

# Cognitive and Cross-Cultural Adaptations of Products, Systems and Services

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## Abstract

The aspects that have to be taken into account while developing systems or services for different user groups worldwide can be categorized into 4 levels (Sturm, 2002): technical, linguistic, cultural and cognitive. Both the technical and the linguistic adaptations can be applied straight forward in that best practices and guidelines were established throughout the last decades. In contrast, cultural and even more the cognitive variations across user groups still present a tremendous challenge. Therefore, it is argued to focus on the latter ones while working on a research agenda for adaptation to worldwide user groups.

## 1 Introduction

Numerous studies have shown that prior exposure to visual stimuli as well as constructs such as field dependency have an impact on people's way of seeing the world based on cultural and environmental factors.

Segall et al. (1966) studied the sensitivity towards optical illusions cross-culturally. The effectiveness of both the Müller-Lyer illusion as well as the horizontal-vertical illusion was shown to be related to visual cues given by the environment the subjects grew up and lived in. A concrete application of these effects might be found for instance in 3-dimensional icons designed for a mobile phone. Their universal understandability could be limited if the information is conveyed by using these illusions.

The concept of field dependency first defined by Witkin (1950) distinguishes two ways of perceiving the world around us: separating objects from their background (field-independent) or focusing on the relationships of the objects perceived (field-dependent). Holtzmann et al. (1975) have shown that US citizens tend more towards field-independency in comparison to Mexican citizens that tend more towards field-dependency. Witkin and Berry (1975) saw in their research a correlation between the level of a society's individuality and field dependence. It was found that field-dependency is more prominent for people from collectivistic cultures while individualistic cultures tend more towards field-independency. Furthermore,

men are more field-independent than women according to Halpern 2000. My own research, however, suggests that there might be an impact of experience in using information technology and formal schooling on the field-dependency of test subjects, too (not yet published).

At first sight, field dependency is expected to have an impact on the effectiveness and efficiency of different visual presentations and layouts of interactive systems. In addition, Reed and Oughton (1997) discovered as well relations between the users' way of traversing menus and the concept of field dependency. This might lead to research questions focusing on the information architecture of interactive systems.

As pointed out by Sturm (2002), these cultural variations of cognitive characteristics have to be explored further in order to determine possible opportunities for the cultural adaptation of systems. In addition, the importance to check user experience research for its external validity has yet to be established among HCI researcher.

## 2 Research

### 2.1 Topics

The research topics include but are not limited to:

- Internationalization and localization of products, services and systems
- Cultural and personal factors on system design
- Variations of research methods based on culture and personality
- Interaction of culture and cognition
- Universal factors in global system development
- Entrepreneurship

### 2.2 Methods

As far as the research methods are concerned, both qualitative and quantitative approaches are used based on the research question. This starts at a multi-months ethnographic research and ends at controlled lab studies.

## 3 Author's background

Prof. Dr. Christian Sturm is professor at the Hamm-Lippstadt University of Applied Sciences in Germany. He holds a degree in computer science from Furtwangen University and a PhD in cognitive psychology (major) and cultural anthropology (minor) from the University of Freiburg. His research interests include cross-cultural and interpersonal aspects of human-computer interaction, experience research and entrepreneurship. Prof. Dr. Sturm has worked in both industry and academia in Europe, Latin America and Africa.

Prior to his current position, Prof. Dr. Sturm was associate professor for human-computer interaction at the German University in Cairo, Lead Customer Experience Designer at Hewlett Packard in Barcelona, a research professor for Cross-Cultural Human-Computer

Interaction at the Universidad Tecnológica de la Mixteca in Mexico and a freelance consultant for cross-cultural usability in Munich, Germany. Furthermore, Prof. Dr. Sturm lectured on usability, human factors and user experience at Furtwangen University and the Instituto Europeo di Design in Barcelona.

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