

# Chapter XLVI

## Cultural Appropriation of Software Design and Evaluation

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### ABSTRACT

*Communities all over the world have established their own value systems which do not necessarily correlate with the intrinsic values of technology. The account of internationalization and localization of information technology reveals that an abstraction of the receiving societies' culture leads to the design of unusable and unwanted socio-technical systems. Cross-cultural research extrapolates major challenges of current development practices. Longtime established methods, understandings of quality concepts, and metrics of socio-technical systems can no longer be assumed to be universals. Thus the author argues that as much as the design of socio-technical systems has to be synchronized with the target community so does the design and evaluation process itself as well as the underlying quality concepts. Empirical research in the design of information and decision support systems in the Namibian context demonstrates the need for a change of paradigm in socio-technical system design and supports the presented culture-driven design framework.*

### INTRODUCTION

Technological innovation has progressed with breathtaking speed during the last decade. Especially in the field of information technology where people are under constant pressure to keep abreast of development be it at work or in their private space. Although technology is intended to be used by every citizen, not all can manage. Societies are divided in "technological know and know nots". The socio-technical gap is widening by the day as the

technologically skilled are the one's continuously driving technology further. However in socio-economical terms, all communities are targeted to use technology. Researchers and practitioners worldwide are facing numerous challenges in developing usable systems for specific socio-cultural contexts. Crossing disciplinary or cultural boundaries implies that one should reconsider conventional assumptions, concepts and methods (Winschiers, 2006). As much as artifacts are cultural so are processes, thus software as well as their development method-

ology are not universally applicable. The invalidity of established design methods and concepts is best explicated with case studies from a society where the value system is highly distinct from a technological society. Our experience is based on the design and evaluation of information and decision support systems in Namibia, a southern African country. From these case studies, similar evidences from the literature and theoretical models, lessons can be learned informing appropriate socio-technical system development.

Culture in this chapter shall be seen as an orientation system including values, beliefs, and behaviors of a group sharing genuine or virtual reality. An important aspect of our debate is to consider culture as much as a structure and a process as defined by cross-cultural psychologist Boesch (in Eckensberger, 1997): Culture represents the field of action which it induces and controls and is also continuously transformed by it. Thus considering culture in relation to the action of software development implies that culture induces and controls the development but is at the same time transformed by it. The dynamic and mutual interdependence of culture and information technology has become apparent through manifold experiences of technology transfer, internationalization and localization efforts and cross-cultural design.

## **The Intrinsic Culture of Technology**

It has been acknowledged widely that Information Technology represents the culture and worldviews of its creators. Functionality as well as user interfaces of the world-wide-web and other IT applications being determined mostly by western, male, middle-class representatives are highly cultured and gendered.

Luis Hestres (2003) has identified features reflecting the American culture, such as individuality, low-context communications, competition and cooperation, business, tight time management, and high work ethic in Microsoft Outlook. Information

and knowledge architectures in web-applications match with the predominant western classification scheme (Winschiers and Paterson, 2004). The worship of values, such as rationality, instrumentalism, effectiveness, efficiency, and competence in technologically driven societies promotes continuous transformation of technology and society in line with the professed objectives. Software products preserve those values through explicit quality formulation as part of the software development process. A typical software specification comprises functional requirements as well as software quality attributes. The software is designed and evaluated in accordance with specified quality criteria. Major architectural and interface decisions are guided by the quality attributes specified thereby fully incorporating those values. Common software quality attributes are Safety, Understandability, Portability, Security, Testability, Usability, Reliability, Adaptability, Reusability, Resilience, Modularity, Efficiency, Robustness, Complexity, and Learnability (Somerville, 2004). The definition of “*usability*”, (or user-friendly) furthermore, incorporates its origin from a modernist or enlightenment tradition. It is commonly described in terms of time to learn, speed of performance, error rate, retention over time and subjective satisfaction (Shneiderman and Plaisant, 2005). Consequently, industry-recognized methods for evaluating a system’s usability focus on efficient and accurate performance (Badre, 2002).

However empirical research with Namibian user groups has demonstrated a deviating understanding of a “usable” socio-technical system. It was associated with terms such as *trust*, *communicative*, *easy*, *comfortable*, *conducive* (Winschiers and Fendler, 2007). Allen and Buie (2000) have further examined how different frequently used terms in Usability Engineering, such as “intuitive”, “user-friendly”, “logical” could be compromised. They conclude that if a common meaning is not ensured among the concerned group a software solution is created that is different from the one intended.

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