Designing 3ERP to meet use and users - methods to handle cultural diversity and collaborative networking in SMEs

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Link to publication from Aalborg University

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ABSTRACT
The purpose is to describe a project the aim of which is to develop and validate the scientific methodological foundation for design of user friendly and usable, flexible and configurable global Enterprise Resource Planning system for Small and Medium sized Enterprises (SMEs) which are adoptable to cultural diversity and support the collaborative networking tasks embedded in 3gERP. Focus is on Human Centered Design methods and tools which must be developed to handle cultural diversity.

General Terms
Human Factors, design

Keywords
HCI methods, cultural diversity, collaborative networking, business systems

1. INTRODUCTION
Like most complex systems, also business systems such as Enterprise Resource Planning (ERP) systems have point of departure in engineering and has grown out of the IT industry in the developed world. It is not the end users who have been the point of departure for the development. On the contrary, the system development of the first ERP-systems, introduced in the 1980's were building on accounting systems, and the aim was to integrate all transaction systems within one system. The 2nd. Generation was concerned with enabling sharing and practices across entire enterprises. ERP systems is just about to enter into its 3rd. generation and the focus is on the decision maker and delivering relevant information in real time for decision purposes. (1,2).

Very large integrated ERP-systems e.g. SAP and Oracle are examples of second generation systems. These standard systems are mainly tailored to particular and large enterprises on a global scale. This is very often at a very high cost due to customization and re-programming, hence the implementation cost may be 2 – 10 times the prize of the systems itself.

The ERPs of the third generations is aimed at small and medium size enterprises (SMEs) worldwide, but such expenses are not only prohibitive to the developing world, but also to SMEs in the developed world. There is a vision to come up with a much more comprehensive global ERP-system, which can be localized to different countries / industries/enterprises with a minimum of initial and ongoing efforts. The idea is a component based software development. A software core will be further developed with ready-to-implement components which will be tailored to the specific company, industry, or culture. The vision is the MS Office Package, that is the ERP systems perceived as MS Office, though an ERP system will be vastly more complex due to very different requirements.

However,, the issues addressed in the development of an ERP systems for SME´s do not include a use nor an end-user perspective nor is culture addressed. To the software and consultant companies the user is the customer to whom they are selling the product. The end-user, the employees who are the ones to use the system, are sparingly addressed. An example is the perception of the user as a role: the administrator, the secretary, the accountant. But users are not roles, they are humans engaged in work which takes place in a context and in a given culture.

The aim of our project is to contribute with a complementary human centered perspective. We do this by addressing a number of issues critical for successful development, implementation and use of ERP systems. Examples of such issues are: End-users, cultural perspectives in relation to knowledge- and power hierarchies, collaborative work (embedded in the ERP systems).

2. OBJECTIVES
The research objectives are to develop HCI methods and tools to handle cultural diversity and ERP constituted networked communities. A second aim is to develop HCI guidelines for

design of complex business systems based on a use and user perspective and from a cultural point of view.

Seen from a business perspective the aim is to operationalize the HCI methods and techniques which addresses cultural diversity and ERP constituted networked communities into guidelines and tools for use of HCI methods and tools when designing and building component based global ERP systems which has to be localized.

3. INTERACTION

Our approach is to view the ERP system as an artifact mediating(3) human interactions and transactions in the service of human objectives. The claim is that if the design of global artifacts is to be successful, the development process need to bring together the humans, the system and the cultural context, and this requires a human centered approach to the localization issue and the design process.

We understand interaction and transaction as 'acts of meaning'.(4) and the point of departure is not the single human, but humans involved in complexes of communities of practices (5) and organizations in specific cultures.

4. METHODS

The HCI approach is inspired by ethnography and user centered tradition but founded in a Dialogue Design approach which has mutual learning as basic principle(6). We see our project as an essential complementary contribution to the traditional understanding of localized ERP applications. That implies understanding of the real use and the real end-users in cultural context so that ERP systems can be designed which are usable in a local context. However, also the HCI methods needs to be developed to handle cultural diversity, they have all grown out of the IT industry in the western world

Point of departure is existing HCI methods, and the first step will be explorative field studies followed by complementary approaches including more structured data collection: observations, qualitative interview, dialogue interview with the researcher as primary person. Also digital cultural probes will be developed. The process will be iterative both in methods and in prototyping. The test and evaluation will apply some of the latest techniques: visual interaction test, mind tape etc. all with the aim of understanding the uses and users and their community of practice in a cultural context..

5. PHASE MODEL

We have developed the model below to give an overview of how we see the project. It is divided into five themes some of which are overlapping, and the process is iterative:

Theme 1-project area A: Cultural contextual capture (localization)

Mapping culture differences

Study SMEs in different cultures

Mapping user profiles and multi-users constellation

Theme 2-project area B : Future 3gERP visions and conceptualizations: objectives, tasks and practices

SMEs

Multi-users/single users (managers)

Global trends (social software)

Theme 3– project area C: A human centered perspective on the future IT-architecture of 3gERP – test and evaluation for cultural diversity

Categorizations, representations and information structure

Seemless integrations of modules

Interoperation across multiple organizations

Theme 4-project area D: Test and evaluation of future 3gERP user interface

Exploring expectations for

future interfaces

3-d, mobile, multi-modal

Development, test and validation

Scenario design

Video personas

Theme 5 - project area E: Implementation practices as learning and knowledge sharing

Exploring future implementation practice

Networking, multi-modal communication and collaboration/social software

Development , Test and validation of e-support/learning methods and tools

Guidelines

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