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A study of user context dependent multilingual communications for interactive applications

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Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Human Factors (HF).

Introduction

Of the study objectives

The present study addresses the issue of localisation for multilingual context-dependent interactive applications. "*Localisation*" is the process of adapting the application for a specific country. It implies not only translation of dialogues or phrases from one language to another, but also the adaptation of idiomatic and cultural characteristics. The same issue is relevant to multilingual interactive applications where several languages are to be supported simultaneously.

The objective of the study is to define how to simplify the development process of highly interactive multilingual applications and to ensure the top quality of their localisation.

The present study is intended for anyone dealing with complex localisation of context-dependent interactive products, such as dynamic online systems, video games, serious game and eLearning, smartphone applications, internet-based applications accessed by PC or mobile, etc. It concerns applications designers, developers, publishers, product managers and distributors, as well as all stakeholders who may benefit from its use, including service and application providers, end-users, etc.

In short, the present study primarily concerns those who have already experienced a serious localisation problem, when designing or using an application, especially designers, publishers, users or all those who don't want to experience this problem at all.

Therefore, the present study tries to achieve two key goals:

- To describe the state of art in the localisation issues and techniques, especially regarding context dependency;
- To describe a way forward, a proposed roadmap leading to guidelines or potentially standard in that area.

Although this roadmap may need additional collateral information, the study shows that the contents, the scope and the potential solutions for such guidelines is clearly defined, so that the Technical Committee may launch these guidelines study with no delay, nor additional research required.

Of the study background

ICT users are becoming increasingly involved and fully immersed in applications such as video games or one-to-one Internet-based applications. The more immersed the user, the more successful the application! Two key factors determine the extent of such immersion: an increasingly realistic environment (such as graphics), and a more in-depth textual or oral interaction. Applications therefore demand "online" textual or oral interactivity with the user in a complex, accurate and natural-sounding way. Texts are created on the basis of the user context, which, in turn, depends directly on the user's actions and his/her environment.

The complexity of dialogues and interactions with the environment in different context has become so important that it is practically impossible to plan for every potential combination. Text "*strings*" (chains of characters) to be created by the application are therefore constructed dynamically from scripts for human-machine dialogues, through "engines" generating at real-time phrases that are dependent on these context variables.

Once created, these applications are to be adapted into languages or countries different than the original ones they have been created for- a process known as *"localisation*". It implies not only the linguistic translation of dialogues or phrases from one language to another, but also the adaptation of idiomatic and cultural characteristics. In simple applications, with little dynamically generated text, the localisation process includes the translation of the whole User Interface (UI) and text strings from the source language into the target language.

This is however not possible for interactive applications based on variables and interactivity scripts. Localising such an application implies translating all possible UI and text strings from one language into another, identifying all variables and their potential values, and also translating these variable values into the target language. The fact that majority of applications are being written in English or Asian languages, which have a very simple grammar system, increases the difficulties when translating into other, more complex-structured languages, where grammatical agreements vary depending on case, number and gender. The problem becomes even more critical when having to adapt cultural variables. These issues can lead to limiting the number of countries in which the application can be marketed. Alternatives are either forcing users to use English, or releasing poor quality applications in localised languages, risking a poor audience or worse, a negative buzz.

Several types of industries are facing this critical problem, such as the game industry, education, telecom, internet, automotive industry, etc. Many of them are working around the problem by simplifying the dialogues to avoid grammatical barriers, therefore reducing the quality and the level of immersion. And there are no emerging languages technologies able to propose a valuable solution yet.

Therefore, there is a strong need, both for the designers and for the end users, to study issues relevant to the localisation of such context dependent multilingual interactive applications, approached from all relevant stakeholders' perspectives, to understand the complexity and specificity of the issue throughout all the involved application segments, to analyse how these sectors are addressing or working around the problem, and finally how the whole application development community can define together a common way to solve this increasingly critical issue.

Of the study boundaries

The study will focus on ***text-based*** interactivity, since this is the core of all communications, even audio ones. Indeed, applications are either explicitly text based (messages are displayed to the user or taken from him through keyboard) or they add an audio interface, as input or output. Audio inputs are based on Speech To Text (STT) and Automatic Speech Recognition (ASR) technologies to be able to record and process user input. Audio outputs are either pre-recorded audio (then static and with no link with our scope) or based on Text-To-Speech (TTS) technologies able to generate speech out of a dynamic text. The present study will then not consider audio at all, and the speech technologies STT, TTS, ASR, although of high interest in multi-language systems, will not be presented in the report as being totally out of scope.

It is also important to explain what part of the concept of UGC – User Generated Content – the present study is covering. UGC is a generic term covering all types of information, used in a broad range of applications, which is coming directly from the user, such as news, forums, comments, blogging, digital video or images, podcasting, etc. In the present study, since target applications are context dependent interaction, UGC is restricted to the user context, including his profile, his inputs, his history and previous actions, etc., which could be recorded in real-time context variables, as in 1-to-1 marketing, or games or role playing in eLearning scenarios. Typically, user input such as comment, chat, discussion, is out of scope. However, user input asked for a name, an answer to a question, a decision, a choice, are to be considered. In a first phase, "closed" inputs only will be taken into account, and later more open and informal answers.

1 Scope

The present document gives an introduction to and an analysis of the most important issues and areas of relevance to context dependent multilingual communications for interactive applications. It provides a clear description of the most common difficulties and problems faced by application designers and localisers today, and how they solve or work around these.

The scope of the present document is summarised through the following statements about the study:

1) It defines localisation and explains what is involved in the localisation process of interactive application, including the management of interactive and non-interactive applications translations.

2) It describes in detail problems and issues related to the localisation of interactive applications, to help understand the limitations, needs and existing solutions or work-around used in the field.

3) It identifies the different industrial and technical domains that are directly concerned by the issue. It looks at several innovation activities related to the domain and provides a state-of-art presentation of languages technologies and research in the domain of multilingual applications, translation management and localisation.

4) It collects information from the different industry sectors identified, examining their needs, their localisation process, their management of translations, and potentially, specific tools or processes they are using for solving or working around the problem.

5) It provides a generic analysis of the situation, plus a specific analysis related to each identified industry sector.

The present document addresses the localisation process, which covers a large spectrum of issues and activities. However, the study, after providing an exhaustive description of what localisation means, will focus on the localisation aspects relevant to the highly interactive applications heavily using context variables.

The present document had an initial focus on the game industry but it does not restrict its scope to video games. On the contrary, it will expand its vision beyond games, aiming at identifying all other technical and economical sectors facing similar issues.

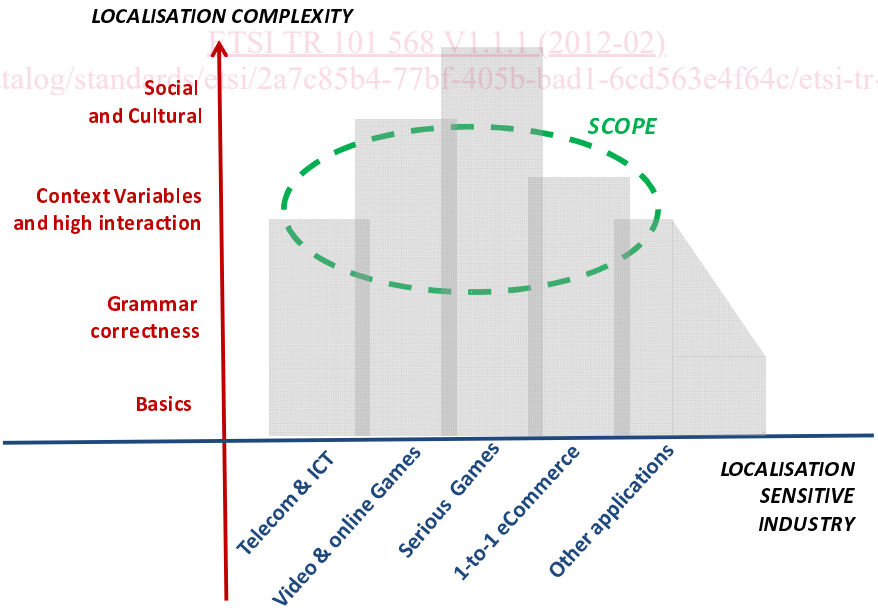

Figure 1: Technical Report Scope diagram

Finally, the present document will not provide an exhaustive analysis of advanced research projects and techniques, but it will review the main existing or known areas of innovation and analyse whether they may help solving our problem.