

Chapter 4

Authoring of Serious Games for Education

Florian Mehm

Technische Universität Darmstadt, Germany

Christian Reuter

Technische Universität Darmstadt, Germany

Stefan Göbel

Technische Universität Darmstadt, Germany

ABSTRACT

Serious Games (SG) place requirements on all members of a development team, from the designers and domain experts to artists and programmers. In order to support the collaborative work required in serious game production, authoring tools can be introduced in the development process. They allow members of the team to work in one common environment and to have one uniform vision of the project, as opposed to a work environment in which each group uses some software tools exclusively and multiple visions of the finished game do exist simultaneously. Presenting a range of examples including the authoring framework StoryTec, the use of authoring tools for the development of SG is explained in this chapter.

INTRODUCTION

The development of games as well as Serious Games is cost-intensive and requires a development team with a range of different skills. For the development of SG this includes the expertise of subject matter experts and pedagogues in addition

to game designers, content producers and game programmers. Research aspects include mechanisms to support authors (domain experts such as teachers, coaches and trainers as well as game designer and game developer) in the collaborative, interdisciplinary authoring and development process and to enable personalization and adaptation

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of single and multiplayer scenarios considering the characteristics of individual users (players, learners) and user groups (e.g. a school class).

Whereas this chapter concentrates on the authoring process, the next chapter focuses on personalisation and adaptation issues of SG. The mechanisms and research and technology development principles are presented in the context of the best-practice examples (projects) 80Days (EU, FP7, Technology-enhanced Learning—providing a single player learning experience for geography) and StoryTec (technology transfer project in the field of authoring SG funded by the State of Hesse in the frame of the LOEWE program for economic and scientific excellence).

BACKGROUND

The development of a SG in general is similar to the development of a regular entertainment digital game, with the additional challenges of providing appropriate content for the game's serious purpose. Traditional roles found in game development include game designers, who are tasked with setting up the game's story, game world, characters, and gameplay. Technicians, i.e. game programmers and associated roles, are then tasked with creating the technical infrastructure of the game and realizing the gameplay, while artists (graphical artists, sound artists, etc.) create the necessary assets such as 3D models, images, or sounds for the game. Finally, the game's quality is assured by game testers (typical gamers testing the functionality, feasibility, usability, and user/game experience) before being released.

In the creation and testing of a SG, the previously user groups receive new tasks and simultaneously new groups are added. This already indicates the increased complexity compared to entertainment-only games. The development team is augmented with domain experts, who introduce specialized knowledge about the target domain, as well as – in the case of digital educa-

tion games – pedagogues in order to establish an educational design of the game. Common tasks for these groups include the creation of exercises or exercise pools, whereby in practice commonly general purpose tools are used for the creation and dissemination of the created content to the rest of the team. Further, the subject matter experts are responsible to check the content-related correctness and the fulfillment of intended goals beyond entertainment before deployment of the SG.

The core game development team, as mentioned before, also receives more tasks as compared to the development of an entertainment-only game. Since one major purpose of the SG is the presentation of domain-or purpose-specific content, the game design has to be adjusted for this, either by providing possibilities for placing this content in the game or by adapting the gameplay itself in such a way as to be beneficial to the SG's purpose. An example for the former could be an adventure game placing educational content in the dialogue with a character, while an example for the latter is a physics game involving actual simulated physics-based puzzles the player has to solve by means of interacting with a simulation.

It is necessary to closely link the content production and programming of the game with the serious purpose. The art production has to be managed to create assets which conform to the content of the game, and programming tasks have to be carried out keeping the serious aspect of the game in view by providing the necessary features.

Authoring Frameworks for Serious Games

SG Authoring Frameworks for interactive experiences might be placed in the middle ground between Authoring Tools in the eLearning field and the tools used by professional game developers (See Figure 1). E-Learning Authoring Tools are in place at a multitude of educational institutions as well as companies, and can be used to create educational courses which are presented to users

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