

Localization, Culture, and Global Communication

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INTRODUCTION

The ‘native language’ (the *mother tongue*) is one of the most decisive identity factors of a nation. Besides being of political importance, it carries a high emotional value and is strongly related to culture. Due to technology, particularly the Internet and due to individual ownership of computers people have more opportunities to interact and cooperate with others outside their local community (Nakakoji, 1996). As a consequence, software products must be used in different countries. As early as 1960, the first technological steps were made by IBM (Hensch, 2005) in order to find ways of processing and displaying Japanese characters. Initially, the prime concern was an adequate representation of national characters (including diacritical characters of European languages), typically called *national language support*. In the meantime, an ever increasing number of people are in need of using software products. Technological progress allows communication via pictures and also via colorful, animated displays showing people in their natural surroundings, resulting in software products becoming a part of their daily environment. Computers today execute more complex tasks in closer imitation of human behavior. As a consequence people expect the computer to adapt to their individual culture.

Experience has shown that the transfer of a software product into a geographically (and culturally) different environment implies much more than a simple language translation: we speak of *localization* (Ishida & Miller, 2005), that is *the process of adapting a product to reflect the local standards, culture and language of another market* (GSSI, 2000), or *the infusion of a specific culture into an international product*. It requires a comprehensive rethinking of logic and presentation, sometimes even paradigmatic changes to the offered product (Chroust, 2000; Collins, 2002; Davis, Grimes, & Knoles, 1996; Esselink, 2000; Ishida & Miller, 2005; Kubota, 2003).

In this contribution we identify several layers of localization and concentrate on those layers which

show a high interaction with the cultural environment of the user. *Examples are identified by “□.”*

BACKGROUND

Both the need for more adequate localization and the means to provide it have increased over the last few years. Factors promoting the need for localization are:

- **Technological advances:** Increase in speed and quality of computers especially due to modern displays technology permit high-class near-real-life videos.
- **Increased realistic animations:** The text-oriented computer interfaces and largely culturally neutral applications (ledger, bookkeeping, etc.) of yesterday did not require much localization. As long as communication functions through formalized representations (e.g., UML-diagrams) little cultural context is transmitted. This changes when communicating via language, images or video (Nakakoji, 1996). Improved graphical support enables images and video-clips of real persons in realistic surroundings to be shown. Images and videos carry many subtle cultural messages. This increases the need to localize, especially with respect to social behavior of the actors and their cultural setting according to social conventions. But, these videos are consumed in the familiar cultural environment of their viewer and discrepancies become more evident.
- **User expectations:** More and more people come in contact with software (often in hidden form). An increasing percentage of them are not willing, interested or able to communicate in a foreign language with the system, they expect high-quality communication in their mother tongue (Miller, 2004) compatible with their cultural expectations. In contrast to traveling in a foreign country, access-

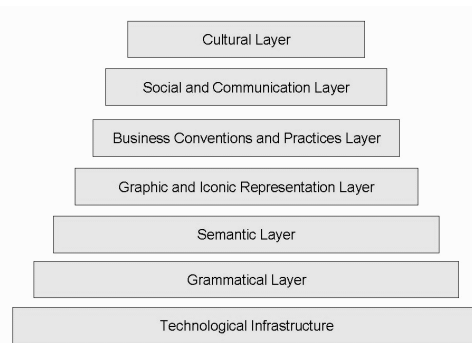
ing systems from one's habitual business or home environment makes deviations from the cultural norm strongly apparent. This is psychologically different from traveling to a foreign country.

- **International cooperation:** Global outsourcing of software production induces localization problems both in the product and the production process (Krishna, Sahay, & Walsham, 2004). International business processes will require products which can even be operated transparently in different languages at the same time. Subtle questions about translation of user inputs and outputs arise.
- **Buyer's market:** Due to the ability of global shopping, there is a surplus in offered software world-wide. Emotional factors play a considerable influence on buying decisions. When trying to attract customers' interest, mother tongue and familiar cultural settings and graphics are the best eye catchers. Customers prefer products that have local branding elements corresponding to their culture. Bad or inadequate localization will diminish the thrust of potential buyers (Lohse & Spiller, 1998). Potential buyers must also be able to understand the usability and functionality of a product quickly (using demos, introductions, examples) otherwise the opportunity is missed. Again cultural compatibility is a must.
- **Increased non-personal interaction:** Communicating by a computer is deprived of many channels (e.g., intonation and body language) used in face-to-face encounters. Cultural mismatches might therefore result more easily in misunderstanding.
- **Return on investment:** Producing software for a (small) local national market is in most cases economically unsuccessful. Software products as international commodities make it necessary to localize on a common base product (a 'product line'). This approach also allows even small, local niche suppliers to compete with their products in the international market.

LAYERS OF LOCALIZATION

Localization has to be performed on different levels of increased comprehensiveness and cultural dependence (Figure 1). Higher levels usually rely on lower-levels of localization.

Figure 1. Layers of localization



Technological Infrastructure Layer

The basis for localization is technical and organizational provisions. They are mostly invisible to the user, mostly providing *internationalization*, that is making a product ready to be localized. Necessary provisions are well understood and will only be sketched below (Barbour & Yeo, 1996; Chroust, 2000).

- **Separation of text and code:** The basic strategy is to separate text and code in order to be able to translate the text without affecting the functionality (the code). For localization only the text-part is replaced. This seemingly simple scheme, however, cannot be fully achieved, see (Chroust, 2000).
- **Storage size for texts:** English is a very compact language. Other languages usually take more space. As a consequence panels and layouts often have to be redesigned to accommodate other languages. □ *IBM reserves 30 percent extra space in order to accommodate languages other than English.*
- **Code pages/Unicode:** For a localized product the correct code page or the appropriate Unicode settings must be provided.
- **Sorting sequence:** Unsophisticated sorting algorithms use the bit representation of the individual characters of the code page. As a consequence national characters (e.g., 'ä') appear out of sequence. The alternative is a more complicated (and therefore slower) sorting algorithm (Mustafa, 1996).
- **Sorting of names:** The position of the 'family name' is different in different cultures. □ *"Franz Liszt" becomes "Liszt Ferenc" in Hungary.*

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