Practical Experience of a Seamless Integration of eLearning into Traditional Teaching

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Abstract:

eLearning rarely can be established from the scratch within corporate environments. Most often traditional training concepts are well established and need to be taken into account when developing a concept on eLearning. The purpose of this paper is to describe our experience of such an integration process along a real world example with an European training provider teaching IT content.
We identify 5 phases within the project, were the following 2 are the most significant ones. The first one is to perform a systematic analysis within the company. Afterwards a concept for a modification of the course curriculum is developed in the second stage.
In the paper we outline the step-by-step procedure for the whole integration process and close with a concept for planning and escorting a piloting stage.

1 Introduction

Plenty of information can be found of how to build eLearning right from the beginning, but hardly anyone addresses the process of seamlessly integrating eLearning into existing traditional training structures.

We want to provide an insight into this rarely adressed topic and introduce a complete process which is found to be useful along the integration process of eLearning. The most important aspects of this process are the domain analysis and concept development. These two topics are described in more detail and are visualised through examples from an industry project which is divided into following five phases:

- **Requirements Definition:** In the first stage the requirements for the implementation of eLearning, with objectives, stages and schedules are defined.
- **Domain Analysis:** Within the second phase, the domain analysis, the critical factors for success have to be discovered by means of recording the current corporate culture and organisational structure. With the obtained information it is possible to identify connecting factors for eLearning supplements.
- **Concept Development:** The complete reinvention of the existing course curriculum is hardly ever reasonable. Therefore the concept development, beeing the third phase in the process, must contain the determination of which domains have to be taught further on with traditional methods and which ones may be altered to eLearning methods.
- **Implementation:** During the implementation stage an eLearning Management System (LMS) has to be selected and customised. If standard content for the courses can be used, it has to be uploaded into the eLearning system, otherwise new content has to be developed in this stage.
- **Piloting / Evaluation:** In the last stage the piloting takes place. There a group of learners an a trainer attends the new course, the results are recorded and evaluated afterwards.

2 Project Overview

The whole project was carried out in joint cooperation with an European training provider and was planned for a duration of appoximately 18 months.

The course offerings cover IT-content like computer and internet basics, knowledge on MS office software applications or database design & programming. More than 7000 people are trained annually.

The target group is private in a wide range of age and profession. Course participants are taught in groups of up to nine people. Presence lessons take place every 14 days. During the meantime, participants have to do paper & pencil work.

The purpose of the project was to integrate eLearning into the traditional teaching methodology. There was a strong expectation that eLearning could improve the economic success and lead to further benefits beyond the every day training work. One objective of the project was to verify this expectation and prove the investment of establishing eLearning true.

3 Highlights of the Integration Process

The five development phases are introduced and defined in [1]. The purpose of this section is to present practical experiences with this process based methodology for the integration of eLearning into traditional teaching. Some of the phases are not described

in detail. The focus was set on illustrating the domain analysis and the concept development phase, which are found to be the most important ones.
The purpose of this section is to summarise the objectives in the refferring project phases and to present selected results, interpretations and consequences of our practical example.
All examples share a similar structur:

Methodology: describes how the work has been carried out.
Result: summarises the main result of the work-package
Consequences: plots down the main aspects of possible consequences

3.1 Requirements Definition

The definition of requirements is the initial activity within an eLearning project.There the objectives of the project have to be defined and the practical value of the implementation has to be shown. The particular details of the various stages and a first schedule with milestones and resources have to be developed.
Basically the definition of the requirements is nothing new, it's rather similar to other software development projects. One of the most significant differences is that experts in traditional teaching often lack of expertise in defining eLearning requirements. So in this stage the art of collecting all needed information for defining the requirements is essential. The question of importance is to get a clear statement what the expected benefits and objectives are.
In this stage of the project there is the need to communicate all available options of eLearning and to illustrate the most important risks or possible consequences.

3.2 Domain Analysis

On the basis of the requirements document, the domain analysis must be performed. The aim is to develop an "outside view" to the domain addressed. This outside perspective helps to verify the requirements and assures an objective understanding on the problem domain. The purpose is to perform a detailed analysis of the basic teaching and learning situation, the identification of successful conditions which need to be taken into account, the isolation and description of the invariants and the verification of the requirements analysis.
The analysis should cover all technical and social aspects. The instruments for performing this analysis are to test for:

- the basic teaching and learning situation.
- the condition of the actual learning materials.
- the motivation and views of the employees.
- the demands of the target group.
- the actual technical equipment and the teaching and learning infrastructure.

Basic teaching and learning situation:

Methodology: The actual teaching and learning situation of the training institute has been examined by means of structured interview techniques and through course participation. Members of the project team have performed many interviews with trainers, course attendees and persons from administration and management. They also registered for courses and attended them to receive an insight into the teaching methodology.
Result: The teaching methodolgy of the institute was found to be task- oriented. The learners were asked to solve tasks within their individual working environment. Trainers are available in case of problems. Before heading on to new content there is always enough time to ask questions and to review and prepare the homework.
Consequences: The teaching methodology was found to be very successful. Learning new skills through well-known problems is very efficient - learners already know their problems - they are allowed to concentrate on new solution techniques. Thus this methodology had to be preserved as is when integrating eLearning.

Course Curriculum / Learning Materials:

Methodology: Team members analysed the course curriculum and looked through all of the offered course materials. Here, the training provider offered printed learning materials and a CD-ROM with multimedia material and sample training files. These materials have been tested against actuality, their didactical quality and for their visual appearance. The completeness of the courseware related to other standard courses was a further test criterium. The next step was to review the sequence of the different course offerings for their eLearning suitability.
Result: The result showed that parts of the learning material have been out-dated or ran the risk of being outdated soon. Basically the structure of the courses was found to be suitable for the use in a blended eLearning course, although the order of basic modules need to be re-arranged in case of eLearning.
The test against completeness showed that the accredidation as Microsoft Office User Specialist Course is not easily possible due to a lack in contents.

Consequences: The course structure could be kept - the granularity had to be increased. A more detailed modularity enables a more efficient eLearning course arrangement. The order of modules had to be re-arranged due to the availability of internet-knowledge within the learners at certain phases of the courses.

Due to the problem with the actuality, a version upgrade within some content had to be performed.

As preparation of future MOUS accreditation - the most significant topics yet missing were included into eLearning sessions, others were left for later improvements.

Motivation of Employees:

Methodology: The motivation of the employees is one of the most important factors for a successful eLearning establishment within a company. A relevant selection of trainers and administration and management employees were invited to be a member of the project team. Their input was vital for the progress in the project.

Result: Unlike many other eLearning projects - trainers, administrative staff and the management had a very positive view on eLearning.

Consequences: Although there was a wide support of the eLearning project within the employees - the task was to inform them about possible changes in the workflows, about changes in the teaching methodology and of course to answer the many questions of people. For this reason - several information workshops have taken place.

Target Group

Methodology: One of the mistakes often made during an implementation of eLearning is to forget about the requirements of the learners. [3]

On the one hand the willingness of the learners to use a computer for learning is important and on the other hand the prerequisits have to be created to ensure learners access to computers.

In order to get to know the target audience and to ensure that eLearning is a possible teaching methodology for them - existing application forms of participants have been analysed. By means of this information, a survey of previous knowledge and an overview on interests, articulated by course participants has been recorded.

Result: Course attendees are of different age ranging from very young people (18) up to rather old persons (65). There was no specific frequency in profession. The dissemination over previous knowledge was equal.

Consequences: The results of this evaluation led to an adaption of the structure of the course curriculum. Until now - no differentiation of participants due to their previous knowledge had been possible. With eLearning - a more personalised learning path is possible. Learners will be enabled to choose among various entry and exit points in the curriculum based on their pre-knowledge and interests. Trainers are given tools to support this decision process.

Technical Equipment

Methodology: To analyse the available technical equipment is essential, because outdated equipment could be a limiting factor for the delivery of eLearning. Members of the team attended various courses and analysed the overall learning conditions and the technical equipment including hardware, software and internet connectivity.

Due to the fact that the LMS usually requires additional server capacities and programs like database software, the currently used server side technology was analysed too.

Result: If needed computers were provided by the institute for the duration of the course. The availability of an internet connection was in most cases a problem because today people in rural areas in Austria usually cannot establish very fast connections.

Consequences: The eLearning course material had to be developed in a way that no exceedingly rich made contents were used. A balance between speed and visual appearance had to be developed.

3.3 Concept Development

In the concept all data from the previous steps is bundled and tailored to an individual solution for integrating eLearning into the existing teaching and learning infrastructure. In this stage eLearning specialists, curriculum designers, IT-experts and teachers have to work together to develop this concept. First the particular courses have to be analysed against their eLearning suitability and then the appropriate combination of eLearning and traditional learning has to be developed. Afterwards the course curriculum is defined.

eLearning Suitability / Teaching Model

The suitability of a particular courses can reach from suitable for pure eLearning to suitable only for face to face learning. In between there is a spectrum of traditional teaching with the help of technology based supplements and coached eLearning.
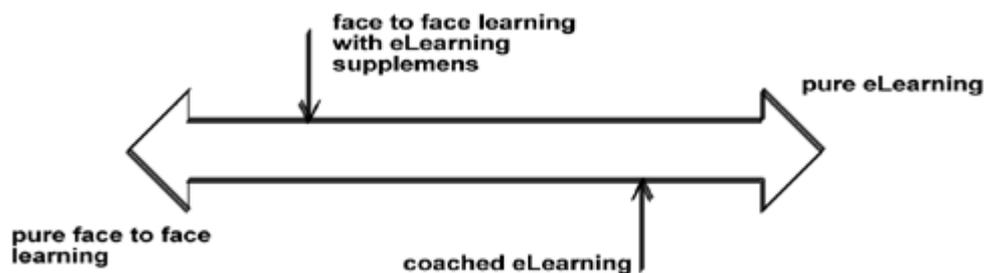
Figure 3-1: Range of eLearning suitability

Methodology: In our project we tested course subjects like computer basics, internet basics, network basics and courses for Microsoft Office products for their eLearning suitability.
We evaluated each particular courses by means of identifying demands for supplements and consultations with trainers. After this evaluation we matched the teaching model to each particular course.
Result: Most of the courses were found to be suitable for coached eLearning, except for the basics about computers and internet. There the limiting factor was the previous knowledge of the learners. When the learners begin these courses they do not know enough about computers and the internet to attend these courses over the internet.
Consequences: In the case of the course on computer basics and the first part of the Internet basics we decided to teach through face to face learning with some help by CD-ROM based training material. The rest of the curriculum was planned to use a combiation of face to face learning and coached eLearning.

Course Curriculum

Methodology: The course curriculum defines the structure of the new courses. At first the sequence of the individual courses has to be planned. The second step is to plan the structure of the particular courses.
Result: We decided to place the course about computer basics into the first position of the course curriulum, followed by the course about internet basics. The sequence of all other courses has been left open and is defined due to the learners individual requests and the trainers advice.
The particular courses were divided into two main parts. The first part with several face to face lectures with trainers coaching the participants in an interval of 14 days. The second part is to learn at home with eLearning. During this part there are provided exercises, tests and examinations supported by electronic communication with the trainers. In the exercises, content from the face to face lectures is repeated and new topics are introduced. The tests are built to give the learners an overview of how much they already know and the examinations are there to prove their knowledge to the trainers.
Consequences: There had to be developed a concept and storyboard for the excercises, tests and examinations. In the storyboard the content and appearance of the various exercises, tests and examinations was settled.

3.4 Implementation

In this phase of the project the results of the concept development are implemented. On the basis of the defined objectives and requirements an eLearning management system has to be selected. Afterwards the course framework and courseware is being developed.

eLearning Management System (LMS)

Selecting a LMS is a big challenge. There are many systems available - nearly all of which differ in functionality and services. High-quality systems are cost-intensive. The market is very confusing and it is almost impossible to compare LMS in a transparent way. There are many references on "How to" select and establish an LMS from the technical point of view, one of which is [4].

Course Framework

Methodology: The course framework consists of all the routine parts of the course that do not concern the subject matter itself but that are nevertheless an essential part of it. Advertisement and information sites, course introduction, registration, user adminstration and curiculum management are just a small selection of the activities being covered in this work-package. [2]
After the finished concept development it should be clear which supporting web pages should be created and how they should look like.
Result: Within this very project - no online administration was necessary. All other information and advertisment had to be developed, reviewd and inaugurated.
Consequences: From the many activities necessary - only two are summarised herein. For the FAQ-page questions and referring answers had to be collected from more than 200 trainers and have been developed into an electronic form. Topics for the glossary had to be gathered from the courseware.

Courseware

Methodology: There is a huge variety of standard courseware for face to face teaching or for pure eLearning available. Unfortunately non of this is sufficient for use within the concept of blended learning. For this reason - nearly all material necessary during the eLearning sessions had to be developed from the scratch based upon the existing teaching material of the training company. The main work was to verify if existing material is still usable and if - how it can be used as the basis for the eLearning material.

Result: A decision was made to develop most of the multimedia teaching content on our own. The main reason was that the training provider already had appropriate course materials in use, which could be adapted and supplemented with little effort.

Consequences: A storyboard for adapting the old course materials and supplementing it with excercises, tests and examinations for the eLearning part was developed and discussed among the customer. Afterwards, printed courseware for the face to face part and HTML based content for the eLearning part with exercises, tests and examinations has been created and tested.

3.5 Piloting/ Evaluation

Piloting is a key issue of success for an eLearning project in general - and for an integrated traditional/eLearning project in particular. It is strongly recommended to form a piloting team and invite at least one representative person of every concerrned interest group, division or department. The piloting phase also includes review and re-design phases and back-loops to the respective former design and analysis phases.

The piloting phase in our industry project is scheduled for autumn 2002. Although we are not able to present any experiences within this project now, we will present the most important details of the planning pase.

Methodology: Piloting is supposed to be performed among a small test group under real-world conditions. Therefore we plan to nominate a sample of some 50 candidates in 5 training groups. For this group, real-world conditions will be established. This includes the choice of learning places as well as the equipment with the respective technical infrastructure. The whole piloting is escorted by specialists who monitor all actions with focus to document the success.

Result: All results of the monitoring process are to be summarised into a written report. The purpose is to analyse whether the integration of eLearning was a success and to plot down all positive and negative aspects along the application. Referring to the requirements it is important to verify that all objectives have been reached. It will also be of importance to notice where there is room for improvement and make suggestions for continuing work.

Consequences: The results have to be presented to the management. All inidcations for improvement have to be taken into account before the eLearning integration is to be applied to the whole teaching environment.

4 Summary

We developed a process for smoothly integrating eLearning into traditional teaching methods by means of identifying and respecting existing successful environment factors. We are gathering experience and building up competence in this field. With this paper, we showed some application highlights of our developed "Assured eLearning Integration Process" along a real-world example. The first results are promising although the piloting phase is still pending.

Our objective is to testify our theories by means of several other projects with our process based methodology and further enhance the integration process.

With partly diverging requirements from other customers we are adapting, modifying and improvement the process and develop a more generalised prozess and implementation description based on our findings.

Acknowledgements

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