TLCC - Towards a framework for systematic and successful product internationalization

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Abstract:
This paper presents an integrated framework for successful product internationalization. It covers the different points of view and different approaches existing in the development team in order to provide a guideline and to broad the horizon to the different dimensions involved in the process.

Keywords

Product internationalization, Culture, Cognition, Usability, context-based design, user-centered design

Introduction

Every professional line of thought comes along with its own approach to the process of internationalization of products. Due to superficial views of how and which characteristics can be adapted to a foreign market as well as the imbalance of power between the different professions within the development team (Cooper, 1999) a systematic integration of all variable aspects is difficult. This is particularly true for high tech products as their complexity calls for an extensive consideration of the context, in which they are used (Honold, 2001). The questions arise which are the criteria a systematic approach should follow and how the different point of views should be combined?
In this paper a four-level-framework to the process of internationalization is presented, which integrates the different approaches in a categorization system providing a step by step guideline. It is based both on practical experiences of the German author working on information technology projects in Latin America and theoretical essays.

The framework

The name of the framework - TLCC – is derived from the initial letters of each of the four levels:

- Technical level
- Linguistic level
- Cultural level
- Cognitive level

Each of these dimensions cover one of the variable aspects of a product and cannot be seen independent from one another. Starting at the top, each level provides the prerequisites for the next one. Cultural adaptations for instance do not make any sense if the product is not usable due to the lack of technical prerequisites.
The following sections describe the model with each of its levels in detail. Furthermore, a high-resolution version of each screenshot is provided at: www.christian-sturm.com/iwips2002/index.html

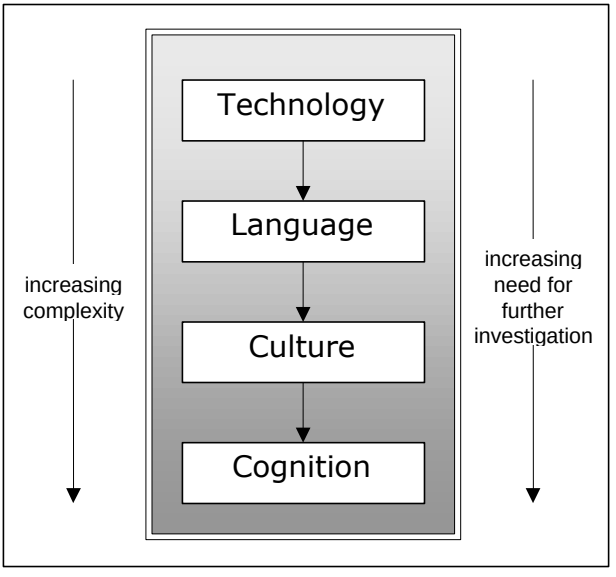

Figure 1: TLCC - The framework for systematic product internationalization

The technical level

The first level covers all technical aspects of a product. It includes the technical infrastructure and technical standards used in the foreign country the product has to be adapted to. It refers e.g. to

- GSM, TDMA or UMTS in the case of cellular phones
- PAL, NTSC or SECAM in the case of the video norm
- Power supply standards for 50/60 Hz and 220/110 V including plugs
- ISO-norms for character sets, Unicode

The adaptation of these issues ensure that the product works from the technical point of view and is the basis for the next level.

The linguistic level

For most of the technical products the international adaptations stop here, where different language versions are produced. The words and texts of the interface and manuals are translated and several aspects like punctuation, vocabulary and grammar are transferred, but often without the consideration of cultural differences. The following screenshots show the Arabic and Eng-

lish version of “arabia.com”, where the linguistic and graphical variation is handled in a very technical way:

[Figure 2 at www.christian-sturm.com/iwips2002/index.html]

The whole layout is mirrored due to the right to left orientation of the Arabic language. Furthermore the Arabic version needs more space for each character, what can be seen in the menu bar on the right/left. It contains in both versions the same items.
The cultural level has to be seen apart from the linguistic level as cultural differences in translations are a lot of times disregarded. This can be seen e.g. in the fact that in most of the cases one Spanish version is taken for all Spanish speaking countries. Not only the usage of words but as well differences in the grammatical structure are ignored. In Spanish there are basically two different grammatical forms used to express the past. One is called “pretérito indefinido” and the second one “perfecto compuesto”. The first one describes actions in the past that happened just like a single moment and implicates not only a distance in time but also in action to the happening in the past without any influence to the present. This means that no one has or had any kind of influence on it, basically a passive point of view. The “perfecto compuesto” is used to explain a happening in the past as a duration, which still has influence on the present, what implicates a more active way of seeing it, active meaning because of the influence the person has on it. The interesting point is that in Spain, as a European country tending more to a “doing”-society in the cultural variable of “action” (Brake, 1995), the “perfecto compuesto” is the predominant grammatical form used to express action of the past, whereareas Mexico tends to be a “being”-society, using essentially the indefinido as a passive form to express actions in the past.
Treating language adaptations not in such a technical way considering the cultural implications leads to a more successful product internationalization like shown in a research investigating the differences for the design of manuals for cellular phones in China and Germany (Honold, 1999).

The cultural level

The third level includes the cultural dimension of the use of products. It basically covers two areas: the context of the use and the meaning of symbols, graphics, colors and metaphors used in the user interface.
The cultural context of the product use and its position in the everyday life delivers the information concerning the required functionality. As Siemens has shown in conducting an intensive field study observing the usage of

Figure 3: Screenshot of www.hva.nl

German washing machines in Indian households (Honold, 2001) it is impossible to determine the number and type of functions needed without taking the context into account.

In comparison, Internet presentations not only have to consider the context of use, e.g. if the decision making process for buying something on a B2C webpage is group-based or individual-based. Furthermore the goals of the user (Cooper, 1999) have to be seen with their cultural bias like shown in the following comparison (compare Marcus, 2000):

Both screenshots (Figure 3 and Figure 4) are initial pages from University web-presentations. The first one comes from the Netherlands, an individualistic culture with a low power distance index (Hofstede, 1997). These values find their equivalence in the design and the structure of the given web-presentation. The major concern of the target group (potential students) are their possibilities to achieve their own visions and goals. You get on this page the information concerning the student life in Amsterdam and on the campus as well as individual career opportunities.

In contrast, Figure 4 shows an example from Uruguay, a Latin American country being a collectivistic country with a high power distance index (Hofstede, 1997). So in this case the target group (potential students and their parents) is interested in the position the University fulfils through the director as a major representative in the society together with its history and its legitimation. The opportunities for the students to work on an individual self-realization is not important as the correspondent items in the menu, which can be seen as a list of priorities, occur after a long scrolling down action.
Figure 5 shows the case of a Mexican private University, which is organized comparable to a private University in the U.S. There one can observe a mixture between both extremes showed above. The page contains both informa-

Figure 4: Screenshot of www.rau.edu.uy/universidad/

Figure 5: Screenshot of www.cem.itesm.mx

tion for the parents together with the responsibility the school has in the society and information concerning the individual growth of the students. It is an example for the process of cultural change due to the globalization process.
In summary the consideration of the cultural context delivers the information concerning the required functionality and the attitudes and goals of the user while analyzing the context of use.

The cognitive level

The list of the required functions does not yet deliver the information concerning the question of how they should be presented to the user. The cognitive level therefore goes beyond the pure meaning of interface components covered by the cultural level. It encloses menu structures, priorities, interaction styles and techniques as well as basic cognitive processes used in human computer interaction. This level is undoubtedly the most underestimated one but has a great impact on the usability of a technical product.
The design of menu structures and function priorities can be investigated e.g. with simple card sort methods. But when it comes to cross-cultural differences in cognitive strategies and external referential systems, a lot of required interdisciplinary research is still on the agenda. A problem can be found in the different goal of the two scientific approaches of cognitive psy-

chology searching for universals across humans and cultural anthropology investigating differences on a group level. Cognitive anthropology as a section in anthropology tries to close this gap since a couple of decades (D'Andrade, 1995), but the transfer to the field of HCI is still in its infancy. An interesting finding is shown in Figure 7, where the horizontal-vertical illusion (Figure 6) was investigated cross-culturally (Segall, 1999). In cultures that are used to have an "open vista" like on a plain the upper vertical line is recognized longer than the horizontal one whereas groups living e.g. in the rain forest perceive both lines with an equivalent length. Findings of this kind have a direct impact e.g. on the design of icons or symbols.

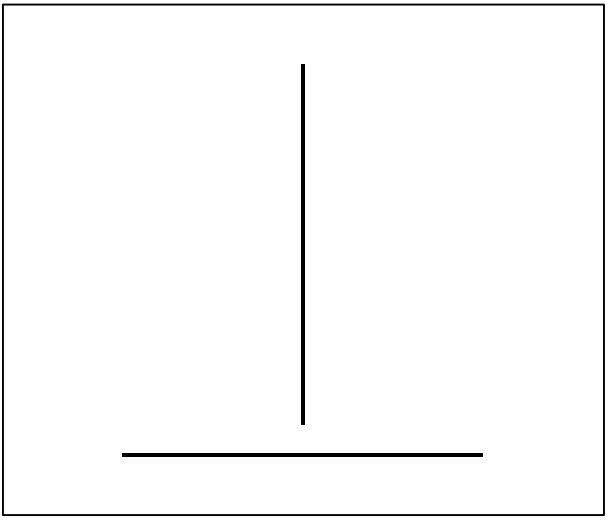

Figure 6: The horizontal-vertical illusion

Another interesting research connected to the cognitive level was conducted by Nasar (Nasar, 1984). He found, that in contrast to Japan, where vegetation and vehicles are most frequently recognized in urban street scenes, the people in the U.S. mentioned new buildings as most significant element. This should lead e.g. in the case of an interface for a navigation system in the car to different results concerning the design of maps and speech interfaces in both countries.

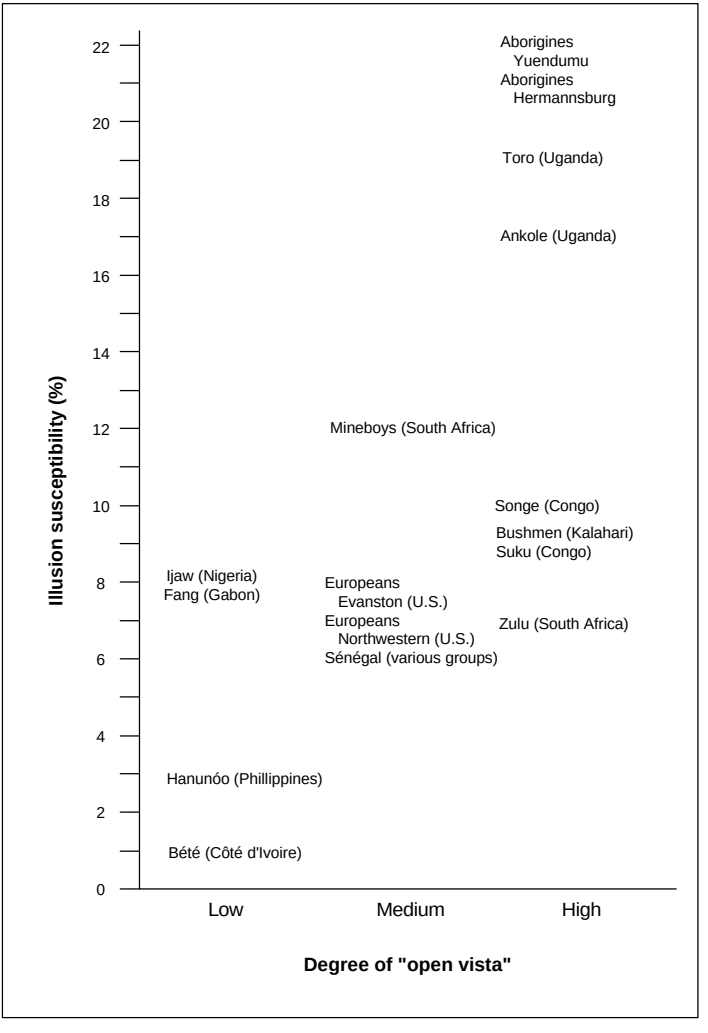

Figure 7: The horizontal-vertical illusion in a cross-cultural comparison (Segall, 1999)

Conclusion

According to my experience there is a need to combine all different approaches to the process of internationalization in order to come to successful results. As shown in this paper, the technical and linguistic variations only cover a small area of what can be done in order to adapt a product to the different contexts of its use.

Finally I argue that there is not only a need for including ethnological methods into the process of cross-cultural product development but combining the different lines of thoughts into one integrated approach, in which the emic (local) point of view should drive the whole development process.

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