

METHODOLOGICAL CONSIDERATIONS IN CROSS-CULTURAL ICT-DEVELOPMENT

User-Centred Design Methodologies for China Revisited

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Abstract. A meta-view on results gathered through the application of six different user analysis methods in China is presented. Fun-of-application, openness, creativeness and interactivity of applied methods are proved to affect their application in cultural context.

1. UCD, UX and ICT

User-Centered Design (UCD), the User Experience (UX), and Information and Communication Technology (ICT) build a triad. Further advancements in one part of this triad allow and are a prerequisite for the further development of the other parts and vice versa. However, even though being strongly inter-related with each other, each part represents a distinct domain.

UX describes the overall experience of the end-user when engaging with a product or service. Humans perceive their environment through various pieces of information received through different channels. Different filters, physical as well as psychological ones, enhance the perception of some information while reducing the perception of other information. Hence, information perceived is partially blurred and recombined with other information, prevailing mental models, existing knowledge, prior experiences and even emotions and feelings. Thus the overall UX is determined by the visual, physical, acoustical and olfactory traits of a product that make up product characteristics, such as its (interface and interaction) design, utility, usability, accessibility and functionality, by user traits, such as cognitive abilities, aesthetic preferences, knowledge and education, and traits of the domain of usage of the product or service, namely its context

ICT plays a major role in determining UX by setting the scope of possible product traits and functions within a particular domain. The further advancements of ICT enable the implementation of new product functionalities and

designs, which in turn influence a product's utility, usability and accessibility and thus determine the product's contribution to UX. Good UX will only be achieved if the product's functionalities and design are aligned with the users' traits and the requirements of the domain.

UCD describes activities and processes to ensure product and technology features to be aligned with the user and the context of product use. The core philosophy of this development approach is to achieve good UX with state of the art ICT products through intensive user engagement throughout the product development process. Thereby, the development process is an iterative process starting with an in-depth analysis of the user, the task and the context followed by the development of initial solutions and prototypes that are constantly further developed and evaluated together with the prospective user until an appropriate level of product sophistication is achieved. Activities carried out in different process stages comprise analysis, development/design and evaluation activities.

Thus the triad's goal is to develop products that provide a maximum of positive UX utilizing latest developments in ICT through UCD activities to efficiently and effectively translate the user's needs, wants and traits, as well as contextual requirements and limitations into product specifications.

This paper is intended to venture into the methodological advancements of international UCD activities. After a brief introduction of cross-cultural User-Centered Design (ccUCD), first results and a meta-view on research conducted on the application of user-analysis methods for and within the Chinese market are presented and results discussed.

2. UCD across cultures

The scope of engaging users from markets and cultures abroad is strongly determined by the UCD approach pursued for international product development. At this, one can differentiate between two basic approaches, which can be understood as the two extremes of one product development dimension. The one extreme, the so called product globalization, is the development of only one product for all markets the product will be sold in. Localization is the other extreme. Its goal is the development of one product for each single market the product will be sold in.

Without going into details of both approaches it seems obvious that each approach asks for different users to be engaged and that UCD activities will be executed with differing underlying objectives. While analysis, design and evaluation activities within the globalization approach must ensure the translation of user requirements into product qualities under elimination of culture bound metaphors and representations, activities within the localized approach specifically incorporate cultural values into the product. In consequence one

can expect the engagement of users from abroad to be more intense within the latter approach than within the prior. Even though partially applicable for both cases, the following remarks particularly aim at UCD activities within localization approaches.

In most cases a company will not have a local design and/or product development department in each country products are to be developed for. For carrying out UCD activities with real user engagement, this leaves any company with two possibilities. Either to hire a local UCD agency to carry out UCD activities in situ or to send own staff into the target market to carry out the activities required. Obviously the prior approach requires suitable agencies to be available in the target market, a requirement which cannot always be met, and comes with high demands in terms of communication and knowledge transfer. The latter approach even though more straightforward poses high demands on planning and organization and cannot always guarantee access to suitable users. In most cases a mixed approach will be pursued with some activities completely carried out through local experts, whilst others are merely supported by local facilitators and again others are to be completely accomplished with in-house development teams that are sent abroad. Which activities to outsource and which to carry out with own resources is a case-to-case decision. A trade-off between costs, information accuracy, depth of insight and speed will occur in any case. Not at least this trade-off is influenced by methods to be applied within activities conducted.

3. Research on UCD methodologies across cultures

Methods applied in ccUCD activities basically are the same ones as in regular UCD activities. To date only very few indigenous UCD methodologies are developed, and surprisingly little research on cultural effects on UCD method application is conducted. One example of indigenous UCD methods are Emotion Tickets developed by Chavan (Chavan, 2005) to overcome the lack of communicating critical opinions of Indian users (due to social standards) in product evaluation activities. However in most cases classic UCD-methods, which have their origin mainly in the fields of psychology and sociology and were mainly developed in the west, such as interviews, observations, focus groups, etc. are used. From own experience it is known that when applied by local experts in distinct cultural backgrounds these methods often are altered to suite local requirements - not just infrastructure and organizational wise, but to also suit the local user's preferences in a better way. What is changed, why it is changed and what are the benefits of these changes however is hardly documented or even publicized.

Some research on ccUCD method application is done at the Department of Informatics of the Copenhagen Business School, Denmark (Clemmensen and Goyal, 2005), the Department of Industrial Design of the Korea Advanced Institute of Science and Technology, Korea (Lee and Lee, 2007) and at the Department of Mechanical Engineering of the University of Kaiserslautern, Germany.

3.1. RESEARCH SETUP

Research presented here is part of a project which objective is the identification and definition of facilitators and obstacles of the application of methods for cross-cultural user analysis. More precisely the aim is to identify what makes some methods work better than others in specific cultures, i.e. China, Germany and Korea, and what are the requirements of successful method application. Within this paper initial high-level results for the Chinese case are presented and discussed.

We expect user traits, such as values, personality and motivational preferences, which in turn are influenced by culture (Kagitcibasi; Bond and Smith, 2006), as well as method traits, such as fun-of-application, openness, creativity and interaction-level (refer to TABLE 1), which obviously are culture-free, to determine quality and quantity of information gathered within the user-analysis. Due to cultural influenced variables some methods, with method-traits serving these variables better than others, are expected to generate better, more valuable results than methods that serve these variables less.

To reveal these interdependencies six different user-analyzing methods, differing in the attributes mentioned above were executed with Chinese users. One half of methods applied, i.e. interview, puzzle interview and cultural probes, were single-user methods with a maximum of one user and one researcher engaged in method application and the other half were group-methods, i.e. focus group, anecdote circle and inspiration card workshop, with a maximum of five users and two researchers engaged simultaneously.¹ In total 89 users participated, 59 of them in group and 30 of them in single-user methods. Users were recruited among graduate and undergraduate students of Dalian Maritime University, China. For participation they were rewarded with a small monetary gift equal to two meals in the school's cafeteria.

For each single-user method ten sessions were executed and four for each group method. Methods were executed by Chinese researchers in local language. To account for researcher- and learning-effects, six researchers were

¹ For brief method introductions refer to Courage & Baxter, 2005, Callahan, 2004, Säde; Keinonen & Soosalu, 1998, Halskov & Dalsgård, 2006 and Gaver; Dunne & Pacenti, 1999.

engaged in method application in total of which always two shared two methods, i.e. always one researcher was responsible for carrying out five single-user and two group methods.

TABLE 1. Methods and Method-Traits.

	Method	Fun	Openness	Creativeness	Interactivity
single	Interview	low	med	low	med
	Puzzle Interview	high	low	med	high
	Cultural Probe	med	high	high	low
group	Focus Group	med	low	med	med
	Anecdote Circle	low	med	low	low
	Inspiration Card WS	high	high	high	high

3.2. RESULTS

To analyze insights and ideas generated by the users a codification scheme was developed. Codified information then was categorized into the dimensions information-source and information-target. The source of collected information describes where the user’s idea or insight collected stems from, while the target of collected information codifies where the user’s idea or insight is aimed at.

TABLE 2. Dimensions of Collected Information.

D1	D2/D3	Meaning	
Information-source	Experience	critical events remembered by the user in which s/he was directly or indirectly involved	
	Opinion	judgments made by the user on elements of the product or the environment	
	Action	actions reported by the user s/he took or would take	
Information-Target	Context	User	information on the user, his/her preferences, lifestyle and behaviors
		Competitor	information on related services or products available in the local market
		Domain	information on the domain the service or product is developed for
		Infrastructure	information on the development of structural technological requirements relevant to the product or service

Information-Target	Product	Function	information on functional requirements of the product or service to meet requests
		Design	information on preferences regarding interface and interaction design
		Unique Selling Proposition (USP)	information on unique functional and design trait combinations that are perceived as a unique advantage of the product or service

In total 1249 ideas were generated. With 469 ideas, puzzle interviews clearly generated more ideas than any other method, followed by focus groups with 226 and interviews with 199 generated ideas. Inspiration card workshops, anecdote circles and cultural probes only yielded 129, 115 and 111 insights respectively.

For comparing method application efficiency, however, a comparison of number of ideas generated per user instead of total number of ideas generated per method is more relevant. At this, single-user methods proved to be more effective than group methods. Puzzle interviews generated by far the most ideas per user (44.7), followed by interviews (19.9) and focus groups (12.0). The figure below gives an overview of ideas gained and their distribution across insight dimensions.

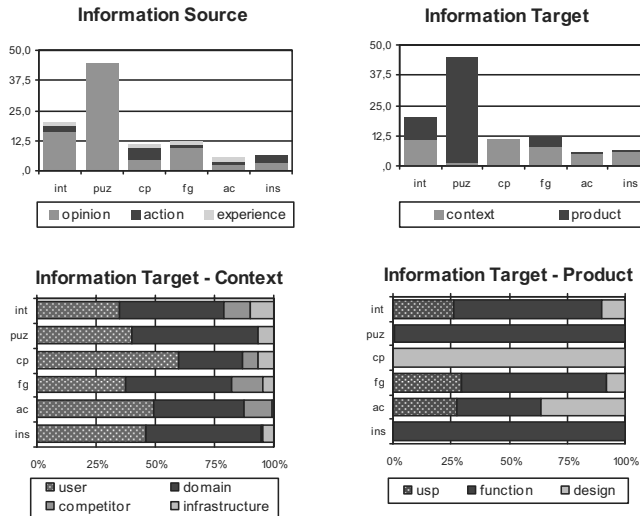


Figure 1. Insight Distribution (in [ideas/user] or [% of total information target]).

The main sources of insights were user opinions on the product to be developed, its context of use, or features of the user (77.9%). Actions and experiences accounted for 16.3% and 5.9% only. Information gathered aimed almost equally at the context and at the product (47.8% and 52.1%).

Just like the number of ideas generated, information source and target also differed in their distribution according to method applied significantly. So do insights from puzzle interviews stem from the users' opinions only, are almost completely directed towards the product and there they completely aim towards product functions. In contrast, almost half of the insights gained through cultural probes are derived from user actions and are directed towards the context of use.

3.3. DISCUSSION

Culturally China is often defined as a collectivist or interdependent country and thus one might expect group methods being more efficient than single-user methods here. Results prove, however that this expectation seems faulty. In total and per user single-user methods generated more insights than group-methods (779 and 25.2 vs. 470 and 8.2). One reason might be the group-composition. User sampling ensured that users of one group did not know each other prior to participation. Collectivistic and interdependent behavior, however, mainly apply to in-groups. Thus even within collectivistic culture one cannot simply assume members of a randomly chosen group working more efficiently together.

In regard to method traits influencing the application of methods, results show that less open and more structured methods produced significantly more results than more open and flexible methods. Both, puzzle interviews and focus groups, produced significantly more insights than their peer methods. The clear structure of those methods obviously helped the user to direct his/her thoughts into a particular direction and thus supported idea generation. Hence, the target of information is affected by the methods openness. At this, less open methods seem to guide the users' thoughts more towards the product to be developed while more open methods allow the user to venture into the broader context of product use more.

Even though the fun of method application has an important effect on the user's motivation, this does not necessarily mean that high-fun methods generate more or better results. Results suggest that fun methods that provide only little guidance might let the user have a great time during method application, but insights gained are not necessarily better or more. This could particularly be observed within inspiration card workshops. However, fun methods that also provide guidance during application, such as puzzle interviews, proved to generate the highest ratio of ideas.

Interactivity and creativeness of applied methods also seem to affect the method's applicability. Equally to fun of application their affect seems to be mediated by the method's openness.

4. Concluding remarks

First and high-level results presented here suggest that particular the openness of a user analysis method influences its applicability for the Chinese context. Less open methods that provide more and direct guidance seem more applicable than unstructured and open ones. Hence, the openness a method seems to mediate the effects of other method traits, such as fun-of-application, creativeness and interactivity.

Results presented here, however, can only be considered as a very broad and brief climbs of factors influencing method application in China. Within further research these results will be further scrutinized. They will be related to specific, culturally influenced, user traits, such as personality, values and flow, and compared to results gathered in Korea and Germany.

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