



# Software Process Improvement Case Study



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## Orchestrated Review of the Project Storyboard

### Overview

*Multimedia* is a consortium of the University of Chieti operating in the advanced communication and multimedia technology sectors. It is active in two distinctive areas :

- publishing of educational and informative titles on CD-ROM
- distance learning based on telematics and multimedia technologies.

A distinct characteristic of the development phase of multimedia titles is the direct participation of a diverse range professionals in the design phase, each contributing their own heterogeneous experience, specialist knowledge and working methods .

In this context the critical element is the need to comprehensively define the project of multimedia production with the aim of minimising interventions on the product during advanced stages of production. In the light of this requirement, the Consortium adopted an improvement plan aimed at defining a procedure for reviewing the 'storyboard' which, in the development of a multimedia product constitutes the detailed design document. The project, coordinated by the Technical Director of the Consortium, **Dr Achille Di Girolamo**, was developed through the following fundamental phases:

- analysis of the requirements of the review procedure
- definition of the procedure
- application of the procedure

The application phase produced significant results, both in terms of optimisation of project resources and in product quality. In particular it has been estimated, against a cost of 15 working days devoted to the product review, that a saving of around 40 working days for the correction of project errors discovered during the course of the operation was attained.

Particular emphasis was placed on the improvement of interaction within the project group, above all in relationships with external professionals.

### The Organisation and its Environment

The multimedia Consortium, one of four Technological Innovation Centres at the Scientific and Technological Park of Abruzzo, was formed in 1995 by members of the University 'G. D'Aannunzio' of Chieti and Cyborg Ltd.

The Consortium uses technologically advanced equipment and its own specialised personnel in activities related to the multimedia industry.

It also avails of contributions from external specialists from various disciplines for its products, together with the specialist expertise of members of the consortium.

The company mission is the study, design, implementation, publication and promotion of advanced

communication systems. The Consortium's production consists of various CD-ROM medical-scientific and technical-scientific publishing lines and advanced distance learning services, also by means of multimedia and telematics technology.

In the Consortium's field of activity, the objective of process engineering assumes strategic importance, strongly encouraged by the management and motivated by various considerations, primarily the need to coordinate the various activities carried out by professional resources, some external, who form a varied and heterogeneous group.

## **The Starting Point**

The improvement project was born of the need to design a pivotal point in the productive process, consisting of a review phase of the *storyboard*.

In Multimedia CD-ROM production, the *storyboard* is similar to the software design process, as it is the fundamental reference point for the work of programmers, electronic graphics, video and audio technicians, and multimedia data processing personnel. The improvement project plan, besides responding to precise company objectives, is based on the results of an assessment, which identified the software design process, in this case exactly identifiable with the development of the *storyboard*, as one of the processes prioritised for improvement.

Correlating the results of the assessment with the objectives of the company, the improvement project can be more clearly defined as:

- formulation and introduction of a procedure for the orchestrated review of the *storyboard* of a multimedia application by the entire project team.
- carry out , following experimentation, a quantitative evaluation of the benefits obtained in terms of savings of working days for the entire project.

## **The Improvement Project**

### **General approach**

Particular importance was attached to a preliminary phase of research, within the company, into the requirements of a multimedia application development process.

The intention of this phase is to define a general reference design planning outline with a wider scope than the specific objective of the project.

The importance of defining the process is also related to the need to improve the relationship with the customer by defining a “common language”.

The need for a “common language” is also useful in the relationship with the content author, i.e. the expert on a particular subject who, although not competent in the field of information technology, belongs to the project group and therefore also the review group of the same project.

The phase also serves to make personnel aware of the problems of design, and in this sense has a training function.

### **Planned Phases**

The improvement project was divided into the following fundamental phases:

- analysis of requirements
- definition of procedure
- experimental application of the procedure and its review.

### **Analysis of requirements**

In this phase activities are aimed at identifying the methodological and procedural requirements of the orchestrated *storyboard* review procedure.

A working group was constituted and the problem of procedural documentation for the review was analysed.

The analysis of requirements was particularly complex, owing to the heterogeneity of the working group: each professional figure is involved at different phases of the project and has distinct operating responsibilities.

At the end of the analysis phase a questionnaire is drawn up to identify the necessary procedural requirements.

A final specification for the *storyboard* review was produced from analysis of the questionnaire results.

### **Definition of the procedure**

The procedure was defined with the collaboration of representatives of authors, the *storyboarder*, the production manager, software developers, the interface designer and electronic graphics technicians.

The procedure took into account critical aspects that frequently cause problems of interpretation, representation or development in the production phase. Particular attention was paid to the fact that the storyboard review can take place at different times and places according to the actors involved.

To this end a custom software package for distance managing of the storyboard review process by the participants was purchased.

### **Application and review of the procedure**

The procedure for orchestrated review of the *storyboard* was tested on a real application, a medium-sized CD-ROM product titled: “Industrial Applications of Lasers - Mechanical Manufacture”, made in collaboration with the ENEA Department of Innovation-Direct Publication, under Dr. Anna Grazia Gandini.

The participants involved in the *storyboard* review applied the previously formulated procedure, and made some

improvements and changes. On conclusion of the review, a report was produced containing all the critical aspects revealed on the *storyboard* with the aid of the new procedure.

The report was the basis of the subsequent phase of verification of the procedure's impact.

### **Project organisation**

The project was coordinated by the company's Technical Director, Dr Di Girolamo and the working group consisted of:

- an ENEA executive, scientific coordinator of the project
- an ENEA researcher
- an external technological consultant specialised in laser technology
- a project manager
- a systems analyst
- electronic graphics technician

### **Instruments and methodology**

A group working method was set up for communication and exchange of documents from a distance.

This was considered necessary because part of the working group involved in the improvement project were outside the company structure. For this purpose, documentation usable in both paper and electronic form was prepared, in a mutually compatible form with a data input process based on a user-friendly interface.

### **Impact of human and cultural factors**

The involvement of more persons in the definition of the procedure was considered important.

There was a notable impact on relations with external collaborators due to the existence of a company reference model.

## **The Results**

The results obtained by the improvement project can be thus synthesised from a qualitative point of view:

- the existence in the company of a reference model for the production cycle
- the acquisition of a review procedure for the detailed design

- introduction of a working method suited to teleworking
- the working group's awareness of the importance of an orchestrated re-examination of the project.

From a quantitative point of view a comparison was also made, within the limits of data obtained on one application, between:

- working days necessary to make corrections of design errors.
- working days employed in the review process.

The estimate of working days for an intervention relating to the first category was defined on the basis of available historic data relating to similar projects.

The calculation of numerical indexes was developed from a table of the summary checklist compiled during testing of the procedure.

The result obtained consists of an estimate, against a cost of 15 working days employed for the project review, of a saving of around 40 working days for the correction of design errors in the course of the operation.

The level of attainment of the objectives of the improvement project was also evaluated by the **Mentor's** final assessment, according to the same initial method and standard of assessment.

The results can be summarised thus:

- the detailed design process, planned and documented, is rated at level 2 of the SPICE standard; the testing of the procedure, currently limited for obvious reasons of time to a single application, prevents the rating of the process at level 3.
- the existence of the above procedure, rated in a wider context of a project cycle model, has a good chance of increasing to a mature level, not only in the detailed design process, but also in other processes such as product testing and configuration management.

The final assessment also confirmed the technical personnel's awareness of the problem of improvement and the need for continuous training in multimedia technology.

## **Lessons Learned**

The project represented an optimal opportunity for the company to embark on an improvement with objectives projected over a longer period than the duration of the SPIRE initiative.

It was considered important to apply the concept of 'procedure' to a type of activity until now entrusted to the experience and professionalism of individuals, but



characterised by the risk of inability to manage the process in an organised way, due to the heterogeneity of the working group's expertise.

It was equally important to define, in the initial phase of the project, a cyclical model of the development of the multimedia application, useful as a reference for future improvement operations.

### **Plans for the Future**

According to the Technical Director, **Achille di Girolamo**, the results obtained "*aren't a finishing point, but rather a*

*starting point for an improvement plan in the medium-long term*"

The aspects of production that the company intends to qualitatively improve are diverse:

- testing
- configuration management
- production control

Added to this is the obvious intention to extend the procedure to all company projects while at the same time improving the planning and organisation of the project team, above all in the context of teleworking.

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*more information is available on the web site*  
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