The Increase of Croatian ERP System Vendors' Competitiveness with the Support of Online Translation Service

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Abstract. *Enterprise resource planning (ERP) systems are highly complex and their development is very long and expensive. The market needs to be defined in order to develop and maintain ERP systems. Croatian vendors need to be competitive in both domestic and foreign market, due to the size of the domestic market.*

The research indicates that only a small number of Croatian ERP systems vendors have linguistically adjusted their product to the demands of the foreign market. Linguistical support is essential for foreign market distribution and this situation can be resolved by preparing technology that would allow ERP systems vendors to translate the system in multiple languages in a simple, fast and cheap way.

The application of standard software component with the support of publicly accessible on-line translation service would fasten the ERP systems translation process and reduce its price. The system would be ready to use instantly, and the translator could verify and upgrade local translation base when necessary (human aided machine translation).

Key words. ERP systems, competitiveness, software localization, accessible on-line translation service, human aided machine translation.

1 Introduction

Every business management system needs an efficient information system which must enable an increase of competitiveness in increasingly complex business surroundings. ERP systems are designed for managing and leading the business systems and, as such, are integrated into all functional parts of business. Some modules and applications of ERP systems are used by all business system employees regardless of their IT and foreign language knowledge. Therefore, the ERP system must be adapted to business and translated in system user's language.

Standardization of business processes, legal regulations, reports and international accounting standards make business coordination of ERP systems among different countries, especially EU, much easier. Users' demands and legal regulations become increasingly similar, enabling different ERP systems to be used in different countries without any significant adaptations.

The situation is not the same when it comes to languages used in ERP system. When the ERP system needs to be adapted to other countries, problems regarding translation of system components appear, resulting in increase of time and cost needed for its implementation in the new surroundings. This paper aims to explain the innovative way of using translation procedure for different ERP system components to make translation of client software components fast and cheap by using publicly available online translation services.

2 Development of the ERP system

Successful business production system management and optimal available resources planning cannot be achieved without ERP system. The properties and functionality of modern ERP systems were being formed during last few decades, combining the best practice and IT achievements.

MRP **(**Material requirements planning**)** and MRP II concepts are the predecessors of ERP system. ERP systems are software packages designed for managing and leading the business systems. They are composed of modules and applications which support functional areas like: planning, production, supplies management, marketing, distribution, transport, accounting, finances, human resources management, project management, CRM, quality management, e-business, etc. [1]. Integrating all business processes and optimizing available resources helps the ERP systems manage business system as a whole and implement best practices for every single process in the company.

Different branches of economy have different demands regarding the ERP system, so the ERP system's ability to adapt to various business processes

and to enable the integration of additional, specialized modules is very important [2].

All of the above makes the ERP systems extremely complex and their development process long and expensive. Every vendor needs to insure that his ERP system are marketable in order to develop, maintain and improve the ERP system. Croatian vendors need to be competitive in both domestic and foreign market, due to the size of the domestic market. In order to penetrate the foreign market, it is very important to localize the ERP system.

ERP vendors are focused on their local market and their aim is to adapt to the users' business needs. Some ERP systems were translated into foreign languages from the beginning, while the others regarded language adaptation as an expensive and long process. The EU now has 24 official languages (including Croatian) and when expanding to the markets outside EU, the number of languages grows immensely.

3 Croatian ERP system vendors competitiveness

The analysis of the software industry in Croatia in 2012 indicates that this particular branch had an income of 4, 79 billion kunas, which makes 1, 4% of the GDP. The analysis explains that the total income of software vendors' in Croatia (2172 producers) was 4, 79 billion kunas which represents the growth of 409 million kunas compared to 2010. The export increased to almost a quarter billion kunas - up to 989, 9 million kunas. In 2012 it made 1, 38% of total Croatian export. The data indicates that about 20% of the software vendors' total income was gained on foreign markets. Analysis included companies which classified their activities under the code 62 which stands for "Software development, consulting and activities regarding IT" and they were mostly SMEs (small and medium-sized businesses) [3].

According to the data given by the Croatian Chamber of Economics, software industry belongs to the ten largest export businesses; however there are still some undiscovered possibilities that could contribute to larger export of Croatian software products and with it, the ERP systems.

4 Localization of ERP systems

ERP system is a very specific software product which enables the vendor to distribute it multiple times, even at global level, with only few adjustments. Development phase demands certain investment; therefore the development of such a complex system is not marketable if made for only one user. Expenses regarding ERP system distribution or adaptation to other potential users are relatively low compared to the development phase. ERP system business processes are practically identical for certain business branches regardless of the country. The adaptation to the foreign market users does not involve demanding and expensive changes of the design and program logic.

Prerequisite for the success of ERP system on the global market is software localization. During localization, the semantics remains the same, while the syntax changes) [4]. Software localization includes several aspects of products adaptation to certain market:

- language adaptation
- business adaptation
- technical adaptation and
- cultural adaptation.

Language adaptation includes translation of user interface, reports, messages and documentation into foreign language and, depending on the country, the use of specific script. Software adaptation is essential in using special measurement units, number format, time, currency, etc. A good ERP system design understands that the translation into foreign languages is done without changing data structure or program logic.

Business adaptation includes software adaptation to law and legislative regulation and to the standards of a certain country.

Technical adaptation includes software adaptation to certain technical infrastructure.

Cultural adaptation includes a selection of culturally dependent parts of software, in order to create a culturally independent version of the software which could then be adapted to certain cultures) [4].

Software localization, especially ERP system software localization, is not just about translation of user interface or documentation; it is a more complex process. The procedure can change the database or data flow depending on legislations of certain countries.

Experience has shown that translating user interface, especially if the system was not planned for multi language surroundings, is the toughest job. If the system needs to be translated into more languages at the same time, and to some languages that use different script (Cyrillic, e.g.), one needs to find a way to reduce costs) [6]. This paper will suggest an innovative way of user interface translation, as well as the translation of other elements of ERP system by using a few well-known and publicly accessible technologies.

5 Croatian vendors ERP system language support research

5.1 Research methodology

The subject of this research was the language adaptability of the Croatian ERP system vendors. Research instrument was interview. The sample

consisted of 27 well known Croatian ERP system vendors, chosen from www.poslovni-software.com portal. Since the detailed data about language adaptation has not been published in promotional materials, and the aim was to ask additional questions, the data was to be collected by a survey. Since the survey proved to be difficult to conduct (it is hard or impossible to obtain the answers), the decision about conducting an interview was made. The interview was conducted via telephone.

The following questions were asked:

- Does the ERP system supports foreign languages and if it does, how many?
- Does the system have the possibility of supporting foreign languages?
- Do you plan to implement foreign language support?
- Do you have any ERP system users outside Croatia?

The data for all 27 ERP system vendors defined in the sample was collected.

5.2 Research results

Research results show ERP system current language support for the total of 27 Croatian vendors:

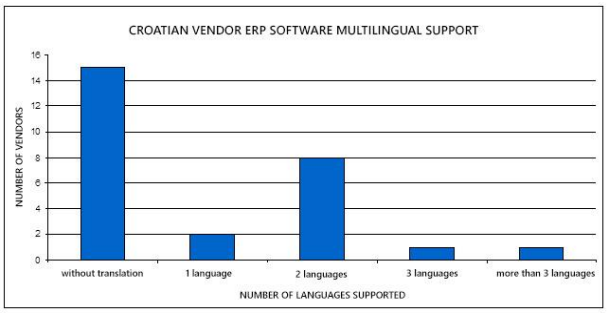

Figure 1: Research results for the Croatian vendors ERP system language support

Almost 15 out of 27 ERP systems have not been translated into any foreign language. When asked do their ERP systems support foreign languages and how many, the vendors responded that the translation is possible if the client asks for it.

Almost all surveyed vendors whose products are not translated into foreign languages, point out that they had neither technical problems nor the need for important law regulations adjustments and that they plan to implement the language support. On the other hand, other vendors that have been surveyed and that have implemented the language support have clients outside Croatia.

It could be concluded, based on the results, that ERP system vendors can translate the system into a foreign language if necessary, but the problem is in the duration and the price of such a process. One cannot expect the user to buy ERP system if the system does not support his own language, due to the particularity of the ERP system which is integrated in whole business system.

In order to overcome the problems, it is necessary to find the way to enable ERP system vendors a simple, cheap and fast translation into as many foreign languages as possible.

6 Using free on-line translation services for ERP system multilingual support

6.1 On-line translation services

Machine translation started to develop along with the Internet in the early 1990s. Before that, machine translation was of low quality and used only by large companies. With the Internet, machine translation flourished. Internet users around the world can access web sites written in many languages. Since the web content is subject to change, machine translation is almost only efficient way of translating. Machine translation systems can be divided into 3 categories [6]:

- Systems integrated in web browsers
- Systems integrated in multilingual search engines
- On-line translation services

On-line translation services are created for interactive translation of words or phrases on multiple languages. There are both commercial and free versions and some of the best known free translation engines are: Google, Bing, Babylon, Reverso, Bablelfish, Systrans, etc.

The advantages of Google Translate when dealing with ERP multilingual support:

- Communication with the service at the code level
- Independent researchers mostly rated Google Translate the best on-line translation service [7], [8]
- Large number of multilingual support
- Free usage.

translate.google.com is free and publicly accessible translation service created for interactive translation of words or phrases on multiple languages. One can send the request for translation to the service through one's own software components created by different development tools with the help of certain software techniques. Google Translate translates the content in a predetermined way, so the content can be decoded and displayed in one's own user interface [9].

6.2 Disadvantages of using Google Translate service in language software component support

Direct translation of all software components with the help of Google Translate is not used for several reasons [5]:

a) At the present level, machine translation does not give completely correct and reliable results. That could be solved by making a list of machine translation exceptions, prepared by a live translator. If there is an exception for a certain word, then the word would replace a direct translation obtained from Google translation service.

b) Direct use of translation service each time the translation is needed demands the translation service to be reused multiple times. Depending on the user interface complexity, internet connection speed and on-line service's availability, the translation of a certain component may last up to ten seconds – unacceptable in practice. In order to solve the speed problem, a local translation base designed for registration and re-usage of all translations can be used. When translating every word in user interface, the service first searches the local base and then, if unable to find the word, the service searches Google Translate. This procedure saves end user's time.

c) The procedure of connecting to Google translation service demands more lines of the program code for every word that needs to be translated. It causes a few problems: the size of the code and its operational version grow, the need for a large number of changes on the existing ERP system program code (it can indirectly represent the source of new mistakes in already existing software). The above mentioned problems can be solved by developing a special software component as user interface between ERP system module and Google translation service.

The biggest challenge is the quality of the machine translation. If the goal of translation is to produce publishable high-quality text, machine translation may act as a first step to producing a rough translation. In the second step, a human post-editor may then correct the output to the desired level of quality.

Post-editing machine translation output (also called human aided machine translation) is cost-efficient if the effort of post-editing is less than the effort of translation from scratch. The efficiency rises with the quality of machine translation. If the machine translation system reliably brings the meaning across, the post-editor does not need to know the foreign input language. Since bilingual speakers are much harder to come by than monolingual speakers, this reduces the cost of correcting the output. One may also imagine a scenario in which a monolingual post-editor fixes the mistakes in fluency of the English output and a second bilingual post-editor fixes the mistakes in meaning. Note that if the monolingual post-editor knows something about the subject matter of the text, he will catch many mistakes in meaning already [10].

6.3 The solution to using Google Translate in ERP system multilingual support

The aforementioned problems can be solved by implementing local translation base. Every new word or phrase is stored in the local translation base to be used in the future translation. The access to the local translation base is faster that the access to the translation service engine. The translator can verify the entries in the local base (human aided machine translation). That gives the quality to the translation. Since every ERP system uses some kind of database, local translation base can be implemented in the same software infrastructure.

All of the software mechanisms needed for linking one's own software and Google Translate can be implemented in the same class. Setting and using such class in one's own application that supports the usage of COM objects is very simple, therefore additional changes to the original program code are not needed [11]. At the beginning of every basic module application program code one needs to add the localization class. The *Localization* class, prepared during the research with the purpose of integrating all the mechanisms necessary for a quick and efficient translation of software components into another language is implemented in Microsoft Visual Studio development tool and as such, it can be used in many projects based on the same development tool.

Described translation mechanisms of the existing software are verified in the Information System for Education before being implemented in the ERP system. ISE - Information System for Education, whose development is financed through the EU funds (CARDS 2003) and implemented in several educational institutions in Croatia, needed to be quickly translated to Polish due to the opening of the new educational institution in Warsaw. Since the educational institution is registrated in Poland, it chose the ISE system for monitoring the andragogical documentation and its own business (including entry, display and printing of all relevant data in Polish). The translation of all key parts of the user interface was done by implementing the procedure described in this paper. The results represent the cornerstone for implementing the same technology in ERP systems.

6.4 Future research and development possibilities of the given solution

By implementing the given solution and the development of the on-line translation service, the quality of the translation will increase without changing the ERP application's program code. It is extremely important to improve the components that allow the translator to arrange the local translation base while the application is active. Local translation base can contain translation of the words related to ERP application which would improve the quality of

the translation (one could avoid generic terms provided by web services).

Since most of the on-line translation services provide the possibility of hearing the original and the translated text, it is also possible to implement that in the localization class. By doing that, the ERP system would be suitable for blind and vision-impaired people.

7 Conclusion

The research indicates that only a small number of Croatian ERP systems vendors have linguistically adjusted their product to the demands of the foreign market. Linguistical support is essential for foreign market distribution and this situation can be resolved by preparing technology that would allow ERP system vendors to translate the system in multiple languages in a simple, fast and cheap way.

Translation done by using corresponding software and online services has an big potential and can solve the problem. Automated translation system prototype is successfully used on several less demanding projects. Current results show great acceleration of the whole process while reducing the number of people involved in the project, thus reducing the cost.

The application of the described procedure in ERP system would accelerate the process and reduce the price and it can support any of the 71 languages Google Translate supports, including all of the official EU languages. It is important to immediately start using the ERP system in any available language and then enable the translator to gradually arrange the local translation base step by step.

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