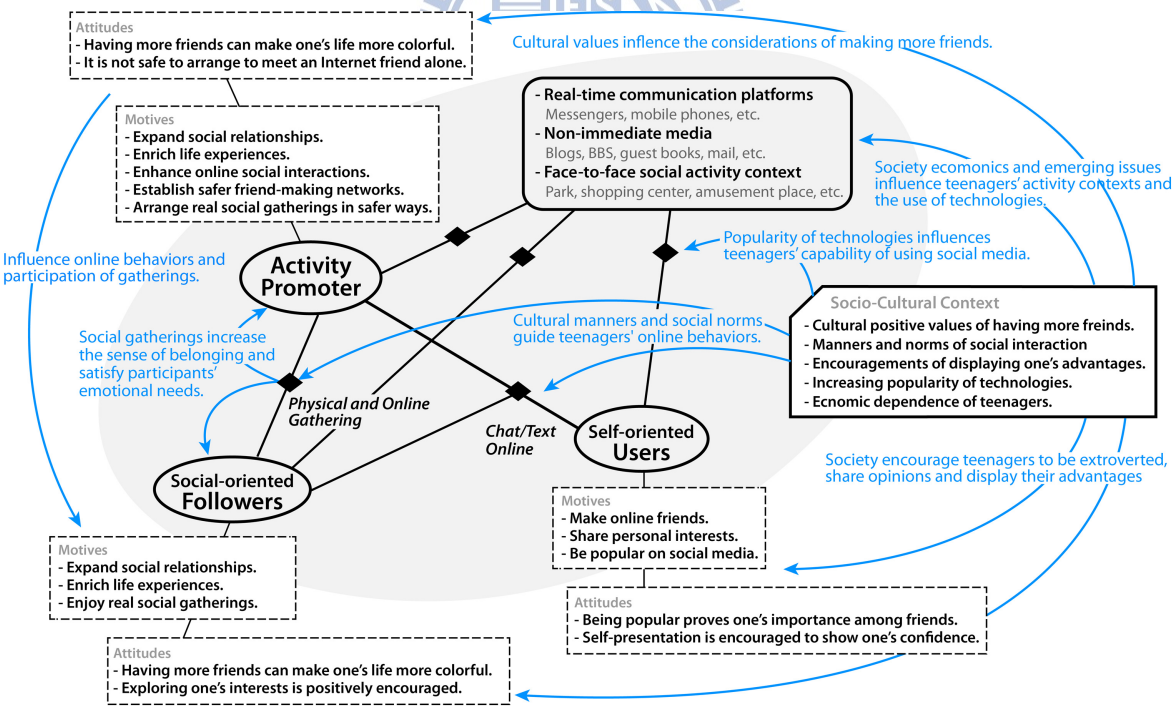


Figure 17. The multi-level social activity model of teenagers' friend-making activities.

This study supports my argument that an integrated viewpoint is beneficial in social interaction design, as the information about social and cultural contexts and the way these influence users' motives and behaviors can be applied and reused in many different design

projects. In addition, understanding users' motives and attitudes helps practitioners to understand users' requirements and predict customer engagement. Current design research generally focuses on a single platform or a particular environment, which narrows down the context of activities and overlooks people's ability of manipulating the resources they have to achieve goals. Furthermore, although traditional ethnographic approaches, such as grounded theory analysis and thick reports, can reveal rich information of socio-cultural contexts, they are very time consuming and require more experienced researchers than are typically available in rapid design cycles. Therefore, it is considered that MLSAM could serve as research guidelines, which help researchers and designers gain important socio-cultural information in a short time and present the knowledge in a more sharable diagram with development teams.

7.2 Service Design

MLSAM was applied over the course of one and half year as part of a service design case study in Portugal. The case study formed part of a longer three-year project, which developed a formal, enterprise-scale service design process to bridge the gap between business goals, service design methodology and engineering concerns. Therefore, the project was split in two parts. The first part was a one-year pilot study to understand customers' activities and attitudes towards media consumption and to map customer behavior to the business goals of a media company (Teixeira et al., 2012). In addition, a metamodeling tool was developed (Huang et al., 2011) to help domain experts and designers model their thoughts and knowledge, convey their ideas and communicate within development teams.

The second half of the project aimed to develop a complete process for large-scale service design through a design practice. In this part, we combined our understanding of customers' media usage and the company's business goal from the previous study, with agile software development (Beck et al., 2001; Martin, 2003; Cockburn, 2006) and state-of-the-art user experience and service design methods (Patrício, Cunha & Fisk, 2009; Holtzblatt & Beyer, 2011). To identify MLSAM's role in a service design process and to evaluate its applicability in a different cultural context, the design topic is chosen to support football-watching activities, which have long been a popular and cultural tradition in Portugal.

The design process began with interviews and observations of 20 active sports fans and people who had participated regularly in football watching activities, followed by modeling according to MLSAM and the work models of contextual design, to understand their

experiences, motives and behaviors in sports watching. Following multi-level modeling, design concepts were developed for the service. Three personas and 30 different design concepts were then generated in a workshop, and 15 subjects were asked to do card sorting to rank the design concepts. In the last phase, several interaction and service design techniques were applied to define the details of the prototype, including scenarios and storyboards, *Customer Journey*, *Service Architecture*, use-case analysis and *Service Design Blueprint* (Shostack, 1984; Oulasvirta, 2004; Bitner, Ostrom, & Morgan, 2008; Patrício, Cunha & Fisk, 2009; Patrício et al., 2011). To gain overall feedbacks and to improve the systems, formal usability evaluation was conducted with five active football fans, by following *Collaborative Usability Inspection*, *Rapid Iterative Testing and Evaluation* and *Single-Subject Testing* (Nielsen & Mack, 1994; Lockwood & Constantine, 2003; Constantine, 2005).

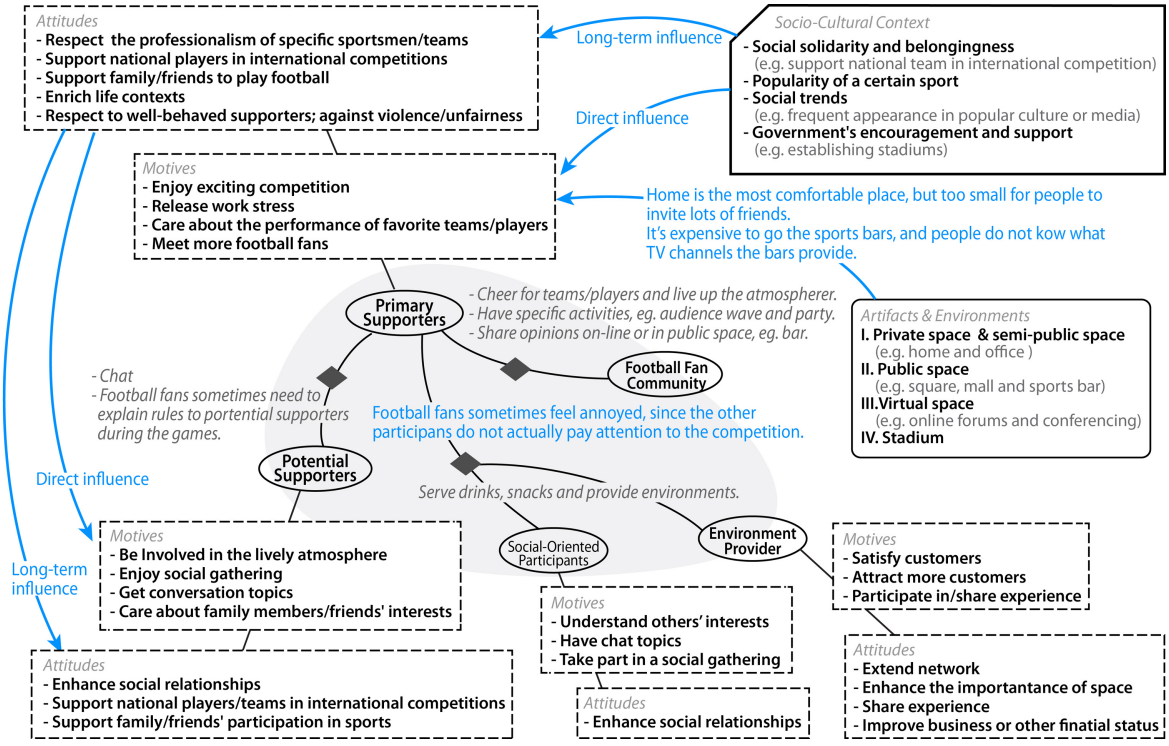


Figure 18. The multi-level social activity model of football watching in Portugal.

MLSAM modeling highlighted many different types of participants in the studied activities (Figure 18), of which two (primary supporters and potential supporters) were selected for the continued development of the service. Primary supporters enjoy watching games, with strong interest in the details of the game and high quality game play. Potential supports consider football watching primarily as a social activity and their motives for participation are generally derived from primary supporters' interest. These results were later compared with those of a previous pilot study, which was conducted by interviews with grounded theory and

activity theory analysis. It highlighted the importance of understanding customers' soft motives in service development and explained how these motives were connected with different activities (Teixeira et al., 2012).

In addition to being a less time-consuming process, the information gained by MLSAM matched the findings of the previous study, and offered a grouping of these motives so that different types of customers could be easily identified. The model contains an overview of the whole activity, including macro-level phenomena (e.g. how government supports and encourages football consumption) and micro-level phenomena (e.g. how people actually participate in football games and their general perspectives on football). This overview helps researchers, designers and system developers communicate and discuss detailed service design concepts. In addition, identifying target users and potential users by their different motives and attitudes helps designers define persona in the phase of design concept development (more details of persona development will be discussed in Chapter 8).

7.3 Evaluation Workshop

To evaluate if MLSAM is capable enough of depicting both macro-level phenomenon and micro-level interaction details on social activities and if it is easy for designers and researchers to use it, a workshop was held based on findings from a one-year study of senior citizens' karaoke activities in Taiwan (Deng, 2011). The study involved six participants and used field observations and interviews using an open research plan and followed traditional ethnography. The findings were then arranged into a set of statements, which were mapped into the five work models of contextual design. Some observations relating to the influence of cultural tradition upon subjects' perceptions and preferences of artifacts and environments (e.g. how participants sing karaoke during a tea ceremony outside a local temple) could not be represented in these work models. The workshop presented these remained statements to ten user experience designers and researchers, all familiar with common user study methods, and introduced them to MLSAM[1] (Huang & Deng, 2008). The ten workshop participants were separated into three groups, and were asked to apply MLSAM to represent the remaining

[1] '*Social interaction design in cultural context: A case study of a traditional social activity*,' is the first article introducing the concepts of MLSAM, published in 2008. The multi-level social activity model at the time was named as *the enhanced cultural model* (ECM). In the evaluation workshop, participants were introduced the concepts of MLSAM by the original article, and therefore they were using the name of *the enhanced cultural model*, see Appendix II.

statements, which the other work models had failed to represent. At the end of the workshop, there was an open discussion about the strengths and limitations of MLSAM.

Most participants agreed that MLSAM helps researchers and designers to consider the macro-level social and cultural contexts, such as social values and traditions. Participants also expressed that they felt MLSAM bridges macro-level social and cultural phenomena with the micro interaction level, including physical and social interactions. In addition, MLSAM provides a summary of the most important components of an activity into one single model, which reveals all the relations among these components and allows designers to discuss their relations. However, the discussions also revealed several problems associated with the presentation of MLSAM.

- Too much information: MLSAM tries to portray the relations among culture, people, interactions, artifacts, environments and individuals' motives and attitudes, and most participants considered the model to be too complicated to understand and to read. One participant also said that it is difficult to focus on cultural issues while building the model, since too many other details need to be taken into account.
- Difficult consolidation: participants felt that due to its complex layout, it would be difficult to consolidate different MLSAM models into one.
- Ambiguity of motives and attitudes: some participants had trouble distinguishing motives from attitudes, and considered it difficult to know which part of the model a statement should be mapped to.
- Lack of cultural depth: participants generally felt that MLSAM could not reveal the influences between different cultural levels and that the model's representation of culture was overly simplistic.
- Richness, details and guidelines: participants generally agreed that MLSAM can complement other research frameworks and methods, but that the model should provide more specific guidelines on how to represent the depth of culture and the details of nuanced social interactions.

During the workshop, many participants felt that the statements from the field study did not sufficiently capture the information that the model was supposed to contain and that they lacked in specificity and detail. Since the participants were not involved in the original research, it became very difficult for them to interpret the meanings and to imagine the actual

situations behind the statements in a short-term workshop. As the methods used to generate the statements for the workshop were very similar to those used in our other case studies, we speculate that the problem was primarily due to poor explanation of the results to the workshop participants.

7.4 Refinements

I argued that it is important to have an integrated perspective on research for social interaction design. Current theories, frameworks and models applied in HCI and CSCW cover most micro-level phenomena, including individuals' cognitive processes, interactions and physical contexts. However, these methods generally limit their scopes to a narrow context and avoid socio-cultural considerations. Although some work has highlighted issues in interface design that stem from cultural differences, it has mainly focused on finding behavior patterns and collective preferences in different cultures.

To gain a more integrated viewpoint for social interaction design, I applied Ritzer's paradigm as lens to locate and compare the scopes of common research frameworks and models. The analysis identified one research method, the multi-level social activity model (MLSAM), which has the potential to complement well with more established methods. As shown in Figure 19, MLSAM highlights the influence from macro-subjective level to micro level, and is thus potentially a suitable complement to the other design research methods and frameworks used in IT development.

Through three case studies, multiple significant advantages of having an integrated viewpoint in design practice were found. First of all, a better understanding of higher-level (macro) phenomena, such as people's technology use, socio-economic status and cultural values, helps designers make better decisions in IT product and social interaction design. In addition, macro-level information can be applied in different phases of design processes and in large-scale or long-term service design projects. For instance, understanding users' diverse motives can help the development team design more adaptive systems, and the information about users' socio-cultural backgrounds and expectations on technology can be repeatedly applied in different design projects. Secondly, by studying micro-subjective level phenomena, researchers and designers can be aware of why and how people participate in a certain activity. This information helps identify different requirements and types of potential users and develop more accurate personas. In addition, having an integrated viewpoint helps researchers understand how cultural and social contexts influence individuals' behaviors and attitudes (i.e.

values, norms and traditions which are passed on and inherited through generations can have strong influences on daily-life behavior). Knowledge gained through an integrated viewpoint can also be applied to evaluate whether design concepts match social norms and people's reactions in different situations.

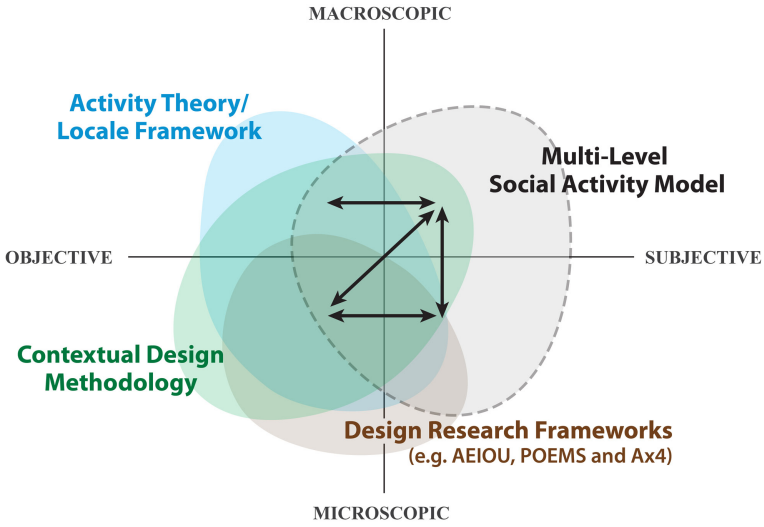


Figure 19. Design research scopes in Ritzer's paradigm. MLSAM covers the missing social and cultural issues, and may complement the other design research methods and frameworks in the topic of social interaction design.

The case studies also evaluated to what extent MLSAM is capable of representing the linkage between macro- and micro-levels. In the first and second design studies, I found that it offers knowledge of similar depth and richness as that provided by ethnographic methods, which are far more costly in terms of time and resources. In addition, the information MLSAM contains does complement the other common design research frameworks and models, and it provides a summary of the important components of an activity in a single graph, which can provide designers, researchers and developers with a focal point for discussion. However, in the third evaluation workshop, the participants also indicated several problems associated with modeling MLSAM. Most participants considered this summary graph included too much detail, which made it difficult to read and to use, and felt that MLSAM lacked layers to represent the depth of culture. Since the document used for introducing MLSAM did not provide clear guidelines on how to identify cultural contexts, most participants had trouble extracting cultural information from the research results. In effect, this reduces MLSAM's capability to represent the richness of culture in social interaction design and therefore I propose the following improvements to the model:

- Reduce information: As shown in Figure 19, I concluded that the scopes of current design research methods and theories are largely limited to micro-level phenomena (e.g. accountability and usability) and macro-objective phenomena (e.g. community structure and labor of work). Therefore, the use of MLSAM should focus on identifying micro- and macro-subjective phenomena (e.g. cultures' values and individuals' motives).
- Provide guidelines for identifying cultural contexts: Traditional qualitative research processes, such as grounded theory and longitudinal studies, are often too expensive to be applied in rapid design cycles. I propose applying Schein's (1990) three cultural levels (observable artifacts, values and basic underlying assumptions) or Rousseau's (1990) five layers of culture (artifacts, patterns of behavior, behavioral norms, values and fundamental assumptions) to capture the depth of culture. In addition, researchers who wish to understand the characteristics of a specific culture may want to consider Hofstede's (2001) six dimensions of organizational cultures and Hall's (1969/1990) two dimensions of intercultural communication.
- Clarify motives and attitudes: In MLSAM modeling, motives were defined as reasons for an action, which are changed by time and influenced by circumstances; attitudes were defined as perspectives and opinions toward situations, which are formed by personal experiences and backgrounds. However, many workshop participants had difficulty distinguishing the difference between motives and attitudes. None of the three studies supported the necessity of this separation, and I therefore suggest that MLSAM combines motives and attitudes into a single concept to reduce its complexity.

7.5 Summary

In this work, I argue for the necessity of an integrated viewpoint in social interaction design, which considers both micro-level phenomena (e.g. individuals' motives) and macro-level phenomena (e.g. technology use and religions). Current social platform development is either based on user experience studies or high-level design strategies, such as social translucence and social visualization. I have showed that most strategies have their roots in microscopic sociology, a set of theories that have been criticized for being too narrow in scope and for overlooking high-level socio-cultural factors. At the same time, user experience methodology focuses on a single activity or context, and can therefore only reveal micro-level information about usage situations. Combined, this has led to a situation where both researchers and designers systematically overlook macro-level issues that may have significant implications

for how well a system is received by its final users.

A potential alternative approach is offered by longitudinal qualitative research approaches in social science and anthropology, though such methods are not suitable for direct application in rapid IT development, as they generally require experienced researchers and are time-consuming to execute. Based on a comparison of current design research methods and frameworks using a sociological integrated paradigm, I consider that the multi-level social activity model (MLSAM) has potential to complement current user experience methods by capturing both macro- and micro-level information in social activities.

Through a series of three case studies, we evaluate what benefits can be gained from an integrated viewpoint in social interaction and service design, and whether MLSAM is capable of providing such insights. I conclude that an integrated viewpoint is particularly helpful for identifying different types of users and for developing representative persona, and its macro-level findings can generally be reused in different projects to enrich design concepts. In addition, we find that MLSAM can successfully capture rich subjective level information (e.g. cultural values and individual's attitudes) and help researchers understand how socio-cultural phenomena influences individuals' behaviors, while being significantly less time consuming than anthropological approaches. However, we also identify several problems associated with the model and therefore I propose a series of improvements.

The results have shown that social activities are fundamentally complicated and that cultural contexts are difficult to identify. Access to experienced researchers therefore remains helpful in design studies for social interaction, to help select appropriate research methods and to capture and interpret rich data. However, I point out a set of existing cultural models that can be directly applied by practitioners to gain relevant insights. The last part of this thesis will focus on the additional benefits we gained by applying MLSAM in design practices, and propose a more integrated research framework for supporting designers, researchers and practitioners in social interaction, experience and service design.

PART IV

INVISIBLE USERS

Chapter 8

REFLECTIONS

This chapter summarizes the benefits of applying MLSAM early in a design process and in design for different purposes. The findings originate from the three case studies of design for social interaction presented in Chapter 6 and Chapter 7; a traditional ritual of a Taiwanese tea ceremony, Taiwanese teenagers' social activities and technology uses, and sports watching in Southern Europe. New challenges and emerging issues that we had met during design research for supporting socio-cultural activities is also presented.

8.1 User Modeling and Personas

Understanding target users is considered as a basic step towards developing good products and services. In traditional industrial design, marketing and product development, a wide range of research methods, including survey, field study, interview, observation and focus group, have been used with the clear purpose to identify target audiences' preferences and needs (Lynch, 1960; Zeisel, 1984; Laurel, 2003; Huang and Deng, 2008). For complex system development, diverse research methods, including user-, context- and activity-centred design approaches (e.g. participatory design, contextual inquiry and many ethnographic techniques), have been developed and applied to understand end users' requirements, behaviours and usage contexts (Holtzblatt & Jones, 1993; Kensing & Blomberg, 1998; Preece, Roger, & Sharp, 2002).

To support rapid IT development and iterative design processes, it has become important to have clear images and models to represent end users. For instance, user modeling in software engineering has focused on having an internal representation of different types of users, which includes all information of users' cognitive process, background knowledge and interactions with systems (Kobsa, Koenemann, & Pohl, 2001; Huang et al., 2011). This type of user modeling or profiles can be applied to develop more flexible systems, adaptive hypermedia, educational and tutoring systems, to simulate different types of users in evaluation, and are reusable and applicable in later development of new products and services (Arias et al., 2000; Fischer, 2001; Brusilovsky, 2001; Montaner, López, & de la Rosa, 2003).

In addition, much work has extended the modelling variables to cover users' previous computing experiences, personality traits and overall context (Beck, Stern, & Woolf, 1997; Murphy & McTear, 1997). For instance, Beck et al. (1997) have addressed SaD (static and dynamic) user modelling, which focuses on both static information such as gender and age, and dynamic information such as diverse computing experiences and personality, and argued that both types of information will reveal how well a user accept and interact with a hypermedia application (Hothi & Hall, 1998).

With a purpose similar to that of user modeling, personas have been used to portray user types in marketing, product and experience design. The original concept of personas is to create fictional characters to represent different user or consumer types by describing their interests, perceptions, possible reactions and attitudes towards a certain product, service or a brand (Cooper, 1999; Rind, 2009; Long, 2009; Pike, 2010). Many studies have shown the benefits to having personas in the design process, such as giving all members of the development team a clear and common image of their target audience, evaluating if design solutions meet users' needs, and enhancing practitioners empathy on a certain type of users (Cooper, 1999; Rind, 2009; Miaskiewicz & Kozar, 2011).

Although both user models and personas can offer various benefits in different phases in iterative design process, including initial concepts development, user testing and redesign cycles, there are several problems associated with their application in complex system and services design. First, user-modeling methodology has been developed with a focus on human-computer interaction and centers on analysis of behavior patterns, cognitive processes and demographic data. The models can reveal detailed information of the ways that a single user interacts with systems, but are incapable to take large-scare social and collaborative work contexts into account (Suchman, 1987; Grudin, 1988; Ackerman, 2000; Fitzpatrick, 2003). On the contrary, the demographic information that traditional personas offer is limited to a few high-level attributes (e.g. economic status, family size and political attitudes) but lack of detailed information in terms of behaviors and interactions with products. Secondly, both user models and personas restrict their scope by overlooking activity contexts; user modeling only focuses on direct users of systems and personas mainly represent target consumers, rather than revealing potential participants involved in the activities of interest. Both user models and personas cannot explain and represent subtle social interactions and communication between people, which is often the focus of social media, experience and service design today (Preece & Maloney-Krichmar, 2003; Huang, You, & Deng, 2009). In addition, many

researchers have also criticized persona development for lacking scientific process and clear guidelines, which decrease the method's reliability and model's representability (Rönkkö, 2005; Chapman & Milham, 2006; Chapman et al., 2008; Portigal, 2008).

In this chapter, I reflect on three design projects and discuss the suitable methods to find potential target audience in the early stage of the design process. The chapter will present emerging challenges in design research and derive insights for how to identify direct users, potential users and invisible users, through an understanding of participants' relationships and roles within a broader context.

8.2 Design Practices Reviews

To better support experience and service design in the future, we applied multiple user experience design methods and traditional ethnographic approaches to uncover the complexity of participants' perspectives, interactions and attitudes within social events. Contrary to what is common in traditional user modeling and persona development, we have in these three design studies included both primary and peripheral users and consumers of a certain product or service. Here, we identify different user types by using the contextual design flow model and multi-level social activity model, to highlight participants' roles, relationships and motives. More challenges related user portraits and user models in IT development will be discussed in 8.3.

8.2.1 User Types in a Tea Ceremony

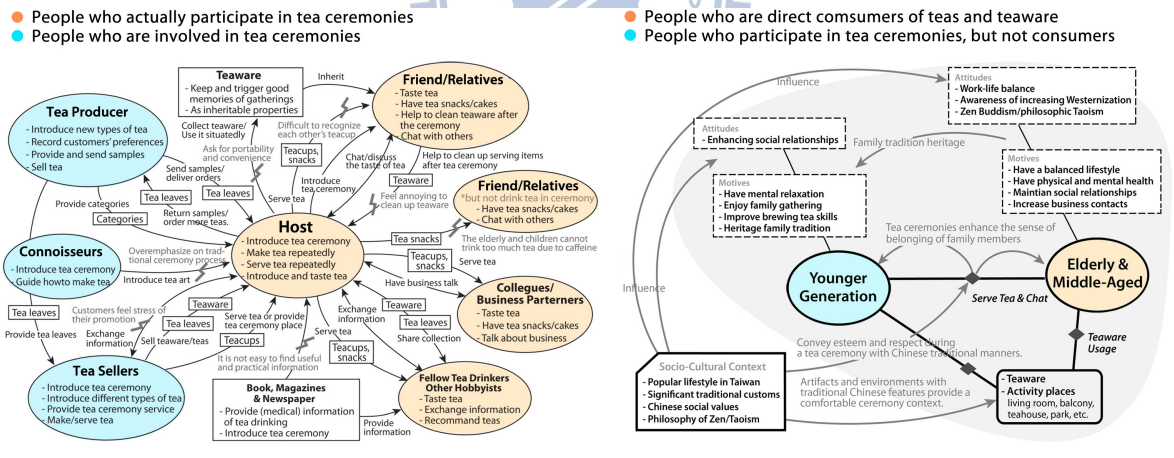
Chapter 6 discussed how the consolidated flow model and the multi-level social activity model represented a Taiwanese tea ceremony. In Figure 20, the groups/participants of the two models were marked in blue and orange color, to highlight different user types involved in the activities.

The flow model in Figure 20a represents the different roles in the ceremony and their interactions. As explained in section 6.2, the flow model has been extended to portray all groups who directly or indirectly engage in a ceremony. Direct participants are the host (tea server), family members and other friends, while indirect participants include hobbyists, tea sellers, tea producers (farmers in direct marketing) and tea connoisseurs. Although indirect participants do not actually attend ceremonies, they significantly impact the act through their close ties to the host. According to the study, the host of a ceremony is most likely a person of the middle-aged generation or the head of household. This person tends to actively exchange

information and sentiments with other hobbyists and tea sellers, as well as seek out information from books, magazines and newspapers.

While the flow model captured roles and interactions, the multi-level social activity model further reveals how participants' underlying motives and attitudes toward tea ceremony differ between generations. It also shows that attitudes and resulting behaviors are all strongly rooted in a cultural context.

Both the younger generation and the elderly/middle-age generations (both groups in Figure 20b) are direct participants in tea ceremonies (marked in orange in Figure 20a). However, a comparison of the two models revealed that although the younger generation is interested in tea ceremonies and has inherited tea-drinking habits from their families, they are generally not consumers of the tea industry. They have never contacted any other participants (i.e. tea sellers and tea farmers in direct marketing), nor do they receive information through magazines or newspapers. Instead, their primary sources of information about tea ceremonies are parents or grandparents. In Chapter 6, this difference was explained by generation-dependent media consumption behavior and differences in economic status between generations.



(a) The flow model of tea ceremonies **(b) The multi-level social activity model of tea ceremonies**

Figure 20. Different user types in tea ceremonies

Continuing the discussion of previous chapters, the multi-level social activity model identifies different user groups by their attitudes towards activities and motives for participation. In addition to people's direct and immediate requirements, we considered that there are many hidden reasons for people to engage in a social activity that may be overlooked by methodologies that do not go deep enough. For instance, the in-depth interviews revealed that the elderly have positive attitudes toward tea ceremonies potentially reflect the awareness of

Westernization, while the younger generation is more attracted by the health benefits associated with drinking tea.

An understanding of differences in user groups' cultural backgrounds and underlying motives can help designers make better decisions in product development, in particular in design for social activities and communication. As the design implications presented in 6.4 and 6.5, communication designs in high-context and low-context cultures require different levels of social cures and social contexts. Knowledge of subtle cultural features, e.g. pouring a cup of tea to convey esteem and respect during a tea ceremony, can further lead to more accurate portrait of users and better predictions of user behavior. However, it is difficult to gain this knowledge using only activity- and usage- centered design methods. Instead, the case studies indicate that the knowledge can be gained from MLSAM's historical and cultural perspective.

8.2.2 Teenagers' Social Behaviors: Adaptabilities and Capabilities

In the case study of teenagers' social behaviors, I mentioned how MLSAM helped us understand how macro-level cultural backgrounds, society's financial status and social trends affect teenagers' motives and capabilities to use technologies.

As shown in Figure 21, MLSAM also helped us identify three different user types among the website users. First, activity promoters, who were extremely confident and familiar with most social norms and manners on social media, voluntarily held gathering events, established clubs and recruited other users to join their own clubs. Second, followers were willing to participate in social events but had less interest to be a group leader or to organize activities. Third and finally, self-oriented users made up 90% of the user base, and their activities on the platform were more self-oriented, such as maintaining and updating blogs and photo albums. They seldom visited others' blogs or left messages to others. According to the in-depth interviews, we found that most of self-oriented users were either introvert or lacked experience of interaction with unfamiliar people on the Internet. Therefore, we further separated these three type users, activity promoters, social-oriented followers and self-oriented users, into to two groups, in which the first group users are more social-oriented (marked in orange in Figure 21) and the second group users are more self-oriented (marked in blue in Figure 21).

Chapter 7 mentioned that some teen users had a common and well-defined procedure for making friends successfully and efficiently in the CrazyVote platform, and most users in the

social-oriented group were aware of and applied this process. First, non-verbal introductions would take place through the voting system or by sending emoticons to others. Communication would then be initiated by leaving a private message, or by visiting and leaving public comments on each other's blogs. People who share similar interests and habits may then exchange other online contact information, such as MSN Messenger or Yahoo! Messenger accounts, and start communicating electronically outside of the CrazyVote platform. In the end, these online friends may end up talking on mobile phones and meeting up face-to-face.

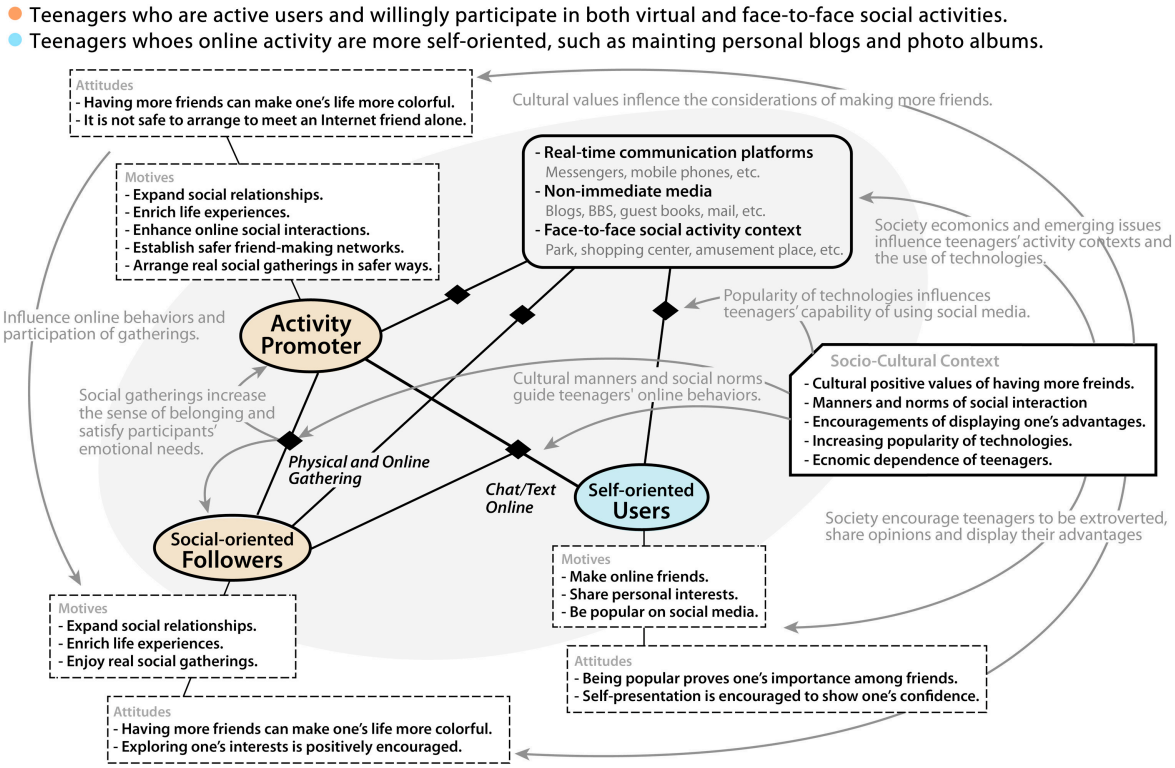


Figure 21. Diverse user types of social media

Past decades' rapid expansion of information and communication technology have made young people comfortable with using a wide range of communication platforms. Although taking place in an online environment, the observed process among Taiwanese teenagers for making friends is natural, mature and matches traditional Taiwanese social norms. For instance, the initial use of non-verbal emoticons and "likes" to make others aware of their presence was described in the interviews as a type of "reserved" introduction, similar to a head nod or eye gaze. Young users considered it too aggressive and too impolite to suddenly show up and introduce themselves in front of strangers. However, according to both interviews and online tracing, users in the self-oriented group were unaware of this process

and fell back on expanding their presentation of themselves in the system. Although both socially- and self-oriented users initially shared the common goal of making new friends through the CrazyVote website, the self-oriented users perceived a difficulty to initiate communication and greet strangers in proper ways, which later caused them to focus on their own blogs.

This study illustrates how more in-depth user research and the multi-level social activity model can lead to detailed interaction issues as well as an understanding of socio-cultural contexts and their influences on users' motives and behaviors. Such knowledge can also be applied and reused in many different design projects. In addition, understanding users' expectations and abilities helps development teams make better decisions and predict customer engagement. For instance, the social-oriented group's capabilities and successful strategies of making friends can be applied in social media design to help and guide the second group users. However, current design research generally focuses on a single platform or a particular environment, which narrows down the scope of research and overlooks people's great ability of manipulating and adapting different their resources.

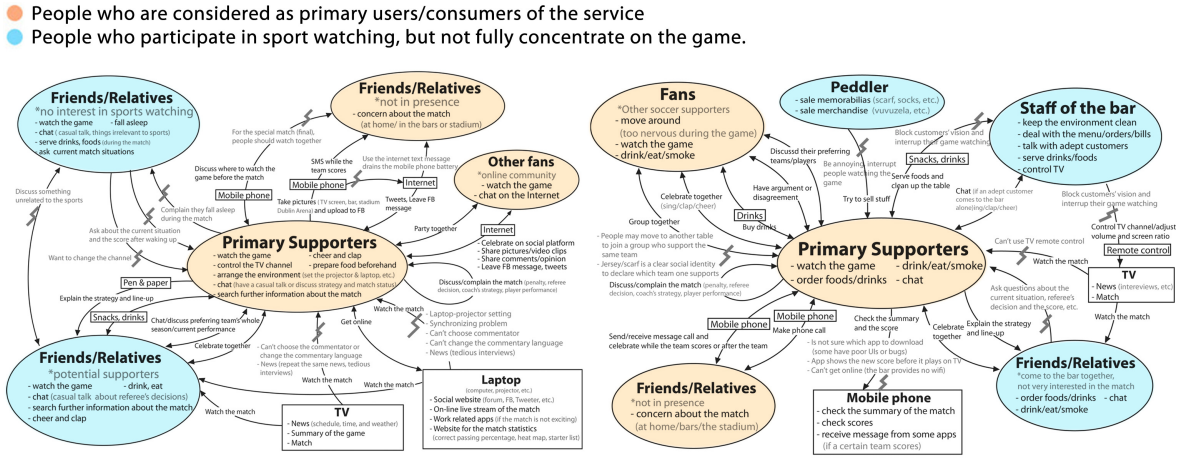
8.2.3 Primary and Potential Customers

The flow model in Figure 22a shows that football fans use laptops and other high-tech devices to enhance their football watching experience at home. Examples include accessing high quality streaming, using a projector, getting more statistical information from websites and discussing referees and penalties with friends on the Internet. People watching the game at home do so either together with family members or with close friends.

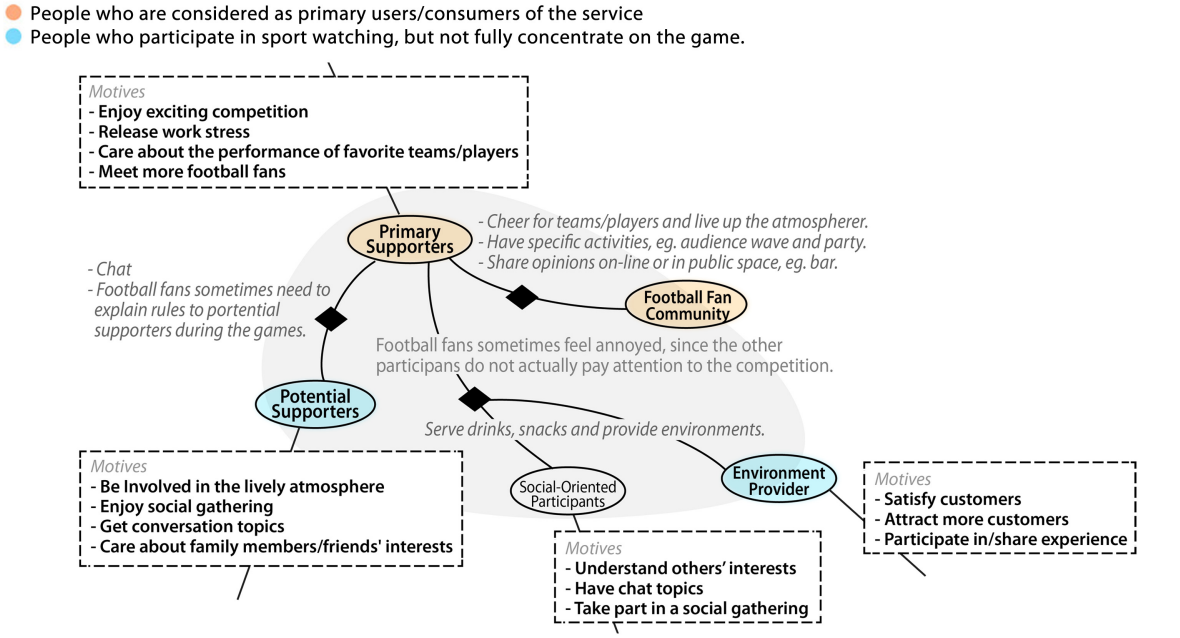
The flow model in Figure 22b shows that a football watching activity in a sports bar involves several different types of people in addition to the football fans. This includes peddlers who sell team scarves and jerseys to sport bar customers, the staff and owner of the bar, and the fans' friends, who despite not being present in the bar interact with bar customers through digital devices.

The multi-level social activity model (Figure 22c) distinguishes several types of people by their different motives for participating in sport watching. Primary supporters enjoy watching games, with strong interests in details of the game and high-quality game play. Potential supporters consider football watching primarily as a social activity and their motives for participation are generally derived from primary supporters' interest (e.g. most of our male interviewees mentioned that their girlfriends, wives and children are trying to

understand the game rules so that they can be more involved in discussions of details together during the game). The other user types, such as bar owners and environment providers, participate in the events because of expectations of business opportunities.



(a) The flow model of football watching at home **(b) The flow model of football watching at bars**



(c) The multi-level social activity model of football watching (partial)

Figure 22. Diverse user types of sport watching

Using the users types identified in the multi-level social activity model, we marked the primary supporters (football fans and community) in orange in Figure 22a and 22b. Entertainment and media companies have traditionally always targeted their products purely towards primary supporters. Groups marked in blue are not primarily attending the gathering to watch the game, but their greater interest in social interaction nonetheless makes them potential customers of a service. Although they are not the main sports fans, it is possible to

include these groups as stakeholders in current or future service design processes to develop better services of greater scope. For instance, bar owners can be clients of media companies, if a service design aims to provide a social entertainment space with complete sport channels and other facilities.

Due to resource and time limitations in this academic project, only primary supporters were selected for the continued development. Based the research findings, two personas were developed who, while both being primary supporters, have very different expectations of IT product use. As shown in Figure 23, two personas and their lifestyle portraits were introduced to the development team in the session of brainstorming and decision-making. All project participants and sponsors agreed that the two personas are very representative of typical football fans in Portugal. The further customer activity journey, service architecture, scenario and storyboard are also developed according to our personas' motives, usage of technology and lifestyles.

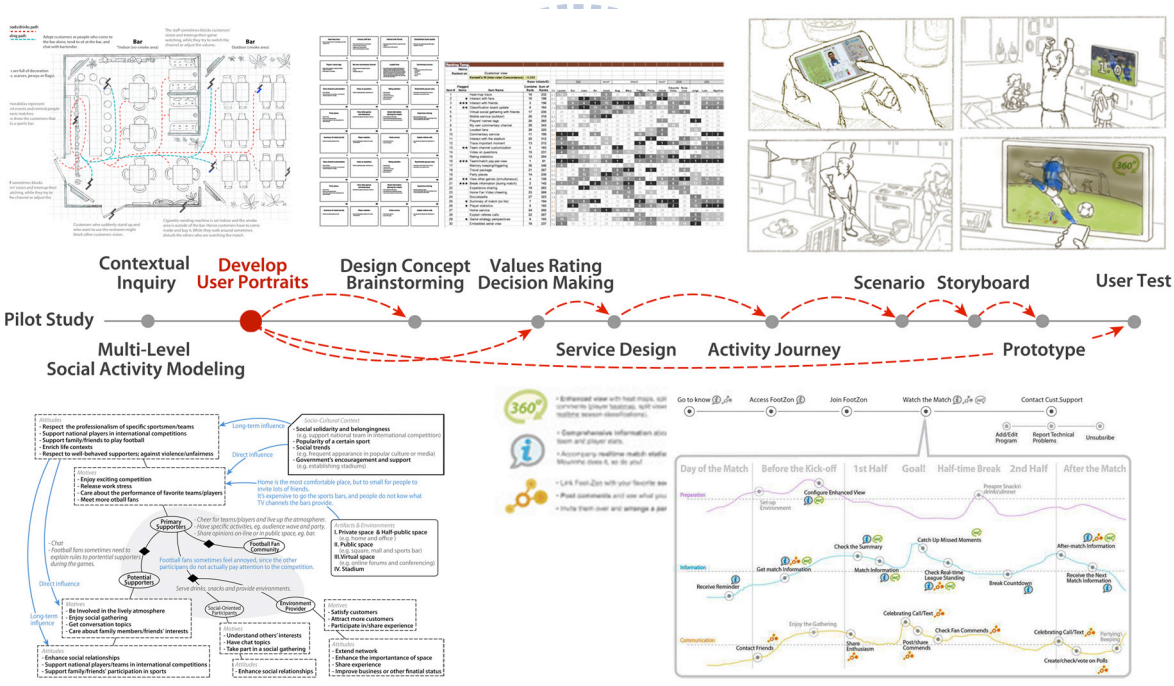


Figure 23. The use of user portraits in service design process.

Having a clear image of two user types also helped designers and engineers generate correct use cases (Cockburn, 2001) and prioritize important features in the later stages of prototyping and system development. For instance, the development team discussed different use cases and designed detailed interaction based on service design blueprints, which require correct selections of platforms (touch points) for a certain type of users (Patrício, Cunha & Fisk, 2009; Patrício et al., 2011). During implementation, we noticed that our user portraits helped the

development team focus on supporting the primary usage situations, and helped reduce the complexity and conflicts while supporting cross-platform interactions. Moreover, the two user portraits were also used to plan the usability evaluation and to discuss our service values in user test sessions.

8.3 More Challenges in Design Research

This section presents challenges associated with identifying different user types in non-goal oriented activities, which lack clear procedures that cannot be broken down into tasks, and in which complex social networks are involved. Based on the observations from the three design case studies, this section will also discuss dynamic and permanent attributes that should be included in design research to help designers and developers portray their users.

8.3.1 Non-Goal Oriented Activities

One of the most challenging parts of design research is to understand non-goal oriented activities, such as casual activities, traditions, entertainment and social gatherings. In such activities, people are driven by complex motives (e.g. to maintain personal social relationships or to inherit family traditions) but lack specific goals to achieve. In other words, most task analysis techniques and rapid design research frameworks cannot uncover the meanings and reasons behinds actions, as well as the underlying purpose of the activity.

In addition, it is difficult to account for detailed and complex social interaction or collaborations within a community in short-term design research. People's social behaviors are generally complex, subtle and situated. Our design cases have shown that traditional behavior analysis and pure observation cannot explain the reasons behind actions. In the study of teenagers' social behavior, it was shown that the young generation's social activities and considerations of making friends are extremely flexible and situated; they interact with each other within intricate communities and choose appropriate communication platforms based on the depth of the relationship.

Traditional research approaches in IT development and industrial design, which focus on a single application, product, context or specific users, cannot reflect the richness and complexity of real social contexts. For instance, in the case study of a Taiwanese tea ceremony, making tea itself is not the goal and purpose of the activity but rather the social gathering and transmission of cultural values. Therefore, it is crucial to extend the research to a larger scope, including its peripheral events, related participants, information flow and

relevant media usage, for understanding a non-goal oriented activity.

Based on knowing the different user types in the design cases, I suggest that researchers who wish to gain deep insights into social interactions use ethnographic approaches of long-term involvement and the multi-level social activity model in the early stage of a development process. A wider research scope can also make development teams aware of all different types of people involved in the activity, including consumers, direct end users, potential users and people who contact, interact or are affected by target audiences. Such an understanding can be of great benefit in design and development for social interaction and services.

8.3.2 Dynamic Demography

Based on the cases, it is noticed that there are two types of information that have not been highlighted in general user modeling, profiling or persona description, yet are important for identifying potential users and predicting their behaviors. The first type of information is dynamic attributes, such as age and IT consumption. The second type is permanent information, such as social values, norms, customs and appropriate behaviors.

The importance of the first type of information emerged from both the case studies of tea ceremonies and of teenagers' social activities. As shown in Figure 20, tea ceremonies are a typical type of traditional social activities that enhance the sense of belonging of family members, which are passed along from one generation to another. However, from marketing and usage-centered viewpoints, the youth involved in the ceremony are neither consumers nor end users. Because of the different media usage, they generally get no information from tea producers, farmers or other sellers (which is mainly accessible from magazines, newspaper advertisement and yellow pages), and they cannot afford to have their own teaware. However, the custom is still inherited, which means that within the predictable future, this young generation will grow to become the target audience of the tea ceremony. In other words, if service designers provide the right information on the right platform, it may be possible to shorten the period of this cultural inheritance and bridge the gap of media usage among different generations.

In the case study of teenagers' social activities, we found that although teenagers are willing to be active users of technology in their pursuit of new friends, their available modes of communication are often limited by their economic status. As teenagers generally have limited financial resources, most IT products and media producers are unwilling to develop services for them. However, the older teenagers will see great improvements in their personal

economy in only one or two years and their great interest and reliance on the Internet will make them the target audience of smart phones, tablet and other IT product in the near future. This type of information, predicting future audiences, is basics in marketing, but it is often overlooked in design research.

To develop better communication and cross-platform services, user profiles applied in design processes should reflect how people's IT product usage, interests and social behavior changes with demographic transitions. Therefore, I consider that design research needs to discover the dynamic attributes of potential users, such as predictable shifts in age, lifestyle, economic status and IT consumption. In addition, inherited customs and traditions within activities should be identified, since this can help designers target the next audience and invisible users within a greater population.

8.3.3 Motives, Attitudes and Socio-Cultural Background

More permanent information, including individuals' attitudes and values, has been highlighted in some work of developing personas. However, as with above-mentioned problems of user modeling, higher-level socio-cultural information such as norms, interpersonal relationships and culture, are generally ignored in design research. All the three design cases have shown that this information is important for proposing and evaluating design solutions in communication, service and social media development.

In addition, according to the MLSAM and flow models of all the case studies, it is showed that participants in a certain activity can have very similar behaviors, but that their concerns, attitudes and motives may still differ greatly. In the sports watching case, the potential supporters come to watch the game because they consider it as a social gathering. In the case of teenagers' social activities, although most users have similar behaviors on a certain platform, their abilities to account for and respond to each other's actions and expectations toward social media are very different. Therefore, I argue that research methods such as task analysis, observation, online logs and behavior tracking are not sufficiently capable of identifying different types of users, and that design solutions will be restricted when treating all types of users in the same way.

On the other hand, it is noticed that in casual activities and communication, social norms and cultural traditions consistently affect people's behaviors. For instance, teenagers' friend-making process on the Internet still follows the cultural manners that apply in their daily life. In the case study of tea ceremonies, some participants consider the ceremony to be part of

East Asian culture and feel responsible to maintain this tradition. In the case study of sports watching, people's attitudes and motives of supporting a certain sport are highly influenced by the community, social economic status and popular culture.

Understanding of high-level information such as values, attitudes and socio-cultural background is easily taken for granted and therefore ignored in design research. Common design research methods and frameworks can reveal the usage context and the ways that people involved in a certain activity, but have difficulty extracting the meanings and values behind activities. The design case studies have shown that ethnographic approaches, interviews and grounded theory can help development teams gain deeper insights, but that these methods are also time consuming and may require highly experienced researchers. However, the information discovered by these expensive research methods can give designers a more solid picture of their target audience, which is of great help when proposing, designing and evaluating concepts. The knowledge can also be reused in future development of new products or features and the initial research investment is therefore likely to pay off.

8.4 Summary

Traditional user modeling mainly focuses on human-computer interaction. Although the models reveal detailed information of the ways that people interact with systems, they are incapable of capturing many factors and contexts critical to design for social interaction. On the other hand, personas represent rich information of users' life contexts and attitudes, and bring various benefits to design practices. However, there is little consensus on suitable methodology for how to develop reliable and representative persona. Both user modeling and personas narrow down their audience groups by focusing only on a small set of important activity contexts; user modeling only focuses on direct users of systems, and personas mainly represent target consumers, rather than describing the many participants involved in social activities.

Chapter 9

DISCUSSION

In the previous chapters, the three case studies have outlined current challenges in understanding users in social interaction, experience and service design practice, such as diverse user types, uncertain activity goals and complex social interactions. This chapter summarizes the benefits that can be gained by extending a design research scope in the early stage of service and product development.

According to what we learnt from the three design cases and the evaluation workshop, I consider that the proposed integrated research approach and the multi-level social activity can identify invisible and potential users in a larger-scale service design and help researchers, designers and other practitioners develop more representative and reliable personas. In addition, how MLSAM can complement other design methods to help development team communicate to each other, predict their future audiences and develop more adaptive service and systems in iterative design process will be listed.

9.1 Extend the Research Scope and Identify Invisible Users

Through using multiple user experience research methods, the multi-level social activity model and traditional ethnographic approaches, I have shown that there are different types of invisible users, who are involved in social activities, but are neither direct product users nor customers. In the case of a tea ceremony, the young generation, who has inherited tea-drinking habits from their parents, is not considered as a target audience of the traditional tea industry and can only access very limited information. In the case of football watching, potential supporters represents a large group of people who participate in the activities regularly because their children, parents, friends or colleagues are football fans and they are willing to share these interests. However, most entertainment and media companies have not considered providing services for non-football fans. Based on what we learnt from the three studies, it is argued that discovering all user types and presenting socio-cultural information will bring many long-term benefits for service or product development:

- Extend product lines: Understanding different types of people and their motives can help designers propose more reasonable design solutions to meet users' needs and requirements. In addition, new opportunities for extending product lines arise from identifying invisible and potential users.
- Prepare for the next generation: As mentioned in section 8.3.2 Dynamic Demography, considering shifts in IT-product usage and economic status of potential users lets designers better predict new needs and expectations of their future target audiences. Instead of only targeting current consumers and end users, this awareness help designers think further and prepare for the next generation.
- Support large-scale and complete service design: In the cases of tea ceremonies and sport watching, I showed that extending the research scope beyond primary activities can help in gaining the necessary understanding of complex social interactions for developing large-scale services.
- Reuse of user portraits: Compared to the outputs of usability and activity research, socio-cultural information such as attitudes, values and norms is more permanent in time and is valid across different media and physical spaces. Therefore, this type of knowledge can continuously be reused and reapplied in different product development.
- Meet social and cultural needs: In IT development and marketing, adherence to social and cultural values is seldom considered a criterion of good product or service design. However, in the studies of social interaction, several details emerged from the research that brought to light and clarified norms and manners that are part of daily life. If design can reflect socio-cultural concerns, I believe it can enrich users' usage experience and increase product values.

As discussed in Chapter 5, most design research frameworks developed in HCI and related IT development have been well accepted and approved for helping both designers and researchers discover domain problems, understand user needs and behaviors efficiently. However, these methods generally do not focus on identifying user types or portraying users with the important dynamic and permanent attributes highlighted in the previous chapter. Therefore, if a development team expects to have the benefits mentioned above, it is recommended to apply the multi-level social activity model and even more time-consuming and expensive research approaches in the early stage of product and service development, to gain a broader understanding and deeper insights about target audiences and potential users.

In addition to identifying dynamic and permanent attributes of people, investigating non-goal oriented activities, especially social events and traditions, also needs an extended research scope to uncover the meanings and reasons behind actions, as well as the underlying purposes of a activity. For instance, in the case study of football watching, we have identified that participants' requirements and underlying motives are varied, including having high-quality watching experiences (primary supporters), having detailed information (primary supporters), discussing the game with others and enjoying each others' company (potential supporters). However, while building a customer journey map (Voss & Zomerdijk, 2007), service architecture (Patrício, Cunha & Fisk, 2009; Patrício et al., 2011) and human activity models (Constantine, 2009) to describe a journey (activity route) of a user and to plan different touch points that characterize user's interactions within the service, it is noticed that these methods can not reveal the diversity of users' underlying motives and purposes of the activity. Moreover, due to lack of notation of different user types (e.g. different capabilities and limitations of using technology), it becomes difficult to decide suitable platforms (e.g. touch points and channels in service design).

For instance, according to the information of the flow model and the multi-level social activity model, the customer journey map is considered to be extended as the *Activity Journey Map*, to cover users' overall activities of football watching and to reflect users' varied expectations. As shown in Figure 24, the map contains three dimensions to present each type of user requirements, which is later used to develop the full concepts of the service, decide touch points and develop service design blueprints.

Social interaction and service design is challenging due to involving diverse user types, uncertain activity goals and complex social interactions. Therefore, I argue that more comprehensive design research with a broader scope is needed to gain deeper insights, which can continue benefiting different phases in an iterative design cycle and help develop more adaptive and thoughtful systems. Through the design research for different social activities in different cultures, I have evaluated the strength and weakness of many methods and techniques in user experience and service design. For large-scale service and adaptive system development, the crucial issues are how to identify invisible and potential users and to reflect the diversity of their expectations and motives through presenting users types. Therefore, it is recommended here to combine well-accepted design research frameworks, the multi-level social activity model and other qualitative approaches, to gain deeper insights of larger contexts and usage situations and to recognize potential and invisible users.

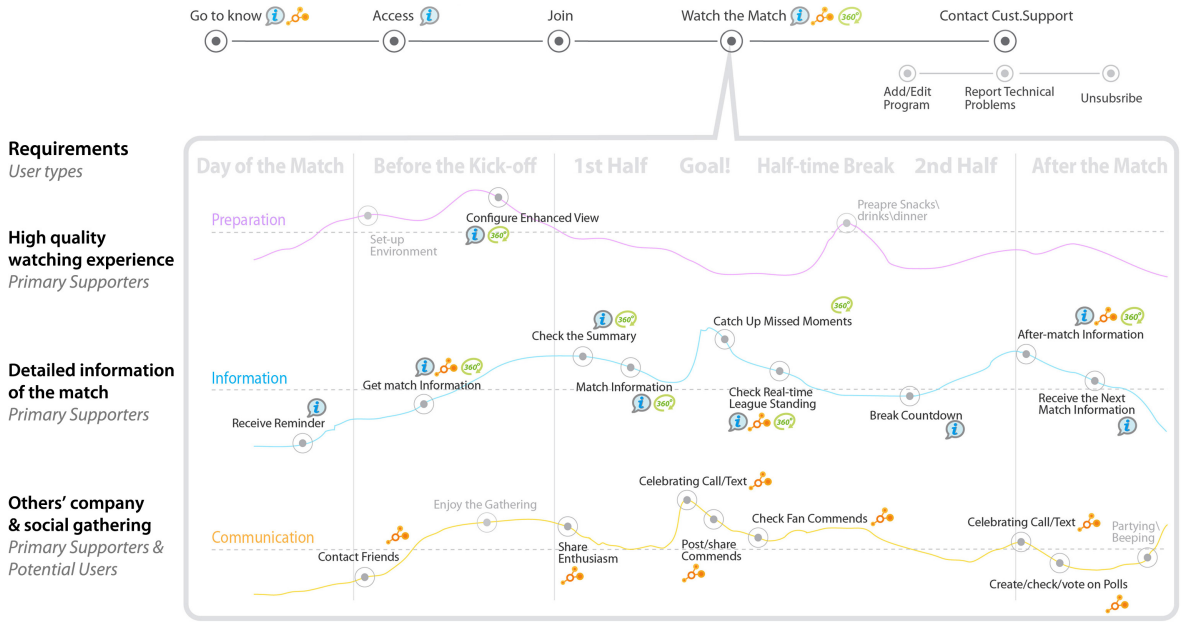


Figure 24. The activity journey map. Different from an original customer journey, this map contains three levels of requirements to reflect different user types, related activities and their expectations on the service.

9.2 Summary and Future Work

In user experience and service design, interaction issues have shifted from usability to sociability. I have highlighted current social interaction design issues and diverse cultural studies in IT development, and located the scopes of commonly used methods and frameworks by using a sociological integrated paradigm. Based on this review, I have argued that high-level socio-cultural information is generally missing in rapid design processes and that awareness of both macro- and micro-level information can have significant impact on social interaction design. Through a field study looking at traditional social activities in Taiwan, I have illustrated how social interaction is inherently rooted and embedded in a historical cultural context, and how an understanding of this context can improve design concepts. A multi-level social activity model was then proposed, to help designers and researchers capture this two-level information.

Through reflections on how the multi-level social activty model could support different types of design practices and processes in three case studies, I also argue that extending a research scope to a larger context creates great benefits for social interaction and service design. User portraits should include both dynamic demographic attributes, such as the shifting of lifestyle and IT usage in the predictable future, and permanent attributes, such as social manner and values. Review of the three case studies has demonstrated the advantages

of having these types of information in design practice, including helping development teams make better design solutions, preparing for the next generation of users and customers, extending product lines and reflecting people' socio-cultural background in developing design concepts.

An integrated research process is proposed, along with suitable research methods for each of its phases. This process is developed to help development teams identify invisible and potential users and gain a broader understanding of users' socio-cultural background. In addition, based on our experience of using the multi-level social activity model, I believe that it can improve communication within development teams and between practitioners. Currently, many research frameworks and methods are emerging from and improved by design practices in different domains. Most of these methods have specific purposes and are useful for solving particular design problems, but it is difficult to apply any of them alone to deal with complex social interaction and large-scale service design.

The proposed integrated approach has potential to provide more representative user portraits and to support different types of design, though this process is also relatively expensive as it uses the multi-level social activity model together with other research methods. In future work, I would like to improve the multi-level social activity model in terms of its presentation and use. I will also evaluate if newly developed design research methods can be integrated into the approach to make it more adaptive, reflective and effective. In addition, clearer practical guidelines for the application of the process can make it easier to use for designers and researchers.

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