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Procedia - Social and Behavioral Sciences 46 (2012) 1430 – 1434

Procedia
Social and Behavioral Sciences

WCES 2012

# Large scale multimedia production management: from strategic planning to six sigma

Joni A. Amorim [a] *, Jose Macario de-Siqueira [a b], Antonio Martínez-Sáez [b]

[a] *Universidade Estadual de Campinas – UNICAMP, Cidade Universitária "Zeferino Vaz", Campinas 13083-970 , Brazil*
[b] *Universitat Politècnica de València, Camino de Vera, s/n, Valencia 46022, Spain*

**Abstract**

Project portfolio management of large scale multimedia production emerges today as a challenge both for the enrichment of traditional classroom teaching and for distance education. Strategic planning of projects involves developing methodologies, reference models and processes while organising project management offices (PMOs) in the perspective of optimising the use of available resources in an organization. In this way, this paper presents a proposal of a project management model for digital content production for educational purposes named EduPMO, an abbreviation of "Educational Project Management Office". The paper includes a discussion on how to pair Six Sigma with project management best practices as a way to improve processes.



*Keywords:* model; multimedia production; organization of eL&mL; quality management

## 1. Introduction

The constraints of e-learning have been reduced and digital convergence is finally being achieved. Different devices have become digital and are now delivered over the World Wide Web via the public Internet or through private corporate intranets. In this new context, Management of Change (MoC) comes into play: teachers demand both digital content and training in order to be able to incorporate multimedia in their daily practice in a satisfactory way. This paper presents an initiative taken by the Universidade Estadual de Campinas (UNICAMP), Brazil, that involves large-scale multimedia production for teaching (MEC, 2007). The text discusses the use of multimedia resources, but focuses on its production while presenting a Brazilian perspective on many challenges and opportunities which are experienced in real world technology projects. A previous study (Amorim, 2010) presented a large-scale educational multimedia production project (MEC, 2007) in a scenario where it was recognised the significant interplay between the fields of project management (PM) and knowledge management (KM). This scenario suggested a potential synergy between project teams and social networks derived from the KM area, known as communities of practice (CoPs). Based on this scenario, a framework is presented and discussed. The paper includes a discussion on how to pair Six Sigma with PM best practices as a way to improve processes.

* Joni A. Amorim. Tel.: +0055-19-3521-4956
*E-mail address*: Joni.Amorim@reitoria.unicamp.br

 doi:10.1016/j.sbspro.2012.05.315

## 2. A framework for projects management

This work suggests a framework for the management of projects on educational multimedia production and use, this being something which may benefit from the use of Internet based CoPs. The framework will be named EduPMO (Amorim, 2010), an abbreviation of "Educational Project Management Office". It includes three components: the model, the methodology, and the implementation. The components should be understood as related but independent entities. Therefore, in order to create a classification system, the main aspects to be considered in the model were divided into nine dimensions, as follows.

In such a model, the dimensions are divided into two distinct categories: implicit and explicit. The explicit dimensions are directly presented, partly or in total, to the different participants in the projects. The implicit dimensions, on the other hand, still affect the work carried out by teams, but they are not directly expressed since these dimensions represent a set of strategies used by managers and by the educational project management office. Despite the obvious interrelationship between the nine dimensions, a new classification was proposed through which two different groups were created in order to facilitate the understanding and the use of the processes involved. The first one included four explicit dimensions, whilst the second one comprised five implicit dimensions

The first dimension, or D1, is the content dimension, and refers to the appropriate understanding of the project fundamental requirements involved, especially in terms of the content to be considered on multimedia production and/or usage (IIBA, 2009). The second dimension, or D2, is the pedagogical dimension, and refers to the teaching and learning aspects involved.

The third dimension, or D3, is the technological dimension, and mainly concerns those processes related to the technical requirements of products to be produced and/or used (Fernandes & Teixeira, 2004; Porto & Souza & Ravelli & Batocchio, 2002; Trindade & Ochi, 2006). The fourth dimension, or D4, is the management dimension, and is linked to the knowledge areas known as project integration management, project scope management, project time management, project cost management, project quality management, project human resource management, project communications management, project risk management and project procurement management (PMI[a], 2008; Kerzner, 2006). The implicit dimensions go from D5 to D9, as follows.

The fifth dimension, or D5, is the strategic dimension, and refers to the fact of meeting the specific strategic objectives through the centralised management of several portfolios and programmes, which may include identification, prioritization, authorization, as well as management and control of the projects (PMI[b], 2008). The sixth dimension, or D6, is the knowledge dimension, and concerns the essential aspects that allow the effective management of knowledge, i.e. compilation, selection, configuration, dissemination and application (Nonaka, 1998; Hansen & Nohria & Tierney, 1999). The seventh dimension, or D7, is the change dimension, and it is usually related to the management of transitions concerning the project itself or the way in which teams work.

The eighth dimension, or D8, is the maturity dimension, and refers to the process improvement (Harrington & Conner & Horney, 1999; Harmon, 2007). The ninth dimension, or D9, is the dimension concerning rights involving aspects such as the innovation management and intellectual property (Moskowitz, 2006).

For each dimension, processes may be presented through a description and/or a diagram depicting the activities and/or tasks to be performed, with indications of inputs and outputs of the processes together with tools and techniques which are useful to the implementation of the process. Template documents focused on multimedia production and/or usage may be presented for the processes, in a way that six sections would be provided to managers and/or to the management team for each process: (1) description; (2) diagram; (3) inputs; (4) outputs; (5) tools and techniques; and (6) template documents. In general, the processes would be generic but the template documents would be specific to the type of project under consideration. In the proposed framework, there are 199 processes classified into nine dimensions (Amorim, 2010): 32 processes for D1, 6 processes for D2, 8 processes for D3, 42 processes for D4, 64 processes for D5, 5 processes for D6, 5 processes for D7, 31 processes for D8 e 6 processes for D9.

The methodology proposed by the framework refers to the implementation of the model and comprises three phases per D-I-A cycle: (1) "D", or Design; (2) "I", or Implementation; and (3) "A", or Assessment. The methodology may be applied to one or more projects conducted by an organization. The design phase should

consider the context of the project in order to determine what is possible to be implemented in the short, medium and long terms. After the design phase, the short term plan should be implemented in order to be able to assess the results and bring about elements for the next D-I-A cycle. In an under graduation course of eight semesters, for example, at least eight D-I-A cycles would be possible, with assessment phases at the end of each semester in order to encourage continuous improvement.

The first phase, "D", or Design, would have the following fundamental activities: (i) identification by the educational project management office of the methodological components to be implemented in the organization while considering the current context, which may include the definition of the relevant dimensions and the development of glossaries, guidelines, etc., as a way to define standards and practices; (ii) planning the life cycle processes, an activity that implies defining the useful processes for each dimension, with description, diagram, inputs, outputs, template documents, tools and techniques to be used; (iii) selecting the platform that will make the implementation of the methodology easier; (iv) if needed, elaborating a formal written document providing details on the management office operation during the specified cycle, including objectives, cost, scope, schedule, etc.

The second phase, "I", or Implementation, would comprise the following fundamental activities: (i) training of the project manager conducted by the management office; (ii) planning in detail the changes to be introduced into the working mode in order to improve the management of a project under consideration; (iii) training of the project team by the project manager or by the management office, thus facilitating the transition (change) on the working mode in order to improve the management of the project under consideration; and (iv) execution, which may include actions such as the use of new software for the implementation of a series of processes of a specific dimension.

The third phase, "A", or Assessment, would include the following fundamental activities: (i) assessing the implementation while considering the detailed planning of the changes introduced into the working mode in order to improve the management of the project under consideration; (ii) suggesting possible actions for the next D-I-A cycle in the specific project being considered; (iii) searching for improvement opportunities concerning the methodology based on the implementation assessment; and (iv) proposing possible reviews on the life cycle processes, which involves possible reviews on descriptions, diagrams, inputs, outputs, template documents, tools and techniques.

In this perspective, the D-I-A cycle will be used continuously as a way to allow the improvement of the methodology based on the different assessment processes concerning each project. In parallel, different cycles could be applied to the same project in the perspective of improving its management during its execution. As a consequence, improvements are more and more frequent and are based on a previously designed schedule. This context tends to favour the use of contributions by both the managers and the teams with the potential to affect the organization as a whole.

As previously stated, the framework proposed for the management of projects on educational multimedia production and use may benefit from the usage of Internet based CoPs. In order to create a platform for the educational project management office that incorporates Internet based CoPs, an implementation proposal focused on the use of free software and free Internet services such as portal hosting will be presented. Despite the fact that a free online repository sometimes comes with limitations of disk space and data transfer, this platform could be an appropriate starting point for the development of the educational project management office within an organization.

The implementation, in this perspective, refers to the importance of using different kinds of free software to carry out all the online management tasks. The aim is to bring about an alternative solution based on the Web for situations in which there is no budget available for infrastructure, in special software and hardware. This solution may work as a support system for anyone interested in the management of educational projects since it would allow access both to the EduPMO Framework and to related CoPs. This environment may be useful for the exchange of experiences between its users and for the collection of important information on how to improve the framework (Amorim, 2010).

An additional objective concerns the discussion of the results of the use of free software and free Internet services in different kinds of projects. In this way, for each dimension, a set of Web pages would be needed to conduct the different processes: descriptions, diagrams, inputs, outputs, template documents, tools and techniques. Due to the fact that the proposed framework should be useful for different kinds of projects related to multimedia production and/or use, the processes tend to be generic while the template documents would be more focused on specific

details. It's important to emphasize that the template documents should be properly adapted in order to comply with the specificities of the project being considered.

Considering a total of 199 processes for the nine dimensions, the portal would require a minimum of 199 Web pages. The platform should also provide specific forums to discuss the applicability of the dimensions of the model. An example could be found in the different languages in which the interface would be available. Portuguese would thus be the language for the Brazilian addressees, while English would be the language for the international audience. The free access modality should be preferred and the creation of similar platforms could be suggested to the users.

## 3. Pairing Six Sigma with Project Management

The previous section presented a reference model with 199 processes that may be used as a way to manage large scale multimedia production. In this section, process improvement will be discussed while presenting a perspective on how to pair Six Sigma with PM best practices (Swanson, 2011). In other words, how do we improve each one of the 199 processes while considering the specificities of the organization? After presenting a brief description of the process to be improved, a team may be allocated to a Six Sigma based improvement project that may last from 8 to 14 weeks, on average. The outcome of the improvement project would be an improved process based on different changes.

The Six Sigma approach to process improvement is the latest in a series of quality control methodologies (Harmon, 2007). It allows managers both to measure process performance and to make changes in the process. There are three types of process change efforts: process management; process improvement; and process redesign.

The suggested mode to pair Six Sigma with PM involves five key steps (Swanson, 2011). The first step involves defining the customer requirements for the process or service: 1.a) defining the project; 1.b) identifying customer requirements; 1.c) documenting process; and 1.d) setting goals. The second step involves measuring existing performance and comparing the results with customers' requirements: 2.a) identifying measures; 2.b) defining measures; 2.c) developing and testing data collection methods; and 2.d) defining baseline measures. The third step involves analysing the existing process: 3.a) analysing data; 3.b) exploring possible causes and testing hypotheses; and 3.c) identifying causes. The fourth step consists in improving and implementing the process: 4.a) selecting a solution; 4.b) piloting test solution; and 4.c) implementing full-scale solution. The fifth step implies controlling the results and maintaining the new performance: 5.a) documenting and keeping a record of the results. Despite the fact that complex projects may be recycled through these steps in order to achieve results, simple projects run straight since the measures are created and used in an attempt to identify obvious improvement brought about by the different changes that have been made.

The suggested approach to pair Six Sigma with PM presented in this paper offers an opportunity to better match the 199 processes to the organization since a manager may establish measures for each activity on the detailed process diagram. A manager may start with a comprehensive look for possible causes while gathering data and applying statistical tools. The problem analysis may comprise the following steps: brainstorming in order to identify causes, reducing the number of possible causes to a reasonable quantity and analysing the data in order to determine the causes that in fact bring deviation from the mean. As a way to improve the process, the causes that are identified and listed will lead the changes.

## 4. Conclusions

This work deals with the significant interplay between the fields of PM and KM, which suggested a potential synergy between project teams and CoPs. Based on this scenario, a framework (Amorim, 2010) was discussed while a computational implementation based on free software and the Web was proposed.

The pairing of Six Sigma with PM best practices was discussed as a possible way to improve processes in five phases: defining the problem, measuring key aspects, analysing the data, improving the current process and controlling the ongoing quality of the process. The authors believe that Six Sigma and PM may complement each

other very effectively. The main Six Sigma principles to be deployed are process control, voice of the customer, root cause analysis, process capability and measurement system analysis.

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