

3D Authoring for Content Experts: a Collaborative Approach

Fabio Pittarello and Augusto Celentano
Dipartimento di Informatica, Università Ca' Foscari di Venezia
{pitt,auce}@dsi.unive.it

1. Introduction

The current production model for 3D scenes, inherited from the early years of computer graphics, prevents a real collaboration among the subjects involved and, as a consequence, the full exploitation of the new potentialities of the 3D media. In this scenario the content expert is only a consultant of the 3d modeler, who is directly responsible for designing the interaction model.

In complex 3D applications interactivity, graphic complexity and content play different important roles that should correspond to different well defined skills: authoring is a collaborative activity that involves different experts.

The *content expert* is the key figure of the extended team of authors that collaborate to the design and implementation of a complex interactive application. He/she is an intermediate actor between the final users and the experts devoted to the design of the low level graphic details: is an expert in the application domain and understands the needs of the final users with respect to orientation, navigation and access to the information content; is able to speak the technical language needed to describe the interaction but needs to be provided with high level interaction interface, built by the graphic experts, because is not necessarily skilled in the fine-grained language of interaction with the technology used to build virtual worlds.

2. Interactive experiences for e-commerce

We illustrate the collaborative methodology [1, 4] with a case study concerning e-commerce. This case study has been drawn after the experience gained in the development of interactive 3D worlds for cultural heritage exhibitions [5].

The case study concerns a 3D simulation representing an interactive experience in a virtual fair. Users can wander through the stands, consult information about the products on exhibition and visit special areas devoted to social events or product demonstrations; they can buy the products or can ask for supplemental information that will be sent by e-mail. The building process involves the organizers of the fair and the exhibitors as active contributors to the design. They play the role of experts of the

application domain. The goal of the methodology is to let such subjects to actively collaborate, using high level tools, with subjects involved in the low level programming of the graphic components.

3. The development life cycle

A fundamental element for the definition of the new collaborative methodology is the concept of *class of experience*. It denotes a typology of interactive experiences general enough to be used as a template for particular uses. For example, the class *shopping in a mall* may be subsequently specialized by authors in different buildings and showing different goods to be sold, still having the same basic interaction mechanisms: same walk modalities, products selection opportunities, payment options, and so on. The aim of this definition is to give authors and users a more intuitive metaphor for building worlds

Figure 1 illustrates the design life cycle of 3D interaction applications, showing also the roles involved.

The *conceptual phase* is characterized by the identification of the content and of the interaction requirements, in order to build a conceptual scheme for the author interface and the final user interface. The main role of this

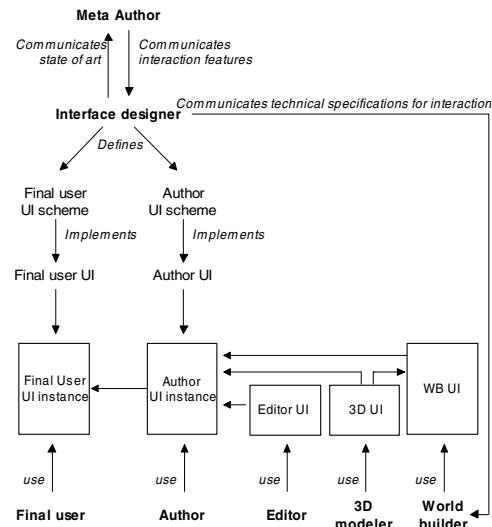


Figure 1. Roles in the development life cycle

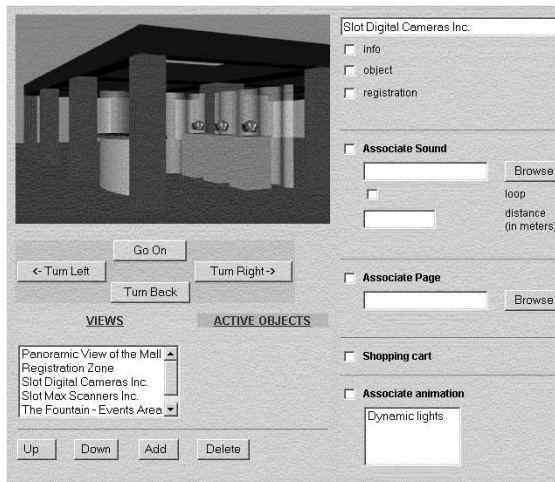


Figure 2. The author interface

phase is interpreted by the *meta-author*, who has a deep knowledge of the content domain and is also skilled in communication and presentation issues. The meta-author discusses with the *interface designer* the current state of art of technology. In this collaboration the interface designer receives information about content and communication techniques. The conceptual phase results in the production of user interfaces schemes useful for defining a class of experiences.

In the *implementation phase* the interface designer, who has a deep knowledge of low level interaction mechanisms, builds the interfaces for the final user and the author on the basis of the user interaction schemes produced by the meta-author. The results of this phase are made available as packages ready for the authors who want to build interactive experiences belonging to the specific class.

Authors, i.e. content experts, are the main actors of the *content development* phase; they choose among the available classes of interactive experience and instantiate the one that fits their particular needs. They take advantage of the skills of a number of complementary actors (writers, graphic artists and 3D modelers) whose task is to edit the information content selected by the author.

Figure 2 shows an example of the author interface applied to our case study. The interface enables the content expert to perform his/her work using only high level interaction widgets; for example, the organization of a the sequence of steps through the stands corresponding to a certain user profile (a *guided tour*) is pretty simple: the content expert moves in the virtual fair using the four directional arrows and when reaches a satisfactory point of

view marks it as an element of the tour, just clicking over the *Add* button. Views can then be subsequently rearranged using a small number of visual artifacts. Additional multimedia elements can be automatically associated to a particular view checking the options on the right part of the screen. The results of the content effort building effort are then saved and exported to the final user interface, characterized by simplicity and by a small number of interaction objects.

In the *final user interaction phase*, the final user takes advantage of the efforts of all the other people involved, interacting with the contents of the 3D world conceived by the meta-author in its overall interactive functions and composed by the author with specific content and interaction mechanisms, through the interface implemented by the interface designer.

4. Conclusion

The fulcrum of the re-organization of the production environments is the *content*; the environments resulting from the application of this collaborative methodology could then be defined *content centered*. Our methodology recognizes the benefits of the *user centered* approach and goes a step beyond. According to the *user centered methodology* [3] users are *consulted* all through the development process; our *content centered approach* encourages users to *actively participate* in the process of creating the product.

The experimental results demonstrate that this methodology enables authors to produce significant 3D experiences collaborating with a pool of computer science experts and other technicians, but without entering into technical details about 3D modeling language and tools.

5. References

- [1] A. Celentano and F. Pittarello. *Class of experiences: a high level approach to support content experts for the authoring of 3D environments*. To appear in Volker Paelke Ed. *Structured Design of Virtual Environments and 3D-Components*, Shaker-Verlag, Aachen, 2001
- [3] D.A. Norman and S.W. Draper. *User Centered System Design*. Lawrence Erlbaum Associates, Hillsdale NJ, 1986.
- [4] . Pittarello, *Desktop three-d interfaces for Internet users: efficiency and usability issues*, PhD dissertation, Ca' Foscari University, Venice, Italy, 2001.
- [5] <http://www.palazzograssi.it>.