

## 1. Introduction

### 1.1 Context

Getronics PinkRocade (GPR) is currently developing a new information system for the “Belastingdienst”, the Dutch tax collectors office. This system will support the processing of “toeslagen”. Since a large part of the population of The Netherlands is involved with “toeslagen” in some way it is of great importance that this system functions correctly. Therefore, GPR is regularly presenting the advancements in the development process in so-called Proof of Concepts (PoCs). These PoCs are used to:

- Show the progress in development and demonstrate the functionality that has been developed so far.
- Allow a group of end-users, which has been formed for this purpose, to explore the functioning, possibilities and limitations of the system.
- Acquire feedback from the group of end-users about the functioning and use of the system.

To support these PoCs in achieving these goals, the concept “Holodeck” has been developed. The Holodeck is a room in which a (work) process can be simulated, allowing people to experience what a certain process and system may look like and how it may be used. In this case, the Holodeck also includes tools to support presentations and feedback sessions. Alternatively, a Holodeck, as a simulation environment, may also be used for training purposes or change management.

For all of these purposes, *serious gaming* was seen as a useful tool that might be added to a Holodeck at GPR. Serious gaming, the use of video games for a serious purpose, was already being researched at GPR at the moment the Holodeck for the Belastingdienst was developed. Like the Holodeck, serious gaming is still a relatively new concept at GPR and the possibilities for its use are currently being explored. The general idea behind the use of serious gaming was to offer customers an attractive way to familiarize themselves with the products that are delivered to them by GPR. The concept of a Holodeck can be seen as another situation in which serious gaming might be useful.

### 1.2 Problem statement

Serious gaming is seen as a useful tool for a Holodeck, because it may support the exploration of a simulation by providing clear goals, offering guidance through rules and a storyline and may enhance the overall attractiveness of the experience. At the same time, a Holodeck, as an environment in which people are engaged in a simulation of a different reality, might serve as a tool to enhance the realism or attractiveness of serious games. The possibilities for the combination of these two concepts will have to be explored in order to be able to use them effectively.

In order to do this, the way in which a good serious game can be developed and how learning can be achieved in such a game will first have to be determined. Since serious gaming is a new concept at GPR that still has to prove its value, it is also useful to define

ways in which the effectiveness of serious games can be determined. Useful measuring and observation techniques will have to be explored. At the same time, the concept of a Holodeck will have to be explored and documented further, determining the form or forms it may take and the goals it may serve.

### **1.3 Research questions**

The problem statement above leads to the following research question, which will be dealt with in this text:

Which design techniques can be used for the development of effective serious games, how can this effectiveness be determined and how can serious gaming and a Holodeck environment support each other?

To answer this research question, a number of sub questions will be addressed in this text:

- Which design techniques and game elements can be used for the development of effective serious games?
- What are possible ways to measure the effectiveness of serious games?
- What is a Holodeck and what purposes may it serve?
- What are the possibilities for combining serious gaming with a Holodeck environment and which advantages may this provide?
- Does a Holodeck require or facilitate alternative ways of measuring effectiveness?

### **1.4 Research method**

This research will start with a literature review aimed at finding techniques and criteria for designing serious games and making effective learning tools out of them. This will be followed by a literature review aimed at identifying the possibilities for measuring the effectiveness of serious games.

After this, the concept of a Holodeck will be defined in more detail and the possibilities for its use will be explored. This will be done by interviewing the inventor of the concept “Holodeck” at GPR, as well as by looking at similar concepts that already exist to identify alternative interpretations of a broader term.

Once the goals, elements and methods of serious games and a Holodeck have been identified these will be compared to identify ways in which serious games and a Holodeck environment may support one another. The Holodeck developed for the Belastingdienst will serve as a case study in this discussion.

The methods for measuring the effectiveness of serious games identified in the literature study will also be compared with the concept of a Holodeck, to see in which ways such an environment may restrict or facilitate the use of these methods. After this, conclusions can be drawn and possibilities for future research can be explored.