

The Role of Business Analysis Techniques in e-Learning Process Development

Stojan Košti, Bojan Cestnik

Abstract: *Business Analysis (BA) is a modern discipline that is involved in most projects where efficiency is to be improved. The tendency of BA is to improve value for a customer, which in turn brings more revenue to an organization [1]. Historically, BA share common roots with system analysis. For example, business analysts are typically hired to investigate, analyze, design, and evaluate organization's business needs. However, business requirements are elicited and analyzed at a much more detailed level than traditionally done during systems analysis. BA also puts more emphasis on understanding user groups and business environments and designing highly usable applications. The discipline of BA is useful for solving business problems and taking advantage of opportunities by helping business people design procedures, structures, and technology to support and enhance their work. Similar requirements and needs are well known within effective and innovative approaches to e-learning. Therefore, the principles of BA can become a valuable asset in developing effective, user-friendly models and processes of e-learning.*

Key words: *Business Analysis, Model, Usability, Process.*

INTRODUCTION

The International Institute of Business Analysis (IIBA™) defines BA as "a set of tasks and techniques used to work as a liaison among stakeholders in order to understand the structure, policies, and operations of an organization, and recommend solutions that enable the organization to achieve its goals" [1]. From this point of view, BA involves identification of business problems and opportunities; elicitation of needs and constraints from stakeholders, analysis of stakeholder needs to define requirements for a solution, assessment and validation of potential and actual solutions and finally management of the product or requirements scope.

The focus of BA is on helping to elicit, analyze, document, and validate requirements and implement solutions to business problems. The same skills that are useful within software development projects often translate well to other types of business solutions. Frequently, an effective solution to a business problem involves a software component along with procedure changes. We can rarely find a business unit that is not using software technology to perform its work. BA helps design solutions, not just software [2].

A comparison of goals that an organization wants to achieve through the establishment of various models of e-learning (which are typically closely related to the Internet and IT) are typical organization objectives. High quality education and good user experience carry a high value for both, the user and the organization. Typical and common goals are lower costs and more efficient time components (faster, as soon as possible).

Similarly to any project, establishing e-learning model consists of a sequence of steps in the project life cycle. The time and thinking invested during initiation lay the groundwork for all the project work that follows. However, numerous other activities are also vital to getting the project off to a good start. At the beginning of a project stakeholders often confuse and understand differently project objectives [3]. Take, for example, the objective "quality". Everyone takes quality seriously and wants to serve high-quality e-learning services. The main purpose of this article is to provide an overview of how useful methods and techniques of BA are in assisting the construction of e-learning processes and usability evaluation. First, we describe key factors affecting successful realization of e-learning projects throughout their life cycle.

We are primarily concerned with the factors that fall within business analyst's domain of interests. Then, we describe the potential methodologies and techniques related to role of BA. We evaluate the findings from the viewpoint of their potential use for BA activities. Finally, we conclude by pointing out the most important findings in the paper.

KEY RESEARCH ISSUES

In this article we focus mainly on areas where the practical role of BA in the project is often neglected, which in practice lead to a large number of failed e-learning projects. For example, the results of a research study in Slovenia [4] show that such e-learning materials in primary school are used on average by only 15% of teachers. In addition, out of ten prepared e-learning materials only five of them are really used in practice. All these facts were revealed just after the completion of implementation e-learning materials project, in which Slovenia has invested 22 million Euros. Three main reasons for the poor results of the project are listed below as potential research issues.

(1) Standardized learning solutions and personalization: Especially for reusability and technical integration aspects the interoperability of learning content is essential. Standardized descriptions and the possibility to search learning object repositories therefore need to be extended and closely interrelated with methods for personalized learning support [5]. Lack of communication and close cooperation between all stakeholders brings solutions to end badly.

(2) User interface: The delivery of e-learning content on different target devices and into different learning contexts is a highly challenging task. Corporate e-learning scenarios give a rich and realistic chance to learn about the real added value of mobile services and situated learning tools. Based on pedagogical models of situated learning and cognition a wide application field can be defined to adapt the selection of learning tools and the customization of learning content to individuals.

(3) Evaluation of personalization and adaptation methods: Evaluation and return on investment analysis are an important factor for the introduction of e-learning solutions at the workplace. This includes the identification of enterprises requirements and of the main success factors for e-learning in corporate environments. Other questions are to determine the real impact of technology-enhanced learning on individual and organizational levels, how to measure this impact, and how organizational issues and community culture influence the success of e-learning in different environments.

Therefore, e-learning initiatives require a serious analysis of alignment before they are pursued and integrated into the organization. In the following contribution we will present more in detail how to choose of appropriate BA approaches to motivate teachers to greater use of e-learning materials and also engage them into the process of continuing improvement of the design of e-learning processes and models.

POTENTIAL METHODOLOGIES AND TECHNIQUES

There are a number of methods related to the BA that might be especially adaptable to the study of the implementation and outcomes of e-learning. Because e-learning is a relatively young and emerging instructional medium, it would be premature to look only at its outcomes. Much valuable formative information can be obtained from the examination of how programs are being implemented and the processes by which they are delivered.

First, we have to collect detailed knowledge of the requirements of all stakeholders. The method, called Requirements Management and Communication, describes the activities and considerations for managing and expressing requirements to a broad and diverse audience [1]. These tasks are performed to ensure that stakeholders have a shared understanding of the nature of a solution and to ensure that those stakeholders with approval authority are in agreement as to the requirements that the solution shall meet. Management of requirements assists with understanding the affects of change and linking business (e-learning) goals and objectives to the actual solution that is constructed and delivered.

Another potential technique is implementation analysis [6]. A goal of this method is to bridge the gap between process and outcome analyses by examining key elements of a program in an attempt to understand what variables affect implementation. Information gained from implementation analysis can be used to improve the functioning of the program during and after implementation.

Following with formative experiment method, we get answers on questions how the technology is being implemented, given the specified goals of its use. Instead of the technology as the unit of analysis, the focus is on the environment, including the instruction, roles of the lecturers and participants of the course, the institution as an organization, and the technological infrastructure [7]. Once an understanding of the phenomenon has been gained through the formative experiment, systematic research then can be planned and carried out to examine specific factors that contribute to successful or unsuccessful educational practices.

After each course held, another evaluation approach, an econometric modelling can yield informative data about the effectiveness of a program. Data can be collected to describe the characteristics and outcomes of a program using economic measures. It is important, however, to recognize the limitations to econometric modelling, as well as the limitations to any particular evaluation method. There are different ways of looking at evaluation and analysis, many of which are sufficiently compatible to form a multi-method approach to research. Using proper Learning Technology Systems Architecture (LTSA) for instance, can prescribe processes, storage areas, and information flows for e-learning [8].

APPLYING BUSINESS ANALYTICS TO E-LEARNING PROCESS

Before we perform an in-depth analysis of how to assess the readiness of the organization and individuals within the organization, one of the first parts is to determine the objective or purpose of the e-learning venture [9]. Without this basis of reference, it would be impractical to determine readiness since one must have the purpose stated first to make any meaningful assessment. Secondly, it is important to understand that as with any change initiative the emphasis should be on evolution not revolution. Adopting this incremental approach will significantly improve the chances of the e-learning success and simultaneously reduce stress about the new initiative.

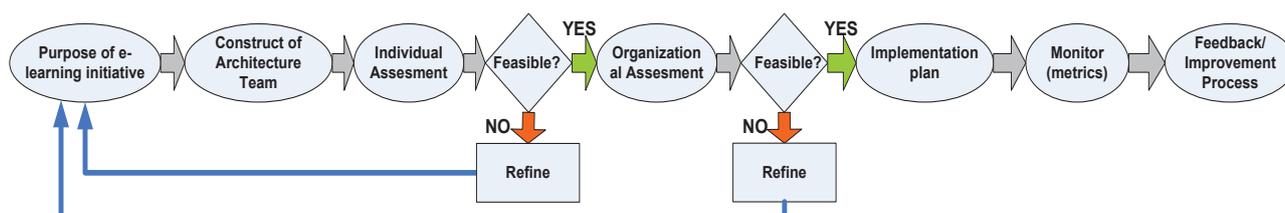


Fig.1. E-learning Importance Continuum (Hebenstreit, 2009)

E-learning implementation continuum can be provided as shown in Fig.1. If we want to achieve this goal, teachers should be well motivated for the use of e-learning materials. They must be immediately engaged in a process of developing e-learning model. We must not ignore detailed requirement analysis to obtain key information from teachers of how e-learning model should look like and which e-learning materials are relevant.

Readiness for e-learning

This individual assessment serves as a means for teachers to provide input directly into the learning initiative that the organization is contemplating. The results of this assessment will serve two very important functions. First, it will be provide a self-reflection

opportunity on teacher's level of preparedness towards the learning initiative being pursued. Secondly, through an anonymous means it will provide valuable feedback back to the architecture project team who will incorporate their input into the development and deployment process. The need for honest and fair responses is critical given how important their input is to the overall success of our organization's e-learning initiative.

In order to do the individual assessment, a few specific areas should be explored:

- Individual alliances: Speaks how well the teachers feel they are a team with the other department(s) and even within their own department. Very valuable information in making sure that organizational and individual issues can be addressed that are hampering teamwork prior to the initiative.
- Individual alignment: Teachers (and other individuals) must first understand what the initiative is and how they can contribute to the success before they can feel aligned with an initiative. To achieve alignment, the reward and recognition system must reward the organizational goals. If there is a general feeling that there is a continuous shift of focus on goals, lack of knowledge of how success is measured [10], and awards do not exist for teams and they are not focused on organizational success, then the architecture team needs to know this.
- Communication assessment: It is critical for successful of e-learning project. How positive does this individual feel management is embracing e-learning? Has the individual heard personally from management, why e-learning has chosen to be implemented at their organization and what is in it for the individual? Does the individual know the members of the architecture team and those who will be working specifically with them? The key will be for senior leadership to be facilitative and not directive in nature to achieve the greatest benefits from e-learning.

Standardization

There must be an increasing emphasis on ensuring access to high-quality education and training materials that can be tailored to individual learner needs and made available whenever and wherever they are required. To create one unified e-learning content model, specifications enable the reuse of Web-based learning content across multiple environments, products and technological platforms. It is important to keep in mind that whatever technology or IT product is selected, it must be used in the right manner to ensure that e-learning is effective. The mere use of IT in a learning environment does not spell success. IT plays a major role in learners' learning experience and this experience can be both positive and negative. For example, collaboration tools that allow more reticent participants to ask an anonymous question may be seen as a great boon to that participant [9, 10]. On the other hand, a video or animation that is either irrelevant or a drain on system resources can be a distraction or nuisance (or both).

Taking into account the principle that we cannot manage the process which could not be measured, well-designed metrics process will provide invaluable insight into how the e-learning project is performing for the organization's people, business processes, and programs. Metrics and other key performance indicators provide several important benefits, including making a business case, refining the implementation process with feedback data, establishing clear objectives and developing lessons learned and benchmarks. As discussed in the opening chapter, e-learning is closely related to other enterprise Business Analytics improvement methods such as knowledge management and information literacy. To identify the business purpose of the project and have an understanding how the project will enhance our objectives, we should follow the decision model steps shown in Fig.4. As we identify the measures that we will use, we will also need to identify a process for collecting these measures. The important element is to

structure information gathering and to probe deep enough to understand how decisions are made and the information that measures can provide to help decisions.

System Measures

For system measures, we may end up relying on manual counts, estimates, or surveys. Surveys can have a dual purpose: they not only collect useful information but they also help educate the survey taker by raising their awareness of key issues or critical success factors for the initiative.

Another useful technique provided by BABOK [1] is interviews and workshops. Merely asking people what information they would like is unlikely to yield useful results. The useful decision-making information could be achieved by asking "what if" questions.

Tracing the flow of the program capabilities (structured program flows), the uses of these capabilities by direct users, and the benefits to the end user is another way to identify the information desired from performance measures. This flow tracking technique is particularly useful for programs for which it is difficult to directly identify or calculate measures for the ultimate end user benefits.

Collected and analyzed will ensure that the measures are correlated to the objectives of the initiative and aligned with our strategic goals. In particular, explicitly note whether the measures give a direct or indirect indication of effects so that project team and stakeholders do not misconstrue or have unrealistic expectations of performance. Also, use the metrics to discover the effectiveness and participation of stakeholders in the project. Collect and prioritize these new ideas and go back to our original plans and assumptions to see if they need to be changed. It is normal that several measures will need to be modified. This is a good time to assemble our team and build a consensus on what should be changed, how to change it, and when to introduce the changes [2].

Performance Measures

Outcome: Measure the change in resource costs (funds, time, personnel) used in a business process over time. To tie this to the e-learning initiative, gauge this against when the e-learning curriculum was made available and its usage, and to other business processes that are not part of the e-learning initiative. Also include surveys of user attitudes and practices.

Output: Conduct a survey to find out how useful people find e-learning. How have people used the available courses? Was it valuable? Is it better than taking classroom courses? Were they able to learn topics that would not otherwise do? How do they suggest improving the system? Measure the usage of distance learning system.

System: How many times have the e-learning materials been accessed? How many members are in the community, and how often do they interact? Conduct a survey and test the site yourself. Is the site easy to navigate with an organizational structure consistent with the way they do work and think about the information?

As we design our metric process, remember that performance measures should be focused on factors that affect the ability to achieve our strategic objectives. We must "pick the right measure" just like "picking the right tool".

CONCLUSIONS AND FUTURE WORK

George Box [11] once said "all models are wrong; some models are useful". The intention of this paper is to illustrate how to introduce modern approaches of Business Analytics to e-learning processes. The motivation is to raise the level of usability and performance of e-learning. We believe that the presented approach has a number of advantages over traditional approaches, as demonstrated in previous sections.

Additionally, e-learning effectiveness requires decentralizing responsibility (to include self-responsibility) and in traditional hierarchical organizations, if not properly aligned, roles can be confusing and not working in concert with one another to achieve the strategic objective. The result is multiple interpretations of expectations and chaos results since management has empowered a project teams and architects to institute e-learning but e-learning projects require concurrent alignment, especially in the first phases. The question we have set to ourselves is quite simple: how does one make sure their e-learning initiative is properly aligned to prevent the aforementioned issues from occurring? If embracement of technology to further organizational objectives is considered an essential element to the success of any organization and within that staff development resonates, then e-learning should be a strategic strategy for those organizations.

The essence of alignment starts with the strategic planning process following with activities to ensure e-learning success and aligning processes within the organization to support the strategic objective if not a stand-alone objective. We believe that in order to increase motivation of teachers and, consequently, to achieve a higher percentage of usage of e-learning materials, a thorough analysis of requirements and involvement of teachers in all phases of e-learning project development cycle is required.

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ABOUT THE AUTHORS

Stojan Košti, MSc, Temida d.o.o., Ljubljana, Slovenia, Phone: +386 1236 3350, E-mail: stojan.kosti@temida.si

Assoc. Prof. Bojan Cestnik, PhD, Temida d.o.o., Ljubljana, Slovenia, Phone: +386 1236 3350, E-mail: bojan.cestnik@temida.si