IT 08 021
Examensarbete 30 hp
Maj 2008

Website Globalization in Monetary Gaming

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Abstract

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To be able to reach new audiences and to be able to target new markets, companies nowadays find great need for localizing content of their online gaming sites. This report highlights the different pitfalls and best practices that need to be considered while targeting an online gaming site towards international customers. These best practices have been extracted from contemporary literature and reports and have then been used to evaluate the work of a company providing an online gaming site. This evaluation has only taken into account the work done by the teams developing the site, thus no managerial and marketing staff have been approached. The evaluation of the company globalization work has shown that their main problems lie in the processes and communication surrounding this kind of work. Many of the pitfalls that the company have fallen into may very well be removed by deciding on needed artifacts, processes, and software solutions that could remedy these problems. Such software could be for example translation memory software that may aid translators in their day to day work, providing more consistent translations to the site.

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1 INTRODUCTION

As the Internet made its debut onto the commercial stage and was made available to the international masses during the early nineties, a whole new market opened up for software publishers, companies focusing on commerce, and service providers of all sorts. By introducing themselves onto the Internet, companies made themselves available to markets outside their domestic borders and soon saw orders coming in from countries not especially targeted with the information and products featured on their websites. This put new challenges in front of the companies, as they realized that new international customers needed to be approached in a different manner than the domestic ones, to make them accept the websites and its content fully.

In the beginning, English was the predominant language used on the Internet, but as more and more people around the world got access, this started to change. Companies around the world started having websites in the languages spoken domestically.

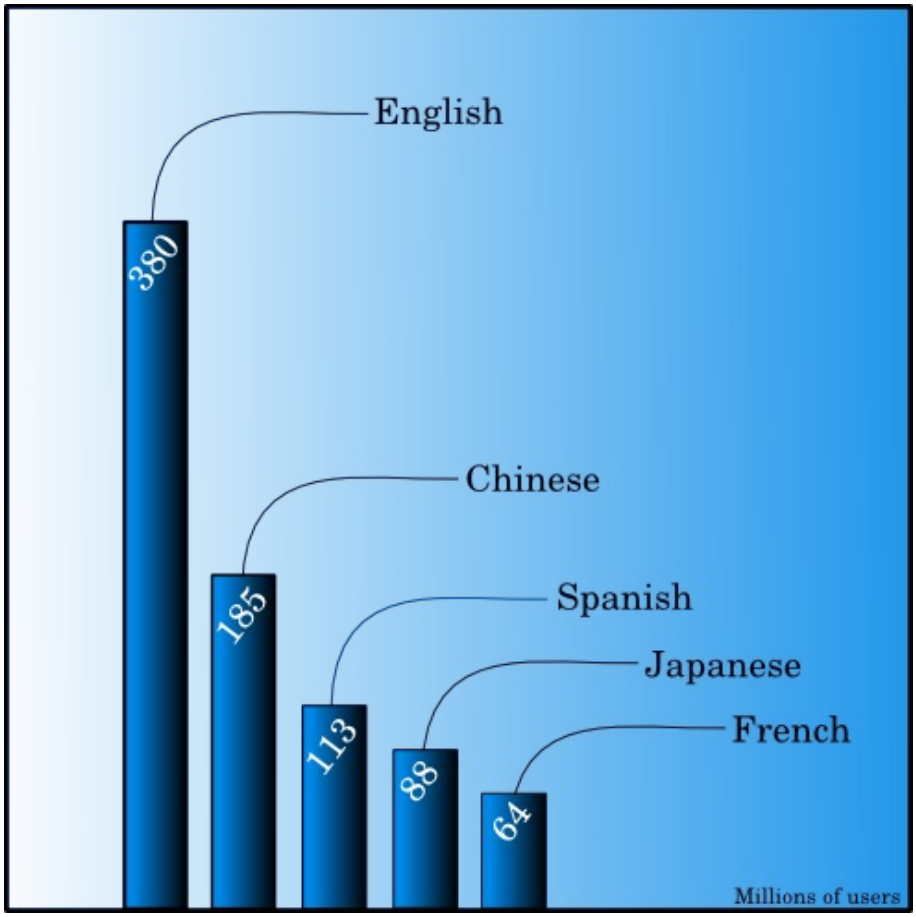

Illustration 1: Top 5 languages used by Internet users, values extracted from Internet World Stats (http://www.internetworldstats.com/stats7.htm).

As Illustration 1 shows, the language distribution of Internet users is very diverse and even though English is dominating, the Internet penetration is much lower in for example China

than in English speaking countries (according to Internet World Stats), suggesting that there will be a lot of money to be made by tapping this emerging market during the coming years. The fact that the Internet usage in Asia and the Middle East is in an upwards spiraling trend, and the fact that people tend to trust and feel more comfortable using websites and software adapted to their native language and culture (Singh & Boughton, 2005), promotes creating websites localized for these markets, thus making the websites more usable, and attracting more business activity. For example Chinese has grown 472.4% in the Internet during the period 2000 – 2007, whereas English has grown by 167.3% during the same time (Internet World Stats).

These considerations are forcing companies to start looking over the borders for new sources of revenue and they need to make sure that their web applications are functional and accepted in the target markets. This can at first glimpse seem trivial and many companies have made costly mistakes in thinking so. Even though the following example by Zaretskij is not exactly web-related, it is a good example of what issues may exist when aiming at international markets.

“Radio Shack's early attempts at international marketing in Western Europe resulted in a series of costly mistakes that could have been avoided had it properly analyzed the uncontrollable elements of the countries targeted for its first attempt at multinational marketing. The company staged its first Christmas promotion for December 25th in Holland, unaware that the Dutch celebrate St. Nicholas Day and give gifts on December 6th. Furthermore, legal problems in various countries interfered with some of their plans; they were unaware that most European countries have laws prohibiting the sale of citizen-band radios, one of the company’s most lucrative U.S. products and one they expected to sell in Europe. German courts stopped a free flashlight promotion in German stores because giveaways violate German sales laws. In Belgium, the company overlooked a law requiring a government tax stamp on all window signs and poorly selected store sites resulted in many of the new stores closing shortly after opening.” (Zaretskij. p. 12).

Website globalization is not only a process associated with translating website content into another language, it contains several other issues that need to be considered, such as cultural differences between how website visitors see the world and interact with it. For example consider some thoughts stated by Aaron Marcus and Emilie West Gould:

“Consider what year this is. Is it 2000? In some other counting systems, it is 4698, 5760, or 1420. Even to refer to the counting system of another culture might confuse or alienate people used to their own native system.” (Marcus & W Gould 2000. p. 34).

“Cultures, even within some countries, are very different. Sacred colors in the Judeo-Christian West (e.g., red, blue, white, gold) are different from Buddhist saffron yellow or

Islamic green. Subdued Finnish designs for background screen patterns might not be equally suitable in Mediterranean climates, in Hollywood, USA, or Bollywood, India. These differences go deeper than mere appearance; they reflect strong cultural values. How might these cultural differences be understood without falling into the trap of stereotyping other cultures?" (Marcus & W Gould 2000. p. 34).

Other, more tangible, differences between languages and cultures, such as the usage of different character sets and reading directions, also put constraints on website layout. For example consider ideographic languages such as Japanese and Chinese, which may need to expand web components vertically instead of horizontally when web content is translated into these target language. Websites that are intended for markets where Arabic or Hebrew is used, texts as well as image sequences are read from right to left and thus may need to be shifted for people to understand what is displayed to them. These are issues, according to BJ Fogg (2001), that may influence the usability of the website, and studies have shown that if a site is difficult to use or navigate, it impacts the credibility of the site in a very negative way. In the context of online monetary gaming, it would be a crucial oversight not to consider such issues, as every issue undermining credibility of the gaming site will be reflected in the revenue stream of the website.

Not only navigational and linguistic issues can impair the web site's usage and credibility, but also the actual content of the site can lower or heighten the users' sense of the site's trustworthiness. For example content referring to local activities in the target country and local anchorage will infer a sense of security to the users whereas content, such as non-local customer support telephone numbers, may lower the sense of security, (Egger, 2002).

The issues discussed above are meant to function as mere examples for starting the thought process of the reader, and to encourage the reader to keep cultural and linguistic differences in mind during projects containing website development, even in the cases where the website is initially intended for use in a single language only.

1.1 THE MONETARY GAMING BUSINESS

Monetary gaming companies are in a business which could see major benefits by introducing itself on the Internet, and as many other businesses online casinos started surfacing in the mid-nineties, providing gaming solutions like bingo, poker, and sports betting. The companies that provide their gaming sites in other languages than the ones used domestically, have a great opportunity to generate money from other countries. For example in Sweden, Svenska Spel have around 35% of the Swedish online poker market share (*Lotteriinspektionen, 2008*) whereas the rest is held by gaming sites licensed in other countries.

Just translating the gaming site into other languages is merely a small step towards making the site usable and trusted. There are many more considerations that need to be focused on before the site is accepted on the international market. These considerations include laws and regulations, what content the site holds, cultural differences, and linguistic rules. If not

all issues have been considered when a company introduces their gaming solutions to an audience in the target country, problems can emerge resulting in anything from users not using the site (giving a bad return of investment), to the company getting sued by organizations in the target country (by not conforming to applicable law).

The monetary gaming business is very regulated and the need for adhering to standards and laws of online gaming solutions native to the target country, is a must before gaming providers and game developing firms can provide games in the country. For example in Sweden, **Lotteriinspektionen** states that according to **Marknadsföringslagen** all time-limits, conditions, and other limitations should be presented in a clear and exhaustive way, so that the user can make a clear understanding of the characteristics and elements of the games *(Lotteriinspektionen, 2005)*.

So, if a company wants to sell or develop gaming solutions such as online casino games to an organization permitted to provide Internet gaming in Sweden, they must ensure that the games and sites follow the rules set up by Lotteriinspektionen and Swedish law. In the example stated above regarding the conditions and limitations, the gaming provider must make the content available in Swedish for it to be clear and exhaustive to Swedish citizens.

1.2 THE GLOBALIZATION PROBLEM

The online gaming industry is a very competitive business and as the Internet removes borders allowing companies to gain market share abroad, companies cannot afford depending on the domestic market for revenue and passing on the available opportunities. But creating a standardized website, using for example English as content language, which should accommodate all different target countries is not an option in todays markets. This is very apparent as for example approximately 75% of users in China and Korea prefer websites in their native languages, and the same percentage of users choose local websites to make purchases (Ferranti, 1999). Also, the fact that only about 8% to 10% of the world's population speaks English as a primary language (Aykin, 2005) speaks against using a global site in one language aimed towards all markets.

What companies going international need to focus on, to attract new and keep their current customers, is the globalization of their websites. **Website globalization** is the process of designing websites to accommodate users from different cultures by providing multilingual content in a form appropriate for the target cultures.

The problem of website globalization is that the whole organization needs to be aware of the process and work towards the same goal of providing multi-culture solutions to their customers. This should be done at all levels of the company, from CEO:s, to marketing, to implementation teams, to customer services. It is not for the implementation team to make the website suitable for international audiences if the managerial staff of the company doesn't see the benefits of the globalization work, and rather see the globalization work as a process where costs can be cut. On the other hand, if the company managers, marketing, and implementation team work towards the goal of providing an globalized website, but the customer services lack the correctly trained personnel, and therefore is not able to handle

the flood of international customers in the way that the customers expect, the process cannot fulfill the promises of the globalized site.

This thesis report will try to highlight the process and technological issues that may appear during the globalization process of gaming sites. The discussed issues concern the workflow of the process, responsibilities of the people involved in the website globalization. Best practices and guidelines that should be considered before actively proceeding with going international with the gaming site will be covered and listed. There are also a lot of technical issues that need to be researched, when using different web technologies, these issues will also be highlighted.

1.3 PURPOSE

This section states the purpose of this thesis work and what will be the aim of the different work efforts conducted during it.

1.3.1 The Purpose of this Thesis Work

This thesis work is concerned with reviewing and finding strong and weak points of a company's gaming platform, regarding the current globalization processes and architecture of the site. This work should highlight problem areas within the technology used, artifacts used, and workflow currently available within the company for accommodating the process of making the site available to customers abroad. The origin and result of these problem areas are then to be discussed and we will look at possible solutions to these issues.

1.3.2 What Will be the Aim of the Thesis Work?

This thesis work will include extracting best practices and available guidelines from recent literature and document these for the use of implementation teams within the company of interest. After the guidelines documentation has been finished, the current globalization work of the company will be scrutinized and documented. This case study should be done in the light of the information found during the extraction of best practices, and should be concluded into a document focusing on problem areas and failing practices within the site and organization. After all implementation issues have been found, a new web-based translation software application will be evaluated to find possible solutions to the these issues. This should be documented as well and form a proposition for using the said software or not. If time allows, possible globalization plans should be discussed and documented for usage in future development projects.

1.4 DELIMITATIONS

Website globalization is a very broad subject to cover and due to the time constraints of this project, the work is delimited to just focusing on the work processes found during the actual implementation part of the process. The work and processes of managerial and marketing staff is indeed equally important due to the need for buy-in from all significant stakeholders, but this subject will only be touched upon in very little detail. For further

information on management buy-in please refer to for example (Woods, 2005). Woods (2005) discusses his Three Pillars for successful globalization, and there states different aspects of management buy-in and the need for a clear business vision for successful website globalization.

The implementation work that is considered during the evaluation is the work of developers and engineers doing site modification and the work done by writers and translators while providing content to the site. The issues regarding their work will be discussed on both a process level and a technical level. Guidelines, technologies to use, and best practices for working around these issues will be covered.

Website globalization is a very large field of research and the subject have been extensively covered in the literature, but as technology is moving forward and is used in different contexts the need for reiteration of guidelines is great. The work of for example Bert Esselink covers many issues found during the software globalization work. Though it is mainly aimed at desktop applications and the documentation surrounding it, the practices are in most cases applicable on website globalization as well. Whereas Esselink goes in to the more practical details of globalization, the work of Aaron Marcus and Emilie West Gould covers the globalization in the light of Geert Hofstede's 5 dimensions of culture (Marcus & W Gould, 2000) and thus cover website globalization from the viewpoint of cultural differences.

The report will be divided into two main parts, where the first parts will cover the different aspects of website globalization in general as well as in the context of monetary gaming. The second part will concern itself with the actual case study of the target gaming site, what is done well and what could be done differently.

The next section covers some definitions of terms that are of great importance when heading into a discussion about website globalization and then move over to the methods and analysis part of the document.

2 METHODS AND ANALYSIS

2.1 DEFINITION OF TERMS

To be able to follow the coming discussions in the analysis and methods sections, some definitions need to be presented to the reader.

2.1.1 Internationalization

LISA (The Localization Industry Standards Association) defines **internationalization** as:

“Internationalization encompasses the planning and preparation stages for a product in which it is built by design to support global markets. This process means that all cultural assumptions are removed and any country- or language-specific content is stored externally to the product so that it can be easily adapted.” (Localization Industry Standards Association, The).

2.1.2 Localization

LISA defines **localization** as:

"Localization refers to the actual adaptation of the product for a specific market. It includes translation, adaptation of graphics, adoption of local currencies, use of proper forms for dates, addresses, and phone numbers, and many other details, including physical structures of products in some cases. If these details were not anticipated in the internationalization phase, they must be fixed during localization, adding time and expense to the project. In extreme cases, products that were not internationalized may not even be localizable." (Localization Industry Standards Association, The).

2.1.3 Globalization

LISA defines **globalization** as:

"Globalization is more than a technical process. While there is a strong technical component, successful globalization involves changing the way an organization does business. As long as international markets are treated as a secondary concern and a place to save on costs, globalization efforts will not be truly successful. In particular, globalization is not a process that starts after a product has been designed. If global concerns and plans for after-market support are not made even before product development begins, costs will go up and quality problems will emerge." (Localization Industry Standards Association, The).

2.1.4 Website Globalization

The definition of **website globalization** can be formulated as:

"Enabling a web site to deal with non-English speaking visitors, i.e. internationalizing the site's back-end software, designing a multi-lingual architecture, and localizing the site's static or dynamic content." (Esselink 2000, p. 4).

2.1.5 Translation

The definition below is provided by Esselink:

"Translation is the process of converting written text or spoken words to another language. It requires that the full meaning of the source material be accurately rendered into the target language, with special attention paid to cultural nuance and style."(Esselink 2000, p. 4).

2.2 THE ROLES

During a website globalization project, a few roles need to be filled and assigned specific responsibilities. The roles specified in 2.2.1 – 2.2.4 and the set of responsibilities assigned to them have been proposed by Nuray Aykin (Aykin, 2005) and form a good set of roles giving the project group the ability to handle the globalization process in a good way.

There are also some roles proposed by Bert Esselink (Esselink, 2000) that add some additional control over the process, these are the roles specified in 2.2.5 – 2.2.8.

The roles in this section are concerned only with the actual development of the globalized gaming site, and it should be emphasized that people on all levels of the company need to buy into the process. Therefore no roles of the managerial and marketing staff will be covered in this section.

2.2.1 The Project Manager

The Project Manager is responsible for handling the management and communication tasks of the project, as well as instilling internationalization and localization knowledge into the team. The responsibilities of the Project Manager, as proposed by Aykin (2005), are:

- **A Well-Defined Strategy**. The Project Manager must define a strategy for the web site's globalization process. This defines the level of localization to aim for, what markets are interesting, time to deliver, and what organizational changes need to be made. This strategy needs to be designed in close communication with management to be given the proper direction of the globalization work.
- **A Statement of Work**. This includes a specification of the localization methodology, information about possible localization vendors, and a project schedule including needed milestones and budget.
- **Vendor Management**. As companies usually outsource their translation efforts to localization service providers. It is imperative to chose the right vendor for the project, as translation is a very central part of the whole process. This work includes setting up clear guidelines for the translators.
- **Communication**. The responsibility for setting up meetings, and setting up a good communication infrastructure also falls on the Project Manager's shoulders. This communication should be established to ensure team interaction and knowledge distribution. This can be done by setting up shared folders containing documents and information, and shared wiki-pages on the Intranet so needed information is easily reached.
- **Content Management**. The Project Manager needs to communicate with locals of the target country to ensure that locale-specific content is generated and reworked correctly for the target culture using the delivery tone and expression expected by targeted players.
- **A Common Glossary**. If the company is leveraging different translators, which is very common during a site's life time, it is fairly common that a word or expression is translated in multiple different ways. By keeping a central glossary available to translators and technical writers this can be prevented, and thus results in more consistent site content. This glossary can also make the translators work faster and therefore cut costs and shorten delivery time, as well as keeping up the quality of the translated content.

- **A Localization Kit**. This kit contains all that needs to be provided to a possible localization vendor. The content of localization kits include for example the glossary and terminology specification, screenshots and other contextual cues that translators may find useful. The reader is urged to refer to the writings of for example Aykin (Aykin 2005, page 11) or Esselink (Esselink 2000, page 48) for more information regarding the contents of the Localization Kit.
- **A Repository of User Interface Elements and Software Elements**. The Project Manager should see to that reusable code, localized icons and graphics, and guides for company branding is centrally available for the development team. This can be handled by providing some sort of repository such as Subversion or CVS, containing all different graphics and code.
- **An International Quality Assurance Methodology**. Quality assurance is integral to the whole process and this methodology contains the metrics for quality and the methods for doing testing and in-country reviews.
- **Maintenance of Internationalization and Localization Guidelines**. Guidelines created with input from the internationalization and localization team. These guidelines should be up to date to keep the site at a consistently high quality.
- **A Post-Localization Issues List**. This list contains analysis of user feedback, process refinements, update maintenance, etc. This list can be used to find ways of making the overall process better.
- **Legal Issues**. Working with marketing and legal advisors to identify legal aspects of targeting the gaming site towards some specific country, for example regarding tariffs, customs, and other things that should be considered.

2.2.2 The User Interface Designer

The User Interface Designer should, like in any other software project, gather information and user requirements for the user interface before doing any designing and coding. It is essential that this is done correctly so that one can prevent future problems when introducing the gaming site into new markets with different cultural values than the original market. This gathering of information should be conducted by observing and collecting data within the target culture, therefore it is suggested to have players in the target country educate the designer regarding design issues specific for their culture. The responsibilities of the User Interface Designer are thus:

- **Do sufficient background research.** This research could be done by reading about a target culture, interviewing and observing users from the culture in focus, and if possible living in the target environment for some time - soaking up valuable information. According to Aykin (2005, p. 12) in-country users could be a used to educate the User Interface Designer if the above methods turn out to be too costly. The more information about the cultural expectations and usage patterns that can be collected and used during the development of the user interface, the better the

interface can be adapted to the locale at hand.

- **Design interfaces with internationalization in mind.** Try to design the user interface of the gaming site with different cultures in mind. For example try to design and use icons that are usable and understandable globally so that they do not need to be redesigned and adapted to target locales later. Make sure not to design the user interface in any locale-specific way.
- **Perform usability evaluations with cultural differences in mind.** This is essential to remove limitations regarding global adaptation of the user interface, early in the development process.

2.2.3 The Software Engineer and Developer

The Software Engineers and Developers are the ones responsible for implementing the needed internationalization and localization concepts into the gaming site. The developers therefore have the responsibilities to create a flexible gaming site and make sure that the whole site can handle internationalization and that it is re-engineered accordingly. This should be considered for all available technologies such as XHTML, Adobe Flash, etc. The Developers should (according to Esselink) have the following characteristics:

- **Should be aware of internationalization issues.**
- **Know what internationalization- and localization-help is available from the target platform.**
- **Be aware of character set issues in interface development**
- **Knowledge in database system, scripting languages, and GUI development**
- **Awareness of localization models and workflow**
- **Possible foreign language skills**

It can not be emphasized enough how necessary the basic knowledge of possible localization issues is for Software Engineers. The benefits of internationalizing and designing the gaming site while leveraging this knowledge, and using the platform specific internationalization and localization help (such as the **ResourceBundle class** and the **JSTL tag-library** when using **JSP**), are very significant. Possible skills in foreign languages can be very valuable as well, as these may give the Developer extra insight in the intricacies of languages and translation.

2.2.4 The Technical Writer and Translator

The last role that is specified by Aykin (2005), is the Technical Writer and Translator. The people holding this position will create content that may end up being translated into a multitude of languages, as well as translating existing content into the language of the regions targeted. Therefore it is important that the people doing this kind of work are natives of the target culture and that writers of source content are aware of not writing culture-specific content.

- **Follow glossaries and terminology specifications.** The terminology specifications and glossaries provided to the Technical Writers and Translators should be used during source content creation and translation. This provides necessary consistency throughout the gaming site as well as making it easier for translators to keep up the translation quality. By using glossaries and specified terminology all different categories of games and interface components will use the same terminology and company brand can easier be maintained.
- **Write content that is free from culture-specific references.** By writing for a global audience and therefore keeping culture-specific references such as religion, culture-specific examples, etc, out of the source content, the content does not need to be reworked for every language and can therefore be easily translated. This will dramatically save time and costs spent on translation and localization efforts.

2.2.5 The Quality Assurance Department

The Quality Assurance Department has a very central role in any software project to ensure that no errors are sent into a production environment. In the online casino business it is imperative that no errors or vulnerabilities are leaked into the wild, where players' money and the company reputation is on the line. Any issues that are found in the gaming site hurts the brand of the company and therefore needs to be found as soon as possible. In a project concerned with globalizing a gaming site, The Quality Assurance Department's main responsibilities (besides security) are:

- **Ensure quality.** The functional, linguistic and cosmetic quality of the localized application needs to be ensured. These tests include for example pseudo-localization and regression testing. The functionality and feel of the games should be the same for the localized product as for the original version of the site.
- **Continuous testing.** The quality checks are performed by the Quality Assurance Department during the whole development process, this to be sure to find issues as early in the process as possible.

2.2.6 The Localization Specialist

The Localization Specialist is a translator that reviews the work done by the other translators, and makes sure that the translators have access to information regarding terminology and style standards used within the web-application and the company. To be

able to keep track of terminology and style, the Localization Specialist should set up and maintain terminology specifications, glossaries and style guides.

This person could also be proficient in handling the Computer Aided Translation Tools used by the translators, so that the effectiveness and correctness of the tool usage can be monitored. This could also be handled by some other role of the project group.

2.2.7 The Proofreader

The Proofreader, as the name implies, proofreads the translated gaming site and possible help-documentation, while focusing on the linguistic quality. This person is responsible for finding spelling errors, grammar mistakes, and seeing to that consistency is upheld.

2.2.8 The in-country reviewers

In-country Reviewers are often used to validate the web site content after it has been localized. This validation can be done by local office personnel in the target cultures, and focuses on consistency, completeness, terminology and language in the light of the target culture.

2.3 THE PHASES

Website globalization in the context of online gaming sites, is a bit different from normal software globalization due to the large amount of different technologies used, the inherent issues regarding security and legislation surrounding this specific industry, and the rapid and dynamic change of content.

The security aspect of online gaming sites make companies lean towards doing the globalization work **in-house**, instead of outsourcing it to **localization-vendors** which is the normal procedure at large software publishers. Due to this direction of the globalization work, we will only touch upon the traditional localization process in very light detail.

The website globalization process is as stated in the sections above, associated with developing a website that is designed in such a way that it is easy to localize and adapt to accommodate users from other cultures in their native language and content format. This process can be segmented into two well-separated sub-phases: internationalization and localization. The next section will highlight the major efforts that are carried through during the two phases.

2.3.1 Internationalization Phase

The internationalization phase focuses on preparing the web application for localization, its adaptation into other languages, and it being functional in foreign cultures without the need for any redesign of the web site. This preparation is done during the development of the application and the internationalization efforts are thus continuous during the whole development cycle. The roles that are active during this phase are the Project Manager, Quality Assurance Department, the Localization Specialist and of course the Developers.

Issues that can be avoided by doing the internationalization work correctly are for example:

- Incorrect display of accented characters
- Text truncations
- Cosmetic issues due to expanded texts
- Fixed formats for dates, time, currency, or numbers

2.3.2 Localization Phase

After the development and internationalization phase has been finished the localization phase can start. During this phase all the application's translatables should be translated and localized into the target language. This means translation of all strings and texts available in the user interface including all error messages, scripts and dialogs. Also graphics, colors and sounds should converted into a format that is understandable, accepted and supports the company image in a favorable way. The translation is accompanied by web page refinement done by the Developers and continuous quality control by the Quality Assurance Team. This refinement and quality control should be minimal if the internalization phase was successful, and quality control can in most cases thus focus on linguistic and cosmetic issues.

2.4 ANALYSIS

This chapter will cover an analysis of the area of globalization of online gaming sites and the issues that are inherent of such activity. These issues will in many cases be equally important for any type of web application containing dynamic content targeted towards international customers. In the respect of an online gaming site, issues will in most cases be kept on quite a high level because of the multitude of technologies used in such a site. The issues that need in-depth explanations will get such a treatment. These issues are connected to the design guidelines and best practices that can be found within field literature. Such guidelines are covered in Appendix A – Guidelines.

2.4.1 Issues Stemming from Technology

Character Set Usage

When dealing with web applications that strive to support a multilingual environment the character set used within the application is of great importance. By making sure that the application uses a character set that supports all the different languages and locales that are to be used in the application, one can remove future design problems that may arise from non-existent character support. Currently the best choice is using **Unicode** (http://www.unicode.org/).

UTF-8 has more or less become a standard for use in multilingual web applications. This due to the fact that it can represent all characters in Unicode and thereby represent all characters that are in active use today. This is a good choice and should be used when

designing gaming sites, game clients, etc, so that they can be easily localized without having to care about possible character set issues.

Technology Usage

Online gaming sites are built from very diverse technologies and frameworks. These technologies may be for example regular **HTML** or **XHTML**, **Adobe Flash**, **Macromedia Shockwave**, **Scripting languages such as JSP, ASP or PHP**, **JavaScript**, and the web applications are then used in a multitude of different frameworks, application servers and databases. These technologies support internationalization and localization in different ways and to different extent, and it is essential that the developers know the different tags and libraries of the chosen technology that may help implementing the web application in a well-internationalized and well-localized manner. For example when using a technology such as JSP, it would be essential to use a tag library such as **JSTL** for handling automatic formatting of numbers, currencies, dates, etc by locale. By doing this, no formatting is hard coded into the source files and such values are formatted according to the chosen locale. This removes the need for redesigning and changing the source when adding a new language and its respective locale to the web application.

Font Usage

When providing games and content to the visitors of the gaming site, the usage of fonts need to be considered by the developers and designers. If the designers choose to go with a font that does not contain characters of future languages, this may result in redesign if support for such languages need to be implemented. It is therefore suggested that developers and designers choose fonts that support the majority of characters. How the fonts are handled in the games and web pages also make a difference, for example if proprietary fonts are bundled inside game clients or if standard fonts are used. If proprietary fonts are used and do not handle characters in a target language there may be licensing issues that need to be taken care of, for example if the company needs to add characters to the font in order to make it usable for a target locale.

String and Language Key Usage

To provide text content and navigational structures in an equally usable format independent of the locale used, the developers and designers need to be aware of all different issues that may arise when handling strings and texts. The developers need to make sure that the web application can handle the fact that different languages use different reading directions and justification. They should also be aware of the fact that different sorting methods may be applied and that multiple different scripts may be used for some language. Some issues that need to be taken care of in a gaming site targeted towards a growing international audience are the following:

- Reading Direction: For example in Hebrew and Arabic the reading direction is from Right-to-Left (RTL) and thus this needs be handled by the site in a good way. The

site should be designed to handle all target audiences equally and be usable for all, even though the site is initially only intended to be used by players originating from on country.

- Scripts: For example in Japanese, different scripts are used depending on what kind of words are written within a sentence. The script romanji fore example, is used for writing words like foreign names such as “Ikea”. All the scripts available in the language used by the target audience need to be handled correctly in both the content of the site and in input from the players. This means that for example a Java back-ends, application servers and databases need to be able to handle these characters and scripts.
- Truncation and text expansion: Text expansion is the source of many interface issues that arise after the translation of language-keys and texts of the web application have been finished. The fact that texts in European languages in average are about 30% longer than the English language equivalents, and that individual strings may be up to 100% longer, put pressure on developers to design web applications that handle such text expansions. If this is not handled, translated language keys may be truncated in the user interface resulting in an unusable design. These issues can be handled by for example leaving enough whitespace for texts to expand, dynamically resize the strings to fit the design, or abbreviate strings that are too long. The first of these options is to be considered the best one.
  One way to test the site's internationalization and string-handling traits, is to apply a testing method called pseudo-localization. Pseudo-localization is employed by modifying for example the source language translation (English) into a new pseudo-translation by adding accented characters and scripts to the language-keys. These language-keys are then used in a Development or Staging version of the site. As these augmented language-keys are much longer than the source language-keys, areas of poor internationalization will show themselves by featuring for example string truncation or invalid characters where accented characters should be shown. These areas can then be fixed before the localization phase is begun.
- Concatenated or composite strings: Developers need to be very cautious of using composite strings in the graphical user interface. The problem with using composite strings is that different languages may have different word order and this is not very compatible with concatenation of strings. For example Bert Esselink (2000) makes a good example from the world of desktop software localization: *“Many applications concatenate “Undo “ and a command name such as “Cut” to generate a more specific “Undo Cut” menu item. If the application is then localized in German, the concatenation will be displayed as “Wiederrufen Ausschneiden”, which is grammatically incorrect, “Ausschneiden wiederrufen” is the correct translation, so the word order is changed”*. Due to this fact, developers should refrain from using concatenated strings if possible.

Sorting

As different languages use different sorting rules when doing string collation, the web

applications should be able to handle this kind of interaction with regard to the locale that has been chosen by the player. The following sorting methods may apply:

- Alphabetical rules: Even though an alphabetical approach is used for sorting, different language specific rules may apply. For example the Swedish words ödla, örn and orm would be sorted (ascending) like:
  - orm
  - ödla
  - örn

  thus in Swedish o < ö. On the other hand for example in German the collation rule ö < o is used. Therefore a list containing the following words: öffnen, ohne, öffentlich, would form the following list after being sorted in an ascending order.
  - öffentlich
  - öffnen
  - ohne
- Other rules: In some Asian languages where ideographic characters are used the elements may be sorted in a very different way. As Wissink and Kaplan states , the "primary weighting for the linguistic characters in the various languages can be based on the main radical within the character, the stroke count of the character, or even pronunciation (e.g., Taiwanese "Bopomofo") " (Wissink & Kaplan, 2002).

This can make it very hard for non-in-country developers and testers to verify that the collation is done correctly. If there exists any help within used technology, for doing automatic collation based on the preferred locale, this should absolutely be considered.

Separating translatables from code

By separating the code and the elements of the site that needs to be translated, one can add new languages to the site in a much more straightforward fashion. By using for example locale specific resource bundles that contain translated and localized resources, such as strings, one can easily extend the site with a new resource bundle for a new target locale. It is also much faster to provide translators with language keys from a resource bundle than extracting them from source code.

Keyboard Usage

If games use input from the keyboard to control for example a character in a bonus or skill game, developers should make sure that the key combinations are suitable for keyboards used in all target locale. This goes for possible hot keys in games as well. For example one should not use accented characters as hot keys due to the fact that they may be hard to type on some keyboards.

Usage of Cookies

Cookies can be used for storing settings such as the language setting selected by the player. By storing a cookie containing the language setting, the site can be displayed in the same way every time the player visits the site.

Platform

Even if the actual web application is developed for handling the different technological issues stated above, problems may still occur if the software platform used for containing the application does not support all character sets used in the web application. Therefore documentation must be read and software such as databases and application servers must be investigated to ensure their suitability for the localized web sites.

2.4.2 Issues Stemming from Cultural Differences

Even though the technical issues may be hard to resolve, once resolved, the site will be ready to handle audiences from different locales – in theory at least. The hurdles that now awaits the company do not have as straightforward solutions as the technical issues may have. These problems are connected to the subtleties of differences between cultures and their inherent customs. The problems that face the organization are concerned with providing the players with a gaming site that is not merely translated, but localized into a form suitable for them. Some cultural differences and what need to be considered will be covered below.

Usage of Language

To achieve a well-localized gaming site, the content need to be focused towards players in a manner that they are familiar with. This means of course that the content should be translated into the language that they use and which is phrased consistently with the players' local language. Many websites translate their content into for example Spanish and think that it suffices to make the site usable for Spanish speaking people. This is not always the case as there are many different dialects of Spanish. For example Spanish spoken in Spain and Spanish spoken in Argentina may have very different phrasing in some cases. This needs to be considered when aiming for new target markets, and the organization needs to realize that a site translated into Iberian Spanish may not be suitable for people in Latin America. If the company wants to target all Spanish speaking countries with the same translated version of the site, a translation firm accustomed with translating content into Universal Spanish should be hired. Universal Spanish would be equally suited for all Spanish speaking audiences.

Focus should also be put on creation of source content that is free from local specific references, examples and slang. By removing such references it is much easier for translators to localize the content and make it work in the different target languages.

Usage of Local Content

When it is possible to handle translations according to the need of the target markets, it is a good idea to look into adding local content to the site. By local content we mean content that is aimed towards making the site feel anchored in the countries of the players. For example if a gaming site features an article about a certain exhibition football game between Germany and Italy, the tone of the article may be shifted between the two language versions of the site. By shifting the support of the teams a little and thus giving the team from the target country more support in the translation of that locale, the player may feel more comfortable using the site and put more trust in it. The version of the same article targeted towards Swedish speaking people should be written in an objective manner, not displaying any bias towards any team.

As people using web sites tend to trust local companies and local websites more than non-local ones, it is also a very good idea to give the site local anchorage by displaying connections to associations, institutions, and for example local sub-contractors in the target country. The site could also display for example addresses to local offices, engagements in the target country, addresses to domestic institutions for helping people that display compulsive gaming habits, or provide the players with local telephone numbers to player support lines. Also providing the users with local payment facilities, a local prize-mix, and following local applicable law is essential for both usability and trustworthiness of the site.

By considering and implementing this into to the gaming site, the company has a great opportunity to strengthen its trustworthiness and take better care of the company brand in all target markets, if this is not done opposite feelings may be spawned and the brand of the company may be hurt.

Issues Related to Religion

Religion is one cultural difference that need to be considered when creating site content. This due to the fact that religion in many parts of the world is such a central part of the daily life and may be a source of great clash of opinions. Content creation should therefore refrain from using religious examples, content referencing deities and religious custom.

Color Related Issues

Colors in user interfaces can have a lot of different meanings depending on the viewers cultural background. An example Aykin and Milewski (2005) give, is that in China the color red symbolizes good luck and prosperity, where as it in the Middle East symbolizes danger and evil. Aykin and Milewski also proposes that *"if the same color palette is to be used across locales, it would be a good idea not to use primary colors in design because they may still carry negative or positive meanings in some cultures." (Aykin & Milewski 2005, p. 48).* These issues should thus be thought through carefully during the design of games and site interfaces in general. Different coloring may be needed for different language versions of the site.

Issues Related to Culture Specific Metaphors

When designing games and interfaces of the gaming site, it often pays off to think through the usage of icons and metaphors in the graphical user interface. For example using a picture of a US post box as a metaphor for email may not translate well into all other target cultures, therefore one should consider using for example an image depicting an envelope for this application instead. There are a lot of such considerations to be pondered and this should not be taken lightly – it may hurt the usability of the site, making the site less popular.

Bandwidth Related Issues

Internet penetration is on the rise globally and new markets are opening up, the issues of available bandwidth still need to be considered though. The availability of broadband connections and needed bandwidth may not be widely accessible in some target countries, and the gaming site should try to be as light-weight as possible, and still give as enjoyable an experience as possible.

External Processes that Need to be Localized

Not only the site in itself need to be adopted to the new target culture, for example if there are lottery games within the site where prizes are given in, not money, but different kinds of goods, these prizes and the distribution channels need to be localized as well. So the prizes should things that are desired in the target market as well as usable. For example it does not make sense having a NTSC-version of a game console as a prize targeted to European players, as the TV standard used in Europe is PAL.

Also, if the gaming company have localized the site by adding for example local support telephone numbers the players can call to receive help regarding their gaming accounts, the support answering at this connection should be able to handle the players in a fashion that they expect. If the site “promises” to handle the players' questions in for example Spanish by providing a Spanish telephone number, and the support personnel is only fluent in English, this may be a major put-off for the players and they may loose some trust in the gaming site.

Do Not Design for Stereotypes

One problem that may occur if the designers and developers do not dig into and research the culture they are designing for, is that they may design the site in a way they think players from the target culture want and find enjoyable. This results in a site that most likely is designed for stereotypes of the target culture and may be unusable and even offending for players actually originating from that culture. Designers should therefore make sure to do their research well and consult in-country-sources such as personnel in local offices or local sub-contractor personnel for information.

Do Not Display Graphics With Offending Content

This is of course common sense, but in some cases it may be hard to define what may be offending to people from other cultures. For example it may be offending to show game characters and photos showing bare skin in Muslim countries or use maps of countries with disputed borders within game clients or graphics. This also boils down to correctly researching the target market before designing.

Time Zone Issues

Some issues that are rather connected to the geographical location of the target countries than to cultural differences, are issues relating to time zones. When countries from different time zones are connected to the same gaming site it may be necessary to carefully decide at what time new content and updates should be released. For example, if currency exchange-rates are used within the site, the updates of these may occur at noon in one country whereas they may occur early in the morning in another part of the world. This may be an annoyance for some players and it may pay off doing updates at different times for the different locales, if at all possible. Also content updates and maintenance work may seem to occur at hours when gaming should be booming in some countries whereas they occur during the slowest hours in one country. Tournaments and games that occur at certain hours may need to be handled differently for different locales, for example poker tournaments should be available during popular hours for all target countries.

2.4.3 Issues Stemming from Content Creation

The issues that are to be considered during content creation have been touched briefly in earlier sections. This section covers multimedia and graphics creation issues.

Localize Multimedia

If there are multimedia available in the site, which provides the players for example with sports highlights, tutorials, or gaming news, this should also be made available to all players in an equally usable form. This multimedia could also be for example banners or actual games within the site. Within games everything should be localized, not only the language-keys used. For example sound clips containing speech should be translated and spoken by native speakers of the target language. Movie clips such as sports highlights and interviews may need to be subtitled or dubbed to be understood by all players.

2.5 METHODS

This section covers the methods that were used to gain knowledge of the field of website globalization and the current state of the internalization and localization within the gaming site in focus.

2.5.1 Research and Documentation

The research within the area of website globalization were conducted during the first month of the thesis work. During this time, books and papers by authorities in the field were read and documented. Information regarding linguistic aspects of translation were sources of interest and also legal aspects of online gaming were briefly covered to find differences between countries and what needs to be considered when gaming companies try to expand into other markets. All this information was then compiled into a document containing guidelines and best practices available within the field today. These guidelines were spanning from globalization process management, to internationalization work for developers, to translation, to localization work for developers, to testing efforts of the quality assurance team. This documentation was then used as a template towards which the current site implementation and globalization process could be compared. This documentation was also one of the milestones of the thesis work, and will hopefully be used to educate company personnel in the matter.

2.5.2 Interviews

The company had no documented process descriptions for the website globalization work, and all information on how the work was to be done, existed only as customs within the organization. Semi-structured interviews were therefore conducted to extract this information.

These interviews were conducted at two different locations, the actual development firm and their customer's office. The interviewees were selected from two teams doing development for the site, from a game design team, and from a translation team. These interviewees were provided with the questions beforehand and during the interview-session, the questions were expanded into free discussions and follow-up questions around the subject. This kind of interviewing strategy was used so that the personnel that were interviewed had some time to think about the subject and reflect on what they actually do along the lines of website globalization. The questions that were sent to the interviewees were to take away the stress interviewees may be put under during the interviews and function as a loose guide to direct the interview. The interviews were conducted to highlight the different processes and artifacts that were present during the current development and globalization work. During the interviews notes were taken down, containing the answers that were given by the interviewees. These notes were then checked and elaborated directly after the interviewing session when the material was fresh in mind. These interviews were then compared towards each other and compiled into a process evaluation chapter in the site evaluation documentation which was a milestone of the thesis work. Support personnel were contacted only through email, but were able to provide very accurate information. Due to time constraints no interviewees were selected from the marketing and managerial staff, even though it would have been very interesting and informative to tap those resources for information. The site evaluation documentation was turned in to the company and highlights some areas of the site implementation and organization that need special attention.

2.5.3 Ocular Inspection of the Site

As the site in its current form uses the languages English, Swedish, Finnish and Spanish, the ocular inspection was done while having the locale set to Spanish which is the newest language of the site. This language also have a presumably low customer base due to its comparably recent addition to the site, making it a good candidate for finding possible internationalization and localization problems (as more issues are found and fixed in the other languages due to their larger customer-base).

During this inspection, the whole site were traversed, all games were played and tested to the extent possible, and external poker-clients and gaming systems were briefly checked. The issues that were found were then documented as a chapter in the site evaluation documentation.

2.6 *ANALYZING THE CURRENT STATE OF SITE GLOBALIZATION*

The company hosting the gaming site in focus of this thesis work had in the early days not been very interested in bringing their gaming solutions abroad, and was therefore not concerned with proper internationalization of the site. During the last few years the need for going global has dawned on the company and the globalization of the company products and processes are now seen as a great need. As B2B (Business to Business) possibilities and solutions are considered, there is a great need to accommodate other companies' users who could possibly become players by finding their way to the gaming site by other companies referral.

The issues of globalization has not been very known in the developer community at the company and translations into new languages have resulted in a lot of issue reports finding their way into company issue trackers, requiring unnecessary developer time and attention. The ones that ultimately benefit from the globalization are not only the players on the gaming site, but the company itself. The company will save money on the whole process (at least in the long run), by streamlining the help desk work and resolving the issues users have, before they even consider contacting the company. The money that goes into the globalization process will also benefit the developers in the way that they can focus more on feature development instead of fixing issues caused by bad internationalization.

The gaming site was initially designed to provide native support for the domestic languages of the company and English were considered suitable for handling the few international players that found their way to the site. Later on, languages such as German and Spanish were added as the need became obvious. The additional languages has been worked into the site to varying extent, and lots of issues are visible within the site as there are quite a lot of non-internationalized games and technologies that need to be face-lifted to accommodate the different languages and their users.

Some parts of the site are trying to live up to the internationalization expectations and for example some good things that have been implemented are:

- The site uses UTF-8 in all HTML-pages

- There is a language selection box with options translated in the languages they represent.
- The language selection is stored as a cookie, so the page is shown in the selected language every visit.
- Locale dependent resource bundles are used to provide the site with static files such as images. Which makes it easier to localize them if needed.
- The developers use JSTL-tags to format currencies, dates and import language-keys
- Language-keys are used and imported from a database, and form resource bundles from where the translations can be fetched using JSTL-tags.
- The site uses Euro as the base currency, but shows for example deposited amounts in the domestic currency of the players as well.

These are at least a starting point but the gaming site HTML-design in need to be reworked to better facilitate localization. The background processes such as translation need also be handled differently to let the company add new languages and new features to the site simultaneously for all different languages.

In today's processes, the company uses Excel-sheets to provide the translators with content that should be translated for the next release. These Excel-sheets do not contain any other contextual information than the language-key pair and the expected length of the string. The translators therefore always translate the new or changed content from scratch unless the developer has updated the Excel-sheet with the old string that should be changed. These translated language-keys are later imported into the site by the developers via back-end import functionality. This creates database entries for the different language-keys. These entries are then read and cached as resource bundles that can be used to get translations for the different site texts via JSTL-tags.

The fact that Excel-sheets are used as the communication medium is in itself a great source of bugs that are found. This may be a result of that translators can copy text, containing unsupported characters not seen at import time, into the Excel-sheets making the web browsers render the strings incorrectly on the site. In some cases even Excel-specific characters may be imported and cause the site to appear incorrect.

The lack of contextual information given to the translators is a big problem as strings in the target language may be much longer (or shorter) than the source strings, resulting in truncated strings in the web site and games. For example the word “odds” could be translated into Spanish as “proporción entre la ganancia y la apuesta”, which is quite a lot longer than the source word. If the translator have a sense of context it would be easier for him to maybe choose another possible word of the equal meaning to use instead, for example “probabilidad”.

Knowing the limitations of the current implementation of the site, it is imperative to provide the translators with tools and work-guidelines to process their content in such a way that it does not break poorly internationalized pages. These tools and processes should provide the translator with context of the content he translates and some sort of translation

memory that can aid him by keeping score of old translations and providing him with translations that are similar to the contents up for translation. This would be a first step towards easing the workload of the translators and the development team. The pages that currently are ill-designed in regards of internationalization should be redesigned to be fully localizable later on. In the following sections we will go through the efforts that the different teams do during the development process in terms of internationalization and localization.

2.6.1 The Internationalization Process

The internationalization process of the company has been investigated through interviews with different stakeholders of the site development. The interviewees were picked from the team designing the games and the site team, to give a broad view of what guidelines exist and how the information is distributed between the stakeholders.

The Game Team

Today, a new game is specified by a Design Team which sets the theme and type of the game. The game content is currently not researched for global suitability, and it mainly aims towards the current languages and cultures currently available in the site. The game client is then developed by game engineers and graphics artists, either in-house or outsourced. There are only minor guidelines available, for engineers and graphics artists, on how to keep the game easy to localize into future languages and cultures. The graphics design of the client is developed during close communication between the artist and the Design Team, resulting in a game client mock-up which is then accepted by the customer.

One guideline that somewhat recently was added to the development process, is that all new games should handle UTF-8 and therefore be easier to localize by supporting the majority of different characters. Though UTF-8 is used, problems for introducing new languages into the games may arise as the games sometimes use bundled fonts that may not support the languages correctly. As there are no other guidelines available for creating the clients in an easy-localizable way, the clients probably would need complete redesign if for example a new B2B-partner needed the games to handle right-to-left reading capabilities.

During the development of the client, needed language-keys are inserted into the client and added to an Excel-sheet which is sent away for translation. This Excel-sheet has, for every language-key, a field for providing a max-value for the length of the translated string. This max-value is the only thing giving the translator a sense of context and a guideline to follow during the translation efforts. This max-value is not always filled in and the files are sent to translation personnel pretty late in the development process, giving the translators quite a short translation-window.

The terminology of the games have not been documented, resulting in different terms being used for the same thing and that one term is being used for several totally different things. This is now starting to be addressed by documenting common terms available in the games.

The Site Team

As in the game team, new site features are developed and language-keys are added to an Excel-sheet which is then sent to translation-personnel pretty late in the development process. As it happens, this sometimes result in late bug-reports related to internationalization design issues. Such issues may be truncated strings in the pages, or problems with Excel-specific characters being imported into the language-key database.

There are no special design guidelines for creating well-internationalized site features available for the developers to fall back on, and it is therefore all up to the engineers to be aware of localization related issues and design new features accordingly. There are no terminology specifications available for the developers and they try to keep up the site's consistency by relying on terminology of similar existing features. The terminology of the site is thus created and decided by the developers and then accepted by the customer. This may in some cases give the site a bit of a mixed look and feel.

As in the case with the Game Team's Excel-sheet usage for communicating needed translations to translators, there is only a field for specifying the max-length of the translation. Thus there is not much contextual information available for the translators. New site features are not specifically tested, by the developers, to be able to handle common internationalization issues such as expanding strings, risking string truncation or other problems that may appear after translation.

2.6.2 The Localization Process

The localization process kicks in after the internationalization process is finished, therefore this section will investigate the different efforts made by the Game Team, the Site Team, and the Translators, after the Excel-sheet containing needed translations leave the hands of the developers.

The Game Team

The localization process from the perspective of the Game Team is pretty straightforward and involves sending the Excel-sheet, containing the language keys (in English) to the translators. The Excel-sheet may contain old translations of the language keys and the upper amount of characters that may be used for certain language-key translations. This Excel-sheet is then sent to the translators pretty late in the development cycle. After the translators have translated the language keys, the Excel-sheet is sent back to the Game Team who in turn bundle the sheet up with their client and import the language-keys into a database. The game client is then tested cosmetically for all the languages that the game client has been translated into. The issues that occur after translation are handled by the developers through re-engineering the client in such a way that no strings are truncated and that there are no visible errors. There is currently no testing regarding the linguistic quality of the translations within the context of the game, and thus only functional and cosmetic testing is employed.

The testers and developers in the Game Team have some functionality for generating game

scenarios that need to be tested, but some parts of the games cannot be simulated and thus are not tested very thoroughly. Such parts are for example error messages. If there are any issues stemming from faulty translation, these issues forces the Excel-sheet to be updated and the translation cycle needs to be reiterated. This in turn adds a lot of time to the development cycle of game clients.

After the developers have squished all bugs in the client, the client is ready for integration into the main gaming site and should be able to handle the same languages as the site itself.

The Site Team

As in the Game Team localization process, an Excel-sheet is updated with the language-keys and their English translations and later sent to the translator as the site feature is finished. If there are old features that are equal to the new one, the language-keys may mimic the old ones to keep up site consistency.

After the translators have done their work and the Excel-sheet have been sent full circle, the language-keys are imported into a database for storing the different translations of the site. This is a separate database from the one used by the Game Team. These language-keys are imported and there are no checks available to see the correctness of the keys during import time. Due to the fact that only ocular checks are done on the language-keys, in some cases Excel-specific characters are imported into the site database, making the site appear incorrectly. After the language-keys have been imported correctly into the database, the features are tested in the site and visible problems stemming from the translations are fixed. As the site uses XHTML the site needs to be tested using all different popular browsers, as the browsers often render the elements of the site differently from one another. This is done by the Quality Assurance team connected to the Site Team.

Some translators have the opportunity of checking the translations of the site in a Staging environment. There are no guidelines stating that this should be done, but it should be considered a step forward to prove that translations are working in the intended context. If errors are found in the Staging environment the translation cycle needs to be reiterated.

As there are different B2B-partners for the site, changing a translation may need several partner CSS-files to be changed to accommodate the update. One could also use locale-specific CSS-files to accommodate updates, but this would have to be done for all different partners as well. Thus this adds quite a lot of work just to change some erroneous language-keys.

The Translators

In between the two phases Internationalization and localization, lies a phase we could call the Translation Phase. This phase is actually a part of the localization process, but as the translation is done (in most cases) without much communication between translators and developers, and the fact that translators do not get much contextual information of the language-key usage, we take a look at these efforts as a different process.

The language-keys are received by a person who is responsible for managing the different

translators and the translation firms used. The Excel-sheet containing these keys is then distributed to the firm or freelance translators doing the translation.

The background of the translators is currently unknown and their education and nationality is not currently taken into consideration as long as their work is done on time and looks alright. The translators that are used depend on how large a project is; if it is a small feature, the language keys are translated in-house and if it is a large project, a firm is hired to do the work. The firm that is hired to do the translation is not in any way specialized in doing translation for online gaming companies, which may shine through on occasion, as wrong terminology is used.

When the translators get hold of the language-keys, they receive only a max-value of the translation length as a guideline. The translators receive no additional translation-kit containing for example screenshots or explanations of where the language keys are used and in what context the translations should appear, resulting in the wrong terminology usage due to the lack of contextual information.

The translators do not localize the content for the site in any way, and thus all localization efforts are done during the actual content creation. It is thus imperative that the content creators bare in mind not to use content that is locale-specific and that it is free from slang and locale-specific examples. This is a problem as the translation process may distort the content written in a way that it approaches the target players in a certain way, so that it in the end is not suited for the target audience anyway. Also it his very hard for the content creators to actually write content in such a way that the translations of their texts should appear as localized. This should be remedied, by letting translators that are native speakers of the languages in question translate and localize the content accurately.

Currently the translators have no known translation memory applications and thus only have the possibility to leverage old content if the developers provide old language-key translations in the language-key Excel-sheet. There is no terminology specification or project-specific glossary provided to the translators and it may be hard to find the correct term and keep the translation consistent with already existing content on the site. The Game Team have started to look in to documenting common terms used within game clients, and it would be a good idea to keep this document up to date and provide it to the translators translating the games. By doing this, the terminology would be kept consistent throughout the games, in all translations. Some translation firms may internally use standard formats for text that should be translated, instead of using Excel-sheets. The translation process may gain momentum if some other format such as for example the formats proposed by LISA (http://www.lisa.org/Standards.30.0.html) were used instead.

After the language keys have been translated, the translations are checked for errors by a translator with access to a Staging environment. This need to be done after the language keys have been sent back to - and imported by the developers. By checking the content in the actual context of the site, issues may be spotted and fixed. Today the personnel responsible for hiring translators have started to look into in-country reviewers for checking the translations in the light of the specified locale. This has not been done earlier and will probably help the process greatly.

3 RESULTS, DISCUSSION AND CONCLUSIONS

3.1 RESULTS

This thesis work have resulted in three documents that have been turned in to the company. These documents are of the following character:

- Guidelines and Best Practices
- Gaming Site Evaluation and Process Evaluation
- Evaluation of a Proposed Translation Memory Tool

The first document was the fruit of researched literature covering the field in focus and was a distillate of the guidelines and best practices that could be found.

The second document were the result of carefully traversing the company gaming site while noting inconsistencies in the light of the documented guidelines and best practices from phase one. This second document also contained a process evaluation based on the information extracted from the interviews done with different stakeholders of the company.

The last document contains an evaluation of a web-based translation memory tool that was proposed to speed up translation and content updates. This document was built from the information given at interviews with stakeholders and product documentation available.

The documents have in large been well received by the company representatives and hopefully highlights the problems and opportunities well. If these documents are revised correctly and made available to developers they may start a thought process that may help the site development greatly. Also, this documentation may also be used as leverage when discussing the need for funding globalization work within the site, with managers.

What can be seen as a future direction and continuation of this thesis work, is the investigation of the website globalization work done by the managerial and marketing staff, as well as the viewpoint of support personnel. This future work could give a hint if there is company-wide consensus on how to proceed with this process, or if discussions need to be held to focus the company efforts in the same direction.

3.2 DISCUSSION

During this thesis work, I have found that the work for providing global users with an enjoyable, reliable, and localized gaming site very challenging. The challenges lie in the multitude of technologies and frameworks used within such sites, all giving the globalization work its own share of implementation problems and headaches. The processes of web site globalization is of equal or even higher importance than the technological aspects of site globalization and development work.

If the globalization processes and workflow are not in place within the organization the projects will be seriously hurt by issue-trackers filling up with bugs relating to internationalization and translation. These processes need to be defined on a higher level and there should be managerial consensus and backing of these efforts if they are to be

successful on lower levels of the organization. The hands of developers and translators are tied if this backing does not exist and globalization efforts will be of very mixed quality throughout the site, as there are several teams working on different subsystems comprised into one visible site for the players. These teams should have the same guidelines and specifications for doing their globalization work and external systems that are tied into the site need to be localized correctly as well. These systems could be for example banner handling or external game systems that are out of control of in-house site developers and their localization therefore need to be handled by contracts higher up in the hierarchy.

The site that were investigated during the work of this thesis, showed many signs of poor internationalization. This was probably due to the relatively late realization of the globalization need for the site, resulting in design decisions that were suboptimal. Many of these issues may have been avoided if contracts with design-providers would have included specifications of internationalization and localization. Now the developers will have to live with the initial design problems and try to remove them whenever possible, but this is hard and the site may need major redesign somewhere in the future.

Currently the developers and translators work much on their own and have no documented guidelines for how to design and work to achieve a well-globalized site. This have resulted in terminology problems that are clearly visible in the site and strings and texts that have been truncated. These issues could very well be removed, by documenting and applying guidelines and best practices into the development process. Also terminology specifications and project specific glossaries may help the translators and developers keep up the consistency of the site, giving it a more professional and trustworthy appearance. The linguistic and localized content quality of translations should also be checked more carefully than it is today, by for example using the knowledge and input of in-country reviewers. By doing this the company may strengthen their brand more carefully and make sure that the site is actually usable for the target audiences.

As the gaming site needs a fast flowing current of content to feel fresh, it is imperative that the process moves away from the very slow translation-cycle which uses Excel-files as a means of communication, giving way to other faster channels for moving translations into the site. Such a channel may be for example web-based translation memory systems that provide the translators with new and changed content automatically. This should also give the translators contextual information by providing a for example a preview mode of the site in which they can easily check their translations. Such a system is now under evaluation and if it proves itself usable it probably will be a part of the workflow in the future. By leveraging old translations, translation of new and changed content will be much faster giving the company a means of sending out information to the different language versions of the site simultaneously.

The usage of technologies that support internationalization and localization is very prominent in some areas of the site whereas in other parts it seem non-existent. Usage that supports website globalization may for example be that the developers create their JSP-pages while using JSTL-tags to handle language-keys, format dates, and handle currencies depending on the locale that has been chosen by the player. Such technologies should be

used site-wide to provide a better experience and nicer appearance. This, again, boils down to the consensus of team managers on the need of web site globalization. Discussions between the different teams should thus be held, where these issues can be discussed.

3.3 CONCLUSIONS

This thesis work have resulted in a more profound understanding of the issues concerned with developing software for global audiences. These issues have been documented and communicated to the representatives of the company and may very well become leverage in the discussions for future globalization of the gaming site. The work of the company is of course not done in this area, and someone should pick up where this thesis ends. One critical area that has not been researched in enough detail is the proposed translation memory application. This research was more or less impossible to do as the documentation of the application was non-existent and the sub-contractor providing the application had no resources available for the thesis worker during the time-frame of the thesis project. As the research was seriously hampered by the previously stated facts, research was limited to setting up a development-environment and investigate the site code-base to get a feel for what kind of problems that could arise during the integration of the tool. Regretfully this could not be finished due to time constraints.

Additional areas that remains to be investigated are researching and documenting the globalization work done by the divisions of the company that have been left out of this document, for example managerial and marketing staff. This work should then be concluded into a plan for future globalization work and decisions on what documentation, education, and artifacts should form the basis for the process and what is economically feasible. This process need to be unified across the company to achieve the desired effect. This is hard work but the rewards may be great both for the company and their customers.

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5 DICTIONARY

Adobe Flash	Technology used for creating games, animations and rich internet applications
B2B	Business-to-Business – E-commerce taking place between Businesses.
HTML publishing	HyperText Markup Language. The standard language of the World Wide Web
JavaScript	Client-side scripting language designed to look like Java
JSP	Java Server Pages. Scripting language used for designing dynamic web pages
JSTL	JSP Standard Tag Library. Library providing capabilities such as formating currencies and dates, depending on a locale.
Lotteriinspektionen	National Gaming Board - The department responsible for gaming practice in Sweden
Macromedia Shockwave	Multimedia technology enabling Adobe Director applications to be viewed in a web browser
Marknadsföringslagen	The law that regulates marketing in Sweden
ResourceBundle class	A class that bundles resources together, which can be accessed by name. One ResourceBundle is specified for each locale.
UTF-8	Byte-oriented encoding form of Unicode
XHTML	Extensible Hypertext Markup Language. Publishing language for the World Wide Web that conforms to
the	XML syntax.

6 APPENDIX A - GUIDELINES

The content of this appendix will be focused around best practices and guidelines associated with the globalization of websites. The guidelines have been extracted from the various reference literature found in the reference section of this document.

6.1 GENERAL GUIDELINES

6.1.1 Central versus Distributed Web Site

The gaming company should decide if they provide one single central web site which supports all different languages and cultures or if it should go for several distributed web sites that are specific for languages or regions. It might be easier code-wise to keep several distributed sites localized, but there is a massive overhead if the company needs to push out content to the all sites. If the company decides on a central multilingual site, the internationalization work is more demanding but changes need to be applied only once.

6.1.2 Central Oversight With Local Empowerment (COLE)

Woods proposes, in (Woods, 2005), an approach for managing the development of the web site, called Central Oversight With Local Empowerment. The COLE-approach has, according to Woods, been used by large companies such as Dell and HP. What it actual means is

“The optimal approach would then provide a centralized infrastructure that oversees and coordinates all processes, while all processes would route content through the local offices to enable them to develop and/or review content for their markets. ” (Woods 2005, p. 136).

By doing this one ensures that the content is actually suited for the target markets.

6.1.3 Separate Generic and language-Specific Content

Create database architectures that separates generic and language-specific content., this so it is easier to add new and update existing languages. The generic content can be reused and be the same for all language versions whereas the language specific language-keys and resources can be put in locale-specific resource bundles. It is easier to provide the translators with language-keys that have been extracted from a database than to extract them from a large quantity of source code files, and one also ensures that translation does not break the source code in any way.

6.1.4 Give the Translator Some Sense of Context

It is advisable to give the translator some way of previewing the translations in context of the gaming site. If the translators are given this opportunity to see their translations in context they can decide on better phrasing of the translated text. For example the English word “none” can be written in several different ways in German (e.g. “keine” or “kein”),

depending on the genus of the word that “none” refers to. This can only be decided if there is contextual information on where the translation should be used. This could also be done by for example appending some notes to the translatables, e.g. “use no more than XX characters”, “this is concatenated with message xx”, or providing some sort of preview of the website after the changes have been done but before the developers start fixing the issues that may come from for example expanding texts.

6.1.5 Implement a Tracking Tool

“Ideally the site should have a tracking tool that automatically detect changed or new content and send it directly to the assigned localization vendor and/or reviewers before it is returned and inserted in the content database.” (Esselink 2000, p. 38).

By adding such a system, the translation process may be sped up significantly, as much of the communication is not handled via email or other off-line routes.

6.1.6 Language Selection

The user should be able to change the language setting on every page, as he might not always navigate to the main page of the site, but also come to the site via a bookmark or a search engine result. The selected language should be stored in a cookie so that the rest of the site navigation can be shown in the correct language automatically.

6.1.7 Use Translated Language Options

Translate the language options into the languages of the people to which the option is directed. For example use “Svenska” for Swedish.

6.1.8 Do Not Use Flags in Language Selection

Flags do not work as language selection options as there may be more than one language covered by the flag. For example in Finland both Finnish and Swedish is spoken. Thus there is no 1-to-1 mapping between languages and flags.

6.1.9 Native Navigation Structure

The user should be presented with a navigational structure which uses the native language and traditional navigation direction of the target language. This means that the user interface should be able to handle for example right-to-left reading directions without major redesign.

6.1.10 Develop an Efficient Update and Change strategy

See to that the website is as easily updated and changed, for example the addition and removal of articles, content, games, or pages. What this means is for example that it should be possible to add new entries into existing menu designs without breaking the layout in any language. Some menu options may for example need to be hidden for certain locales,

due to legal reasons, and the site should still be shown correctly.

6.1.11 Develop and Manage Design Style Guides

Create and maintain style guides for the graphical components of the application. This should be done to ease the work of developers during the internationalization and development phase. This will ensure consistency between the different pages and language variations of the page.

6.1.12 Create and Manage Terminology Documents and Glossaries

Terminology documents should be used within the project group to sustain consistency and make sure that the same terminology is accurately used over versions and added languages versions of the pages. Glossaries are also a great reference for the translators during the localization phase and should be provided in the localization-kit.

Linguistic style guides are also a great reference for translators to keep the translation consistent and to the point.

6.1.13 Classify Pages for Cultural Adaptation

The pages of the web site should be classified depending of the need for cultural adaptation. According to Esselink in (Esselink, 2000) these three headings are appropriate:

1. Pages that require heavy cultural or regional adaptation
2. Pages that require straight translation
3. Pages that require no translation

Marketing texts are translatables that fall under the first heading, and these may need to be rewritten by authors that are native in the target language. Esselink also states that this is more than mere translation as it is an integral part of the companys global branding initiative.

6.1.14 Color Palette Usage

“If the same color palette is to be used across locales, it would be a good idea not to use primary colors in design because they may still carry negative or positive meanings in some cultures.” (Aykin & Milewski 2005, p. 48)

An example Aykin and Milewski makes, is that in China the color red symbolizes Good luck and prosperity, where as it in the Middle East symbolizes Danger and Evil.

6.1.15 Include Local Content in the Localized Pages

The users' comfort level regarding the web site tend to be higher if there is local content in the website that they are using. This could be information regarding local offices, social engagements in the target country, local studies, and client references.

Make sure that site provides local payment facilities, a local product mix, local distribution systems, and local laws for taxes and tariffs etc.

6.2 DEVELOPER

The following sections contain guidelines for the Developers during the internationalization and localization phases.

6.2.1 Internationalization Phase Guidelines

- Use generic icons holding no locale-specific features
- Avoid too many graphics with text, and keep a blank image with the text in a different layer (if the text is not graphical). This makes it easier to localize later. There should be a new layer for each language translation, keeping all versions of the graphics in the same file.
- Always include the charset parameter in the HTML header
- Create a resizable layout structure, and avoid complex formatting that may be hard to change if the need arises after the localization phase.
- Avoid using fonts as design features and do not depend on certain font width and height for certain user interface elements to look correct. This should be considered as fonts may be overruled by browser settings.
- Avoid using tabs or spaces to format text. The formatting should be done in CSS-files instead.
- Allow tables to resize dynamically, and allow for text expansion to occur in table cells, this to make sure that no truncation of strings occur. It is advisable to add about 30% extra space space to GUI elements due to the fact that on average translated sentences are about 30% longer than English translation counter parts. For individual words this expansion may require up to 100% extra space, thus being quite evident in for example buttons. Also, non-Latin characters may require different line heights, spacing between lines, spacing between characters, etc, which may break the design of the gaming site if they are not accounted for. Of course these issues should also be considered when designing using cascading style sheets or other technologies.
- Make sure that translated menus fit inside the screen width on all required resolutions, so that no horizontal scrolling is needed. The requirements should be based on statistics of screen resolution usage in the gaming site target markets.
- Separate translatables from the code by using for example resource bundles and language keys. This is preferable due to security, quality and efficiency. The security part of using external technologies for holding resources that need translation, lay in the fact that freelance translators and translation-providers have no access to the source code. The quality and efficiency lay in that it is easier to

find and translate texts and string that are separated from source, and ultimately only the resources need to change when a new languages are introduced.

- Choose a folder structure for resources which mirrors the usage of different locales. This should be done so it is easy to see in which locale the resources are localized to, as well as it makes it easier to find and add new localized content to the directory.
- The code should rely on language support available in the API, for example use JSTL-tags in JSP-pages to implement locale-dependent date, time, currency, and number formatting.
- Make sure that regional standards are met by seeing to that the following are implemented correctly:
    - Sorting rules (collation)
    - Reading direction and justification of text content
    - Measurement formats (for example use the metric system if applicable)
    - Time
    - Date
    - Calendar
    - Currency
    - Address formats
    - Phone numbers
- Use Unicode to ensure that all characters can be used in all input fields and can be displayed correctly in the web site.
- To ensure that the site has the appropriate language support and is internationalized correctly, use a testing method called pseudo-translation. Pseudo-translation can be done by adding a pseudo-language containing strings with accented characters that are longer than the strings in the source language. By using this method of testing, the Developer can find design issues stemming from poor internationalization before the localization phase has been started, minimizing the number of possible issues that may break the design after translation.
- Use language-specific cascading style sheets or templates for specify the page layout. This could be based on language or culture, e.g. use one template for Western countries and different one for Asian countries.
- The components of the web pages should preferably have the same size in all language versions.
- Avoid adjusting the space between buttons (especially closer to each other).
- Dialog boxes should have the same number of buttons irrespective of language. If

possible, there should not be any discrepancies between different versions of the gaming site.

- Never change font attributes of items in dialog boxes, overall use consistent fonts in all parts of the gaming site.
- Dialog boxes should be made to fit inside the required resolutions.
- Always conform to available style guidelines when creating new content to minimize consistency problems.
- Take into account that some languages are read from right-to-left and that some words and sentences should not wrap into several lines in the same way as English or Western languages.
- Do not concatenate strings as it is hard to predict how long they may become, and it may also introduce translation errors due to missing or added spaces. The order of concatenation is also important as the word order is different between languages.
- Make sure that all texts are localized, also third party content available via an IFRAME or via JavaScript:s.
- Make sure that all links to external pages point to localized versions of the external pages (if available).
- Make sure that the internationalized web site design works in all required browsers and for all browser versions. This should be taken in consideration as different browsers render HTML-elements a bit differently than others.

6.2.2 Localization Guidelines

- Fix the issues that have been introduced during the translation, for example truncated strings and changed appearance of the site.
- Make consistent changes to the web site. If a cancel button has changed 5px in one dialog, make the change site-wide and update the style guides.
- Always do some functional and cosmetic testing during the localization work, to see that no regressions are introduced.
- Discuss solutions to issues with the translators. Maybe they can use a shorter word to cope with a truncation issue?

6.3 USER INTERFACE DESIGNER AND GRAPHICS DESIGNER

The following section contains some guidelines regarding the development work for Interface Designers and Graphics Designers.

6.3.1 Internationalization Guidelines

- Do not use country-specific icons or imagery. By using country-neutral icons,

localization time and cost can be lowered. For example, use the image of an envelope when creating an icon for depicting mail functionality, instead of using a mailbox which can have different designs in different countries.

- Make sure that the color palette is neutral to all cultures. If possible do not use base colors, as these often have different meanings in different cultures.
- Do not use text that must be translated later, directly in images. It is much more time consuming to localize images than to translate language-keys.
- If text is needed in an image, use different layers for the text and the image content so it can easily be changed to fit into the localized version of the web site. Use one new layer for each language and render only the appropriate layers when generating images for the languages.
- Make sure to research the culture towards which the design is aimed, as some imagery may even cause offense. For example a picture of a pig may symbolize savings whereas it in Muslim and Jewish culture is considered filthy.

6.4 TECHNICAL WRITER AND TRANSLATOR

The following sections contain the guidelines associated with translation and localization. Much of the guidelines are also applicable for source language content creation.

6.4.1 Localization Guidelines

- Avoid deleting leading or trailing spaces: "Copying " (note the trailing space) is followed by the file name in run-time. If you delete the trailing space would force an Italian translation to be displayed as "CopiaAccount_information.pdf". This may happen if the developer has used spaces as a design feature, even though it is discouraged.
- Don't change dates, time and number formats in the resource file, these should be formatted using tags or something else.
- Language guidelines
  - Write using a culture-neutral language when writing source content that should be translated later. This makes it easier to translate later.
  - Use the glossaries and terminology reference documentation while writing and translating to maintain consistency of the content.
  - Choose terminology which is consistent with the target platform (browsers, etc). some software publishers make their terminology available online. This so it is easy for players to for example clear their cache after they have logged out from the site or clear out their cookies to get rid of their language settings.
  - Ensure that the translations of software strings are consistent within and between software products (such as games and the web site in which they are

embedded).

- Be creative: avoid literal translations of software options. Always verify the meaning or function of the software option, and use a word in the target language that accurately describes the feature.
- Avoid using the first person (I or we) anywhere in messages, and avoid using second person. Proper respect should given the player, depending on their cultural background.
- Always try to use the imperative mood, as this makes the text easier to follow.
- Use a consistent style and grammatical form for specific types of user interface components. It is better to use the imperative form for menu commands and dialog box options and buttons. Also try to be consistent when translating status bar messages.
- Where there are exclamation marks used in the English language, do not automatically include these in the translations, unless absolutely necessary. It is less common in many other languages to use exclamation marks. Always research the target culture carefully before trying to localize content for the players of that region.
- Use consistent translations for both option and dialog box. "Sign up now" option should show a dialog with the header "Sign up now".
- Adjust capitalization to target language standards
- Adapt the language in the user interface to suit local conventions. For example "Congratulations, you have successfully registered to the site" may need to be more formal in other languages, so delete the "Congratulations" part of the language-key.

- Space restrictions
  - There are always space and length restrictions that must be considered while translating. Most other European language texts are longer than English counter-parts.
  - Truncation of strings often become evident when the application is built and deployed. Therefore the translator should preview the translated web site and consult a localization engineer if any issues occur.
  - If fixed form or dialog layouts are used. (example where one screen layout is used for all languages), the translators must be very creative and select shorter words or abbreviate words. A translator may be forced to vary the length of specific terms due to space or length restrictions.
  - Use consistent and accurate abbreviations and add them to the terminology glossary
  - Keep menu names, commands, and other software texts as short as possible

when translating user interface items. This will minimize resizing efforts later.

- Concatenated Strings
    - Developers often concatenate strings to form longer sentences such as "Undo Cut" which would be concatenated as "Wiederrufen Ausschneiden" in German, which is grammatically incorrect. “Ausschneiden wiederrufen” is the correct term. So the order of this concatenation is important.

6.5 QUALITY ASSURANCE AND TESTERS

The following sections contain some questions that needs to be answered by the work of the Quality Assurance Team during the gaming site globalization process.

6.5.1 Internationalization Testing

The internationalization testing is performed before localization work is started, and focuses on testing the localizability and international support of the web site. The testing should assert that the web site supports all locales, and that it is easy to localize (e.g. the design scales correctly as texts are expanded etc). This step need to be acknowledged as it is very important to ensure that budget impacting issues, stemming from poor internationalization, are found early and can be taken care of before the localization phase. It is very hard to fix issues in all languages after localization has been done. This iterative testing process also minimizes post-localization testing.

Testing the web site for international support consists mainly of answering the following questions:

- How are languages, regional settings and scripts supported in the site?
- Does the site support all possible extended characters?
- Are multi-byte content parsed, processed, and displayed correctly by the site and back-end?
- Are regional settings, such as date, time, currency, calendar, decimal separators, measurements, address, and phone formats, correctly managed?
- Collation: are different sorting methods supported? (for example is the Japanese Shift-JIS phonetic sorting order supported for Japanese versions of the site?)
- Third-party components - Do these components pass all required internationalization tests?
- Does the site and games support international hardware such as keyboard layouts?

To ensure the localizability of the web site the following issues should be considered:

- Have all resources, that need to be translated, been externalized?
- Have any regional settings been hard coded in the site? If so, make them dynamic

using for example JSTL-tags.
- Are there any concatenations that may cause problems during translation?
- Does dialog boxes and forms allow for text expansion or are they fixed size, and thus may require future redesign?
- Does the site or games contain any bitmaps or icons with texts that may need translation?
- Does the site or games contain any graphics, colors, or other components that need to be adjusted for certain cultures?
    - To find such problems, try involving target language native speakers in the internationalization testing cycle.
    - Use pseudo-translation as an integral part of internationalization testing, to spot internationalization problems early.

6.5.2 Localization Testing

The localization testing is particularly important when dealing with web sites where the content is created on the fly, for example when technologies such as JSP, PHP or ASP are used. The testing is done after the website has been translated and it focuses on the translated content in context, reviews the cosmetic and linguistic quality of the application. The linguistic testing should be done by a native speaker of the target language as there might be issues found that are subtle and very culture-specific. The cosmetic testing consists of verifying the look and feel compared to the non-localized version of the web site.

This linguistic testing includes reviewing every dialog box, menu and as many strings as possible in the web page. Issues to consider during the testing are:

- Has everything been translated, or are there pages and sections that are not?
- Are accented characters displayed correctly within the site?
- Does the punctuation and abbreviation follow the linguistic rules of the target language?
- Is localized text wrapped, hyphenated, and sorted correctly according to available rules?
- Are there any truncations in error messages and dialog boxes?
- Do menu items and dialog box titles have consistent translations? The heading of the dialog and the text of the menu item should be the same, not to spawn any confusion of what menu item was clicked.
- Are there any icons, graphics or sounds used in the site or the games, that need to be adjusted to fit in the target culture?
- Do concatenated strings display correctly?
    - Are there any issues with leading and trailing spaces?
    - Do the translation form proper sentences in the translated version?

- Does the translation make sense when read in context of the gaming site?

Cosmetic testing on the other hand focuses on the user interface and issues to consider during this testing are:

- Are the number of menus, options, etc the same in all versions?
- Have dialog boxes been properly resized to fit the content and the required screen estate?
    - pay attention to dynamic dialog boxes where different fields can be displayed depending on the web-application or game state.
- Are all characters displayed correctly?
- Everything fits on the screen in all required resolutions?
    - menus, options, etc
- Are the site aesthetics acceptable in the target culture
- Does the tab order match the order in the source version of the site?
- Are all necessary options available in drop downs, etc?
- Do pop-ups and dialog boxes show correct regional settings?

After the linguistic and cosmetic testing has been completed and no major issues have been found the user interface should be frozen to hinder late changes just before releases.

6.5.3 Functionality Testing

When the user interface has been tested to ensure proper linguistic and cosmetic quality, the web site functionality needs to be tested accordingly. This is done to verify that the web site's functionality has not degraded during the localization process. This testing is done in comparison to the original version of the web site. The issues to consider during this testing are:

- Are the set of features the same as in the original site?
- For Asian languages, is input supported correctly?
- Does the localized version point to web sites that are not in the native language?
    - Are localized versions of these pages available?