Framing Serious Games Development as a matter of business

Louise Møller[1], Poul Kyvsgaard Hansen[2]
[1,2] *Aalborg University*
[1] *lmni@create.aau.dk,* [2] *kyvs@business.aau.dk*

Abstract

There are a large variety of serious games aimed at providing knowledge for both teams and organizations. Some games aims at supporting the team in a given project or development process, whereas others aim at widening the knowledge, skills and competences in an organization on a more general level. In the serious game literature attention is either given to the design and development of serious games or to the development of the serious games' business models. In this study, we explore the interaction and linking between the development of the serious game and the development of the game's business model. The paper investigates the development and business models of 24+ analogue serious games and learning tools in the Danish market. Empirically, the paper is based on close interaction and semi-structured interviews with some of the key serious game developers in Denmark (plus one in the US), some of them with a portfolio of up to ten serious games. Besides from uncovering some of the basic motivations to design and develop serious games, the paper will explore, how the game developers' interaction with the costumer and their different business strategies, influences the way the game is developed.

Keywords: *Serious Games development, end-users, business models;*

1. Introduction

Serious games have been praised for their ability to motivate, foster and monitor learning, while at the same time providing the players with a fun and entertaining experience [1-3]. Some research have pointed out that it is 'the fun and entertaining part' of the serious games that provide the motivation for players to learn [4-5] and, even further, some researchers argue that fun and learning are inevitably interlinked [6-8].
Most definitions of serious games takes for granted that serious games are run on - or aided by a computer. For instance, Susi et al. [9] have found that usually serious games are referred to as: games used for training, advertising, simulation or education, which are designed to run on personal computers or videogame consoles'. Another example is Zyda, who defined a serious game as: *'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'* [3, p. 25].
This paper is build upon a more open definition of serious games, which not only leaves room for board games but also for other kinds of learning tools. The definition is provided in the book: Serious Games: Games that Educate, Train and Inform. Here, Serious Games are defined as: *'a voluntary activity, obviously separate from real life, creating an imaginary world that may or may not have any relation to real life and that absorbs the player's full attention. Games are played out within a specific time and place, are played according to established rules, and create social groups out of their players* [1, p.19]. The games and learning tools that are investigated in this paper come in the form of board games (with or without digital add-ons) and play-oriented tools.

1.1 Development of Serious Games

Even though, the design and development of digital and analogue serious games may differ, the recommendations and development models for digital serious games can be a fine starting point for understanding the development of serious board games. According to Prensky [2], there are several

things that contribute to the players' engagement in serious game i.e goals that motivate, rules (which helps provide structure to the game), and elements of play (which can create both intense and passionate involvement).
Some authors point to the structure of the game as a vital key to motivation and engagement [10-13]. (Examples of these structural components can be viewed in figure 1). Other authors argue that motivation and engagement occur when there is the right balance between the game difficulty and the players' skills; in such a case, the player may experience gameflow [14-15].

1) Keeping the start simple to allure interest
2) Keeping the game and instructions simple to minimise time spent on learning rules
3) Providing short modules with a high possibility of satisfactory outcome
4) Provide access to learning tools (instructions, tutorials, clues etc.)
5) Integrating feedback and debriefing into the game
6) Providing the possibility to correct errors
7) Ensuring a satisfactory way of ending the game.

Figure 1. Examples of structural components, which are key to the player's motivation and engagement, based on [10-13]

In 2005, Zyda made a simplified descriptions of the tasks for developing a digital serious game. According to him, the serious game consist of four main elements created by four different teams: *'The design team craft the story, which provides the games entertainment component. The art team provides the game's look and feel. The programming team develops the code that implements story requirements, interface features and networking, web connectivity [etc.] (...)' and finally there is a team, which makes sure that the pedagogy is implemented. The pedagogy in this case is: 'activities that educate or instruct, thereby imparting knowledge and skills'* [3, p. 26](see figure 2).

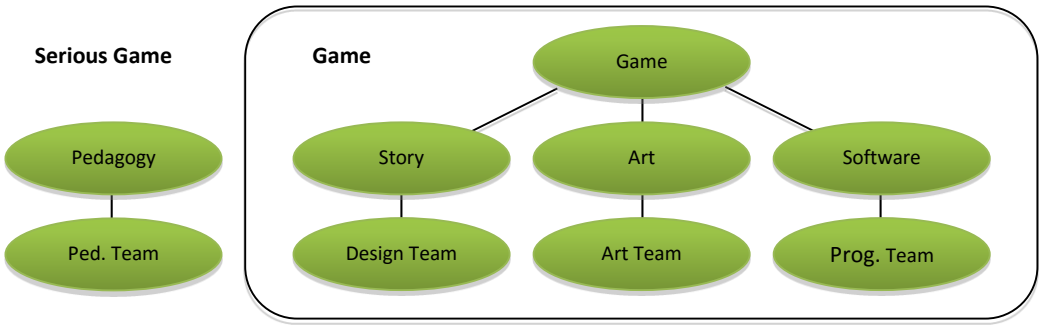

Figure 2. Simplified version of Zyda's model [3, p. 26].

1.2 Narrative or not?

One of the much debated and still not settled topics in the game development literature is the use of narratives [16]. Some authors argue that the narrative is the opposite of a game, because it hinders the game's ability to let the story emerge from the user's interactions [17-18]. Others argue that even though the games may not be a narrative in all its aspects – at least they has some narrative aspirations or elements [19]. However when it comes to serious games, it is argued that: (…) the role of the narrative becomes more pronounced because of the requirement to deliver specific learning outcomes [20].
Jenkins [21] have identified at four narrative elements with relevance for game development and design: 1) evoked narratives; 2) enacted narratives; 3) embedded narrative information and 4) emergent narratives. The narrative elements are unfolded in figure 2:

The evoked narrative	The game includes elements from stories the game player already know (i.e. in games that build upon a movie or so.).
The enacted narrative	The game is placed within a narrative environment
The embedded narrative	The game has different disconnected narratives, which the player is suppose to add together and make meaning of (like in a detective story or crime novel)
The emergent narrative	The game enables the players' emergent narratives be presented

Figure 3. Overview of Jenkin's narrative elements; based on [21]

1.3 Interaction between game and business development

Typically, the development of the serious games' business models is presented as something, which happens after the development of the games [22-23]. From a communicative point of view it makes sense to present it as such, but from an empirical and especially entrepreneurial perspective this division can be questioned. An open and unexplored research question therefore is: How does the development of a serious game and the development of the game's business model influence each other? In this study, we explore the interaction and linking between the development of the serious games and the development of the games' business models. The aim is to unfold the development of serious games from an empirical perspective and provide new direction for the serious games community to explore.

2. Methodology and Cases

Empirically, the paper is based on close interaction and semi-structured interviews with some of the key analogue serious game —and learning tool developers— in Denmark (plus one in the US), some of them with a portfolio with more than ten serious games. In most of the cases, one or more of the games in the serious game developers' portfolios has been observed in action and followed up by the semi-structured interview.
In the study as a whole, there are five different serious game or learning tool developers: Workz, Andromeda Simulations International Inc., Relation Technologies, Gametools and LEGO® SERIOUS PLAY®.

2.1 Case 1: Workz

Workz is a consultancy or 'change bureau' with focus on strategic changes within organizations as well as the developer of games such as: *WallbreakersTM*, *PlaymakersTM* and *War RoomTM*. Workz have a portfolio of 12 serious games divided into three categories: management simulations, tailor-made games and process tools.
At Workz, the games are sold as integrated part of the consultancy offering and it is seen as a way for the business to differentiate itself from other consultancies within the area of strategic change. Every time a game is used, it is customized to the organization, it has to be used in, going from smaller alterations all the way to new tailor-made games. Accordingly, Workz have their own game-development team including 'special matter experts', game specialists and graphic designers. As part of their offering, Workz certify internal facilitators the organizations they consult. The internal facilitators then run and disseminate the game throughout the organizations based on a licencing agreement.

2.2 Case 2: Andromeda Simulations International Inc.

Andromeda Simulations International Inc. is the company behind the family of games called *Income/Outcome®*. The aim of the games are to provide their players with an understanding of business strategy, market dynamics and financing through a visualization of a given company's balance sheet, income statement and the simulation of the company's market situation.
Initially, Andromeda Simulations International Inc., with the people behind, was doing consultancy work in the area of finance and strategy, but, in its present form, the company's main focus is to

market *Income/Outcome*® both in private organizations as well as in Executive MBA programs. *Income/Outcome*® is used and marketed in mainly two different ways: 1) in private organizations (the game is customized i.e. so that the case description and the challenges in the game is aligned with the private organization's context and challenges, and, further, the game is customized to the participants background as well as the possible timeframe; 2) In educational programs (like the Executive MBAs, the game is often run in a standard case version, which again is aligned with the participants' background and the possible timeframe).
Income/Outcome® is marketed through certified facilitators, who then run the games based on a licencing agreement. Andromeda Simulations International Inc. helps the facilitators to customize the game and provide customized game books - if necessary. In the US, Andromeda Simulations International Inc. also facilitate the game and develop new versions/levels of the games when there is a demand for this from a specific situation or organization.

2.3 Case 3: Relation Technologies

Relation Technologies is a game developer with main focus on marketing their games (or concepts as they call them): through a close partnership with consultancies and facilitators, who uses the games as part of their own business. This means that, in opposition to most of the other cases, *Relation Technologies* do almost no consultancy work for clients – unless it is specifically asked for. Instead, they always point to one of their partnering consultancies to provide the facilitation and implementation of the games.
Relation Technologies' portfolio holds 3 games: *Changesetter*, *6 Styles* and *PublicProfessional*. There are different ways of customizing and redesigning the games according to the specific organization it has to be used in. Typically, this is done by the external consultant or facilitator (because the games/concepts are made in such a way that this is possible). For more comprehensive changes or new game designs, it happens in collaboration between *Relational Technologies*, the external consultancy/facilitator and the organization for which it should be used.
Almost all Relational Technologies games (concepts) are sold through licence agreements to external facilitators/consultants.

2.4. Case 4: Gametools

Gametools is a game developer with partly focus designing new games and partly focus on marketing their off-the-shelf games. Initially, the company strategy was to develop and market off-the-shelf games only, however, presently, they do both. They have a portfolio of 7 off-the-shelf games including games like: *Co-creator*, *Wavemaker* and *ChangeNavigator*.
Gametools' products are sold partly to the private sector and the public sector. Gametools either sell their products directly to organizations (private or public) or through consultancies/course providers (incl. universities and other learning institutions)
To private and public organizations, this developer either help designing new games within a special field of competence or they educate internal facilitators in some of their off-the-shelf games and create a licence agreement – in some cases, they also provide a one-time use of the game with a facilitator included.
To consultancies/course providers, they offer certification in their games and typically create a licence agreement.

2.5 Case 5: Lego (Serious Play)

LEGO® SERIOUS PLAY® is a spin-off from the Lego Company. The initial idea for the learning tool was created by Kjeld Kirk Kristiansen (owner of Lego and grandchild of its founder) and the two professors; Bart Victor and Johan Roos, and this idea is based on some of the organizational challenges within the LEGO® Company itself. However, soon after its initial prototypes and test, it proved to have relevance for many other organizations.
In its seven-year lifetime, LEGO® SERIOUS PLAY®has been influenced and re-developed by a number of people and it has undergone a series of changes and modifications. In its first version, it was a learning tool with two specific applications, which was licenced to a small number of external consultancies, who facilitated LEGO® SERIOUS PLAY®. Later on, it was developed into a method that included a number of different applications and different ways of using LEGO® SERIOUS PLAY® – along with a new licencing setup. Today, LEGO® SERIOUS PLAY® is an open-source method or learning tool. The 'Lego bricks' used in the learning tool - is sold by the LEGO®

Company and it is possible to get a facilitator certificate through a few external (former internal) LEGO® SERIOUS PLAY® co-developers.

3. Analysis and findings

For the analysis of the interviews an analysis template was used. The codes in the template was initially guided by the research question and the purpose of the study, and then changed during the coding process as more insights unfolded. The template is reviewed in the figure below:

Codes
Initial idea/business opportunity
Driver/motivation for game
Market analysis
Interaction with costumers
Costumer relationship
Value proposition
Sales channels
Revenue streams
Game development
Game narrative
Game facilitation
Game changes/versions
Key activities

Figure 4. Codes used in the analysis of the interviews

Based on the coding process a number of themes emerged. The themes represent only initial indications in regards to the research questions. As reviewed above the study is only based on five cases and hence the themes must be seen in the light of this limitation.

3.1 Direct contact to market as initial driver and motivation for the game

When looking across the five different game or learning tool developers, it appears that the initial driver and motivation for creating the games comes from a direct demand or interaction with the game's (or tool's) costumers. The game developers are in all five cases either researchers or consultants, who are in direct interaction or contact with the organizations the game is developed for. This gives them thorough insights into the organization's challenges and limitations, and it is these insights along with the developers' specialist knowledge that are used as a basis of the first prototype or rough version of the game.
In some cases, the game or tool is directly demanded from the organization (the costumer), other times the games is introduced by its developer as a way of making researcher's or consultant's specialist knowledge experiential or training-based. However, in all five cases presented in this study, the initial development of the games are characterized by a very agile process, where the game is constantly aligned with the challenges, the aim, the resources of the 'case company' and in most of the cases. Further the game development is managed in small development cycles, where a rough prototype of the game is made (i.e. out of cardboard, wood etc.) and then tested a number of times by the 'case company'.

3.2 Narrative elements based on close interaction with the costumer

The close interactions with the costumer of the game may also be the reason why all of the games or learning tools investigated in this paper hold some kind of narrative element. Most of the games start of with a specific or general case description that either tells the story of the specific organization's status and challenges or, as in the example of Income/Outcome, where there is a general case description of how the game players have inherited a large amount of money from their uncle, based on which they can start their own company.
The narrative elements can also come in the form of embedded narrative information. I.e. Gametools designed a game specifically for a museum where children are challenged to solve a mystery by

connecting different stories (provided to them by 'possessed' and talkative objects in the museum, that they are able to see via an iPad).
The narrative elements can also be in the form of providing resources for emergent narratives. Here Lego Serious Play is good example: it enable its players to generate metaphors and share personal narratives via the creation of i.e. of how they see a given challenge, situation or project.

3.3 From specific to generic versions and back

In the prototype phase of the games development, it is still the close interactions (or consultant/client relationship) with one or more organizations that drives the further development of the game/tool forward. In most of the cases, it is the incoming 'orders' that create the financial basis for driving the development of the games.
In all the cases, the games development can almost be described as a pendulum swinging from development of client specific game versions to the development of more generic games versions, which again can be customized or redesigned to different clients.

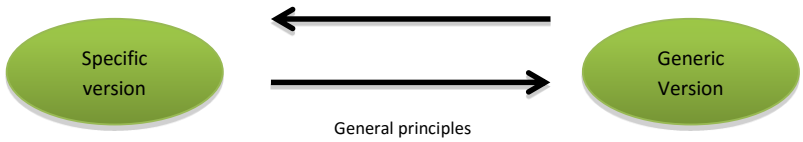

Figure 5. From specific to generic version and back

Typically, the first version of the game is very specific to the organization it is developed to, and from this very specific version, a number of general principles are taken out and put into a generic version, which again can be used as a starting point for developing a new specific game to another organization/client. This again leads to a second specific version. Sometimes, the second specific version provides changes or alterations to the generic version; sometimes, it provides a second generic level or version of the game. This process continues until the game reaches some kind of maturity.
The game and learning tool developers use different ways of describing the development from a generic to a specific game – as well as the design of new games—, but basically, the development are handled in four different ways. 1) Some kind of adjustment of the case (which the game is build around), so it fits the organization or client. 2) Changes either to the theoretical perspectives that drives the underlying logic of the game, the graphic design of the game (i.e. according to the organizations or clients own visual identity) or some kind of adjustments to fit the specific organization, group of players etc. or 3) A whole new game based on existing game principles and last but not least 4) A whole new game based on new game principles.

3.4 The business models influence on the serious games' development

Parallel with the development of the games of this study, runs the development of the games' business model, which, at some point, needs to prove that the game can be turned into viable business. As explained above, most of the game developers did not start of as game developers, but rather the games becomes part either of their consultancy portfolio or an exit from a position in academia or in the private sector into their own consultancy or game development company.
Making a business out of a analogue serious game or learning tool have in all the cases described in this paper proven to be a challenge. First of all, it can be a struggle to identify and convince organizations to use the games (basically because value of the games is hard to describe and much easier to experience). Secondly, the sales process is very time consuming - as one of the interviewees disclosed: *'it typically takes around half a year from the initial contact with the organization/client until the sale is happening'*. And thirdly, the different cases invites to consider that business models and strategies in the game development companies are changed a number of times in the first couple of years, simply to have a cash flow, and, consequently, the long-term viability of a business model is never tested.

In terms of business strategy, the game developers reviewed in this study, have at some point all been faced with the decision of identifying themselves either as a consultancy or a product company. Some of them may even have changed their decision on this topic a number of times and some of them try to handle both.
In the cases where the game developers identify themselves as a consultancy, the development and facilitation of games becomes part of the consultancy's offering. Typically, this means that the development of the games will be more targeted towards the specific clients and almost all the games sold will either be customized or tailor-made or end up with the development of new specific games. It also means a large part of the incomes derives from the game development itself along with the certification of internal game-facilitators and other consultancy functions. Second to this comes a lower income based on the licence agreements. The advantage in this business model is that the game in itself is part of a larger offering provided to the client – with a potential higher revenue than the game in itself can create. Finally comes a relatively high control with the games development and use (quality management).
The disadvantage of this business model is that it is hard to scale (because the consultancy becomes a bottleneck in terms of developing and offering the game) and personalize the game become limited to large organizations.
In the cases where the game developers identify themselves as a product company, the game itself becomes the offering, which means that either the game must be robust enough to be self-facilitating or the customer of the game changes to consultancies, facilitators or course providers (i.e. learning institutions). For the development of the game, this means a focus on consolidating the generic version of the game. Sometimes, this is done through a thorough test and iteration of the game until it reaches a self-facilitating level or by developing the game according to the needs of its new costumer. In both the case of Relation Technologies and Lego Serious Play, there are examples of how a game is transformed into a concept or a method with different 'building-blocks' that allows the consultancies or facilitators to use the game in different ways according to the costumer. The offering is targeted towards the consultancies, facilitators or course providers, who then makes the game or learning tool part of their offering to the end-user (private or public organizations) and the income is mainly deriving from the licensing agreements with these.
The advantage of this business model is that it is scalable. The network of consultancies and facilitators makes the game available to a large group of end-users. However, the disadvantage is that it takes a long time to make viable, and, the game developer have rather little control with the further development and use of the game because it is always represented through others (quality management). On top of this comes the management of the licensing agreement: in terms of maintaining the customer relationship to the consultancies and facilitators (since the use of the game depends on them) and the development of a feature in the game, that allows the game developer to monitor the number of times the games are used in a low time-consuming way.

4. Conclusion

In the serious game literature attention is either given to the design and development of serious games or to the development of the serious games' business models. In this study, we have explored the interaction and linking between the development of the serious game and the development of the game's business model. The paper investigated the development and business models of 24+ analogue serious games and learning tools in the Danish market. Empirically, the paper is based on close interaction and semi-structured interviews with some of the key serious game developers in Denmark (plus one in the US), some of them with a portfolio of up to ten serious games.
The study indicates that extensive collaboration and insights into their costumers may be one of the key drivers for developing serious games. Further, the paper indicates that the development of the games sometimes are driven by incoming 'orders' and specific needs and wishes from costumers – which again leads to a constant shift in the way the game is developed, going from specific versions of the game (developed with a specific organization's needs and situation in mind) to a generic version of the game (developed for various organizations) and back again. And finally the research indicates that, in the end, the business model behind the game can have a large influence the final version (s) of the game.
The paper is a first exploration of the interaction between the development of serious games and their business models. It to be seen as a starting point for further research and discussions on this topic. At this point it provides only indications, but hopefully it also provides interest in this pragmatic side to serious game development.

References

[1] Michael, D. & Chen, S. (2006) Serious Games: Games that Educate, Train, and Inform. Thomson Course Technology PTR, USA

[2] Prensky M. (2001) Digital game-based learning. New York: McGraw-Hill.

[3] Zyda, M (2005) From Visual Simulation to Virtual Reality to Games. Computer Vol. 38, No. 9, p. 25–32. http://dx.doi.org/10.1109/mc.2005.297

[4] Malone, T.W. (1981) Toward a theory of intrinsically motivating instruction. Cognitive Science,Vol 4, p. 333–369. http://dx.doi.org/10.1207/s15516709cog0504_2

[5] Malone, T.W. (1984) Heuristics for designing enjoyable user interfaces: Lessons from computer games. in: Thomas, J.C. & Schneider, M.L. (eds.) Human Factors in Computer Systems. Ablex, Norwood.

[6] Gee, J.P (2004): Learning by design: games as learning machines. Interactive Educational Multimedia Vol. 8, p. 15–23

[7] Marsh, T.; Nickole, L. Z.; Klopfer, E.; Xuejin, C.; Haas, J. & Osterweil, S. (2011a) Fun and learning: blending design and development dimensions in serious games through narrative and characters. In: Serious Games and Edutainment Applications. Springer, UK, pp. 273-290. http://dx.doi.org/10.1007/978-1-4471-2161-9_14

[8] Marsh, T.; Xuejin, C.; Nickole, L. Z.; Osterweil, S.; Klopfer, E. & Haas, J. (2011b) Fun and learning: the power of narrative. Proceedings of the 6th International Conference on Foundations of Digital Games. FDG 2011 6th International Conference on Foundations of Digital Games, 28 June - 1 July 2011, Bordeaux, France, pp. 23-29. http://dx.doi.org/10.1145/2159365.2159369

[9] Susi, T.; Johannesson, M. & Backlund, P. (2007). Serious Games – An Overview. Report HS-IKI-TR-07-001) p. 4.

[10] Kelly A. E., O'Kelly J. B. (1994) Extending a tradition: teacher designed computer based games. Journal of Computing in Childhood Education, Vol. 5, No. 2, p. 153–166.

[11] Oyen, A. & Bebko, J. M. (1996). The effects of computer games and lesson contexts on children's memonic strategies. Journal of Experimental Child Psychology, Vol. 62, p. 173–189. http://dx.doi.org/10.1006/jecp.1996.0027

[12] Dempsey, J.V.; Haynes, L.L.; Lucassen BA and Casey, M. S. (2002). Forty simple computer games and what they could mean to educators. Simulation and Gaming, Vol. 33, No. 2, p. 157–168. http://dx.doi.org/10.1177/1046878102332003

[13] Mitchell A. (2003) Exploring the potential of a games-oriented implementation for m-portal. Paper presented to the MLEARN 2003 Conference – Learning With Mobile Devices, 19–20 May 2003, London.

[14] Van der Spek E. D. (2012) Towards designing for competence and engagement in Serious Games. in Ma M.; Oliveira M. F.; Hauge J. B.; Duin H. & Thoben K. (eds.) Serious Games Development and Applications, Springer, p. 98-109 http://dx.doi.org/10.1007/978-3-642-33687-4_8

[15] Sweetser, P. & Wyeth, P.(2005) GameFlow: A Model for Evaluating Player Enjoyment in Games. Computers in Entertainment Vol. 3, p. 1–24 http://dx.doi.org/10.1145/1077246.1077253

[16] Simons J (2006) Narrative, Games and Theory Game Studies. The international journal of computer game research. Vol. 7, No. 1.

[17] Adams, E. (1999) Three Problems For Interactive Storytelters. Gamasutra December 29, 1999

[18] Juul, J. (1998) A Clash Between Games and Narrative, Paper Presented at the Digital Arts and Culture Conference, Bergen, November 1998.

[19] Jenkins, H. (2003) Game Design as Narrative Architecture, in Harrigan P. & Wardrip-Fruin, N. (eds.) First Person: New Media as Story, Performance, and Game MIT Press, Cambridge.

[20] Reeve, C. (2009); Narrative-based Serious Games in Petrovic, O. & Brand, A. (eds.) Serious Games on the move, p. 73-89, Springer, London. http://dx.doi.org/10.1007/978-3-211-09418-1_5

[21] Jenkins, H. (2003) Game Design as Narrative Architecture, in Harrigan P. & Wardrip-Fruin, N. (eds.) First Person: New Media as Story, Performance, and Game MIT Press, Cambridge.

[22] Bergeron, B. (2006) Developing Serious Games, Charles Rivers Media, Massachusetts

[23] Schell, J. (2008) The art of game design, Elsevier, Burlington.