LET'S BE SERIOUS – ICT IS NOT A (SIMPLE) GAME

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ABSTRACT

In this paper we will discuss the requirements for introducing a (serious) game as a tool for training skills in the area of application and business information service management. We introduce a reference model for (serious) games, that serves as a touchstone to determine the effectiveness of service management games, and we will indicate the architectural requirements that must be met to satisfy these criteria. Technical and artistic issues in developing effective service management games will also be discussed, as to provide clear guidelines how to approach the production of service management games.

INTRODUCTION

There is a growing need for ICT service management which provides ICT service providers with the basic functionalities to manage complex information systems. Since the early 1990s the world of ICT infrastructure has been in a state of constant flux due to profound changes in field of Information and Communication Technology (ICT). The complex interplay between technological innovation and the rearrangements of applications, service oriented architectures, and enterprise integration has led to new service management operations. Within this broad ICT field of operations an increasing number of process models, frameworks and methodologies are being developed and described, some of which are tied to a specific form of administration such as ASL, discussed in section 2, in the case of application management), and BiSL, also discussed in section 2, in the case of functional management.

At Getronics PinkRoccade, a leading company which acts as a service provider to many large institutions in the Netherlands, we are developing an integrated role playing and simulation environment for ICT service management. The adoption of serious game technology is motivated by the observation that with regard to the complexity of the tasks involved in service management, which also includes extensive communica-tion with clients, traditional methods of instruction and learning are not adequate. Following Huizinga's dictum that *in the game we confront a function of the living creature which cannot be determined either biologically or logically*, we regard games an an effective learning environment. From a game theory perspective, which we will discuss in section 3, a game not only provides the learner with an environment to learn the rules, but also allows us to re-create to some extent the context that promotes an actual involvement of the player with the world in which to apply these rules.

The structure of this paper is as follows. In section 2, we will provide a brief overview of application and business information service management at Getronics PinkRoccade. In section 3, we will further motivate the use of serious games, and provide a reference model for (serious) games. In section 4, we will make a first attempt to identify the criteria for effective service management games, and in section 5 we will outline architectural requirements for such games. In section 6 we will some technical and artistic issues in game development after which, in section 7, we will draw our conclusions.

APPLICATION AND BUSINESS INFORMATION SERVICE MANAGEMENT

ICT infrastructure facilitates the provision of services and information. The success or failure in the application management as wel as functional management depends on whether the actors in the value chain are able to provide better ICT services as required by the end users. However, the provision of new and better services is a complicated process, because it requires coordinated actions between many players. In the field of outsourcing, for example, the management of expectations of the client users and the ICT provider users are not only dependent on a service level agreement but also of the changing perspectives, roles and interests. Failures could have major consequences for both parties.

ASL stands for Application Services Library, Pols and Meijer-Veldman (2006), and is a method for the performance of application management in the broadest sense of the term independently of any supplier. It is an extrapolation of and a supplement to ITIL for the pur-

poses of application management. Not only does ASL offer a cognitive approach, framework and conceptual context but also best practices for the purposes of practical implementation. It is intended to make it simpler for applications to provide optimum support for business processes throughout the entire life cycle of the latter.

BiSL stands for Business Information Services Library and constitutes a method for the performance of functional management in the broadest sense of the word independent of any supplier, which is to say, anything from operational duties, such as support for users and handover tests, through to strategic information management. It is a type of ASL for business and customer and user organisations. BiSL also offers a cognitive approach, framework and conceptual context as well as best practices for the purposes of practical implementation. BiSL helps professionalize those functions which direct and utilise ICT in close proximity to business. It facilitates efficient operation and hence cost savings through standardisation better management of and communication with ICT suppliers (smart buying and demand management), and also improves the match of ICT with business requirements (business IT alignment).

At Getronics PinkRoccade, ASL and BiSL are instruments in determining ICT strategies in cooperation with clients. The integrated gaming an simulation environment we are developing is meant to train our employees in the use of ASL and BiSL. In developing this application we draw on our experience in business process simulation, Eliens et al. (1996), and visualisation Schonhage et al. (2000).

A REFERENCE MODEL FOR SERIOUS GAMES

There are many resources on serious gamesa[1]. To indicate what it is all about, we present a quote from virtual heroes[2]:

> *Serious games and simulations are poised for a second revolution. Today's children, our workforce and scientists are increasingly playing, learning, and inventing in visually intensive "virtual" environments. In our increasingly experiential economy, immersive educational and training solutions are needed to advance the workforce of tomorrow. Game-based learning and technologies meet this challenge.*

However, regardless of the fuzz being made, apart from the euphorics their is little attention to determine in a more scientific way what the actual value of the game is in the learning process, and what elements or aspects of the game contribute to the learning experience. To provide such a foundation, we propose to adopt a modified version of the classic game model introduced in Juul (2005). According to Juul (2005), the defining characteristics of a game can be expressed by making explicit the *rules* of the game, the *outcome* of the actions of the player, the *value* attached to these outcomes and the *effort* required of the player to obtain these values. In addition, the model proposed in Juul (2005) adresses why a player develops an *attachment* with the game and what might be the possible *consequences* of playing the game in relation to the real world, for example making friends in an online role playing game or become famous in a game contest.

As an illustration of how to use the model to evaluate a game consider, for example, that with respect to the effort required of the player, games may be very different in what skills the player needs to have to obtain the desired outcomes, dependent on the type of game, that is whether it is a role playing game, a strategy game, or a first person shooter primarily focussed on the perceptual-motoric skills of the player.

To what extent the story underlying a game is important is not only dependent on the type of game, but also on the technology used to realize the game. To quote Juul (2005): *game fiction is ambiguous, optional and imagined by the player in uncontrollable and unpredictable ways, but the emphasis on fictional worlds may be the strongest innovation of the video game.* Clearly, video games have proved to be appealing, not only by a younger audience, but also for more mature player, since they realize the immersive aspects of game playing in the most dramatic way. However, whether we want our trainees in service management to be virtual heroes of the immersive kind is yet to be seen.

CRITERIA OF EFFECTIVE SERVICE MANAGEMENT GAMES

As a first attempt to formulate criteria for effective service management games, we give a characterization in terms of the reference game model, introduced in section 3, as outlined below:

- *rules* – service management protocols
- *outcome* – learning process
- *value* – intellectual satisfaction
- *effort* – study procedures
- *attachment* – corporate identity
- *consequences* – job qualification

There is no need to emphasize that this is only a first approximation, and for that matter a rough one. What we must keep in mind, however, is that the model is not only applicable on a macro-level, to characterize an entire game, but more importantly may also be applied on

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[1] www.cs.vu.nl/~eliens/media/resource-serious.html
[2] www.virtualheroes.com

a micro-level, to establish the criteria for each (relevant) step in the game play, that is, as we will further outline in section 6, for each problem situation for which an effective solution must be provided by the player/learner. To emphasize the relevance for service management games, we wish to add two more criteria to the model, respectively *scenarios* and *reward*, dealing with the (serious) content of the game:

- *scenarios* - problem solving service management
- *reward* - service level agreement

Currently, there already is a great offer of business management games. For example, when googling on *game*, *business*, and *management*, we find, among many other offerings games to train leadership[3] (which provides urgent problem situations in a variety of areas, including military and health care applications), and entrepreneurship[4] (which provides a eight round cycle of sessions instruction how to start a business, get clients, etc., with extensive feedback in the form of reports and comments after each round).

A general observation we may make here is that the games we have seen so far primarily focus on functionality and offer at best an efficient interface, which we do not find very appealing from a more artistic perspective.

Architectural requirements

As observed in Van Houten and Verbraeck (2006), the defining characteristic of management games, from an architectural perspective, is the need to combine the so-called *game loop*, which propagates actions of the player into the game state, with what is known as the *simulation loop*[5], which determines what events occur, and schedules future events based on a simulation model.

For the game play, we need to develop, or use, some sort of *game engine*, which following Sherrod (2006) may be regarded to consist of the following functional components:

- rendering system – 2D/3D graphics
- input system – user interaction
- sound system – ambient and re-active
- physics system – for the blockbusters
- animation system – motion of objects and characters
- artificial intelligence system – for real challenge(s)

The level of sophistication of each of these components may vary, dependent on whether we want, for example, to introduce compelling visual effects. For a management system in general it is indeed arguable whether we need a fully fledged physics system, although, as we will discuss in section 6, for a climate resource management

system it might be a valuable, at least fun-enhancing asset.

Other requirements are set by the possible need to offer the game online, as a multi-user game, and possibly with extra facilities such as chatting and instant messaging.

Finally, we must consider that not only the game engine is important, but perhaps even more so, the *game programming*, that is the computional means to define the rules of the game, and the (visual) outcome of player actions. Van Houten and Verbraeck (2006) introduces a rule-based formalism for game programming, where our own preference would be a combination of simulation and embedded logic extending an existing game engine such as Delta3D[6], or in a more lightweigth fashion based on our *intelligent multimedia platform*, described in Eliens et al. (2002).

Game development − technical and artistic issues

In essence, according to Schuytema (2007), a game is simply a series of processes that takes a player to a result. However, observing with Kress and van Leeuwen (1996) that *games are an increasingly important element in our visual culture*, we must, in developing a game, spent sufficient attention to the visual appearance and the sensorial aspects of game.

Recently, our group at the VU has been involved in'developing a climate game[7] for the *Academische Jaarprijs* competition, where a number of similar issues with respect to game development re-occurred. In particular, in developing the actual scenario(s) for the game, which allows the user to control climate-related resources, dependent on the power obtained in previous game play, we had to look at each choice point for an adequate solution, using a checklist, that comprised the possible perspectives of the player, the scenarios determining the challenges set for the players, as well as the visual effects, as an implicit reward for the player taking action.

In the *climate game* project, we are further exploring various technologies, including interactive video with flash, as well as the use of the HalfLife2 game engine, whith which we gained experience in developing a promotional game for our faculty, Eliens and Bhikharie (2006). With regard to the use of 3D we may remark that since ancient times a walk in space has served as a mnemonic device, and as such spatial memory may aid in retention and understanding, which might also provide a decisive argument for the use of 3D in a service management game! .

Conclusions

In this paper, we have introduced a game model which served as a reference to discuss the criteria for effective service management games. We have observed that the quality of a game lies both in the general flow of the game experience and in the individual moments during a playing session, which have to be defined both with respect to the (learning) goals set for the (serious) game, as well as the involvement of the player, that is fun. Against the background of these criteria we have indicated architectural requirements as well as technical and artistic issues in the development of service management games.

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