Serious Games Integration in Companies: A Research and Application Framework

Aida Azadegan

Nottingham University Business School
South Building, Jubilee Campus
Wollaton Road, Nottingham
NG8 1BB, UK
Aida.Azadegan@nottingham.ac.uk

Johann c.k.h. Riedel

Nottingham University Business School
South Building, Jubilee Campus
Wollaton Road, Nottingham
NG8 1BB, UK
Johann.Riedel@nottingham.ac.uk

Abstract— Serious Games are games that educate, train and inform using entertainment principles. Serious Games have the potential for application in companies. However, less investigation has been focused on how to integrate Serious Games in to companies.

The authors have developed a classification framework to help understand the different ways serious games can be used in companies. In order to achieve this aim, cases of serious games were identified from experts, conferences, events, developer companies and the Gala Network. These cases were reviewed to identify serious games relevant to business and management. From these, cases were collected of serious games application/use in companies. These were then classified according to the types of use in the classification framework. The identified ways serious games can be used in companies were: in corporate training, for change management, through viral diffusion and Gamification. A case study of each type of use is presented in the paper.

Finally, future work towards the refinement of the framework that can add to theory building for research in the use and integration of serious games in companies is discussed.

Keywords - Serious Games, Integration in Companies, Integration Classification framework, Gamification.

I. INTRODUCTION

Serious Games (SG) are 'more than fun' - a brief survey of the literature reveals that Serious Games are (digital) games used for purposes other than mere entertainment. Zyda [1] gives a formal definition of Serious Games: "a mental contest, played with a computer in accordance with specific rules, that uses entertainment to further government or corporate training, education, health, public policy, and strategic communication objectives". These have been applied to a broad spectrum of application domains ranging from training, simulation, and education, sports, healthcare, corporate, government and other socially relevant topic or business areas [2].

Serious Games are an innovation that uses IT-based techniques, to create more dynamic companies. Serious Games introduce different types of applications in corporate settings. Examples of this could be teaching employees to solve problems in a non-traditional way using trial and error or by developing marketable business skills. Beck and Wade [3] show that compared to non-gamers, employees who train with video games are good at "multi-tasking, good at making decisions and evaluating risks, flexible in the face of change and inclined to treat setbacks as chances to try again In this paper we are seeking to understand the requirements for Serious Games for use in business and industry. This work is being carried out as part of the GaLA - "Games and Learning Alliance", Network of Excellence on Serious Games. As a part of this, the network will elaborate methodologies for a non-intrusive integration of Serious Games in companies. The integration should cover implementation guidelines, best practices, examples, assessment criteria and integration tools, as well as successful evaluation methods. This paper is an initial contribution to this.

II. METHODOLOGY

Success stories exist about the integration of IT tools into corporate-settings; however, integration is a complex and challenging process. In addition to the generally positive economic benefits, advantages such as convenience, standardized delivery, self-paced learning, and variety of available content, have made IT-based learning technology a high priority for many corporations [4]. In this paper, we are trying to understand in what alternative ways Serious Games have been, and can be, used in companies. We introduce a classification framework that helps to organize the knowledge and understanding towards the integration of Serious Games in corporate settings. This will help to build theory about how companies can use serious games and how they can be integrated into companies.

To identify Serious Games, which have been used in companies, a case collection process was launched. This sought to identify Serious Games, which were relevant to their use in business and management, and to identify case studies of their application in companies. The Serious Games cases were collected from different sources described below:

1) Consultation with colleagues from the GaLA network: Case studies were collected from, and discussed with, GaLA network partners during regular meetings and during meetings of the two special interest groups - SIG 3.1

IEEE computer society

Business and Management and SIG 3.2 Engineering and Manufacturing.

2) Reviewing the last five years of the proceedings of the International Federation for Information Processing (IFIP) Working Group 5.7 SIG Workshop on Experimental Interactive Learning in Industrial Management: The papers published in the SIG proceedings for the years 2007-2011 were reviewed [5-8].

3) From consulting experts attending a recent industry event on Gamification (Games for Brands, London, 27th October 2011): cases of Gamification were collected by attending the presentations of the speakers who were representing Game companies active in game design and development, as well as through discussions with the experts at the event.

4) Reviewing case studies online: By doing a Google search for Serious Games developer companies and looking for case studies of serious games focusing on business, management and those used in companies.

Table 1 shows the results of the case collection process.

TABLE I.   SUMMARY OF SERIOUS GAMES/CASE STUDIES IDENTIFIED

Collection Source	Number of Serious Games/ Cases	Number of SGs in Business and Management	Number of SGs used in Companies
GaLA Network Colleagues	74	52	22
Recent IFIP SIG Proceedings	44	23	8
Games for Brands event	40	3	3
Online case studies	98	26	26
Total	256	101	59

In total, 256 cases of serious games were reviewed and from these the number of cases that were relevant to business, management, and industry was 101. The cases of application of serious games in companies were 59. Of the 256 Serious Games identified 39% were relevant to business and management; the others were relevant to education, health, etc. However, only a small number of actual applications in industry were identified – 23% of all Serious Games identified.

Analyzing the identified cases we concluded that there are only a few ways that serious games can be used in companies. A framework was then developed to classify the different ways in which serious games can be used in companies. All 59 of the Serious Games cases used in companies were classified. This framework is the first step to understanding how serious games can be used in companies. The framework forms the first element of theory needed for research. Theory building from case study research is particularly appropriate because theory building does not rely upon previous literature or prior empirical evidence [9]. This framework is described in detail in the next section.

III.   SERIOUS GAMES INTEGRATION IN COMPANIES – A FRAMEWORK

The case analysis above were combined with our experience in Serious Games and our awareness of developing trends to refine a classification framework of how Serious Games can be used in companies (See figure 1 below it classifies use into four types): a) in corporate training, b) in active company interventions, c) through viral diffusion and d) with Gamification. These four ways are described next.

Figure.1 Classification Framework for Serious Games Integration in Companies

A. Corporate Training

Serious Games-based learning is gaining credibility and popularity for corporate training. As more and more people play computer-based games for entertainment, corporate employees have come to engage easily with game metaphors and interfaces. Employees enjoy the interactivity, and most people will select "playing a game" as the preferred learning model when given a choice. In addition, according to the results of research on Serious Games performed within the GaLA network, the effectiveness of knowledge transfer to the job makes Serious Games a good investment for the company. An example is INNOV8 [10], developed by IBM.

B. Active Company Intervention

Within the tradition of change management, interventions in companies (typically by consultants) have been used to improve the company. Serious Games have also been used as interventions in companies. The aim of these interventions is not to train people, but rather to help transform the people and the company. Classic examples of this approach are LEGO® Serious Play™, a facilitated workshop, where participants are asked different questions in relation to an ongoing project, task or strategy and the SimLab™ method [15].

C. Viral Diffusion

Similar to viral marketing, the viral diffusion of games in the corporate environment can happen through strategies using social networks, word of mouth and other techniques. Games integrated through viral diffusion happen outside the formal structure and training processes of companies – the Serious Games are simply made available to all the relevant staff and marketing campaigns, or tournaments organized, to encourage playing of the game [16]. This strategy for integration is new and has been enabled by employees having desktop computers and especially recently by mobile phone gaming.

D. Gamification

Finally, Gamification (also known as "funware") has emerged in the last couple of years. It is the use of game design techniques and mechanics to solve problems and engage audiences. Typically Gamification applies to non-game applications [11]. Gamification works by making technology more engaging, by encouraging desired behaviors, and by taking advantage of humans' psychological predisposition to engage in gaming [12]. The technique can encourage people to perform chores that they ordinarily consider boring, such as completing surveys, shopping, or reading web sites. Gamificiation can be leveraged by companies as a sophisticated marketing technique [13], or where customers are engaged in games, while simultaneously being exposed to the company [17].

IV. CONCLUSIONS AND FUTURE WORK

The work described in this paper is ongoing research on the integration of Serious Games in companies carried out within the GaLA Serious Games network. We focused on the ways Serious Games can be integrated in companies and elaborated on the possible new ways for incorporating Serious Games in companies.

The authors developed a classification framework to help understand the different ways serious games can be used in companies. Cases of serious games were identified from experts, conferences, events and the GaLA Network. These cases were reviewed to identify serious games relevant to business and management. From these, cases were collected of serious games application/use in companies, which were then classified according to the types of use in the integration framework. The identified ways serious games can be used in companies were: in corporate training, for change management/intervention, through viral diffusion and Gamification. The integration framework introduced in this paper helps to build the basis for knowledge and theory development of the use and adoption of Serious Games by companies.

Future work should focus on refining and validating the integration framework by carrying out in-depth case studies of Serious Games adoption in companies. Documenting more case studies can help make a stronger justification of the framework. Work can focus on understanding the barriers, gains and benefits of serious games, and then to investigate how to improve the benefits, and overcome the barriers towards, the use of the Serious Games in companies.

The Framework introduced in this paper helps us to build up understanding Serious Games integration more effectively and defines the basis for future research in the field. There is a need to carry out in-depth case studies of the implementation of Serious Games within companies for each of the identified ways of integration introduced by the framework.

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