Abstract

At worldwide scale the companies are looking to increase their employees skills in order to provide trust in their products and/or services. However, the pressure coming from competitive markets together with the pressure coming from the companies budgets reduction have directed them to look for solutions in order to maintain and develop their employees training programs. Such solution, today more and more integrated by all type and size of companies, is the implementation of an Web-Based Training System. Cost and time savings, flexibility for all parties involved are just some examples of benefits which can be obtained from using a Web-Based Training System. This paper is looking to put at-a-glance the quality component of the Web-Based Training Systems from the view point of the evaluation and measurement methods and means.

Keywords: Evaluation and Measurement, Quality Management Systems, Training Process, Web-Based Training, Web-Based Training System

1 Introduction

Web-Based Training (WBT) is considered by specialists (Lau, 1999) as a new form of distance learning, a form which became more and more popular especially within business environment. “It is perceived as a cheaper, faster and more efficient way to train a large number of employees anywhere in the world”, Lau is saying in one of his articles (Lau, 1999). Indeed, the past twelve years had shown a significant increase of the World Wide Web (Web) use to train employees in order to improve individual performances and to obtain at the end a positive impact on the companies business.

Is difficult to say how much is the slice taken by WBT from the distance learning pie. However, according to Wikipedia, the estimations (EC, 2000) show that the e-learning industry at worldwide level worth around $48 billion (http://en.wikipedia.org/wiki/E-learning). So, the slice taken by WBT should be assumed as consistent taken into consideration that all business sectors corporations or multinational companies having divisions all around the world have developed their own WBT System (WBTSSs) or have employed specialised third parties to design and implement such systems.

The severe competition existing in many areas have dictated to the companies the way to take. Is true that usually a company is not using only a WBTSS but also such system is used in cohabitation with traditional classroom system and/or Computer-Based Training System. In other words, is a better chance to see the companies using a blended training system than a WBTSS. Even the progress achieved by Information & Communication Technologies (ICT) is great, even we
have Internet, mobile phones, smartphones, tablets, computers, notebooks etc. is still necessary to have a face-to-face interaction so the traditional classroom training will not disappear right away.

The organizations involved in the educational process, and especially those from higher education sector, are important contributors to the development of various WBTS also because they are using WBTS as part of their distance learning programs. In the next pages of this article the author will address the WBT and WBTS quality aspects referring also to evaluation and measurement of the quality component, all these being seen in a larger context provided by distance learning. Also, for the purpose of this article the author will use as a general term the word “trainee” in order to cover all categories of people (i.e., employees, students etc.) involved in the learning process and the word “trainer” in order to cover all educators, teachers, trainers, professionals etc. involved in the training delivery process.

2 Web-Based Training Systems (WBTSs)

2.1 Web-Based Training (WBT)

The Web-Based Training is based on the delivery through Internet, using a Web browser and having in hand a standard personal computer or a portable device (i.e., notebook, laptop etc.). This type of training has been spread around mainly during the past two decades as many large companies having a significant number of trainees were looking to replace a part of their traditional face-to-face training classes with something more flexible, faster, cheaper, and time saving for all involved in training process without chopping off the targeted levels of expertise, skills and knowledge.

Why WBT is considered today at corporate global level by so many business sectors as a powerful tool which ultimately can change the business itself? Well, is sufficient to have a look to the graph presented in figure 1 (http://www.hp.com/large/ipg/assets/bus-solutions/power-of-visual-communication.pdf, 2004). According to Hewlett Packard specialists the “studies show that people remember 10% of that they hear, 20% of what they read and 80% of what they see and do” (http://www.hp.com/large/ipg/assets/bus-solutions/power-of-visual-communication.pdf, 2004). And the answer to the above question became in such context very easy one as WBT is based on what the trainees see & do.

At the very beginning the exploitation of this new training resource has been limited to smaller WBT activities mixed together with other types of interaction between trainers and trainees (i.e., online discussions, online interactive workshops etc.). Taking into consideration the advantages offered by WBT (i.e., easy delivery to trainees, coverage of a wide audience, low cost on long term after initial design-development-implementation phase is completed, effective interaction due to see & do available features, friendly training environment, time saved, flexible schedule etc.), than should not be anymore an issue to accommodate ourselves in this new business climate.

![Figure 1 – Oral and Visual Information: Percentage Retained](http://www.hp.com/large/ipg/assets/bus-solutions/power-of-visual-communication.pdf, 2004).
2.2 Brief Overview of WBTSs

The WBTSs are not so complicated systems from architectural viewpoint. However, there is a significant impact which is financial for any company looking to have such system implemented and this is related to the initial phase referring to design-development-implementation. Therefore, most of the companies and especially the ones of small and medium size are applying a different strategy which is the use of third party providers. A schematic architecture of a WBTS made available by a third party provider is presented in figure 2 below.

Figure 2 – A schematic architecture of a WBTS

Relatively simple like architecture the WBTS presented in figure 2 can be depicted in three major sub-systems which are: a) the human sub-system (providers, trainers, and trainees), b) the WBT resources (training courses available, training modules part of each training course, tools for all types of assessment, feedback tools etc.), and c) information & communication technological infrastructure (comprise from all tools, hardware and software, used to support WBT).

3 Training Quality

3.1 About Quality Management Systems (QMSs), Standards, and Training

More and more companies are looking to do better on the market sector where they activate. They want more trust from their clients’ side, want to gain more image capital and they want to be at the end a brand. Not an easy thing to do considering the competition, the depletion of natural resources and the social-financial-political unrest from many parts of the world.

Therefore, reference points were necessary to be set-up in order to compare, to certify or, making simpler the argument, to evaluate and measure, and to verify and validate. For these purposes and for some others have been published families of international standards which covers the training topic as well as well as local (national or organization’s standards). However, is to be mentioned a very important aspect and this is that the international standards are guidelines in comparison with national and organization’s standards. The last two categories of standard could be obligatory at local level (national level or organizational level).

One of the ways identified by the companies in achieving their targets above briefly explained was to implement a Quality Management System (QMS). ISO 9000 family is a family of standards used today by many companies and by more an more organizations involved in all levels of the educational process to: define, support and finally, to lead to the achievement of successful business/education.
The ISO 9000 family is talking about principles, methods and tools what any company can use to achieve the satisfaction of their customers. As stated in ISO 9000:2005, sub-section 0.2, there are eight principles which should be followed by the companies within their QMSs. From all these principles I would like to cite three of them which in my opinion are extremely important and also the minimum required to be achieved by a company if wants to survive in business (ISO 9000:2005, sub-section 0.2):

- **Customer focus**: Organizations depend on their customers and therefore should understand current and future customer needs, should meet customer requirements and strive to exceed customer expectations."

- **Involvement of people**: People of all levels are the essence of an organization and their full involvement enables their abilities to be used for the organization’s benefit.”

- **Continual improvement**: Continual improvement of the organization’s overall performance should be a permanent objective of the organization."

Well, why these three principles are important for this article context? Just because all three claim the existence of competent human resources and competent human resources means trained people, and trained people means that a training system has to be in place. Is a very important requirement in ISO 9001:2008, number 6.2.2, called “Competence, training and awareness” (ISO 9001:2008, 6.2.2), where training is seen as an action deemed to provide the required competence for product/service realization. All the above together with the definition for training (“training = process to provide and develop knowledge, skills, and behaviours in performance”) as stated in I.S. ISO 10015:2005, 3.1, section 3 “Terms and definitions”, prove that one of the engines in getting a continuous improvement of the business is the existence of a training system (I.S. ISO 10015:2005).

One of the direction explored and in use on large scale today for training the people is the WBT which is involving the ICT hardware and software. According to ISO/IEC 19796-3:2009 which is a dedicated ISO standard referring to ICT implementation for learning, education, and training, it is very important for a company to have in place a model for quality management/assurance activities which can be used to ensure a continuous improvement of all processes and sub-processes existent in QMS, including here the training process. Without re-inventing the wheel, I’m considering that for the purpose of the present article the model offered by ISO/IEC 19796-3:2009 is sufficient and can be used to understand in a simple way which are the activities which can contribute to continuous improvement.

![Figure 3 – Quality management/assurance activity model as presented in ISO/IEC 19796-3:2009](Source: ISO/IEC 19796-3:2009, section 6 “Quality management/assurance activity model”, figure 2).
Additionally, to the model from figure 3 another model worth to be mentioned and this address directly the impact what the training itself has to has in order to improve the quality. This cycle model is presented in figure 4 and is the cycle introduced by I.S. ISO 10015:2005.

3.2 A brief Overview of the Training Process

According to “Introduction” section of I.S. ISO 10015:2005 “Personnel at all levels should be trained to meet organization’s commitment to supply products of a required quality in a rapidly changing market place where the customer requirements and expectations are increasing continuously” (I.S. ISO 10015:2005, section “Introduction”, paragraph 2). So, it is concluded that among all processes governed by a QMS must be also a training process.

Any type of training, including here WBT, has a life cycle which has been excellent captured by the I.S. ISO 10015:2005, section 4 (see figure 5). As can be observed in figure 4, I.S. ISO 10015:2005 is identifying four stages which should be continuously monitored by the management of a company (I.S. ISO 10015:2005, section 4) and these are: 1) defining trainings needs; 2) design and plan the training; 3) provide the training; 4) evaluate the training outcomes.

WBT supported by dedicated systems (WBTSs) could follow same models and cycles as the above presented regardless the business sector where the companies activate.

4 Quality Evaluation and Measurement for WBTSs

Quality evaluation and measurement is a very generous subject debated by many specialists around the world and presented in various studies, research papers etc. As a personal opinion, is difficult to separate the two sub-processes which are part of ISO 9001:2008, requirement 8 “Measurement, analysis and improvement”.

In figure 6, the author of this article is presenting a benchmarking framework for the evaluation and measurement of the quality component for WBTSs.
The proposed framework is based on the WBT process analysis and is looking to comply with the requirements established by ISO 9001:2008, I.S. ISO 100015:2005, and by ISO/IEC 19796-3:2009. Firstly, a process-based analysis of the WBT has to identify the main components which have to be considered before starting to “plan-do-check-act” (ISO 9001:2008, section 0.2, “Process Approach”). This layer of main quality components is interacting with a second layer comprising from elements (i.e., methods, techniques, tools etc.) which should be used for the purpose of evaluation and measurement. Part of the main components are considered as functional tasks, tasks which have to be performed by individual responsible or groups of responsible functions. Also, is an area of interactivity which requires direct involvement of the trainers and trainees in getting the WBTS evaluated and measured.

Maybe is debatable the fact that the framework starts with the Management review component as well as with the continual improvement. In this article, in author opinion, there is an aspect which should not be treated differently than is presented in ISO 9001:2008 and this is the fact that one of the very first requirements are those related to Management responsibility (ISO 9001:2008, requirement 5.0). Also the author considers that is normal to attach the continual improvement to the Management responsibility considering that this is also one of the functional tasks of the Management in a company.

5 Conclusions

Without considering the discussion over the proposed topic ended the author considers that each company, each organization should empower each employee they have to assume individual responsibility in reference to training. This should be a first step in getting an improved performance. Also, the author considers that the WBT is the future and sooner or later the
traditional classroom trainings will disappear leaving more room for implementing WBTS and blended training systems.

Prior looking into the future a company must establish what they want to achieve and how they want to reach the proposed targets. WBT offers solutions as well as challenges. However, WBTSs offer a significant constructive support from social, technological, and cultural viewpoints to any person who believes in her/his capabilities to achieve a certain level of competence and to change positively the future of the community they belong (http://en.wikipedia.org/wiki/Blended_learning).

6 References

6.1 Conference Proceedings:

6.2 Technical Reports:

6.3 Internet Sources:
http://en.wikipedia.org/wiki/Blended_learning

6.4 Standards: