



**Österreichisches Forschungsinstitut für /
Austrian Research Institute for /
Artificial Intelligence**

TR-2014-05

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**Design Pattern Canvas: Towards
Co-Creation of Unified Serious Game Design
Patterns**

- Freyung 6/6 • A-1010 Vienna • Austria •
- Phone: +43-1-5336112 •
- <mailto:sec@ofai.at> •
- <http://www.ofai.at/> •



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The Austrian Research Institute for Artificial Intelligence is supported by the Austrian Federal Ministry for Science and Research and the Austrian Federal Ministry for Transport, Innovation and Technology.

Citation: Gregor Öavcer, Simon Mayr, Paolo Petta: Design Pattern Canvas: Towards Co-Creation of Unified Serious Game Design Patterns, to appear in: Camilleri V., Dingli A., Montebello M. (eds.) Proceedings of the Sixth International Conference on Virtual Worlds and Games for Serious Applications: VS-Games 2014, September 9-12, 2014, Malta, EU.

Design Pattern Canvas: Towards Co-Creation of Unified Serious Game Design Patterns

Gregor Žavcer

MEi:CogSci, University of Vienna
Vienna, Austria (EU)
gregor@plur.si

Simon Mayr

ISGINnovations GmbH
Vienna, Austria (EU)
Simon.Mayr@ISGINnovations.com

Paolo Petta

Austrian Research Institute for AI
Vienna, Austria (EU)
Paolo.Petta@OFAI.at

Abstract— We introduce the Design Pattern Canvas, a visual tool for alignment and decomposition of game designer activities.

Keywords—*design methodology, design patterns, serious games, co-creation*

I. INTRODUCTION

Serious games design faces challenges of creating an engaging gameplay, which can be argued to be of importance for purpose outcome, as perhaps a key reason to use serious games is their alleged motivational appeal [1, pp.2,13]. Therefore, to address the issue of creating engaging serious games, best practices in game design should be considered. However, a major issue and limitation in game design is the lack of a shared design vocabulary and toolbox containing both broad application solutions and solutions specific to specific game genres [2, p.10]. An approach that seems to be a promising field of research and a suitable solution for people involved in serious game design is pattern design [3, p.17].

II. GAME DESIGN PATTERNS FOR SERIOUS GAMES

A. What Are Game Design Patterns?

A *design pattern* is often defined as a general reusable solution to a commonly occurring problem after it has been successfully applied in specific contexts in response to specific design problems [4, p.5]. The pattern description itself is just a summary of causes and effects, describing one way to reach a given objective [5]. It is important to note that unlike earlier uses of patterns, Bjork et al. argue that not all aspects of design can or should be seen as solving problems, especially in a creative activity such as game design [6, p.5].

B. Why Use Patterns for Serious Games Design?

In summary, game design patterns are relevant for problem-solving during development, idea generation, as creative design tool and to communicate with peers and with other professions [7, p.3]. Analysis, categorization of games, and support for exploration of new mediums and platforms are also listed [6, p.8], and the usability and advantages of design patterns have also been recognized in the serious games community [3, 4], where currently each project is more a new challenge than the re-use of established and well-grounded procedures, and lack of such procedures slows down production and likely has a negative impact on the quality of the products [3, p.2]. Patterns

help to better understand features that make play engaging and motivating, this e.g. helps maximize patients' intrinsic motivation and smooth out the medical aspect of therapeutic games, consequently making a serious game more effective for treatment or therapy [8, p.5]. Analysis and insights into games and design problems from using design patterns are especially important in *experimental game design*, where the goal is to push the limits of existing games and genres [7, p.12]. As patterns are a formal means of documentation [5], we can finally argue that they are key enablers for *structured* research in the serious game domain.

C. Criticism of Patterns

Most criticism of design patterns, such as considering them a fad and either too formal or not formal enough, comes from other fields, but can be also applied to game design patterns [7, p.4]. Still, these objections do not really criticize the notion of patterns, but rather the quality of their current conceptualization, use, and unspecified level of analysis they address; also, game design patterns are only useful as long they can be used and applied with reasonable effort to support development of a game or solve particular design problems [7, p. 2].

III. DESIGN PATTERN CANVAS

A. Related Work

The following proposal is also inspired by previous efforts [6, 8, 9]. Furthermore, as design patterns are used in several other fields, we should not shy away from looking for best practices outside of game design. In this regard, a very successful tool is the so-called Business Model Canvas (BMC) introduced by Alexander Osterwalder [10].

B. Considerations

In general, designers want standardized tools and techniques that do not sacrifice the freedom and creativity inherent to their craft and allow them to build experimental prototypes directly from the definition of a set of game characteristics [2, p.10]. In order to be useful for game designers and other stakeholders, the canvas should be:

- Intuitive and familiar
- Easy to update and enabling iterations
- Not time consuming to create
- Short (preferably fit on a single page)

- Using a widely shared design language
- Facilitating knowledge sharing and transfer
- A tool to build experimental prototypes directly from the definition of a set of game characteristics
- Standardized
- Considering the perspectives of designer and player

C. Serious Games Design Pattern Canvas – Alpha Proposal

The serious games Design Pattern Canvas (DPC) (Fig.1) is a visual chart with elements describing a pattern's purpose, mechanics, audience, consequences, collected data, related research, and ethical considerations. DPC helps break larger game design problems into smaller pieces and assist in a bottom up approach to designing serious games.

Tagged descriptions in the DPC are not meant to hold *all* necessary information; they should be complemented with underlying detailed descriptions and visual representations (diagrams). The chart can be looked at from the center, where the left side is aimed at design questions (“*serious*” part) and the right side is dedicated to interaction design (“*game*” part). To improve the usability and experience of using the tool, ideally the DCP would be implemented as an application, e.g., on a tablet computer.

IV. DISCUSSION

The proposed DPC is in its initial stage and many questions remain to be addressed throughout the development of the DCP and the underlying tools. As serious games have serious purposes, evaluation and validation are major issues to be addressed with scientific care.

ACKNOWLEDGMENT

OFAI is supported by the Austrian Federal Ministry for Transport, Innovation, and Technology.

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| Serious Game Design Pattern Canvas | | Name | | |
|---|--|---|--|---|
| Related Research, References <i>Has the pattern been used in any previous research or serious game? Has the pattern been evaluated and validated? A section dedicated to validation according to the scientific method.</i> | Using the Pattern, Related Patterns <i>When is it appropriate to use the pattern? How does the pattern fit the bigger picture?</i> | Purpose <i>Why should we use the pattern? For serious games purpose can be defined as message-broadcasting, training or data exchange [9] - should be more specific for patterns.</i> | Mechanics, Task, Gameplay, Rules <i>Rules, input methods, Space/Time/Drama-related setup. Challenge and variability should be also considered.</i> | Scope, Users, Stakeholders <i>Who is our user? What are they like? What are their motivations? The typical use of personas can be implemented here.</i> |
| | Key Data <i>What data do we gather? Do players generate research data?</i> | | Media, Biofeedback, Channels <i>What channels does the pattern use? Which device? Is there any biofeedback?</i> | |
| Ethics <i>Are there any ethical concerns? Are there any negative effects in particular for serious game scenarios? How is privacy handled?</i> | | Desired Outcomes, Consequences <i>This section should give emphasis on interaction results as initially proposed in the game design pattern template by Björk et al. [6].</i> | | |

Fig. 1: Serious Games Design Pattern Canvas (alpha proposal). inspired by the Business Model Canvas [10]