Changing Faces of Game Innovation
Changing Faces of Game Innovation
GaIn and GIIP Research Project Report

Edited by Annakaisa Kultima and Kati Alha
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HI!
INTRODUCTION: CHANGING FACES OF GAME INNOVATION

This book is a collection of research and concept papers developed as a result of the Games and Innovation (GaIn) and Games Industry Innovation Processes (GIIP) research projects. The GaIn research project (January 2009—March 2011) was designed to study game industry design, innovation practices, and playful innovation. Understanding creativity as a domain-specific phenomenon, the objective for GaIn was to map the domain of game design as an organic practice with specific formal restrictions in order to create methodologies and tools for generating, refining, evaluating, and managing game ideas in a systematic manner. The GIIP project (March 2010—March 2011) studied the innovation processes of Finnish game companies and supplemented the research goals of GaIn. These two projects have provided answers to many of our initial research questions, as well as initiated several new directions for future research.

The GaIn project was a part of the Transformations of Digital Play (TDP) project, headed by professor Frans Mäyrä. Both the GaIn and GIIP projects were funded by the Finnish Funding Agency for Technology and Innovation, University of Tampere, University of Jyväskylä, and the following industry partners: Nokia, Veikkaus (Finnish National Lottery), Digital Chocolate, Ixonos, Universomo, Mr. Goodliving/RealNetworks, Kuuasema, Moido Games, IGLOS, and Sauma Technologies. The projects were coordinated by the Game Research Lab at the University of Tampere. The GaIn and GIIP research teams consisted of: Annakaisa Kultima, Jussi Kuittinen, Timo Nummenmaa, Kati Alha, Juha Köönikkä, Juho Karvinen, Tuuli Saarinen, and Tanja Sihvonen.

The project was divided into several different mini-studies, where rich data was gathered by combining traditional and experimental research methodologies. We conducted several interview studies and surveys, utilized drawing exercises and protocol study approaches, wrote literature reviews, organized game design workshops and events such as game jams, and engaged in our own design processes (see Figure 1). The results presented here are a valuable contribution to game design theory, and provide our commentary on the topics of idea generation, innovation, design, and management within the game industry. An especially important part of the project has been to provide concepts and prototypes of tools, which contribute to the present design practices. In this way, the results of the projects are popularized efficiently, as well as put to the test by industry professionals.

Despite the decades of ongoing evolution within the game industry, the processes, views, and tools toward innovation are still changing. In a general way, the results of the present project seem to tie in one way or another to the concept of change. As a hybrid of engineering and arts, the game industry seems to be essentially coupled with constant change, whether it is change within one project and game concept, change in personnel and company structures, change in production models and tools or business models, contents, platforms, and consumer base—the systematization and standardization of the processes face the challenge of change.
The current state of innovation within the game industry

At the beginning of this project, an interview study of industry professionals’ opinions about innovation was conducted by interviewing speakers at three of the major industry conferences in 2009. That study indicates an interesting division of opinions within the industry. Even though the industry is seemingly maturing and more systematic and instrumentalist views toward innovation are increasing, artistic and pessimistic views are also present. It is evident that the game industry is still rather personal, and as it evolves simultaneously in essentially different directions, the innovation perspectives of the industry players seem to vary accordingly.
The current state of game design theory

The state of game design theory needs more perspectives. We studied the formalization of game design for this project; our focus was on the functional nature of game design and understanding the associated cognitive processes. The literature on game design heavily emphasizes understanding the games’ properties and particular design principles in particular, leaving the design activity itself less clearly defined. By examining game design more comprehensively, and by taking into account the activity, cognitive processes, and environmental factors associated with design processes, we have found it possible to develop suitable tools to support game design. To this end, we formed models and tested them on a practical level.

Game idea management

Tools for idea management represented one of the key study foci of the GaIn project, as our previous research indicated that recording ideas is a special challenge for game designers. The GaIn project study mapped out the use of idea management systems within Finnish game companies and also reviewed the features of systems that were available on the market. In both cases, the approaches seem to vary substantially as sophisticated and well-developed tools are hard to find. In general, idea management tools seem to be an area in desperate need of innovation.

Based on the reviews and our research workshops, the iDelar concept was born. The focus of iDelar is to change the use of idea systems from mere idea recording into full-fledged idea management, and to support the use of pieces of recorded ideas.

Design and ideation practices within the game industry

We conducted the second international data collection study as a survey study focusing on practices of generating new ideas, features, and design solutions, as well as the recording and reuse of ideas. A section is included in this text that focuses on attitudes toward innovation, which was in fact a methodological triangulation of the interviews conducted during an earlier study.

Some of the findings support and elaborate on the results of earlier studies, and gave us inspiration for iDelar. The findings about idea recording and reuse were of particular
practical value. For personal practices, pen and paper seem to maintain their popularity, even though digital documents on a computer hard drive, mobile phone, email, or Web services (like Google Docs) are common too. The centralized recording of ideas within companies varies by, for example, the size of the company, the availability of resources, and the volume of ideas at hand. Generally, wikis, email, network drives, and cloud services are most commonly used for recording ideas. Our data showed that recorded ideas are above all used as inspiration, and that only pieces of them are used whereas using whole ideas without modification or removal is an exception.

**FINNISH GAME INNOVATION PROCESSES (GIIP PROJECT)**

To understand the realities of game innovation processes, 24 professionals representing different roles from 7 Finnish game companies were asked to participate in an interview study enhanced with a drawing exercise.

Game development processes have undergone changes throughout the years, an observation that is true of all the participating companies. These processes have been shaped and reshaped to fit to the needs of the product, platform, and publisher, as well as other considerations (e.g., available resources). From an innovation perspective the form of these development processes varies as well. The results of the drawing exercises emphasized the critical role of ideas, people, evaluation, and iteration.

As expected, changes within the product and concept throughout the production line were consistently acknowledged. In almost all of the process depictions, iteration was positioned in one way or another. In fact, it was such a basic part of the development process at every company that it rarely got specific attention in the interviewees’ explanations. A natural extension was the role of agile development approaches: Most of the interviewees mentioned Scrum as one of the development tools. Some of the interviewees followed the Scrum framework more precisely and some only used parts of it.

The lack of standardization brings special challenges to game production. Constantly changing processes make it hard to reinforce shared understanding, and a lack of uniform vocabulary can further lead to misunderstandings and reworked content and code. The challenge is amplified given the issues associated with communicating abstract and dynamic things such as design vision and ideas. Agile development methods can partially solve these problems, but more tools for communicating processes and managing changes are needed.

**DESIGN EXPERIMENT(S): MONSTER CONFIDENCE AND MONSTER THERAPY**

It was also important that the research team immersed itself in the game design process. The role of the resulting design experiments that the team members conducted was threefold: First, personal engagement in design activity brought deeper understanding to the rich data that we had collected within the industry; second, the deeper level of design thinking and sensitive nature of group dynamics were possible for us to investigate; and third, we were able to
do experiments with the concepts. Several design activities were conducted throughout the project.

The main design experiment was recorded with design diaries, and the early stages of design thinking and group dynamics were examined. The concept Monster Confidence was born and later transferred into a Facebook concept, where the purpose was to study the possibilities of data-driven design and simulation tools. The focus of the design experiment was to gain an understanding of the changes that data-driven design and games as services impose on the design process.

**Simulation as a Game Design Tool**

One of the tools that we developed was approached from a formal point of view. The applicability of programmatic simulation to support the early stages of game design was studied. We found that, with simulation, it is possible to examine game properties that are difficult to prototype otherwise. In addition, building and using simulation models at the early stages of the design process supports the functional characteristic of game design, where continuous shifts between different abstraction levels are typical.

**Game Jams and Playful Innovation**

GaIn was also part of the Global Game Jam event held at the end of January 2010. For the GaIn project, we coordinated the first Finnish Game Jam, encouraging collaboration between the Finnish jamming sites: Tampere, Helsinki, and Kajaani. The event created such successful experiences that the collaboration was continued and extended in 2011.

The method of “jamming” is traditionally used in the music industry, where instant production is favored over planning to produce new songs. The same philosophy combined with a time limit is the simple concept behind game jamming. The nature of the event can be turned into a creativity technique that companies can use internally, or as an open innovation concept where new ideas arise from students and hobbyists. In both cases, it is evident that jamming practices can contribute to game design processes; this method of innovation needs more research and development.

We also ran an idea generation experiment at the 2010 and 2011 game jams. The game jam team ideation phase was facilitated with different idea generation techniques and games. The context of a game jam was interesting from the research point of view since it simulates the reality of game production: An idea is built around design constraints and further developed into a playable game. We molded the VNA ideation game into a theme-specific tool and got positive experiences with it: In relative terms, it produced the largest number of interesting ideas that also fit the constraints.

For this project, several playful innovation methods have been developed and tested. We have produced new card games for restriction-based brainstorming and contextual ideation, as well as studied the previously developed game-based tools further. The new concept of IDECARDS is introduced here and brings these findings together.
**FINAL WORDS**

The Galn and GIIP projects created an ensemble of mini-studies that bring together different perspectives on game design and playful innovation. The collective results of these studies illuminates game design practices and give direction to the development of game design theory, which previously focused on design principles and conventions rather than the activity of design itself. As game design processes are in constant change, and because this change is a part of the nature of those processes, our studies of the game industry have a lot to offer to other industries as well. Game industry professionals are the professionals of change in more ways than one.

Even though the projects are finished, the work is not over. Two years is not a long period of time. We continue working with the topics discussed here: For example, some of us are working with our theses on topics related to game design and innovation. The articles presented in this book should be treated as works in progress as some of them will be elaborated further and later published as conference and journal papers.

As game research is still lacking a rigorous body of research of design tools, practices, processes, and activities, we have barely touched the surface here. We encourage other researchers and students of game research to get inspired by our results, just as we encourage game companies to develop their practices further and open up their processes to nosy researchers. Even though most of the papers in this book are work in progress, we wanted to open up the whole project to the outside world. It is a wonderful topic and so much more is there to be found!

*Annakaisa Kultima and Jussi Kuittinen*
**HOW TO READ THIS BOOK**

This book presents the research findings of two research projects: Games and Innovation (GaIn) and Games Industry Innovation Processes (GIIP). Some of the papers collected here were written in collaboration with other projects and researchers.

Each article was written to function as a separate entity. The articles are organized into three thematic sections, and texts vary from extensive theoretical studies to small practical texts of tools designed and tested as part of the GaIn and GIIP projects. This book is not intended to be read from cover to cover; instead, it can be referenced piece by piece as needed. We also provide summary cartoons for each text to provide easier access to the results. The collection of these cartoons is published as a separate booklet to provide a short overview of the whole project.

This book presents a lot of studies that should be considered work in progress. Academic research is not known for its fast pace and the game industry is far from being a good target for slow-motion consideration. Typically the difficulties arise from the popularization process and the need to reflect the relevance of the findings. In order to release as many interesting results and thoughts as possible, we made the decision to include works in progress, concept papers, and think pieces in this book. Some papers have already undergone a more thorough review process and were published as conference papers during the GaIn and GIIP projects. Those papers are summarized here as they are still the results of this very same whole. Under each article title, you will see tags that describe what kind of study the paper presents and whether it is a work in progress, a conference paper, or something else. These tags should, therefore, help you interpret the maturity of the writing.

**Tags:**

**Think Piece**
These texts present thoughts that have emerged from the data drawn from the whole project and in between different data collections, literature, and discussions. These texts might pose interesting hypotheses for further studies.

**Work in Progress**
These texts present the early versions of papers and tentative results of studies, possibly to be developed later into conference papers or other types of publications. These texts have not yet been subjected to the attention of a critical academic audience and might lack a theoretical framework.

**Conference Paper**
These texts are already published elsewhere and are only summarized in this book. The conference papers have undergone review processes that varied
according to the conferences. The most common practices have been peer reviewing, blind review, or board review.

**Concept Paper**
These texts introduce concepts that were formed and designed during the Gain and GIIP projects. The papers might present some theoretical grounding for the concepts, but the main focus is the idea itself.

**Theoretical Framework / Theoretical Study**
These texts introduce theoretical frameworks or other theoretical explorations and may not be reflective of synthesis of any new data. Instead, these texts form their own theoretical frameworks or contribute to existing theories.

**Literature Review**
These texts draw from the discussion of other studies that map out pivotal concepts discussed in several texts in this book.

**Empirical Study / Interview Study / Survey / Content Analysis / Protocol Study**
These texts present the findings of observational studies, interview studies, or other specific data collection activities. Some papers bring together the findings of separate data collection activities.

**Experimental Method / Exploratory Research / Workshop Study**
These texts present the findings and experiences of a case study that used a method that was experimental, unfamiliar to us, or developed specifically for the study. These papers lay the groundwork for future studies.

**Tool / Method**
These texts present tools and methods studied or developed within the project.
SUMMARY CARTOONS WITH WORD CLOUDS

Before each article, there is a cartoon-style summary page. The word cloud in one of the speaking bubbles is actually made from the article itself and represents the contents of the article. The characters came from our game concept Monster Confidence, which was a platform game about an unconfident but cute monster jumping over obstacles. The concept evolved into Monster Therapy, where player can give their monsters random treatments such as yoga or magical pills. As time passes, the monsters become more and more monstrous, indicating the traumas they have had inflicted on them. Perhaps this was a metaphor for all the hard work and hair splitting that we experienced with our studies and projects. We started as beautiful and simple and now we are monstrously many-eyed and complicated—filled with new questions. Perhaps over the coming years we will find ways to drop the excess body parts and become simple again. Academic work is bound to include cycles of complication and simplicity. Studies evolve from simple hypotheses into complex findings that are then tied back to simple theories. There are definitely more body parts and eyes to be found, but hopefully some have merged into one along the way.

Here is the whole team of researchers represented as monsters:

ACKNOWLEDGEMENTS

We would like to thank the Finnish Funding Agency for Technology and Innovation and all the consortium members of the Transformation of Digital Play (TDP) and Games Industry Innovation Processes (GIIP) projects for their support and funding. We also want to thank all the game developers who answered our questionnaires and participated in our interview studies, as well as all the participating companies of Galn and GIIP for providing us the access to dive deeper into the world of game innovation and game design processes. Some of the companies are no longer there, but we thank all the people who worked with us.

For comments, discussions, helping hands, and support we need to thank our dear colleagues at our research group at the Tampere University Game Research Lab.

And a special thanks to our friend Alex Thayer for cleaning up our sloppy Finglisms and giving feedback on the texts.
CHAPTER 1: CHANGE
1. CHANGING PROCESSES: FINNISH GAME INNOVATION PROCESSES

I WAS THINKING...

WHAT IS THE STATUS OF FINNISH GAME INNOVATION PROCESSES? WHAT'S HAPPENING IN THERE?

Well, Finnish game developers, probably like developers everywhere, are working in an environment of constant change. There are so many things happening at such a fast pace that processes might be difficult to maintain. And often people may have completely different ideas on the matter. Despite the different vocabulary they might use, they manage to work it out by maintaining flexibility and concentrating on people and their ideas.

SOUNDS LIKE FUN!

WELL, CHALLENGE CAN BE FUN...

Work in Progress / Interview Study / Experimental Method

Annakaisa Kultima
Juha Köönikkä
Tuuli Saarinen
Juho Karvinen
Kati Alha

ABSTRACT

In this article, we explore the findings of the Games Industry Innovation Processes (GIIP) project. In this study seven Finnish game companies were asked to describe their innovation processes from the point of view of everyday development. From each company three to six interviewees explored their thoughts with the help of a drawing exercise. The results of this study reflect the constitutive instability of the game industry, its relatively young age, and the small size of the companies studied. There is no standardized or stable innovation process and the vocabulary and perspectives used to describe such activities differ among the actors. In its simplest form and from the perspective of everyday development, the core of the game innovation process relies on the ideas that arise from the iterative and collaborative processes of the creative personnel, which include at a minimum a designer, a programmer, and an artist. These processes undergo changes depending on the products, platforms, outside actors, and the people working on the teams.

1. Introduction

The game industry is touted as an innovation-centric industry [26]. The game industry is also characterized by a volatile business environment with constant changes [4]. Over the past five years alone, we have witnessed several major changes that have molded the processes that game companies need to consequently update. For example, the customer base for the industry has been broadening due to the “casual turn” of game culture. As digital environments have become accessible to wider audiences, it is natural that digital games have been also introduced to a more heterogeneous base of users [14].

As a result, the design values and production processes used within the game industry have changed and the variety of game products is broadening as well [14]. In addition, there is a shift from the product paradigm to a service paradigm [22]. Games are becoming more of a service than boxed products sold on store shelves. Innovative new business models, especially the free-to-play model, have also impacted the processes used as well. Designers are facing the challenges of designing the evolution of the game that happens after its launch based on the reactions of the players. Reactions matter because cash flow only comes when the game keeps customers playing. The rise of social media services, such as Facebook, has been one of the changing forces in this process. Games like Farmville that have fifty million monthly users [3] have convinced not only the newcomers, but also the veterans of the game industry to establish their
services within the social media space. Accessibility and easy experiences have also penetrated the mobile markets. The Apple iPhone and App Store, as well as other companies’ touchscreen phones, have revolutionized the way that mobile games are played and made available. Independent developers have gained more attention as digital distribution has given them possibilities to earn a living from the hobby they love. The growth of small companies has been fast and new start-ups are appearing constantly. The turbulence within the industry is not only affecting the small companies: The bigger players are affected by these changes as well.

As the changes within the game industry provide possibilities for new innovations to thrive, they also create instability among existing companies trying to maintain consistent processes. Innovation processes must be flexible enough to react to the merging of new trends and the change of platforms. Even though new ideas are touted as the critical part of innovation processes in general [5], game developers need to emphasize and support creativity not only during the pre-production and idea management phases of a project, but throughout the whole production process. Creativity is a vital part of that process from start to finish. Games are highly challenging targets of design and creativity, as the subjective and experiential nature of game experiences [24] molds the design process.

This challenge is also acknowledged in the literature of game design handbooks. For instance, Salen and Zimmerman talk about game design as “second order design” [21], which means that one cannot directly design the game experience or how the experiences will turn out. Games can only be indirectly designed by designing the game system. Oftentimes the idea is possible to evaluate only after a playable demo is made. Fullerton [7] speaks about the importance of iterative processes and the playtesting of game concepts. It is different to imagine the game than to actually engage in the activity of the game. The whole ecosystem of the gaming experience has to be rethought as the industry changes affect more than the gameplay design: The whole context of the experience must be examined critically [17].

The practice of creating games using innovative processes is not thoroughly studied. Several design books have been written by game professionals to record game design practices [cf. 1, 7], but a rigorous body of academic perspectives on this issue is lacking. The design books look mostly at the target of the design: the games themselves. The practice of making games as a design activity is left unmentioned [13]. However, relevant studies do exist.

For example, from the perspective of management studies, F. Ted Tschang [23, 24, 25, 26, 27] has conducted several studies that are relevant to the investigation of innovation practices. He has written on how game companies balance the complexities of production with the players’ need for new innovations. Our previous studies have dealt with the practice of coming up with new ideas [15], the ways in which such processes could be enhanced [18, 19], and the tools for recording ideas [2, 10]. The inspirations for ideas may come from other forms of media, such as movies and TV shows [9], which is not surprising considering the typical game developer’s interest in pop culture.
games must be new and fresh while staying familiar and attracting a certain audience. Using conventions is, therefore, an essential part of the creative process of making games.

Games are also made with love and passion for the medium. The industry is still rather personal [16] and this phenomenon should be acknowledged as innovation processes are further developed. However, the previous studies that we have conducted have not been able to tackle the statement “it is all in the execution.” The more important part of the game innovation process is the process of making the games come alive. This is not to say that ideas are not important within the game production process: The role of a game idea is to provide a starting point for the design process [15] and fuel for further design decisions. This is why the innovation process and its associated activities cannot be studied separately from the game production process. Thus, the purpose of this study was to examine innovation in the context of the everyday development process.

2. METHOD AND DATA
We wanted to conduct a study that would examine innovation as part of the game production process. Based on previous experience, we did not want to rely solely on interview data because the results of those data can be too abstract and speculative. Yet although ethnographical methods would better suit this kind of examination [cf. 26], such methods were not possible with our resources. Our project timeframe provided us only two separate two-week observation periods of two of the companies to provide background material for this study and for the Games and Innovation (GaIn) project analysis.

During spring and summer 2010, 7 Finnish game companies were examined with a mixed methods approach. The basis for the study was thematic, semi-structured interviews with 1-2 interviewers at a time. We mixed the interviews with a drawing exercise. The participants were forming a tangible picture while they were interviewed on topics related to innovation processes. This approach allowed us to gather rich data on the practice of game innovation without having to witness several production processes from the beginning to the end using first-hand observation.

We interviewed 3 to 6 people from 7 different Finnish game companies. In total, 24 interviewees represented different roles in the production process: hands-on (game designer, junior game designer, artist, and writer), mid-level (senior game designer, producer, lead graphic artist, lead programmer, team leader, project manager, and community manager) and top-level (CEO, creative director, VP of technology, artistic director, and art director). In the bigger companies the levels were further apart from each other, while in the smaller companies the teams were working with each other on a daily basis. This structure is common within the industry, as titles and roles are not fixed within the game industry and are usually company specific [7].

The Finnish game companies selected for this study varied in size, age, and domain of design. The variables can be seen in Table 1.
Table 1. The scale of the companies according to the size, age and developmental experience.

<table>
<thead>
<tr>
<th>THE COMPANIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of companies</td>
</tr>
<tr>
<td>7</td>
</tr>
</tbody>
</table>

In general, we had a good selection of companies and their innovation practices. The background of the interviewees varied mostly on the level of the experience within the industry, with less variance among other factors such as education and age (Table 2). All the interviewees were male.

Table 2. The background of the interviewees.

<table>
<thead>
<tr>
<th>THE INTERVIEWEES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education</th>
<th>High School</th>
<th>Polytechnic</th>
<th>University</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>13 %</td>
<td>17 %</td>
<td>71 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Experience</th>
<th>less than 3 years</th>
<th>3 to 5 years</th>
<th>6 to 10 years</th>
<th>10 or more years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8 %</td>
<td>29 %</td>
<td>50 %</td>
<td>13 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Role</th>
<th>director</th>
<th>producer/project manager</th>
<th>Designer</th>
<th>programmer</th>
<th>artist</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>33 %</td>
<td>13 %</td>
<td>17 %</td>
<td>13 %</td>
<td>25 %</td>
</tr>
</tbody>
</table>

The interviews were enhanced with a drawing exercise with an initial word set that the interviewees could use to get inspired. The initial word set was formed based on the game design and innovation literature and selected game-related publications [cf. 6, 8, 21, 24, 26]. The words were chosen to represent the most basic components used during the game development process.

We ran an evaluation workshop (see Figure 1) with a handful of game professionals and researchers to iterate the form of the method. In the workshop we used three different variations to this approach and based the final research tool for the feedback and observation at the workshop. The word set was purposefully quite large to prevent the drawing session from becoming an organizing exercise (see Figure 2). We wanted to prevent screening of the whole word set so that the tool would provide a common ground but encourage the interviewees to use their own words. The pen-and-paper (see Figure 3) variation was not successful in the testing workshop because of the difficulties of interpreting the composed, complex picture. We noticed that the large set of words overwhelmed the informants and we paid specific attention to how we grounded and directed the whole exercise.
Figure 1. Testing the different variants of the research tool.

Figure 2. Test interviewees organizing the word sets.
Figure 3. The pen and paper approach resulted in uneasy and complicated picture.

The set of words was accumulated during the interviews, but the amount of words was kept approximately the same from one session to another. If there was time between the interviews, the word set was stripped down to its approximate original set. Sometimes the sessions were so tightly scheduled that this was not possible.

The set of words was purposefully hand drawn to lower the threshold of the interviewees to add new words to the set. The interviewers asked if they could assist with drawing a new word if a suitable word was not found fast enough. In the end, the initial word set worked as an inspiration and as a starting point for the discussion and picture forming activity, and many words were added during the interview sessions. Naturally some words were overlapping and some words were used in only one or two interviews.

Table 3. The numbers of the words used in the exercise.

<table>
<thead>
<tr>
<th>THE NUMBER OF USED WORDS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All used words</td>
<td>632</td>
</tr>
<tr>
<td>All used unique words</td>
<td>278</td>
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<tr>
<td>Initial word set</td>
<td>134</td>
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<tr>
<td>Unused initial words</td>
<td>42</td>
</tr>
<tr>
<td>Used initial words</td>
<td>92</td>
</tr>
<tr>
<td>Added unique words</td>
<td>191</td>
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</table>
In total there were over 600 words used (see Table 3), with almost 300 unique words. The initial word set was only 134 words, from which 42 words were not used at all. At the end, the amount of added words was 191. Thus, the process was successful as most of the words in the pictures were added by the interviewees themselves.

The sessions were audio and video recorded, and the final state of the pictures were also photographed. The interviews were later transcribed into text and the pictures were clarified (see Figure 4 below) by redrawing them with drawing software and adding elements, arrows, and texts to them with the help of the video material.

![Figure 4. An example picture of a model formed by an interviewee (A), which was then digitalized (B) and supplemented (C) by the researchers.](image)

Our methods provided us rich data to analyze. There were at least three different levels of data representations for the analysis: 1) the pictures produced by the interviewees (the innovation process models), 2) audio material (discussions during the drawing exercise), and 3) video material (sometimes the interviewees were pointing at the pictures and explaining the complexities that were not possible to capture by drawing).

We based our analysis on the grounded theory approach and content analysis. Whereas the pictures provided us a concrete reference for comparison, the discussions provided a possibility for the triangulation of the data. This means that the different levels of the data have always been interpreted in light of the entire data set. However, the lack of previous research has forced us to rely on relatively shallow interpretations. The main purpose of the study has been to provide an outside view for the benefit of the companies. On the academic level, this analysis could be further elaborated by using related theories and studies from the areas of management studies, creativity research, social psychology, and design research, to name just a few relevant areas.

In the remainder of this paper, we discuss our general findings. In general, the most interesting findings of this study refer to the common ground of the game developers, the philosophies behind the models of the innovation processes, the special role of iteration in game design, the commonalities in the processes, challenges within the processes, and the context of process changes. Certain
issues arose in most of the companies, giving a more general overview of the status of game productions.

3. SHARED VOCABULARY

One of the levels of the data was the formed pictures and the words that the interviewees selected to describe the process. As already described, the method was built so that the initial word set would not turn out to be an organizing exercise. There were simply too many words for that, and the interviewees had to start forming their own words, the ones that they hopefully would use in the actual development process as well. The initial word set acted as a guide to understand what the exercise was about but did not give a concrete direction of what the picture would be. In this way we were able to get data that could be relatively easy to compare. We compared the formed vocabulary of the pictures within the companies to see how much common ground the pictures represented.

Interestingly and yet not surprisingly, the need for explicating the process was present in all of the companies. The common understanding of the process and its details is not completely shared within any level of activity if we look at the level of specific words that were used. Overall, the amount of shared vocabulary among companies was surprisingly low.

Common vocabulary is still found, but in some cases the meanings of the words do not match. This adds up to possible misunderstandings, which were reported in the interviews as well. The developmental process and the collaborative nature of creative work already create communication challenges, which is somewhat corrected by game-related education becoming standardized and, thus, securing its place as a criterion for game companies’ recruiting processes.

There were some companies that had developed jargon used only in that company. This is understandable from the point of view of the informal nature of game development processes and the differences among products and their environments. Within a small group, processes are easy to share without formalizing or establishing a standard vocabulary. However, it can be a challenge when hiring and onboarding new personnel. The more vocabulary that is shared among the whole industry, the easier it is to hire talent from other companies or directly from school. On the other hand, variations in vocabulary support the organic nature of development processes and allows greater flexibility within those processes.

Common ground and shared vocabulary

The analysis was conducted by listing the unique words in the final pictures and comparing them on the level of the companies and individuals. The interpretations were done with the support of the discussions during the drawing exercise. However, this is an experimental analysis that should be interpreted with caution. In addition to the complexities of comparing the word counts between the companies, one of the companies had more interviewees than the others and we were not able to
mathematically bring them to a comparable level. Even though the interviewees were from different levels and positions, the results of shared words would naturally change if different combinations of individuals would have been interviewed. The level of shared understanding may differ between members based on their background, how long they have been working together, and in what ways. Also, extrapolating the comparison of a small sample might not be representative of the whole company. However, it seems the differences between companies were not significant and the shared vocabulary does seem to represent the companies. To verify this approach, a bigger sample would have to be collected. These results may give an instrument to discuss the common ground and shared understanding of innovation processes. The views formed here are best analyzed within the companies themselves. Conversely, the analysis brings about an interesting hypothesis of game innovation processes in general, which will be discussed later.

**Shared words among individuals**

The shared words among all individuals (see Table 4) in this study seem to draw a common-sense picture of the game innovation process. In the top three, there are the three main actors of innovation processes in game development: designer, programmer, and artist, accompanied with an idea. Not far behind come producer and publisher, representing development in the modern era. The only word related to creativity is brainstorming, and the words related to the communication of a specific vision are few: design document, demo, concept art, and mock-up. Iteration is also referred indirectly with feedback, QA, review, Scrum, green light, and alpha. The set of words is a mixture of newly-emerged vocabulary (e.g., Scrum) and words that reflect the established yet nowadays occasionally disputed elements in development processes (e.g., demo and design document).

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<th>Word</th>
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<td>37,5</td>
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<td>alpha (6)</td>
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Table 4. The shared words across all interviewees.
Social dynamics of shared words
Creative processes are often presented as person-centric. Even though putting together a modern digital game is a highly collaborative process, it is typical to highlight the talents and individual people behind the processes. Sometimes this is because it gets easier for game media to open up the process behind the product. It can be also part of the publicity plan for the game company itself. Putting a face for the product creates more tangible targets for the fans to show their devotion. However, this is not a completely fabricated picture. For instance Tschang [27] has examined the creative processes of game design teams and has divided this kind of person centralism into two poles: a dominant creator vs. the cabal model. In the former, the vision is directed solely by one talented and respected individual, while in the latter the vision is shared and governed by the team. The two poles represent the radical ends of innovation strategies and most companies fall somewhere in between [27].

Our data support this view. In most cases, the interviewees expressed that “the idea can come from anywhere or from anyone.” But since the initial spark of an idea is not the most important factor in game innovation processes, this statement does not tell the whole picture. Based on analysing the discussions during the drawing exercise, we tracked three companies that indicated a strong creator or a person who was central to the innovation process. As we looked into the shared vocabulary of the company and compared sharing on the individual level, we found that all of these cases seemed to be different.

For instance, the atmosphere was described differently in every case. In two of the companies the centrality of the person was perhaps not seen as negative, but not praised either. In the third company the situation was seen mostly in a positive light. Table 5 reflects this finding.

Table 5. The different kinds of person centralism. C indicates the central person, I and II the other two interviewees.

<table>
<thead>
<tr>
<th>A) Center as an island</th>
<th>B) Center as a demiurge</th>
<th>C) Center as an orchestrator</th>
</tr>
</thead>
<tbody>
<tr>
<td>C+I</td>
<td>I+II</td>
<td>C+II</td>
</tr>
<tr>
<td>0 %</td>
<td>15 %</td>
<td>9 %</td>
</tr>
</tbody>
</table>

In all of the cases, centrality was instantiated differently, which creates possibilities to make interesting hypothesis of archetypes. In the first case (A in Table 5) the person in the center shares relatively little with the rest of the two, 9 % with the other and 0 % with the other. The centrality of this person could be thought of as an “island,” where the others around this person follow him or her. In the next case (B), the central person is sharing the vocabulary quite evenly with the rest, even though there might be slightly more in common in the pictures of the rest of the two. The center could be called a “demiurge” that gets the processes going and maintains them by sharing his or her views on how the process should proceed. The last case (C) is almost the opposite of the first
In summary, it is evident that the amount of shared vocabulary is relatively low among companies. The differences between the pictures may reflect the level and scope of common ground, as well as reveal something about the social dynamics at each company. With the help of the pictures, there is a possibility to establish more commonalities across all of the jargon used and, thus, help communicate the process throughout the company. The words will most probably never be shared by all, but the common ground can be expanded and strengthened.

4. INNOVATION PHILOSOPHIES

Counting the amount of shared words is a rather superficial method without deeper semiotic analysis; therefore, we looked at the emphasis of certain word groups in the pictures to highlight the differences in the processes. In this case, we were mostly interested in the composition of the whole process: What were the most dominant factors in the processes and how they were emphasized in different pictures?

Our initial hypothesis was that the data would include statements on the importance of the ideas, their selection processes, the right kind of atmosphere or other human factors, user studies, user inclusion and other R&D practices, as well as an emphasis of iteration, prototyping, and experimentation. Centrally, the topics were concentrated around four different emphases. The cumulated topics were the importance of the personnel, the importance of the ideas, the importance of the selection process, and the iterative practice of making games. Other views were weakly highlighted.

We call the emphasis of certain aspects during the innovation process as an innovation philosophy. This is the set of beliefs behind the process, or what is thought of as central, critical, or important to innovation itself. As these might not necessarily be hand in hand with the intentional emphasis on production, we do not call them an innovation strategy, even though the strategy might be synchronized with the proposed innovation philosophy. With our data, it became evident that the principles that guide the innovation process are not very complex in practice. The overall view could be formulated as follows: Game innovation is the process where the game ideas are carried, selected, and iterated by the creative people.

Based on the data, we formulated four different philosophies:

1) Idea-centric innovation philosophy reflects the belief that ideas are central to innovation: The original idea is the key to an innovative end product. The core idea may be modified during the development, but it always exists and guides the development process.
2) Human-centric innovation philosophy reflects the belief that people and human resources are central to innovation: Being able to generate innovative products is about having the right people do the right things. Recruiting and management are important.

3) Evaluation-centric innovation philosophy reflects the belief that evaluation and selection processes are central to innovation: There are always more than enough ideas. What is essential is the skill to pick the right ones to produce. Evaluation is present throughout the development process and unsatisfactory features are cut. Evaluation is often done both internally and externally, for instance by the publisher.

4) Iteration-centric innovation philosophy reflects the belief that iteration and flexibility are central to innovation: What matters is the execution. While one cannot know beforehand how the idea works in practice, it is important to keep iterating and testing different solutions, allowing the product to change its direction flexibly.

Even though these views should be treated more or less as Weberian ideal types, as none of the interviewees represented only one type of innovation philosophy, it is interesting that neither other philosophies nor more sophisticated thoughts arose from our data. For instance, there was barely any mention at all of user-centered design or systematic R&D practices. If such mentions occurred, they were often disengaged from the production process itself. The innovation models and production models are oftentimes treated as separate from each other. At the same time, regardless of whether the discussion is about the production model or the innovation model, they do reflect one another.

It is also notable that even though only the first view states that ideas are central, the following two views are also somewhat idea-centric. The picture of the game industry as idea-centric could be challenged, but only at the level of rethinking about the actual role of the use and usefulness of ideas. The innovation process associated with making games is not solely based on one overarching game idea, but different idea acts: producing game ideas and further ideas to design problems, nurturing creativity within the company, and selecting and molding ideas throughout the whole production cycle.

Many interviewees did talk in terms of ideas or about the first idea and its variations. One company used the term “idea 2.0,” representing the second version of the game vision that was done after the initial idea was reworked by the creative director or CEO. Even though some of the companies had somewhat person-centric processes with one dominant creator, in general ideation was described almost entirely as a democratized process. Many of the pictures formed by the interviewees were human-centric. They told the story of game production from the perspective of labor division or group dynamics. The selection processes were guarded by the top management or the designers, depending on the company. Sometimes this role was also the publisher’s role. Evaluation of ideas was also present in the pictures: Some interviewees were describing the practice of
pitching the game ideas internally or to project sponsors. Some companies referred to special meetings where the ideas were presented. Further checkpoints were also included in the process. In addition, it was mentioned that a concept could be discarded after pre-production or even in the production state, as the project stages were not so clear. Iteration was mentioned usually without any strong emphasis. This reflects the everyday role of iteration within the game companies rather than the absence of it.

5. PERSPECTIVES TOWARDS ITERATION

The analysis of the innovation philosophies was conducted only by looking at the words in the pictures. However, iteration loops were strongly present with arrows, spirals, and twirls in the pictures. Also, as the iteration loops were sometimes considered so difficult to describe that the interviewees felt more comfortable to point at the pictures during the exercise and describe different loops from one part to another. Thus, it is probable that the emphasis on iteration would have been higher with most of the interviewees had we included the arrows and other graphical elements in the analysis.

Game design as an iterative practice is widely acknowledged by industry representatives. Fullerton [7] describes iteration in game development as designing ideas, testing them, and evaluating them throughout the whole development process of a game. Game products are experiential and interactive by their nature [24] and it is usually difficult to predict how a new kind of idea will work in practice. According to our data, iteration was seen as an everyday practice for development processes. Actually, it was so common that often iteration was mentioned without further elaboration.

Iteration loops were mainly treated in a neutral light, but sometimes they were described positively or negatively. Even though iteration is a very well established principle for the design process, it still raises some contradictory thoughts among the actors within the game industry. Iteration is difficult to manage and creates personal challenges. It can create feelings of inefficiency, loss of power, and frustration as the hard work that has already been carried out sometimes has to be discarded.

The iterative nature of game design as described by one of the interviewees is as follows:

"In the pre-production we make a guess on what is fun and after that we need to make these prototypes and iterations in order to fine tune it and mould it. So, if we are seeking for something really new, the first guess is usually not right. It usually fails like hell. And usually also the second guess fails like hell. The third guess might be already quite ok. But it is unfortunately often times the fifth that lands on the spot."

Keith [11, 12] discusses this ambivalence within the game industry, saying that large and detailed design documents transform the game development process and make it less iterative. On the other hand, publishers often require extensive design documents if they are going to fund the development of the game. Publishers require more documentation because the risk of failure is much higher in the modern era of the game industry. Keith says that extensive documentation and scheduling generate a false sense of security.
Many of the GIIP companies expressed that they hoped for more time for the pre-production phase. They saw that better planning before development commenced would lower the need for iterations during the production phase. It was stated that if the conceptualizing phase and prototyping were not adequate or done improperly, the consequence would be problems during development, requiring a lot of resources at the end of the process. Some interviewees had opposite views: they wanted more flexibility into the production phase and did not believe that pre-production could save it.

Keith [11, 12] notes that the agile developmental method Scrum adds more iteration to game development processes. However, it seems to be unclear whether this is so, since Scrum can also help game companies reduce the need for iteration as the process becomes more manageable [20]. It seems that even though iteration is an everyday practice and a natural part of the design process, the practices may differ remarkably. This could be taken as an indication for the directions of future studies. How is iteration actually working within the game industry? What kind of experiences and tensions does iteration create? Can the high amount of iteration during the pre-production phase actually save resources during the production phase?

6. THE PROCESS

The main purpose of this study has been to map the form and consistency of innovation processes within the Finnish game industry. The pictures that the interviewees formed were different and reflected the unique nature of the design target and the environment, for instance the games and their platforms. However, some pieces were common within the pictures. In the following section, we will look at the general form of the innovation processes within the Finnish game industry by looking first at which phases were described and then by presenting a general model of the whole process. The model attempts to bridge the views of our study participants descriptively and should not be treated as a normative analysis since it does not comment on whether the processes should be built as described here. But as stated previously, the innovation model should not be separated from the development model itself.

6.1 THE STAGES OF THE DEVELOPMENT PROCESS

Fullerton [7] divides the development process into four stages: concept, pre-production, production, and QA phases.

- Concept phase (1 month)
- Pre-production phase (1-6 months)
- Production phase (1-24 months)
- QA/Polish phase (1-2 months)

The participants in our study mostly used the standard industry terms when describing their development processes, while most of the non-standardized terms echoed the established vocabulary. One company had a completely different naming process, which could be explained by the young age of the company. However, they also seemed to talk about the same stages of development as the other companies. Overall, the phases
of development were not as clear as Fullerton’s model (see Figure 5) would suggest: Many of the interviewees described how there was often no clear view of when they were entering to the next phase, and also said that QA was frequently not a discrete phase but a factor similar to the other factors that impact development. Even though the processes were very iterative, there were hardly any mentions of user testing and some participants even thought that testing was something to think more about in their processes.

Figure 5. Fullerton’s stages of development [7].

Phases mentioned in the interviews:
Ideation, upkeep, pre-pre-production, pre-production, development, finalizing, launch, post-life, idea & prototype, pitch, design, implementation, post-production, prototyping, alpha, beta, mock-up (+ prototyping & evaluation), first playable, and sun setting.
Adams [1] draws a simpler picture (Figure 6) of the stages of development. According to him, the stages of the game design process are as follows:

- The concept stage, which you perform first and the results of which do not change,
- The elaboration stage, in which you add most of the design details and refine your decisions through prototyping and playtesting, and
- The tuning stage, at which point no new features may be added but you can make small adjustments to polish the game [1].

![Figure 6. Adams’ stages of the game design process [1].](image)

Our data are more reflective of this model compared to that of Fullerton, but in the end the amount of recognized phases from our data differed from Adams’ model as well. Interestingly, the idea phase, which is not recognized as a phase by Fullerton [7], was also mentioned in the pictures and was often pictured as a cloud or as a vague phase with flexible duration.

The pre-production phase was often depicted as having one or two iteration cycles, whereas in the production phase there were more personnel involved and more iteration loops as a result. In general, the beginning phase was less structured, while the end of the production process had more form.

### 6.2 THE GENERAL MODEL

The picture of the general process (see Figure 7) was formed using our data. The purpose of the general process picture was to simplify and present how the study participants generally formed their processes using the GIIP method, as well as add to the picture presented during the interviews. Our image simplifies the overall development process that is found in contemporary Finnish game development, and is complimented by the issues that were not necessarily discussed in the data at hand but were discussed in previous and parallel studies, including the Games and Innovation (GaIn) and GameSpace projects.

Reading Figure 7 from left to right, the process is linear and includes several iterations.
The dotted line depicts the possibility space of the concept. The first part depicts the idea processes: Ideas can come from anyone and usually the designer is the one that collects them, screens them, and also creates new ideas and the vision for the games. The second part is the pre-production phase, where the idea is further developed into more concrete representations such as design document, demos, or other kinds of prototypes. In the third phase the team or teams are iterating the concept into the product or service that is released to the audience. This phase may include several sub-phases including different milestones, playtesting, testing, QA, and polish. The last part of the picture is maintenance, where the concept is developed further based on user feedback or metrics. The last part may consist of different actors but the team is usually smaller, just as in the preproduction phase. Even though there were rather few mentions of outside influences in our data set, those are different in each stage. The points between the phases can be considered as evaluation points where the design space is narrowed in order to evaluate the design.

Figure 7. A rough sketch of a typical game innovation process.

Any of the phases can vary depending on the company, its resources, platform, involvement of outside actors, and also the product itself. The challenges in the processes and the ways in which the processes may differ are discussed in more detail in other sections of this report.

7. **Ideal Processes**

Even though there are some interesting challenges and difficulties explained and presented in the process depictions above, almost all of the interviewees said that their process picture was already the ideal one. Many of the interviewees thought their development process to be ideal and mentioned few improvements that could be made. Only two said their processes were ideal without the need for improvement. But to have an ideal process, you must start with an imperfect process and modify it until it is ideal.

Therefore, in reality there might be even more problems and difficulties apparent in game innovation processes than were made evident by our study participants. Even if
we managed to get as specific a picture as possible with the drawing exercise, we still wonder what was left unsaid. Either the drawings were genuinely seen as ideal processes or reality was not pictured, or the interviewees could not imagine what they could change in the process.

The reality of production is also not as linear as the pictures may suggest. Some interviewees explicitly mentioned that the process itself has parallel tracks of multiple projects meaning that there could be one person being involved with several projects, in different phases (small companies) or different people in different phases (bigger companies).

8. Challenges within the Processes
Creative work always has its challenges. Even thought the processes would be standardized, the support of creative work and building an atmosphere of trust is a challenge for team leaders and company heads. The game design process is a collaborative effort where different people work with a single production. Maintaining the vision and coherence of the product is challenging not only because it is something that is not yet done, but also because of the difficulties in communicating something new. Tschang [26] talks about different strategies for creativity in game companies. There are different compositions of creative collaboration and cooperation depending on the human resources and group dynamics of the company. In most of the companies analyzed here, the people themselves cause bottlenecks in their companies’ processes. We call them “bottlenecks” because the role of these people seems to be gathering the vision and screening or developing the ideas further. This role can be seen as a good thing, since there are known difficulties in communicating and expressing, thus sharing the vision. On the other hand, this role creates a risk since the whole process is in the hands of one individual. Depending on the official role of this person, it is also possible that the more removed this person is from hands-on activities within the company, the less understanding he or she might have about the production’s everyday realities. There should be more freedom given to team members working at the hands-on level instead of trying to impose strict controls, particularly if the person serving as the bottleneck is not involved with the process on a daily basis. It seems to be a general problem within the game industry that people level up from design positions into management posts without real management experience. The old role is still there and might be difficult to detach from.

Publisher
A notable amount of challenges found in the interviewed companies concerned the publisher. Sometimes it was difficult for companies to understand what the publisher wants and requires. These requirements are often in conflict with the opinions of the developers. Often the restrictions reduce the creativity present in the process of making a game. A more active participation from the publisher was seen as potentially helpful, but this idea was regarded with ambivalence as it could create even more complicated processes. In any case, the role of a publisher or other outside actors within the innovation processes was seen as challenging and might need more clarification.
People
Some of the challenges were found in human resources and in-house communication. Communicating the vision to the others in a company can sometimes be difficult and generally team members might misunderstand each other. As the game industry thrives on the personal motivation of creative individuals, keeping motivation high might cause some challenges. Motivation can be affected if the creative process is highly restricted and there is no room for personal involvement in the direction of where the game is going. Carefully positioning the right people on the right projects and clarifying the common ground could ease this concern, but such challenges are probably part of everyday life with any creative processes.

Pre-production
Most of the companies thought the pre-production stage was the most challenging phase of development. On the other hand, it was also the most pleasant phase for many of the interviewees. It was stated that there is a need for a successful pre-production stage, where the planning of the game has to be airtight. If the pre-production has not been successfully completed it will negatively impact the production phase. Careless planning will become quite costly in the final stages of development and the errors will be more expensive to fix. However, dissenting opinions arose on this point, as some study participants wanted more flexibility toward the end of the production process. It was stated that it is difficult to predict what the publishers or the players want, and it might be difficult to ideate games for that reason without being allowed to make changes late in the development process.

Some regarded the shift from pre-production to production as difficult. It was stated that often there is no clear shift between these stages. It can be difficult to distribute work accordingly and keep things simple enough. It was also stated that there is usually not enough time to properly complete pre-production.

Resources
Company resources, including time, money, and personnel, are vital to game development and naturally some of the challenges related to these aspects. Some of the emerging challenges were related to lacking resources, which made the resulting game unsatisfactory. If there are not enough resources the development ends up half-baked and the final product does not meet the quality standards of its producers. Acquiring resources is another challenge: It is hard for smaller companies to get the right people to make games, and the lack of those people results in unsatisfactory products.

Finalizing
Some of the companies saw the whole game development process as filled with different challenges, but product finalization was regarded as especially challenging. When the game is near completion it is possible that the schedules do not work and there is not enough time to polish the game. This crunch was challenging for one of the companies in the study. Alpha and beta stages come with the crunch and strict deadlines, and these
are problematic because something unexpected usually happens during the crunch and it strains project deadlines. Limited time makes finding the balance between polish, fine tuning, and time usage difficult. Nobody wants to make compromises, but they are required to finalize and release the game. Some of the companies mentioned that the QA phase was something that needs developing.

9. Processes in Change
The data set for this study paints a clear picture: It is evident that the dynamics of the game development processes are closely tied to the product, the platforms, and the people involved. This connection exists not only on the level of time scales, but on the level of iteration rounds and other dynamics of the process as well. For instance, the innovation process of a game sequel is essentially different from that of producing an original game without precedent.

The challenge is in maintaining the processes during times of change. However, this does not mean that there should not be any process or that it is best to leave the process as an organically-developed thing. The role of explicated processes is to prevent unnecessary floating and wandering, and at the same time provide flexibility for exploration and iteration. Additionally, the processes should be shared, visible to all, and revisited when larger changes are made.

Specific issues that affect the development process are the platform that is targeted, the makers of the game, and the final product. The choice of platform affects the development process by creating different milestone definitions, different expertise requirements, involvement of different outside actors, and tolerance for changes to the platform itself. The processes might also be tied to in-house personnel that are involved: For instance, in some of the companies the producer molds the processes. Each producer might have different methods, for example one might use Scrum and others might not. The processes are molded to fit the social dynamics of the current team. Also, the type of the game changes the development process significantly. The development of service-based and online games might never stop and the whole team is tied to that one project, whereas when creating a stand-alone product there is a clear starting point and a finish line for the process.

In the companies examined for this study, the current processes were naturally formed to match the needs of each particular company and its employees. Reacting to changes is always a challenge. Experience adds capabilities to work with changes on the fly, creating more fluid and efficient processes. Changes have to be implemented as the project proceeds: When unexpected things happen, the process shifts direction.

10. Discussion
In general, game innovation processes are not standardized processes. Even though this has to do with the volatile nature of the game industry, it is rather surprising that for many of the companies included in our study, innovation processes had not been discussed at all. These processes are naturally going through changes because of broader changes to
the game industry, and desired stability may never be reached. This might be one of the reasons why the processes are considered difficult to maintain. However, the form for the processes can be found on a higher level and explicating the innovation philosophies behind the processes may be beneficial. Game developers should be experts at handling uncertainty and changing their plans as they go, while also understanding that one needs to have a plan even though the end point and product might be uncertain.

The innovation philosophies of such organic practices revolve around simple concepts: human capital, ideas, evaluation processes, and iteration, the latter being one of the most characteristic aspects of the game industry. Despite the talk about user-centric models and changes in game culture, there is relatively little of this talk tied into the processes we discussed with our study participants. The rest of the innovation strategies and supportive facts might not be visible in our data, as we were looking at the production process itself. However, it is reasonable to say that these two should be at least somewhat tied together: The game innovation process is the production process.

II. Conclusion
This study has mapped the innovation processes of Finnish game companies. The results of this study indicate that there is a somewhat stable sense of what it takes to create innovative games, yet the processes of innovation themselves are in constant change, making it very challenging to develop them further without specific tools. This difficulty is reflected at the level of communication within and across game companies, and it adds to the challenges of resource recruitment processes. However, we believe that there is a possibility to enhance innovation processes without making their organic nature too rigid.

REFERENCES


LOOK WHAT I FOUND...
WHAT IS GIIPNETS?
GIIPNETS is a tool for game companies to make their development process visible to the whole staff. The tool enhances the common ground and shared vocabulary of the development process by simultaneously maintaining changes in the processes. It is a set of magnetic elements that one can write on. It is affordable and easy to mold to the needs of the company using it.

HOW DO I USE GIIPNETS?
1. Get a whiteboard or paint your wall with magnetic paint. Use this space only for GIIPNETS.
2. Make sure that the wall or the whiteboard is located somewhere where everyone will see it daily.
3. Set magnets on the wall and start picturing the development process with the help of magnets.
4. Use the set of words or jargon that is shared in your company. It is better to use industry standard vocabulary as it helps the recruiting processes.
5. Mark phases (yellow boxes), actors (green boxes), milestones or review points (pink boxes), and whatever elements (white boxes) you think are central to your process.
6. Use arrows to mark iteration rounds or other relations between the elements in the process. Avoid drawing additional arrows and elements on the background because that makes it more difficult to implement fast changes.
7. Discuss with others whether they share the same view, and make any necessary alterations.
8. Keep the picture as simple as possible so that it is possible to understand the changes made on it just by glancing on the picture.
9. If you have parallel projects, mark with a red magnet where in the process this project is going. Or, use another set of GIIPNETS to picture the other project if it is significantly different.
10. Keep the picture updated and discuss it with different personnel groups. Alter the picture whenever you think there are changes in the production model. Let personnel give feedback and suggest the changes. Make experimentations.
11. Work on your process and keep it flexible for the changes.

WHY WAS GIIPNETS CREATED?
The idea for GIIPNETS came from analyzing the interviews gathered from the Games Industry Innovation Processes (GIIP) project. This tool was created to help game companies enhance the common ground for development processes even though there are constant
changes to the processes. The name GIIPNETS was formed using the acronym GIIP and the word ‘magnet’. We found that employees used different vocabulary to depict their current development process and some actually expressed the need for clarification of their current development process. It is recommended that all employees know what others are doing within an organization, at least at a high level.

Figure 1. An example use of GIIPNETS.

GIIPNETS can help decrease the risk of misunderstanding others and support the development of the company in a volatile environment. GIIPNETS was made into a physical tool instead of a digital one on purpose. We felt that a digital reconstruction would dissipate into the digital jungle: It would not be used, it would not be updated, and most importantly it would not be present. A digital version would turn into a picture that would be only revisited when problems arise. By contrast, a physical, ever-present picture would imprint on the minds of the whole team with less effort. If used collaboratively, GIIPNETS can also work as a tool for listening to personnel and molding processes so that everybody enjoys what they are doing. As it is a prototype and affordable as such, it can easily be developed further to suit the needs and the philosophy of the company.
I was just wondering... Does it matter how games are made? Like, first I'll have an idea, and then I'll just go and execute it?

Actually there are quite a few development methods that have been around for quite some time. Some fit better for game development than others. The process of making games needs agile methods that can work with iterative processes. The most popular method at the moment is Scrum, but that is not perfect either.

Come again?

Oh, so I need to work flexibly!

Yes, but it takes practice!


2. Change in Game Development Methods

Work in Progress / Literature Review

Juha Köönikkä

ABSTRACT

In this article I explore the literature concerning different game development methods. The game industry has grown into a multibillion dollar business, which has led to bigger budgets and development teams. Large development teams and budgets have created a need for new development methods in order to control the evolving production processes of modern game development. This literature review introduces several more traditional development methods and moves on to more modern agile methods, which are becoming more popular in the game industry.

1. INTRODUCTION

The game industry has experienced fundamental changes during the past decades. We have seen early mainframe programmers shifting through an era of early personal computers and consoles. 1990s brought maturity and 3D games, resulting in the modern video game industry, which is worth several billion dollars per year and which has a seemingly overwhelming focus on action, war, and violence. However, modern video games are not all about violence and action: They can also be seen as creative, fun, useful for developing hand-to-eye coordination, and to some extent they represent a new form of art [3, 25].

For the most part the structure of the game industry consists of independent studios and publishers. Usually the publishers fund the independent studios to develop games [25]. The maturing industry has led to large development teams and multimillion dollar development budgets. Development of a game may take many years and these factors have highlighted the need for evolving development methods.

This paper presents an overview of some of the more traditional development methods and some of the more recent agile development methods.

2. TRADITIONAL SOFTWARE DEVELOPMENT METHODS

2.1 WATERFALL MODEL

Software development has been characterized by the so-called “waterfall model,” which was once used to guide the organization of some of the development process [9] (see Figure 1). The basic idea of the waterfall model can be derived from its name. The development process advances in stages and every stage must be completed before it is possible to move on to the following step. In modern software development, a waterfall model can seem quite inflexible because it cannot react to unexpected occurrences during development or include iterations to the process. When a certain part of a
process is finished, it is impossible to return to that stage. Game development requires iteration in order to fine tune different segments of the game.

Figure 1. Waterfall model [29].

### 2.2 Spiral Model

A spiral model was created as an alternative to the waterfall model (see Figure 2.). The linear process of the waterfall model cannot manage with unexpected outcomes during any of its intermediate processes. Boehm addresses this issue with the spiral model, which takes risk assessment into account more effectively than a waterfall model. The spiral model includes prototyping and iteration, but it is still basically a linear process with explicitly defined processes [9, 23]. The spiral model has been criticized because it lacks definitive activities that software development needs, making the model too ambiguous. Also the division of the axes has been seen as unclear [9].

### 3. Agile Development Methods in Software and Game Development

Agile software development methods saw the light of day in 2001, when the Agile manifesto [5] was released. This manifesto highlights individuals and interactions over processes and tools, working software over comprehensive documentation, customer collaboration over contract negotiation, and responding to change over following a plan [5]. The main focus of agile methods lies in simplicity and speed. In development work the group concentrates only on the functions needed at first, delivering them fast, collecting feedback, and reacting to the gathered information [1].

Agile development methods can reduce the need for creating multiple prototypes, which will be completely discarded after use. Agile methods use increments in development and the aim is to produce complete components in short periods of time. Software can be modified after the release based on the feedback of the product [18]. There are
several agile development methods, including: Adaptive Software Development, Dynamic System Development Method, Extreme Programming, Feature-Driven Development, Lean Software Development, and Scrum [16]. However, some problems can be found when using agile development methods in game development. The structure of a given development team might not support agile methods and sometimes publishers will not support a game development process where features of a game are not repaired at the beginning of the project [18] [14].

Figure 2. Spiral development model [30].

3.1 ITERATIVE GAME DESIGN
Fullerton has been writing about the importance of iteration in game design. According to her, iterative game design is based on prototyping and playtesting (see Figure 3) [10]. Iterative design process is play centered, which translates into a method where game design decisions are made based on the experience of playing a game while it is still in development. Iterative methodology requires a prototype of the game at an early stage of the development process. This prototype does not have any of the aesthetics of the final product, but it contains some of the key elements and mechanics of the final game. Iterative design cycles through prototyping, playtesting, evaluation, and refinement. Iterative design is important for game designers because it is difficult to anticipate beforehand how the game will actually play; The final experience of gameplay cannot be predicted. [22] Ollila has noted that a prototype does not always have to describe
the core mechanics of the game. A prototype can include any aspect of the game. At first it is useful to concentrate only on core mechanics, and after that continue on to other elements [18]. However, Fullerton has noted that the basic game concept should not be modified at every turn [10]. Adams also notes that the fundamentals of the game should be decided at the beginning of the project: If the fundamentals are changed later on in development, it would have a negative effect on the release date of the final product and create unnecessary work [2].

![Figure 3. Fullerton's model for iterative game design][1]

**3.2 Scrum in Game Development**

Scrum is a popular variant of agile development methodology in software development, but it is also used in game development. Scrum is a modular framework, which concentrates on making development processes more adaptive and people-centric. Scrum arranges a larger development team into small cross-functional teams, which prioritize their workflow daily and emphasize iteration. Scrum conforms well to game development because it enables quick and flexible decisions in solving game development problems.

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[1]: figure3.png
In game development, Scrum has small, self-organizing teams of developers who are in charge of small increments of the development; in addition to this the team converses about the product with the customer after each iteration review. The team works in sprints, which usually last from two to four weeks (see Figure 4). They are organized with fixed time intervals. Sprints create small working versions of the game, which enables the customer to see the direction where the game is going and give feedback for the development team. Teams usually consist of six to eight people; teams that have over ten members are considered too large.

One of the practices is that the teams have daily scrums, which last about 15 minutes. During these daily scrums the team discusses what has been completed since the last meeting, what will they be working on next, and what problems are they experiencing. Every team has a Scrum master, whose role is to explain to the customer and team the reasons behind every step of the development [13]. The Scrum master’s duties include leading the daily scrums, identifying portions from the backlog to be completed in the sprint, and evaluating the progress of the process toward a finished product. The Scrum master assures that everyone on the team is making progress, keeps a log of the decisions made within the team, and keeps daily scrums focused. [20] Sprints are based on segments that are selected from a backlog, which is a prioritized list of the tasks to be performed in a sprint. Highest priority backlog tasks will be worked on first, while the lowest will be worked on last. The backlog contains the work that should be done for a product, and in Scrum it evolves and adjust with the project. The end result should be an appropriate, competitive, and useful product. [6]

3.3 UTILIZING EXTREME PROGRAMMING IN GAME DEVELOPMENT

Extensive programming (XP) was developed to take into account the needs of small software development teams in vague and constantly changing environments (see Figure 5). XP teams usually consist of 2-10 programmers. In XP the project is planned
incrementally throughout the lifecycle of the project and feedback is gathered from short development cycles. It is possible to implement new features for changing business needs because extreme programming has flexible schedules [4]. Using XP in game development, the team prioritizes features, works them in order, and tries to keep the code as simple as possible. Small improvements are done to the code in order to keep it simple and functional. According to Scofield there are many important practices in extreme programming, but he mentions five key concepts for a successful game development project: test driven development, pair programming, continuous design, real customer involvement, and energized work. When all of these practices are successfully combined, the end result should be worthwhile [24].

Figure 5. Planning and feedback loop in extreme programming with time frames [28].

3.4 THE BASICS OF RAPID APPLICATION DEVELOPMENT
Rapid application development is a dynamic approach to software development that allows faster deliveries than software created using linear development models. User involvement is highly important and it includes iterative and incremental prototyping. User involvement is an active participation in the development process instead of producing merely input and information for the development team. In rapid application development the users and developers form a collaborative framework. The quantity of documentation is reduced, which increases time for prototyping and testing. Both prototyping and testing are essential in this development method [17].
3.5 USING LEAN PRODUCTION PRINCIPLES ALONGSIDE SCRUM

Lean productions originate from the traditional industries. Lean production principles were started by Toyota in the 1940s. In the 1990s many other car manufacturers and other industries adopted Lean production principles, including software development. Lean production practices aim to reduce production resources in the areas that do not create value for the end customer, preserving value for the customer even though using fewer resources. [15]

Value can be seen as one of the guiding principles of the Lean mindset. In Lean, value is only defined from the customer’s viewpoint: Does something add value to the customer or not? Another fundamental principle of Lean is the value stream, which entails the whole cycle of activity. Other important principles of Lean are flow and pull. Flow refers to the ideal workflow that can be achieved throughout the process. Pull is the concept where things are done when they are required, and not before. Therefore, work is done when needed, not when the need is predicted. However, the elimination of waste can be seen as the main principle of Lean mindset. Waste is everything that does not add to the value for the customer: e.g., unnecessary code or functionality, or schedule delays [8]. Lean principles concentrate on eliminating waste, delivering fast, empowering the team, and seeing the whole. These principles can be adapted to game development. Scrum does not always address changes or bottlenecks in game development. Lean addresses the problems that some Scrum teams face and allows this without having to abandon agile methods. In game development, Keith suggests that Lean production should be used in asset creation [15].

Lean principles allow shorter cycle times in asset creation process, which means more productivity, identification of waste, and greater ease of addressing waste. Lean helps to prevent pile-ups in the workflow of asset creation. Workflow can be improved in many different ways that include: time-boxing, leveling workflow, and reducing waste. In time-boxing, a certain amount of time is given to a specific phase to finish work on asset creation and within this timeframe the assets should be of enough value for the customer. Leveling workflow means that everyone should have work to do every day, so that there are no bottlenecks in the production. Time-boxing and a leveled workflow enable the team to reduce waste and focus on needed tasks. These processes enable higher quality because Lean production minimizes the inventory of unfinished work between each stage of a value stream [8, 15].

3.6 POST MORTEM

The term “post mortem” originates from the field of medicine, and is also known as an autopsy in the original sense [21]. The succession of a game development process can be scrutinized with a post-mortem meeting. It is a method that can be used to analyze what went wrong and right in the development process. Post-mortem meetings can cover elements such as scheduling, design, and technology. They can also include external factors such as the relationship between the studio and publisher, in addition to the relationship between the studio and consumers [26].
In the field of video games post mortems are common: They are used to scrutinize past development processes, but at the same time they are used as a means of gaining publicity. Numerous game design post mortems can be found on the Gamasutra Web site [11], for example, and they are often revealed at different game conferences, such as the Game Developers Conference [12]

4. THE CABAL: VALVE’S DESIGN PROCESS
Valve is a highly acclaimed game developer: Its successful game Half-Life received over 50 game of the year awards and sold more than a million copies worldwide [7]. Development of Half-Life was quite problematic because the first version did not meet the standards of the developers. They decided to start over and rework every stage of the game and this is when the Cabal was formed in Valve.

Reworking Half-Life produced the “Cabal process,” which ultimately made the game into a success. The word “cabal,” in common language, stands for a small group of plotters, but at Valve the word is used to describe their design process. Cabal has its emphasis on teamwork. It does not have a dedicated game designer, but the whole team can be seen as the embodiment of the game designer. Tschang describes the Cabal as a bottom-up, group-oriented design group comprised of members who are not originally designers [27]. This group works collaboratively without visionary leaders. All of the members act as designers, when necessary, but in addition they are able to implement their own design to the project.

The first step in Valve’s Cabal was to make playable prototypes and then make iterations to the elements. The second step was to analyze the prototype and define what made the game fun to play. The Cabal was comprised of a cross section of the company including multiple members of disciplines from programmers to artists, and would create a definitive document that described almost every aspect of the game. Brainstorming was done in Cabal meetings, which were held 4 days a week and the sessions were 6 hours long. The developers in Cabal were swapped every couple of months in order to prevent burnout and design stagnation. After the swap every Cabal had to have prior members in order to retain experience of the process. More meetings occurred in the beginning of the project and less when the game was further in development. In those sessions it was considered desirable that everyone made their contribution to the game. Every member had the knowledge to implement design ideas into the game, or had the ability to do it if needed. The end result was a document that contained more than 200 pages detailing almost everything in the game. The Cabal turned out to be very effective and this led to the formation of mini-Cabals, which were created to address a variety of design problems. Mini-Cabals typically were comprised of people who were most affected by the decisions and fresh perspective was maintained by including people who were not affected by the problems.

Playtesting for Half-Life was done by outside volunteers, who played the game for two hours. The feedback was gathered and implemented back into the Cabal process, which allowed preemptive removal of designs that did not work and to elaborate on desirable elements.
Through constant cycle of playtesting, feedback, review, and editing, the Cabal process was successful in removing portions of the game that did not match desired quality standards. Even though the emphasis is on group activity the initiatives always come from individuals. Cabal strives for coming up with the most optimal compromises in the development process. The Cabal process is still used in Valve [7].

5. Discussion
The maturing game industry faces new challenges in the contemporary field of game development. Budgets are higher and the time needed to develop a finalized product has grown longer. Evolution of gaming hardware has also played a big role in the rise of budgets and prolonged development processes. Bigger budgets, games, and longer development processes mean that a company has to have enough staff to finish a product. The evolving game industry has provoked the need for efficient game development methods. It is worth noting that even though game development projects are growing and need better methods for governing the development processes, at the same time there is an ongoing movement toward smaller productions and development teams. Independent (“indie”), iPhone, mobile, and casual games have attained great success during the past few years and have gathered high revenue with small retail prices, even though the games have been developed with small budgets and development teams. A prime example of this is an indie game called Minecraft, which was developed by a single person. Minecraft has sold nearly two million copies and has supposedly gained so far over $33 million US in revenue [18]. On the other hand the progress of different development methods has emerged because of the need of growing companies, but agile methods can also benefit smaller development companies. From the data gathered as part of the Games Industry Innovation Processes (GIIP) project, many of the smaller companies that were interviewed mentioned that they used Scrum in their development processes and it had positive effects on their development processes.

6. Conclusions
In this article, I have examined different game development methods. First I examined two traditional, more rigid development methods called the waterfall model and spiral model. Secondly, I examined some agile development methods: iterative game design, Scrum, extreme programming, rapid application development, and Lean production principles. These methods offer new and effective tools for development. Agile methods make development processes faster and simpler. Iteration and feedback from the end users play a big role in agile development methods. Using agile methods it is possible to make the game creation process much more effective and organized. Lastly, I examined a development method that was created by Valve called Cabal. In Cabal, group activity is emphasized and the aim is to come up with the most optimal compromises during the game development process. In this article there are some methods explained that can be used in game development, in addition to software development that might be useful in modern game development scene where development processes are in constant flux.
REFERENCES


WHAT IS THE FUTURE OF THE GAME INDUSTRY?
GAME MAGAZINES ARE FUSSING ABOUT ALL SORTS OF THINGS, BUT WHAT DO THE GAME PROFESSIONALS ACTUALLY FIND WORTHWHILE?

Well, they're really excited about all the new possibilities that internet connectivity can offer, whether from a business or gaming point of view. They think that the audience is getting broader and broader, expanding to all sorts of people instead of just gamers, and these new player demographics will want games to offer them deeper, more sophisticated and meaningful experiences, a challenge the game developers are willing to take on.

Technology of course affects what can actually be done, so many are really waiting to see what happens after the present console generation: will there be a new one or will the current consoles stick around for a long time?

WHOA, THAT'S REALLY INTERESTING! THANKS!
No problem!

TUULI SAAVINEN
ANNAKISA KULTIMA
Work in Progress / Interview Study / Content Analysis

Tuuli Saarinen
Annakaisa Kultima

Abstract
In this article we explore the findings of an interview study conducted in 2009 that collected data from three major game industry conferences. We used this data to analyze the trends that industry professionals were following and found interesting at the time. Although the topics of these trends do not predict what will happen in the future, they present a good indication of the direction that the industry could take. For example, a common topic across all themes is that the game industry is broadening in all aspects. As the industry slowly starts to fragment, it is possible there will be multiple game fields in the future instead of one relatively coherent field.

1. Introduction

“If you sit down in this industry and think that you’ve gotten the hang of it and think you know what’s happening in the future, then you’re probably up for a big surprise [••].…”

The game industry is characterized by its instability and the constant imperative of creativity and innovation [1]. By its nature the game industry is sensitive to rapid changes. Satoru Iwata, the head of Nintendo, described at the Game Developers Conference (GDC) in 2011 that the industry is going through turbulent times—a lot of things are changing and it is difficult to keep pace [2]. The audience of digital games is broadening more and more, making the traditional gamers just one group within a vast and ambiguous audience [3]. As a result, the demand for new types of games and ways of playing is increasing by the day, changing the industry along the way. People from all sorts of fields are starting to come in, either blending with the existing, gamer-turned-developer-populated companies, or even more often founding their own companies. They bring new ways of looking at games and game development, and more and more often end up changing existing ways drastically. Technology also has a strong influence on the changes the industry goes through, since it is both an enabler and a restrictor, quite literally defining the limits inside which the industry has to live. Technology does not only affect what kind of games can be made, but also how they are distributed and marketed. In recent years, game technology has enabled completely new ways of reaching customers, sometimes including them in the design process.

One part of a game developer’s job is to follow the current trends and changes happening in the field. Not only do they need to know audience preferences, but also which other actors in the field are creating offerings for the same group of people. When one actor finds a new, innovative, and appealing way of playing, the rest have no choice but to follow if they want to get their share of the revenue stream. If someone finds a way to reach a new, larger player segment, that results in pressure on other companies
to follow. These trends have a strong effect on all areas of game development, for they are so strongly intertwined. When one goes through a big reform, it has notable consequences on all of the others; sometimes the reforms are even more notable than the original one.

2. DATA
During 2009, as a part of the Games and Innovation (GaIn) research project at the University of Tampere, we interviewed 28 game professionals selected to speak at three major game conferences: GDC 2009 in San Francisco, USA; Game Developers Conference Europe (GDCE) 2009 in Cologne, Germany; and Nordic Game Conference (NGC) in Malmö, Sweden. The selected conferences are all acknowledged industry events and bring together many leading professionals, and as such were favorable events from a research point of view.

We interviewed 23 of the participants in person during these events, and the other 5 by phone after the events had taken place. Three researchers conducted semi-structured interviews; the sessions lasted for 20 to 90 minutes depending on how much discussion arose.

The interviewees were selected from among the conference speakers, who were either selected by a strict evaluation process or by invitation, making all of the speakers professionally acknowledged as important participants in the game industry. The professional positions of the interviewees were mainly focused on leadership or development. Other positions were also represented, such as publishers, educators, and consultants. We selected the interviewees to represent different roles and tried to cover a broad spectrum of game development knowledge, experience level, age, and nationality.

We look here at a particular question that focused on the industry trends in which the interviewees were interested. We asked them to describe the kinds of future trends they were following and what kinds of future insights they might have, focusing on their personal interests rather than encouraging them to predict the future. Interviewees were asked questions about innovation from many different perspectives—what they think innovation is, how important they think innovation is for the game industry, how innovation manifests in the industry, and so on. The questions about future insights were asked at the end of the interviews.

The interviews were audio recorded and the records transcribed into text. From the transcriptions, the answers to the interview question about future trends were collected. The researchers read each answer carefully, highlighted the main points, and then named and grouped them together. The analysis concentrated only on parts of the whole data set, the rest of which is discussed elsewhere [4].
3. THE TRENDS
The trends drawn from the data form an interesting and intertwining continuum from “the casual turn” to the effects that digital distribution will have; less frequently discussed trends also arose, such as the expectation or hope for games that offer more meaningful experiences. Most of the trends reflected almost the same amount of interest in both GDC 2009 and 2011 talks. However, many small changes were visible from year to year, indicating some interesting directions the industry might take, such as pushing data-driven and player-centric design even further. They also indicated that other trends might already have established their place in the industry, such as social games and independent game development. Trends that seemed small in 2009 had strengthened over 2 years and some of the new trends that have emerged after the interviews were also visible in 2011. Thus, the interviewees’ visions of the future in 2009 appeared by 2011 to be on the right track.

3.1 PLAYERS, AUDIENCE, AND GAME CULTURES
Effects of “casual turn”
The so-called “casual turn” was discussed as a well-acknowledged phenomenon; most respondents who brought the topic up were curious too see what will happen and how, rather than wondering whether casual games are relevant or not. The respondents were no longer interested in what the turn actually meant [5], but in what it would mean in the long run and what kinds of audiences will exist for games in the future. They were curious to know where the casual audience will end up in the future, whether or not they will keep playing, and how their preferences are going to evolve. It was also stated repeatedly that casual games will spread further and further in the future, eventually covering a big segment of the industry, which itself will become immensely broader than it is now. This was summarized by one of the interviewees in the following manner:

“What we think is the whole industry, say ten years ago, in twenty years time will be one part of a really broad industry. And casual gaming, what we figured was casual gaming can come part of that as well, will spread out and cover a load of it.” I01

Casual games are a strong force and their direction seems to be diverging into multiple channels: for example, the games on social networks such as Facebook as compared to smartphone games such as Angry Birds and downloadable PC games by Big Fish Games or PopCap Games. The “casual” movement has established its place in the industry and is attracting more and more actors. The rise of the Casual Connect Conferences is one indication of the popularity of casual games among developers. But the casual design approach is not anymore an island separated from the rest of the industry - it is affecting to the whole spectrum of games [3].

Industry broadening
The broadening of the game industry was of notable interest to a number of interviewees, and the directions in which the industry will or should evolve in the future was discussed from multiple perspectives. In general, the expectation was that both the industry and the audience for games will broaden. Many stated that one reason for the broadening is
the diversification of the audience, and the game industry is starting to understand the real diversity of different gamer types. According to the respondents, this will not only result in a broader audience and more diversity in games and game genres, but also in new ways of designing games.

“I think there’s some interesting work to be done there because once you start to understand the types of gamers, you can [...] then create games that are more segmented to appeal to those styles of play and frequency [...].” I14

The broadening of the industry is not only reflected in sales and the results of market research, but also in game journalism and on different online forums. A demand for games catering to a broader audience is clearly visible, including more content for gaming niches and minorities [6], but also more sophisticated and deeper topics for a mature audience. On the other hand, very simple games that don’t demand much from their players are becoming exceedingly popular, especially on mobile platforms and social media services such as Facebook.

Social games
One big factor that the interviewees brought up was the rise of social games, especially due to Facebook. Facebook has changed the way we think about games, and many interviewees expressed their interest in the next step: to what level can we take “social” in social games, and what the role will be between single-player, co-op, or online types of games. One respondent said he is looking forward to social games about relationships, with the actual gameplay being based on players’ existing relationships, whereas another was looking forward to more innovation in co-op games. Blending the single player and online play experiences was also brought up as an interesting concept, and one interviewee said he is very interested in Facebook as a platform.

Not everyone was expecting only evolution for the better, however: One respondent wondered whether social games were just a fad that will fade once the next big thing arrives.

“Obviously right now, there’s a lot of people that are [...] making social games, games on Facebook. And it’ll be interesting to see what happens with that. [If] I want to sort of step back and be cynical, I can say, every couple of years there’s some hot new thing that [...] the entire industry follows, and then they realize that it wasn’t as big as they thought it was. [...] So, I guess I’m kind of curious to see how this trend works out.” I23

Interestingly, one reason for the broadening was thought to be that the audience was becoming more sophisticated, and it was stated that the industry should try to educate their audience more strongly in that direction. This would then, according to one interviewee, result in more traction and resonance with the new innovations the industry presents to their audience.

Deeper experiences
As a result of technological advancements, the aforementioned sophistication was also thought to represent itself not just in the audience, but also in the games themselves,
offering deeper experiences on multiple levels. AI was one of the most notable areas where these advancements were expected to show. One interviewee was looking forward to having games that are AI driven instead of being based on scripted events, and hoping for more emergent content rather than linear. Other respondents also saw AI development as an important factor in improving the game experience: They were looking forward to AI becoming smart, natural, able to learn, and having personality. One was also hoping to improve the experience of immersion in the future by merging the UI even more with the in-game world.

“[I]t’s really hard to get games to cross the uncanny valley and not feel weird when they’re dealing with very close-up human behaviour. So I’d like to see other ways to get personal without having to show a close-up of a 3D rendered face.” I21

Given a higher level of photorealism, more personality, and realistic environments of recent games, the respondents were looking forward to games handling more personal topics, things people can relate to and learn from, and making people think and get new perspectives. Games about individuals and unique people, working on a better world, and having a broader range of emotions in games were all seen as important new developments, and one respondent was hoping for new tools for these areas in the future.

“Well I definitely hope we will be able to get a broader range of emotions. And I also definitely hope, but this is more of far distance thing, that we will be able to work on a better world.” I05

This drive to offer better and deeper experiences is not a new trend, but rather an inherent characteristic of game development. It has been present from the very beginning of commercial video game development, but since then has taken on many forms. In 1984, game design veteran Chris Crawford wrote about the unused possibilities games offer, and the possibilities that will become available with technical advancements [7]. During the past decade, this discussion has expanded from including more sophisticated game mechanics, better graphics, and more lifelike artificial intelligence to topics such as meaningfulness and emotion. These two newer trends are quite prevalent and will probably continue to be so for quite a while.

3.2 DEVELOPMENT

Industry bifurcation

The effects of the industry broadening are also connected to game development. A number of the interviewees stated the industry is bifurcating. According to them, the game industry is heading in two completely opposite directions at the same time.

“Well I definitely hope we will be able to get a broader range of emotions. And I also definitely hope, but this is more of far distance thing, that we will be able to work on a better world.” I05

The trend of the “big getting bigger” is characterized by the teams getting larger, team members becoming more and more specialized, production costs and times growing immensely, and the games themselves having huge amounts of content. In many ways
game development was said to be getting closer and closer to movie production. On the other hand, the success cases of small developers with relatively simple game concepts are telling about the other side of the coin.

Recent developments in the industry suggest that talking about bifurcation might be an understatement. As we saw earlier, the audience is broadening in many different ways, and game development tends to follow such trends. The industry tries to respond by developing products that their audience is demanding. This response would indicate that, instead of the industry bifurcating, it might actually be fragmenting—in addition to the big companies getting bigger and the smaller companies staying small or getting smaller, more and more companies are starting to specialize in catering to a particular demographic or a particular gap they have found in the industry. It may be time to talk about “games industries” rather than a single “game industry.” At the same time many companies try to work on multiple platforms and stay flexible with their focus. The volatile nature of the game industry keeps changes constant.

**Independent game development**
The trend of the small getting smaller got a lot of attention, with many of the respondents bringing up their interest in independent games. Small games and game companies being able to make it in the game market were highlighted often in the interviews. Independent development was seen as the cradle of innovation, and the domain for art games, but also financially viable as a result of changes in distribution models. The interviewees stated that new business models make it possible and commercially sustainable for even self published, low-budget, small games, or for a very small team to work on a big game for years and fund it with their own money.

“I’m interested [in] this trend of being indy developer, like succeeding on your own and making a game by yourself in many years and actually polishing it [and] that earn[s] you money after three or four years.”

Independent game developers have started to become an established part of the game industry, perhaps as a counterbalance to the “big team AAA-title” development processes and strong commercialization of their products. It is getting more and more difficult to define what independent development actually means, for independent game development at the moment seems to include everything that is not AAA-development, whether a 1-person art game project or a 40-member company with funding. The blurry lines may become clearer in the future, with different types of game development differentiating themselves as separate entities.

**Maturing industry, player-centric design, and data-driven development**
Not only was the industry seen as bifurcating but also maturing. Team consistency was stated to be changing toward greater diversity, but greater maturity of the game industry was also seen in games dealing with more serious topics. A related sign of changes in the development side is the design process becoming more sophisticated through online-enabled, data-driven, player-centric design, as well as the effects this new design model will have on the design process overall.
The interviewees stated that co-production not only within the industry but also outside of it will become the new trend, and integrating players with the development process more thoroughly will increase the importance of user-generated content. Moving from the so-called gamer audience to the mass market was also expected to affect the content greatly, forcing designers to bring in topics completely new to them.

“The biggest change for us is the shift from the gamer audience to the mass market. It's kind of obvious that happens, [and] it's very different challenge to develop games for somebody that’s not your best friend.”

The audience broadening, the industry bifurcating or fragmenting, and the industry maturing are all strongly intertwining trends that affect each other. The broadening of the audience forces developers to take on new design challenges and to specialize in certain types of games. It has also resulted in a broader range of people with very different backgrounds entering the industry. New types of knowledge are needed in order to cater to the evolving demands of the audience, and in order to keep fulfilling the goal of making games sophisticated.

Data-driven game design is not a new trend as such, but with the new possibilities of digital distribution it has evolved into a very prevalent trend in recent years. Game companies are able to gather very detailed information on players’ backgrounds and play behavior, and it is becoming more and more common to base development and design decisions—even big ones—on this data. This has led to, and is also a result of, player-centric design: developers trying to cater to the needs of the gaming audience, rather than making games for themselves. With this move from the gamer audience to the mass market, and with developers entering the industry from outside the traditional gamer-turned-developer route, the industry is showing strong signs of maturing.

3.3 TECHNOLOGY

Next generation platforms
The technological side of game development is also affected by the changes in players, game cultures, and development as technology is made to live up to the diverse needs and preferences at play. Technology is also the enabling or limiting force behind game development and game cultures. Since technology plays such a defining part in the industry, it is no surprise the anticipation for the next technological step came up often in the interviews. The life span of the present console generation was discussed, and while some were suspecting the next generation might not appear for a long time, others were expecting big technological changes in platforms in the near future.

One respondent stated that the platforms will go through notable reformation during the next five years, and another was looking forward to various devices becoming truly interoperative. These developments were expected to be important sources of innovation: for example, having communities share the same experience while being in different locations. Different devices were expected to have a drastic effect on the ways people play and communicate while playing.
Although the anticipation for the next technical revolution was visible in the interviews, it has become even stronger since the interviews were conducted. Everyone is waiting for the next big technological leap or innovation that would renew the industry and finally enable the things none of the previous platforms were able to do—or at least force innovation content-wise.

In 2009, the Microsoft Kinect was anticipated as the awaited game-changer by some, but many were waiting for a more radical change: a whole new console generation to appear or for revolutionary changes to ways of playing as a result of interoperation between devices. Interestingly, attention can be also drawn to the other platforms for games, such as social media or smartphones. The next generation of gaming consoles may be a less blurry step than what we have previously witnessed.

**Kinect**

One technological advancement that got notable attention was Kinect, or Project Natal as it was known at the time of the interviews. The device was seen as the awaited, brave pioneering step in the removal of physical interfaces, and it was stated that although it was a big and exciting step for the industry, Kinect would probably struggle with all sorts of new and unexpected issues. Either way, Kinect was heavily anticipated, and expected to start a new trend with the possibilities it would afford.

“[T]o see that Microsoft sort of taking the first big step there[--]. It’s gonna be messy, like Project Natal is not gonna be probably the most perfect interface ever, but at least they’re trying that. [---] the new interface affords new types of gameplay that we haven’t been able to explore before.”

Kinect and similar devices were expected to be game changers that would not only enable new ways of playing, but also new types of games. Instead, it may have suffered the same fate as Nintendo Wii, with most games being just remakes of old games and only a few actually being developed with the possibilities of this new device in mind. Kinect does, however, have a brighter-looking future, for physical interfaces have been the key issue for many when it comes to console games. The Kinect might not end up being the device everyone will be playing with, but it has definitely reset the standard for motion-controlled games. It is quite probable that this type of playing will actually result in innovations in gameplay in the future, with the numerous Kinect hacks showing the way to the unused possibilities these interfaces afford.

### 3.4 BUSINESS AND DISTRIBUTION

**Business models**

Digital distribution was seen as one of the biggest game changers, not only due to its effect on the ways of playing and designing games, but especially since it enables new
business models such as online micro transactions, the freemium model, and streaming and downloading games. These new business models were seen as a way of unlocking innovation as the major players lose market share. Platforms and services such as Xbox Live Arcade, iPhone, Facebook, Steam, and OnLive were thought to be important forerunners, and the online micro transactions and the freemium model were especially expected to elicit innovation. Many also thought that games will evolve more and more into services rather than products, and one interviewee was interested in seeing how games will be marketed under these new transaction models.

“I think it’s gonna be... [---]services, I think there will definitely be new ways to reach customers and if Microsoft and Sony don’t want to adapt, Nintendo... They will have much tougher time.” I18

The business models are undergoing significant reformation, and it is hard to predict which ones will prevail and which ones will be forgotten. The traditional “free demo/pay for the full game” model has largely given way to free-to-play games where you pay for additional content, levels, or game modes. Steam, XBLA, PSN, and the like seem to have come to the industry to stay, and are eating into the sales of physical copies of games more and more with each passing day. Instead of physical copies, an increasing share of revenue will come from merchandise, with some games becoming cultural icons in the way that games such as Angry Birds have become. It is possible that in the future all games will be purchased digitally and physical copies will only be sold as collectors’ editions.

**Digital distribution**

In general, games moving digital and online seemed to be a given to most respondents, and many stated that digital distribution is the way of the future. This was expected to happen on both PC and console, with games becoming downloadable instead of offering physical copies. It was also thought to have an impact on the ways of playing and the interaction between players. One interviewee was interested to see how interoperation among devices would allow people from different vantage points around the world to share gaming experiences. Another interviewee was excited about blending the single player and online play experiences in one way or another. Many were also interested in bringing in new ways of playing with real-world friends.

“Having single-player games that are connected online [---], just blending [---]the gameplay experience that we know today with online experiences. [So] you see it as a single player game, [---]and then you suddenly meet people and realize that those people are [---]also playing single player games but you meet them in your single player game.” I26

The influence that digital distribution will actually have in the future is strongly dependent on technological advancement. Cloud technology has already had interesting effects on ways of playing and on the business side, enabling services such as Steam and OnLive. In the future this will probably evolve even further, enabling buying and playing a game on any device with full synchronization of all play data in the cloud. From the player’s point of view, this might mean playing the game in different ways depending on
which device the game is being played on.

4. TRENDS AT GDC IN 2009 AND 2011
We conducted a content analysis to compare interview data and the contexts of the interviews at GDC 2009 and 2011. To see how strongly the interviewees’ thoughts relate to the general trends visible at the time, we looked at the titles of the talks given at GDC in 2009 (see Table 1). For comparison, we also looked at the talks given at the same conference two years later, in 2011, to see whether the trends visible in 2009 had strengthened, diminished, or vanished.

Looking at 2009, it is interesting to see that almost all of the main trends are present in these talks were also brought up by the interviewees, with minor exceptions. Serious games, dynamic and emergent content, and assets were clearly distinct trends at the conference, but they were not mentioned by any interviewees as such, although they do partially relate to and are visible in mentions about deeper experiences. A third similar exception was mobile gaming, which was mentioned only among other new platforms, either from a technological or a business point of view.

Table 1. The division between different topics in GDC 2009 & 2011 talks.

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<td>8</td>
<td>Digital distribution</td>
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<tr>
<td>Industry broadening</td>
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<td>13</td>
<td>Serious games</td>
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<td>Deeper experiences</td>
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<td>Industry bifurcation</td>
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<td>Games for health</td>
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<td>Independent game development</td>
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<td>20</td>
<td>Dynamic and emergent content and assets</td>
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<td>Maturing industry</td>
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<td>Mobile gaming (technology)</td>
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<td>Data-driven development/player centric design</td>
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<td>Technology</td>
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Although the numbers in the table are only directional, we can use them to speculate whether and how the trends have changed from 2009 to 2011. We can see that the casual turn and social games have not gained much more interest, whereas the industry
broadening has gained more interest and deeper experiences has lost some interest. The
trend not mentioned in the interviews—serious games—strengthens the impression that
the industry is broadening. It was very visible in 2009, but had fragmented and merged
into other trends in 2011, such as gamification and games for health.

In the development-related talks there are some interesting changes visible. The
bifurcation of the industry has received less attention, but at the same time the
audience broadening has received more attention. Interest toward independent game
development and the industry maturing did not change substantially from 2009 to 2011.
Data-driven or player centric development seems to be a rising trend, and relates quite
closely to the possibilities that digital distribution has enabled.

The technology side has big changes in interest visible, and at first it would seem that
interest toward platform evolvement has diminished. If we, however, include a distinct
but strongly related trend—mobile gaming—we see that the interest has just shifted
from more traditional gaming platforms such as consoles and PCs to mobile gaming.
The new business models got more interest in 2011 than 2 years earlier, and not just in
terms of the evolution of digital distribution. In just 2 years, a new, reasonably strong
trend called cloud computing has emerged on top of the ones that were already visible
in 2009, and the existing ones have gathered more attention as well.

Although these trends seem to follow the general expectations for the future of the
industry, it has to be acknowledged that our analysis is only directional. If we look at
talks relating to the “casual turn” and to deeper experiences, for example, the latter
seems to be a notably stronger trend, in opposition to what was found in the interviews.
The reason for this is simple: The “casual turn” is a very specific, clearly defined topic,
whereas the topic of deeper experiences includes everything from AI development to
more meaningful stories. Obviously, a broader topic tends to get a larger number of talks
related to it, even if the trend is not necessarily stronger.

The talks were also categorized only by their name and short description, whereas the
actual content of the talks is not known to us. A deeper content analysis would achieve
better results. It should also be noted that the number of talks given at the conferences
is far greater than what is visible in Table 1. For purposes of clarity, we decided to leave
out any talks relating to the basic elements of game development, such as game design
tools, engines, and marketing techniques, unless they specifically exhibited some trend.

In conclusion, it seems that the topics of the speeches interpreted in the context of the
interviewees’ thoughts draw an interesting picture of future directions for the game
industry. However, the changes seem to be less drastic than what one might assume.
To fully understand how different trends affect the industry and which ones prevail,
a deeper study is needed. Looking at past trends would give us important insight into
how trends are born in the industry, how they relate to innovation among other topics,
and which factors determine the trends that will change the industry on a deeper level.
Another interesting and useful topic for future research is to conduct a follow-up study
on the one we completed and see what the professionals think of the trends 5 years
after the first interviews were conducted. It would also be valuable to see what happens to the trends during the next few years: whether they prevail, change shape, or are forgotten.

5. DISCUSSION
The trends emerged from the interviews form an interesting and intertwining continuum all the way from the effects of the “casual turn” to how digital distribution changes the industry. Along with the talks given at GCD 2009 and 2011, the interviews indicate the clear direction in which the industry professionals expect games to evolve, all from cultural, developmental, technological, and business points of view. On the other hand, the interviews also reveal some very basic features of the industry: an endless drive towards creating better and better games in all aspects, to reach a vaster audience, to have better technology, to offer deeper experiences, to have more sophisticated development methods, and to sell more. As a result, the industry is in constant turmoil, albeit perhaps less drastic and rapid than one would expect.

It is quite probable that the trends aiming at doing things better are always present, but just change form or focus from era to era. For example, the trend of offering players deeper experiences has been around for decades. Making the AI better and more realistic has always been strongly intertwined with game development since it plays such an important role in what can and cannot be presented in a video game. Technological advancements and the anticipation for a new console generation are also ever-present trends for the same reasons, as are new business and distribution models. The maturing of the industry, however, is quite a new trend on the scale it is today—although Crawford was already calling for it in his 1984 manifesto, only with the rise of new types of gaming outside of the traditional hardcore segment did it become an important value for game companies on a wider scale. With the non-gamer audience getting larger and larger, the industry is forced to evolve as well, hiring people from very different backgrounds and vantage points to be able to cater to these new player segments.

It would indeed seem probable that instead of bifurcating, the industry is moving toward fragmentation. While game companies might be bifurcating in size, the middle-sized companies will quite probably be an existing part of the industry in the future as well. The real fragmentation will not happen to the size of the industry, but rather in the types of games being produced; in the future we might actually have several game industries instead of just one big industry. This phenomenon is already visible, with many companies focusing on a very specific market segment, such as pre-teens, retro gamers, modern art enthusiasts, middle-aged women, families, and so on. With the rise of data-driven and player-centric development, it seems that the industry will fragment more and more, resulting in different game industries, all catering to very specific audiences. On the other hand, the flexibility to change the path is something that should be maintained within one company. One of approaches will undoubtedly be to target the mass market, to which Nintendo in particular has catered for almost two decades. The popularity of Angry Birds and the revenue from related merchandise sales is just one of many signs that one part of the industry is evolving more and more toward
the hit Hollywood movie model of revenue generation. Digital distribution will definitely play a very big part in this fragmentation, for it has already revolutionized the industry in many ways.

Although some of the presented changes sound quite profound, they will not happen overnight or even over one or two years. Most of them are slow, incremental changes, some of which happen over the course of a few years, and some that have always been there and will always be there. Just as the development of games is an iterative and incremental process, so is the evolvement of the industry: Both are very adaptive, but usually so tied to revenue that taking big risks is typically unfavorable. Instead, the games and the industry change in small steps, gradually over time. Due to this profoundly volatile nature of the industry, predicting the distance future is nearly impossible, but the trends presented here do offer indications of near-term evolutionary directions.

6. CONCLUSIONS
In this article, we have explored the findings of an interview study conducted at three different game industry conferences from the point of view of future insights. The findings form an interesting and intertwining continuum, from the effects of the so-called casual turn to how digital distribution will change the industry. The interviewees discussed the broadening of the game industry, aiming at offering deeper experiences, demonstrating anticipation for the next technological step, and seeking to understand business model innovations, to name a few of the topics described. As a whole, the data suggest that the industry is heading toward fragmentation. The field of digital games is turning into multiple game industries instead of the one, all-inclusive, coherent industry we have today.

REFERENCES

4. CHANGE IN VALUES: CASUAL GAME DESIGN VALUES

I'M A BIT CONFUSED...

WHAT IS HAPPENING WITH THESE GAMES? THERE WAS SO MUCH TALK ABOUT "CASUAL GAMES" AND NOW, WHERE HAS IT ALL GONE?

“CASUAL" IS BEST UNDERSTOOD AS A CHANGE IN DESIGN VALUES. A LOT OF GAMES ARE MORE CASUAL THESE DAYS. THEY GO WITH SUCH VALUES AS ACCEPTABILITY, ACCESSIBILITY, SIMPLICITY, AND FLEXIBILITY. THESE RESPOND TO RECENT TRANSFORMATIONS IN GAME CULTURES: THE PLAYERS ARE MORE HETEROGENEOUS AND THE PLAY HAS BECOME A SECONDARY ACTIVITY IN MANY LEVELS.

OH, SO THEY ARE STILL AROUND?

SURE, MORE THAN EVER, PERHAPS.
4. CHANGE IN VALUES: CASUAL GAME DESIGN VALUES
Conference Paper / Theoretical Framework / Theoretical Study

Annakaisa Kultima

ABSTRACT
In this article, I examine the phenomenon of casual games and the underlying transformation of digital play that the rise of this particular segment of the games industry is exposing. I argue that instead of a genuinely new phenomenon, we are facing a change that can be more accurately characterized as “the normalization of digital play.” The expansion of the player basis as well as the instrumental and functional approaches to games concurs with the transformations of other digital environments. As digital environments have become more accessible to large populations and are increasingly part of everyday lives, the ways and means of using them are becoming multifaceted and part of wider experiences.

In order to respond to the changes, I propose a framework of casual games design values. The set of design values can answer the question “What is casual in casual games?” in a different way: “casual” is present in design values that guide and direct the design decisions of game production. My thesis for such values is: Acceptability, Accessibility, Simplicity, and Flexibility. Most of the discussion over the casual games phenomenon reflects these design values. It is also noted that even though casual games seem to be a certain group of games or certain sector of the industry, in light of these values we can examine casual design in a broader context of digital games.
I was wondering...

Why don't some games work with casual audiences, even though they are simple and easy to approach?

Well, the design process should be thought of in broader terms. We have to consider the other steps of the game experience aside from the gameplay. It is not sufficient to just alter the gameplay, but the environments and the distribution, as well as the whole maintenance process, all have to be rethought, as the whole production process is formed around the hardcore products.

Yeah, that's right!

Oh, so that's the fuzz about the innovation in business models and all!
5. CHANGE IN THE SCOPE OF THE DESIGN: EXPANDING GAME EXPERIENCES
Conference Paper / Theoretical Framework / Theoretical Study

Annakaisa Kultima
Jaakko Stenros

ABSTRACT
As the digital world becomes part of the everyday lives of a larger population, the variety of functions that games are fulfilling and the thresholds of use for digital games also become more versatile. The rise of casual and social game industries indicates transformation in game cultures that embodies this very same development. In this paper, we introduce and discuss a theoretical framework that can be used for designing and understanding game experiences in their situated contexts. The framework illustrates the fact that the design process for casual games, which values acceptability, accessibility, simplicity, and flexibility in game design, has become relevant for more than just casual games. The “casual turn” in games affects not only the gameplay, but the wider context of the game experience. This experiential component should be acknowledged when designing games that are targeted to wider audiences.

The EGE model frames the game design process in terms of different actors working on different aspects of the entire experience. The model helps designers position the wide variety of game-related experiences that a player can have and the evolvement of the experience through time. Even though the variety of design possibilities for any given game is endless, the direction of the design should embody coherent design values. The EGE model is designed to help promote such values through an expanded and more open perspective on game design. Additionally, the EGE model can serve as the basis for the development of future services that provide increasingly enjoyable and fluent game experiences.
6. CHANGE IN CHANGE: DESIGNING GAME EVOLUTION

I HAVE A QUESTION!

I HEARD THAT GAMES ARE BECOMING SERVICES. HOW DOES THAT CHANGE THE CONCEPT PHASE OF GAMES?

CHANGE GAMES DIFFERENT CONTENT PLAYERS

CHANGE TIME DESIGN CONCEPT DEVELOPMENT EVOLUTION

YES, GAMES ARE INDEED BECOMING MORE LIKE SERVICES THAN PRODUCTS. THE VITAL DIFFERENCE BETWEEN GAMES AND GAME SERVICES IS THAT GAME SERVICES ARE IN CONSTANT CHANGE AS THE PLAYERS PLAY THEM. THIS LEVEL OF CHANGE POSES CERTAIN NEW CHALLENGES FOR THE CONCEPTS, BUT IN THE END, WE HAVE HAD SIMILAR CHALLENGES WITH TRADITIONAL PRODUCTS.

THAT MAKES SENSE, THANKS!

YOU'RE WELCOME!

TIMO NUMMENMAA
ANNAKAIJA KULTIMA
KATI ALHA
6. CHANGE IN CHANGE: DESIGNING GAME EVOLUTION

Think Piece / Exploratory Research / Theoretical Study

Timo Nummenmaa
Annakaisa Kultima
Kati Alha

ABSTRACT
In this article we explore the concept of change in the context of game design. Specifically, we are interested in the changes that a game concept can undergo after it has been released. We are interested in different cases that the designers and players can face with evolving game products. Recent changes within game culture and the game industry have made this topic increasingly relevant: Games are becoming more like services instead of products and the key point in game business today is not only to attract an audience, but to keep players interested over time. Digital distribution and online game services provide possibilities for game developers to explore new ways of designing games, but these new channels also emphasize the need for maintenance and can lead to specific challenges that, although not new to the field, are increasingly central. Finally, one of the focal points in designing game services is the evolution of the game concept.

1. INTRODUCTION
While the continuous changing of a system after its deployment is not new to the field of software engineering studies [7], the change of a game product has not been thoroughly researched. Examining this topic is becoming increasingly important as online games make it possible to release a product at a relatively early stage of development. A sizable amount of the game can be implemented while the players are already playing it. Games are turning into services, and Facebook is one of the platforms where this phenomenon is most visible. Games using social media services as their platform are constantly online, providing opportunities to frequently add new content. It is critical to keep the players interested since the revenue comes from micro transactions within the game rather than buying one product at a time [12].

Online games also provide possibilities to experiment with real audiences. New types of games can be put together in a relatively short period of time and taken in different directions based on metrics and user feedback. The game can be “launched” at the same time as production progresses and as the concept itself is being fine-tuned or even reworked.

Change is visible at many levels of game development. Most importantly the production process itself is treated as iterative by nature [3]. Since games are heavily experiential and interactive products [13], one cannot foresee the changes that an idea might undergo as it is being cultivated into a full-blown game. Concretizing an idea and playtesting the concept are pivotal in order to evaluate different solutions and define new directions for the concept [3]. This all applies to the design process of a game service as well, but
there is more to it as the developer has to be prepared to react to the metrics and the feedback of the players in order to keep the players interacting with the game.

Interactive experiences, such as digital games, are essentially based on the concept of change. The players interact with a game system by changing the states of objects within the game world in order to make progress. As the player plays the game, its environments change, the characters evolve, the story may take different turns or the score may grow. A game experience is all about change in this way. In this article, we explore the different ways that the game concept itself may change after its initial launch. But since “launch” might mean different things for different games, we decided to formulate the research question in the following manner: What are the different kinds of changes that can happen (to the concept) after the hypothetical first player starts playing the game?

2. CHANGE IN GAMES
2.1 PLAYERS & EMERGENCE
Complex experiential systems are unpredictable to design. No matter how much testing is done in the development stage, there are always possibilities for unexpected uses and activities. A game experience may differ radically between two different players. Emergent changes in games are initiated by the players. The way that a designer has imagined the game to be played might turn into a different concept in the heads of the players themselves. It can be argued that emergent change applies to all games. However, it clearly happens more in some games than others. Some games are specifically designed to support emergence. For instance, in the massively multiplayer online game EVE Online, much of the game content is the result of the players’ actions. In the game World of Warcraft, players started to collect game resources in order to sell them for real world money, which is not allowed in the game.

2.2 USER CREATED CONTENT AND MODS
The next level of players imposing changes on a game is when the players themselves create content for the games they play. “Mods” are additions or modifications to a game, or are fully reworked games that players have created by modifying the game externally, not just with in-game tools. They may bring new items to the game, change the look and feel of it, or change the rules of the game. An example of a famous mod is Counter-Strike, which was a modification of the game Half-Life that resulted in an entirely different game.

User-created content is something that the player is creating within a game, usually with in-game tools. This kind of content includes, for example, levels created by players inside the game. These kinds of changes have become more and more common, and as they often prolong the game’s lifespan the original game developers frequently encourage players to create more content for their games. There are even games that are built around this very change, such as LittleBigPlanet, Halo 3 with its forge mode, The Sims, and Second Life.
2.3 Updates, patches and upgrades
The “modifications” of a game may come from the developer as well. Currently it is possible to update, patch, or upgrade games on most platforms. Providing additional content is frequently done to keep the players playing the game. For instance, Burnout Paradise was updated free-of-charge for one year. New cars were made available, motor bikes added, and a day-night cycle was introduced. The year was dubbed “The Year of Paradise” by the publisher EA describing the focus on this particular product. In the massively multiplayer online game World of Warcraft, the patches are so significant that they almost resemble add-on packs. The players eagerly anticipate the higher-tier armor that the patches may bring, for example.

It is also possible to add content in patches that is not really important for the game and might even be hidden from the player. The patch might contain an "Easter egg" promoting an upcoming product. The change in the game might attract old players to play the game again because they want to hunt down the additions. A product can be changed even more drastically to suit the needs of the future games. For instance, the developers of the game Portal changed the ending with a patch so that it would better suit the sequel, Portal 2.

2.4 Downloadable content and expansion packs
The next step of updates and upgrades in games is downloadable content and expansion packs, which add to the experience of an already existing game. The original game is often required to enjoy the added content, but the original game itself is left untouched. It has been common to release expansion packs in a physical format and sell them in shops. Nowadays it is more common to sell the expansions through online services, such as Steam, Xbox Live Marketplace [10], or the Playstation Network store. Due to this distribution model, these expansions can be much smaller than when releasing the content required a physical, in-store release of content.

The downloadable content can occur in the form of single additional missions, as is the case in the game Mass Effect 2. Curiously, downloadable content can be already included in the game package itself, as in the case of Katamari Damacy where the additional content was on the game disc but needed to be activated through the online store.

In some cases, expansion packs that do not require the original game in order to be played are released. Such is the case with Undead Nightmare Collection for the game Red Dead Redemption. It includes all previously released downloadable content for the game and is playable without the original product.

2.5 Episodic content and sequels
Episodic content can be very similar to the downloadable content and expansion packs discussed above. In episodic games it is more common that in order to play the next game, one does not have to own the previous one. Each episode can be a standalone product. The episodes are equal with each other, while with updates and upgrades there is one main game that the updates or upgrades build upon. The most prominent
developer of episodic content is Telltale Games. They focus on the adventure game genre and release most of their games as seasons consisting of several episodes. The episodes are mostly released monthly during a season, with set times for each episode’s release. Sam & Max Save the World was their first episodically released game, followed by titles such as Strong Bad’s Cool Game for Attractive People and Tales of Monkey Island.

Sequels are extensions of previous products that are popular among different types of media such as movies and books. There are, however, different kinds of sequels in games: those that clearly iterate on a previous game, those that continue the story from a previous game, and those that take the original concept in a new direction. The division is not always clear, as games can fit into several of these categories at the same time. In the Gran Turismo series, sequels are iterations of previous games in the series. In Dead Space 2 the major differences compared to Dead Space are on the story side, but the gameplay is very similar. One example of a sequel with essential changes is Duke Nukem 3D. Between it and its predecessor Duke Nukem 2, the game changed into a first-person shooter from a side-scrolling platformer.

2.6 Perpetual beta, MMOs, and Facebook games
A very different and a more recent case of change in games is connected to the concept of the “perpetual beta,” which means the game may never leave the beta phase of development. This is especially apparent with games developed for Facebook. Having a game marked as a beta at all times is a very convenient way for developers to dismiss certain complaints as the game is never a finished and polished product. It might also create other challenges, however: For example, a player might purchase an in-game item with real money, but that item might later disappear because it is no longer supported by the developers.

2.7 Seasonal content
Some games, especially social games, have certain content that is tied to a period of time or a certain season. Many games on Facebook have content connected to Christmas, Easter, and other such seasonal holidays. In some cases the seasonal content may be pre-planned, but sometimes it is added on the fly. For example Angry Birds Halloween was released first, but its name was later changed to Angry Birds Seasons. The new version contained new content tied to a new holiday: Christmas. The game was later updated to include other seasonal content as well.

2.8 Product switches and drastic changes
As Facebook allows radical changes to games, it can be possible to change the entire product. One of the most drastic cases has been the Oregon Trail Facebook game, which was turned into the SpeedDate.com service application. Facebook terms of use, at least at the time of the switch, made it possible to change the name and the functionality of an application as long as the change was not kept hidden [4, 6]. Similarly, Star Wars Galaxies: MMO is famous for the fact that the whole game went through a complete overhaul, which, for most fans, ruined the game [15].
Playing an online game is dependent on service providers, which means players can be seriously disappointed when a popular game is shut down. The case of Demon’s Souls is one such example [1, 8].

### 2.9 Open Source Games

A great difference with fully open source games compared to most closed source games is that the source code and assets can be viewed by anyone at any time, even before the game is released. This leads to a situation where it is hard to create a game that is strongly story-based if the developers want to keep the story a secret. The game can also be compiled and played at any stage of development. Players might try it out at a bad spot in development and never come back to play it again. Open source game development can be a good place to learn what is possible in changing environments. For instance, it would seem that open source games should be more successful if there is no linear story and an initial playable game with a low amount of features is released early on during the development process.

### 3. Designing Change

In analyzing these different game evolution examples, at least three different categories for change from the perspective of design arise. First, there are the more traditional video game changes, such as player-driven changes that elicit emergence. Second, the role of the game designer is to provide tools and possibilities to mold and change the game environment. Things like patches and the more current example of data-driven design are more of a reactive change where the developers react to the needs and hopes of game community. Finally, the third category covers pre-planned changes, which means such changes as DLC. These categories are summarized in the following list:

- Emerging change: designing a space for the players to mold their own game experiences.
- Reactive change: changing the game by reacting to direct or indirect feedback from the players.
- Pre-planned change: content that is already designed, or in some cases already produced, before the launch of the game.

Obviously, these three categories can overlap. In some cases one can pre-plan different possibilities for the game concept to evolve, and execute one of the possibilities if the right feedback is received. For some game productions, one may also ease the reactive changes by providing more flexibility inside the game, letting the players themselves change the game and share the changes with others, or by providing support for the hobbyists that help with using all of the game’s potential.

### 4. Game Evolution and Game Experience

As changes in games on these various levels become more and more common, they are bound to change the game experience as well. Some of the changes, such as bug fixes, by definition improve the experience. Many times the changes are expected and even anticipated by the players, as in Facebook games that need to evolve to keep the
players' interest as long as possible. However, sometimes the changes may feel negative, or even unpleasant for the player.

The earlier examples about changing a game into SpeedDate.com or the drastic changes to Star Wars Galaxies: MMO are extreme examples, although smaller changes may influence players’ perceptions as well. For example, too many additions in a short amount of time can make players feel overwhelmed. On the other hand, taking some content away or changing something that has existed for a while into something new often results in negative feedback, at least from some players. Unpopular changes can make people dislike the game and even leave it, as in PackRat after the introduction of micropayments [5] or in CityVille after changing the inventory item caps [9]. The reception of a change can vary among different player groups, so it may not be trivial to act based on user feedback.

In a game that evolves all the time, the game experience differs because players start the game at different times. The players who have been playing during the whole era of a game's evolution experience the changes gradually, while the players who get into the game later usually get the whole package right away. Getting into a game at a later stage of its evolution may feel like fun, as there is a lot more content than at the initial launch, but it can also feel overwhelming. Similarly, different types of players may feel the game’s changes differently. Developers have to think about both the hardcore players, who advance quickly and need new content added quickly so they will not get bored, and the casual players who want a pleasant and simple gaming experience.

As some of the changes are voluntary and many of them cost money, it has given the developers new ways to monetize the business. While the micropayments and downloadable content may feel like cheap purchases, when added together they make up surprisingly large amounts. Where a more traditional MMO game may cost 10 to 20 Euros per month, a “free” Facebook or iPhone game with payable content may cost a hardcore player hundreds of Euros or more. In the worst cases, the purchases may be done accidentally, resulting in a surprisingly high bill later on [14]. Similarly, with downloadable content in more traditional console and PC games, the game may end up costing multiple amounts than the original price tag [2, 11]. In the end, the monetizing aspect can start to feel like greed to the players. Another issue concerning the purchase of content is ownership of virtual items. Usually the player does not buy the item itself, but the right to use it. The developer may remove the purchased content at any time, and when a game gets discontinued the player is not eligible for any refunds.

5. DISCUSSION
As the environment of digital games is changing from products to services, the conceptualization and production processes are also undergoing changes. Even though the possibility for testing game concepts with a real audience can be seen as a positive opportunity, new challenges also arise with service-based games. The complexities of the game experiences, different player groups, and play styles are already challenges for game designers. How to keep different groups of players happy and engaged with the
game while simultaneously maintaining coherent experiences for all is a question that many developers must address. However, there seem to be a number of solutions for service-based game design already available, and the future may hold new innovations that help developers cope with the potentially negative aspects of gamers’ experiences. In many ways the changes are additive by nature: It is easier to just add something rather than to take something away or change something drastically.

The Facebook games that are in perpetual beta provide an interesting case for examining the different ways that change can be designed. Perhaps instead of only adding new things, a game experience could be designed entirely around the concept of change. A game that does not promise anything but different directions within a given time could be an engaging experience if done correctly. An indication for this could be already found in existing cases: two different Facebook games Safari Kingdom and Happy Habitat were thematically rather similar, but their approach to game evolution varied. Happy Habitat evolved like “a living prototype” and created excitement among the players since nobody really knew what was going to happen next, if anything. Safari Kingdom may have turned off some players because it made its evolution visible to them. Facebook games may already be very repetitive and all about grinding: Showing the upcoming levels all the way to level 90 might not be a good design solution. Designing a game service is also about designing the evolution experience.

6. CONCLUSION
In this article, we have explored the different kinds of changes a game may undergo after it has been launched. One of the most pivotal design challenges of modern games is change. From the point of view of design, there are at least three types of change: emergent change, reactive change, and pre-planned change. While change is already intrinsic to game development processes, recent trends in the game industry are forcing game developers to think about how they design the process of evolution that games go through over time. Service-based games provide experiences like other games, but at the core of the experience is the experience of game evolution.

REFERENCES


LOOK WHAT I FOUND...
**WHAT IS DISCO?**

The DisCo software package is a tool that allows for simulating system specifications. In its current experimental version, it is possible to simulate game designs and abstract versions of game systems. The DisCo system is composed of 2 basic parts: a textual specification written in a style similar to many programming languages, and a graphical creation. The creation is made based on the content of the specification, and can be used to simulate the progress of the game on an abstract level (see Figure 1).

![Image of the DisCo software package.](image)

**Figure 1. The DisCo software package.**

The specification is not object-oriented but action-oriented. Actions are continuously executed and can be influenced through an XML file that is read before each action is executed. In order to be action-oriented, DisCo must have an action-oriented execution model (see Figure 2). In order for it to be suited for game development, it should support probabilities. A possibility for outside influence and outside visualization makes the system even more useful.

**HOW TO USE DISCO**

In order to use DisCo, the target of the design must be seen as a set of actions. What are the things that can happen in the game? These can be considered as actions. Who takes part in these actions? These can be considered as the participants in the actions. Creating the actions first and describing their participants places the emphasis on game events instead of content. Using this direction of thinking can be very useful even outside the DisCo software package, although for people who are used to object oriented thinking it can feel difficult at first.

In order to gain the most benefit from using DisCo, the specification should be created at the beginning of development as an abstract representation of the game. By keeping the specification up to date during the development process, it can be used as a form of...
documentation, a way to test ideas, and as a means of communication.

Figure 2. An action-oriented execution model suitable for game development.

**WHY WOULD I WANT TO USE DISCO?**
The DisCo specification can ideally replace parts of the design document. It can be used to specify the game rules and how the system should progress. It can be used as a design tool to help test out ideas without creating an actual implementation.
CHAPTER 2: INNOVATION & DESIGN
I was thinking...

How should one go about researching game design?

Most of the game design literature concentrates on describing the content, e.g., games and good design principles. You should really study the design activity as well. For instance, using models of design activity from other areas of design research can give you a much better view on game design and, therefore, help you create better design tools, for example.

Oh, okay!

Yeah, that's how it really is.
7. SOME NOTES ON GAME DESIGN
Conference Paper / Content Analysis / Theoretical Study

Jussi Kuittinen
Jussi Holopainen

ABSTRACT
The focus of this paper is to have a critical look at the current game design literature through the analytical lenses of the current state of the art in design research. The aim is not to create yet another prescriptive framework for game design but rather to connect game design studies to general design studies in a stimulating way. We first discuss what has been said about design in general, including industrial and graphic design, engineering, architecture, and even software design. We then continue discussing game design specifically compared to design in general and point out similarities and differences. This exercise leads to a somewhat obvious claim that doing game design is an activity similar to any other design field, but that the form and the content are specific to the game design context. This claim has some unexpected consequences: it grounds game design in the large body of existing design research, and it helps in identifying the crucial activities, forms, contents, and contexts that determine the nature of game design. We look at six game design books alongside two distinct but mutually supporting models of design in general. Our focus is in understanding game design as a situated activity and to see how this notion is discussed in game design.

Judging from the selection of the game design literature we analyzed, game design is heavily governed by the object of the design. We argue that game design should be studied through models such as Lawson’s that address the various kinds of activities inherent in design thinking. In our view, this approach will not only allow for a better understanding of game design, but also open up new possibilities of improving the methodologies of game design. We also suggest that game design should be addressed as a situated phenomenon acknowledging the very complex network of issues affecting it. At the moment, the picture painted by game design literature overly emphasises the design of gameplay.
It seems like such a buzz word. What does it actually mean?

Well, it can mean a lot of different things. People often use it in the same way as “creativity” or “invention,” but it actually differs from that and it’s best to understand it as a process of coming up with and executing new ideas. There are also different levels of innovation, for instance radical and incremental innovation. And one can innovate on different things: there is product innovation, service innovation, and so on. They even talk about innovation ecosystems, since it really does not happen in a vacuum. It is a lot more than people usually think of.

Oh, okay. I’m educated now.

Glad to help.
ABSTRACT
Innovation is perhaps best described as the successful application of a new idea or invention. But innovation can be understood and discussed from many levels. Innovation in a certain industry always results in a transformation process that simultaneously undermines the established practices and products and creates new market opportunities. There are many models of innovation processes. Innovation can also be looked as a part of a wider perspective, and discussed as innovation system or innovation ecosystem. This article discusses the concept of innovation from those three perspectives: innovation as an outcome, innovation as a process, and innovation from a wider perspective.

1. INTRODUCTION
Innovation is one of those words that everyone uses; however, the level of understanding varies and may be confused with other terms. “Innovation” is often described as a buzzword and the colloquial use of the term has usually described innovations only as new inventions. The definitions of innovation differ depending on who we ask, even among researchers [11]. The meanings have also changed over time [6]. Furthermore, what could be broadly called “innovation studies” includes various disciplinary approaches from psychology and sociology to engineering and economics, and each discipline has its own approach to innovation.

There are several levels from which to look at innovation. It can be seen as the outcome of the idea or invention, the process, or as a part of a wider ecosystem. This literature review covers these different views in detail. The purpose is to explain some of the different aspects of innovation at a conceptual level, although this overview is not intended as an exhaustive one.

2. INNOVATION AS THE OUTCOME
2.1 DEFINITION OF INNOVATION
A general way to look at innovation is by considering the end result, be it the product, process, or service that has been brought to market. This general understanding of innovation is somewhat fuzzy. People speak of it a lot, but tend to mix in other terms, such as invention [21]. Faberberg [9] compares those terms by stating that “[i]nvention is the first occurrence of an idea for a new product or a process, while innovation is the first attempt to carry it out into practice.” The lag between the two can stretch for decades, as turning invention into innovation requires resources for working out ideas and implementing them. In some cases, invention and innovation can occur very close to each other, making it hard to distinguish one from another [9].
As Faberberg’s definition states, innovation holds the requirement of being something new. Goldsmith and Foxall [11] assert that newness can have at least three different points of view: recency, originality, and similarity. With recency, it is meant that something is new when it has been encountered or acquired recently. Originality refers to unfamiliarity, something being new to somebody. Finally, similarity means how similar or different something is from existing things of the same type [11]. Furthermore, it is worthwhile to consider for whom the innovation should be new. Most of the research concentrates on the firm’s perspective, while others think innovation should be new to the world, the adopting unit, the industry, the market, or the customer [10].

Another feature that innovation must achieve is success. To be called an innovation, it has to be useful and most of the time successful in economic terms [16]. According to Cumming [6], innovation is “the first successful application of a product or a process” [6]. An invention that becomes an innovation needs not only implementation, but also marketing and distribution.

### 2.2 Innovation categories

There are many ways to sort innovations. One basic categorization is to divide innovations into product, process, and administrative innovations. Process innovations are a company’s methods for delivering products or services, while product innovations refers to the end product and administrative innovations reflect the change in the characteristics of organizational or institutional elements. [4]

In addition, innovations are usually divided into groups based on how original they are. Perhaps the most common categories are radical and incremental innovations. Radical innovations are introductions of totally new types of items, whereas incremental innovations are continuous innovations that improve an existing product. The radical innovations can be considered more valuable than the incremental innovations, but Faberberg states that usually the cumulative impact of incremental innovations can be as great or even greater than single radical innovations [9].

In addition to the categorization between radical and incremental, there are numerous different categories and scales. Some place radical and incremental innovation as two ends of a spectrum, such as incremental/new generation/radically new [25] or incremental/radical/transformation [21]. Some concentrate on additional qualities such as sustaining/disruptive innovation, in which disruptive innovations are unexpected innovations creating new markets [5]. Others have similar extremes to incremental and radical innovation, but with different labeling, such as continuous/discontinuous [22], evolutionary/revolutionary [24], or deepening/widening [3] innovation.

Many other individual categorizations have also been formed. For example, Abernathy and Clark [1] categorized innovations as niche creation, architectural, regular, and revolutionary. In addition to radicalism of the innovation, they took notice if the innovation concerned markets and linkages to customers or the capabilities of the company’s technology and production (see Figure 1). Architectural innovations, for
example, depart from established systems of productions, open new linkages to markets and users, and set the architecture of the industry. [1]

Figure 1: A framework for innovation categories by Abernathy and Clark [1].

In another categorization, Henderson and Clark [13] proposed the terms “architectural” and “modular” in addition to radical and incremental innovations. They are positioned in two dimensions: the impact on components and the impact on the linkages between components (see Figure 2). The incremental and radical innovations are seen as the extreme points along the dimensions. Modular innovations change the core design concepts without changing the product’s architecture, and architectural innovations change architecture without changing the components and their core design concepts. [13]

As Henderson and Clark [13] state, there are different ways to characterize different types of innovations, and different categorizations may be useful when having different aspects and focuses. However, the oversupply of categories may be a problem: This issue is clearly seen in the examples before, where architectural innovation was used to mean different things in two different categorizations, even when one of the writers of the articles was the same. The problem is even more evident in Garcia and Calantone’s article, where they identified 15 constructs in only 21 empirical studies. The constructs are used inconsistently even in academic research. The reasons for inconsistencies and overlapped labeling of different types of innovations may originate from the many scholastic communities researching innovation and overlooking findings from other fields. [10]

On the base of their literature review on the subject, Garcia and Calantone [10] proposed the use of categorization of three constructs: radical, really new, and incremental. To
define how innovations were placed in categories, they used two aspects: whether the innovation was discontinuous in marketing or technology, and whether it was discontinuous from a micro or macro perspective. The macro level is whether the characteristics are new to the world, the market, or the industry, whereas the micro level is whether they are new to the firm or the customer. If an innovation is discontinuous both in marketing and technology from a macro perspective, it is radical; if it is discontinuous only in either marketing or technology from a macro perspective, it is really new; and if it is not discontinuous at all from a macro perspective, it is incremental.

![Diagram of innovation categories]

Figure 2: A framework for innovation categories by Henderson and Clark [13].

Carayannix, Gonzalez, and Wetter [4] based their categorization on previous literature as well. They suggested the use of incremental, generational, radical, and architectural as the categories that divide technological innovations. Incremental innovations improve existing technologies in small improvements. Generational innovations are incremental innovations that lead to creation of a new but not radically different system. Radical innovations depart significantly from previous practices. Architectural innovations extend the radical-incremental classification and take notice of changes in the ways that the components of a product or system are linked together. [4]

Furthermore, innovation can be subdivided into at least four concepts: the process, the content, the context, and the impact of innovation. Carayannix et al. relate their classification and some other concepts to these dimensions as shown in Table 1 [4].
Table 1: Dimensions of innovation and relation to different categorizations by Carayannix et al. [4].

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3. INNOVATION AS A PROCESS

Generally, the innovation process includes the steps from ideation to application [11]. Cumming [6] specifies three steps that usually precede innovation: (1) idea generation, (2) the successful development of that idea into a usable concept, and (3) the successful application of that concept [6]. It is difficult to define exactly at what point of the process the innovation emerges [19]. The most creative phase of innovation process is in the beginning at idea conceptualization, and less creativity occurs in the rest of the production process [23]. Innovation process can also mean the iterative process, including the introduction of a new innovation and later, improved innovations [10]. The following sections introduce some of these process models.

3.1 LINEAR MODELS

A linear model of innovation can be seen as outdated (see Figure 3). Innovation processes are seldom straightforward and the linear model precludes feedback from end users. An innovation cannot be produced without the influence of society and recent studies suggest that the role of the end users is much higher than generally thought [14].

![Figure 3. Basic linear model of an innovation process [14](image)](image)

It is common knowledge that the process is not completely linear because a large amount of ideas are generated throughout the different stages of production (see Figure 4). Modeling the process is challenging because a self-explanatory model is difficult to create from a complex process [7].
3.2 INNOVATION VALUE SYSTEM

A linear model might have been useful at some point when the intent was to define linear relationships and discrete activities. One suggestion is that modern innovation strategies in companies have to utilize a strong networked innovation value system (see Figure 5). This system values interdependencies within the functions and highlights two-way communication in the innovation process. A linear model would not be adaptable enough for modern innovation processes [2].

Figure 5. The innovation value system [2]
3.3 Concept Map of the Innovation Process

Innovation can be seen as an evolution of paradigms. Usage of these paradigms enables the construction of a concept map of the innovation process (see Figure 6). The horizontal axis refers to the importance of individuals and the vertical describes the innovation cycle. The vertical axis also suggests that a new innovation replaces an old convention and eventually the innovation becomes outdated and is replaced with a new innovation. Both axes eventually fold back on themselves, meaning that the process always restarts. At first the map might seem linear, but it incorporates feedback loops that emphasize the role of iteration and the recursive nature of the process. This concept map emphasizes the natural selection process of ideas and innovations [8]. Dubberly’s concept map is a prime example of how difficult it is to build a clear explanatory model of the innovation process. When aiming for a definitive process model, the outcome is usually very ambiguous or difficult to comprehend.

Figure 6. Concept map of the innovation process [8].
3.4 DISTRIBUTED INNOVATION

“Innovation paradox” is a term used to describe challenges in the management of modern companies. Innovation should always be treated as a priority at a company. Usually a company focuses on short-term goals when they should be focused on innovation-led growth and management. Innovation needs strong commitment and should be a priority at all levels, including the management of the company [12].

The distributed innovation system was formulated to tackle the innovation paradox. It suggests that an internal innovation process is not enough anymore, even if the process is successful and productive. Distributed innovation does not only take into account the internal innovation processes, but extends beyond the boundaries of the company. This means that interaction between the company and external contributors should be enhanced greatly. Collaboration between the company and external partners constitutes the distributed innovation system [12]. In the game industry, one example of a distributed innovation system is the licensing of development frameworks, which enables two-way collaboration and provides tools for smaller developers.

4. INNOVATION FROM A WIDER PERSPECTIVE

It is useful to look at innovation from a wider perspective, as innovation does not happen in a vacuum. Recently, the concept of the innovation system or innovation ecosystem has been used more and more to stress the importance of interaction between the actors who turn inventions to innovations. The next sections discuss innovation from some of these wider perspectives.

4.1 INNOVATION AND EVOLUTIONARY ECONOMICS

The concept of innovation, along with its causes and consequences, are at the core of evolutionary economics, and it has found its way from academia to the policy makers and become a central means to maintain national competitiveness. When looked at from the evolutionary framework, innovation is not something that is done but something that happens. Whether a given activity can be called “innovating” can only be evaluated afterwards once the success of the activity is known.

Companies strategically seek innovations to create successful products. Intellectual property rights grant the developer of a new product or production process a competitive advantage. This advantage is only temporary, however, and sooner or later the competitors will also have access to the new technologies. New practices (variation in evolutionary terms) are the result of intentional pursuit of innovations or other managerial actions and new workers with their know-how. Competition drives other companies to adopt successful practices and abandon obsolete ones (selection in evolutionary terms). This way the “practice pool” of an industry gradually changes and it maintains its competitiveness. The Schumpeterian concept to describe this kind of techno-economic process is “creative destruction” [16]. If all others adopt new practices, the inflexible firm is in trouble.
4.2 PATH DEPENDENCY AND INNOVATION SYSTEM
In social studies of technology and evolutionary economics, the concept of “path dependence” illustrates that changing practices is slow and, once a path is settled, it is relatively hard to deviate from it [cf. 16, 18]. The parallel phenomenon in biological evolution would be inheritance. Earlier developments in the first-person shooter game genre limit current possibilities to some extent, but at the same time make it possible to further refine the genre. Changing the practices is hard because the developers’ competences and the gamers’ expectations change slowly. Path dependence is a relative concept to specialization, which means focusing available resources and shutting out other possible courses of action. Pathological specialization leads to problems seen, for example, in countries that are dependent on only one exportable commodity. In the same way, a game developer who is too focused on one niche is vulnerable to sudden fluctuations in that market.

The fact that the actors trying to innovate are in many ways dependent on other actors and social structures is in turn illustrated by the concept innovation system. Different national economies are variably capable of producing innovations. Aside from private companies, public funding organizations (such as Tekes in Finland) and universities are essential parts in the innovation systems. This is, of course, a politically relevant topic, as national innovation policies are largely based on these kinds of theorizing [16]. If the change in practices is slow within industries, it is certainly so among public actors. This also means that the idea of path dependence can be applied to whole innovation systems.

When looked at in more detail, the concept of the innovation system does not seem to be that well defined. It can include companies’ internal communications, quality management systems, circulation of labor force members, interaction between producers and consumers, technological possibilities, education systems, and the reward systems aside from the research and development done at companies, universities, and research centers [16]. The concept is nevertheless useful in recognizing that different actors and institutional configurations affect the ability to produce innovations. In evolutionary terms the innovation system could be called an “ecosystem” or “selection environment,” which are equally complex concepts themselves.

4.3 CONDITIONS FOR INNOVATION
As said, innovation happens in a context, and there is a diverse set of conditions for innovation. Aside from internal factors such as company organization, material capital, and human capital, the external environment (law, economy, institutions, social structure, culture) needs to be adequate for innovation. Recognizing this has led researchers to the so-called innovation systems approach [15]. Metaphors borrowed from ecology and evolutionary biology are often utilized here; thus, the concept of the innovation ecosystem.
Innovation has an essential relationship with knowledge and learning. It has been stated that there are three kinds of knowledge a company needs for successful innovation [15]:

- The general level of scientific and technical knowledge, on which other types of knowledge are based but which is usually difficult to apply
- Industry-specific knowledge about general processes, resources, and markets that is shared by companies competing in the same market
- Company-specific, specialized, and localized knowledge, which is usually unique and central to the company’s competitive edge

5. CONCLUSION
This article has brought together some of the different aspects of innovation. Although innovation may be a buzzword, understanding what innovation means is not always clear or agreed upon. Innovation is a complex concept with separate backgrounds in different disciplines. Innovation can be seen as an outcome, such as the product or service, or as the process of creating the outcome. It can also be viewed from a larger perspective, such as when discussing entire innovation ecosystems.

REFERENCES


How much do we actually know about creativity?

We know quite a lot! There have been a lot of different studies on different aspects of creativity, and we have come a long way since the initial steps in the 1950s. Contrary to the traditional assumption of creativity being a supernatural force, there is growing agreement that creativity is the result of a synergy between multiple components. It is quite complex in the end and there is so much more we could study!
9. A SHORT INTRODUCTION TO CREATIVITY RESEARCH
Work in Progress / Literature Review

Tanja Sihvonen

ABSTRACT
This article is a summary and evaluation of some of the relevant literature in the field of creativity research. It surveys the concept of creativity by presenting a variety of understandings of its theoretical foundations. Creativity measurement tests are discussed briefly, and the shifts in the conceptualizations of creativity are outlined. The purpose of this literature review is to offer a brief overview of some of the most significant theoretical perspectives of the field and research results in a pragmatic and usable way.

1. INTRODUCTION
Creativity is considered one of the most important resources of humankind [32] and its importance for social and technological innovation is indisputable [cf. 25]. Arts and sciences, as well as innovation, invention, and social progress more broadly, are dependent on creativity at an individual level and at a societal level [8]. Adapting to changing circumstances, socio-technical development, and problem solving—responding creatively to varying situations—is a prerequisite to sustaining existence and assuring growth for individuals and organizations alike.

Despite the centrality of the idea of creativity and its ever-growing importance in society, research focused on this topic has not been at the forefront of scientific work, not even in the field of psychology where its relevance seems nearly unquestionable. There are several historical reasons for this. The first and most important reason seems to be the background of the construct of, and the problems with, defining creativity.

This has also led to difficulties in all aspects of its measurement; simply put, there is an absence of comprehensive, high-quality measures of creativity. Nevertheless, there are some positive developments. Growth in agreement on definitions, more widely accepted models of personality, and the appropriate use of Divergent Thinking (DT) tests are signs of a positive future for creativity research. [6]

Creativity is a politically and economically charged concept. In practice, creativity testing is used nowadays in educational settings to determine individual characteristics of students, and to formulate curricula and study groups based on these qualifications. A focus on creativity has also discursively raised awareness of the dilemmas that educators face when engaging in the activities of measuring and determining their students’ ratings of creativity, as well as taking part in the discussion of the role and purposes of education in society [cf. 5]. A growing field of study, both in theory and in practice, is research targeted at determining the dimensions of creativity in organizations and business settings.
2. ORIGINS OF CREATIVITY RESEARCH

The origins of the modern research focus on creativity can be traced back to J. Paul Guilford’s presidential address to the American Psychological Association (APA), where he called for more research on the topic. Guilford is also the founding father of the psychometric tradition of creativity measurement. Since that landmark speech in 1950, numerous books have been written and journals launched to discuss the core issues, aiming to provide a solid foundation to the field: with indeterminate success, according to critics. In any case, a vast amount of publications on creativity has appeared in the past 60 years. For example, the Creativity Research Journal has been published since 1988.

Despite the evident fragmentation in the field, influential edited volumes and monographs on creativity have been published, particularly in the past decade. Robert J. Sternberg edited the Handbook of Creativity [30] that covers the area from a variety of angles. Together with James C. Kaufman and Jean E. Pretz, Sternberg published The Creativity Conundrum [31], where they introduce the “propulsion model” of creativity outlining eight types of possible creative contributions.

Jane A. Piirto, on the other hand, created her own model of explaining creativity—the seven I’s of creativity—in Understanding Creativity[27]. R. Keith Sawyer argues that creativity can only be understood in its social and cultural context in his Explaining Creativity [29], and Mark A. Runco provides the research field with a general textbook called Creativity: Theories and Themes [26].

Over the past 100 years, the meaning attached to the concept of creativity and the scope and depth of the research have changed significantly. Creativity has traditionally been regarded foremost as an exceptional, individual quality, but today it is also considered as a life skill that people can employ to develop their potential and their imagination to express themselves and make original and significant choices in their lives [16, 17].

Thus, the emphasis has been shifting from studying exceptional individuals and their characteristics to studying the creative potential in all people in different knowledge domains. This change reflects the growing importance of activities such as participation and interaction, which define the relationships between people and their social contexts, organizations, communities, knowledge domains, and the structure of various kinds of creative processes.

What has, therefore, become a key notion is the importance of communities and social environments that encourage creativity in individuals and group work. Creative and innovative aspects of work have become more important for organizations as they need to be ever more competitive in the Knowledge Economy. Researchers and practitioners alike try to understand creativity in organizations by, for instance, explaining the differences between individual, (small) team, and organizational aspects of it [cf. 35].

One of the most important theories devised to explain the role of the environment in the creative process is Csikszentmihályi’s (1996) Systems Model, where he regards
creativity essentially as a byproduct of the interactions among the domain, the field, and the person [8]. Research is also targeted at developing a larger scale understanding of the relationship between individual and organizational creativity [cf. 3], as well as the importance of innovation and creative processes for organizations [21].

3. DEFINING CREATIVITY
There have been many attempts at defining creativity over the last several decades, even centuries, and the resulting conceptualizations vary wildly. There is still no solid consensus on the scope of the term. Each conceptualization of creativity has particular theoretical and practical implications that need to be taken into account if one wishes to understand the foundations and associations of a particular field of creativity research.

In order to grasp how creativity measurement and assessment work, one must be aware of the divergent philosophical foundations on which the conceptual framework in each case is based. The basic problem with the concept lies in the fact that it is “not a technical word invented to describe the psychological attributes or processes that result in creation” [6].

The definitions of creativity are diverse as the following examples suggest. Creativity can be regarded as:

- the ability or quality displayed when solving hitherto unsolved problems, when developing novel solutions to problems others have solved differently, or when developing original and novel (at least to the originator) products [22]
- an imaginative activity fashioned so as to produce outcomes that are both original and of value; the five characteristics of creativity are using imagination, a fashioning process, pursuing purpose, being original, and judging value [16]
- a process toward achieving an outcome recognized as innovative by the relevant community [8]
- the ability to produce something new through imaginative skill, whether a new solution to a problem, a new method or device, or a new artistic object or form [9]
- a mental process involving the discovery of new ideas or concepts, or new associations of the existing ideas or concepts, fuelled by the process of either conscious or unconscious insight [34]

The variety in the definitions of creativity was singled out as a specific point of interest and a subject matter for a meta-analysis as early as the 1960s. For instance, Ridley [24] identified as many as 26 different definitions of creativity. He divided these into 2 areas, the behavioristic (which identifies creativity with novelty and originality) and the existential (which associates creativity with genius). In his work, creativity is still firmly regarded as an individual characteristic, the qualities of which are put under critical scrutiny. The study remains an example of research where social context is less relevant.
The historical background for regarding creativity primarily as the original product of an individual, or an individual’s work, is very much a Western concept. From this perspective creativity has often been seen as a trait or a gift that is partly genetically determined and sometimes correlated with mystical interpretations. Because creation was traditionally seen to result from divine intervention or mystical powers, it was considered beyond comprehension, analysis, and measurement. For a long time, creativity was also considered something that could not be learned or consciously enhanced [1, 6].

4. STUDYING CREATIVITY
As we have seen, creativity has become a loose umbrella term and lay expression that can be applied to several individual areas of study. These have been suggested to consist of: 1) the person who creates, 2) the cognitive processes involved in the creation of ideas, 3) environmental influences or the environment in which creativity occurs, and 4) the product resulting from creative activity [6, 23].

A similar but simpler way of organizing research on creativity is to use the Four P's model, which distinguishes among the creative Person, Process, Product, and Press (where “Press” is equal to environment) [cf. 15]. Each of the “P’s” can be divided into several sub-categories, which are all present in the research setting with their own genealogies and methodologies.

About 100 years ago, creativity was regarded primarily as an intellectual trait and creativity research was grouped together with research on intelligence. Research on creative problem-solving processes and personality theories led scientists to assess creativity through neurobiological methods, for example. The psychologies of creativity have been listed to consist of the cognitive, personality, humanistic, social, environmental, and psychoanalytical perspectives, and each of these approaches devises its own theories, methods, and investigative paradigms [6].

Broadly, there are currently six methodological categories for studying creativity [10, 19]:

- Psychometric: correlation and regression studies surveying, identifying, and constructing factors that can influence creativity.
- Experimental: direct comparisons that systematically manipulate independent variables hypothesized to influence creativity.
- Biographical: case study analysis of recognized episodes of creativity.
- Biological: measurement of neurological or other physiological activity during creative task performance.
- Computational: formal models of creativity, typically using artificial intelligence.
- Contextual: descriptions of creativity as arising from social and cultural contexts.
The various theoretical frameworks act as the foundation for empirical work, for example, measuring the creative potential of individuals or their work.

The research of Amabile [3] suggests that individual creativity requires expertise (knowledge, proficiencies, and abilities of people to make creative contributions to their fields), creative thinking skills (cognitive styles, strategies, and personality variables), and intrinsic task motivation (the desire to work on something because it is interesting and rewarding in itself).

Coming from a different angle, assigning the perspective of creativity to the process rather than the product or person has led scholars such as Csikszentmihályi to analyze the experience of being creative through the concept of flow, which refers to an intense engagement in an activity and the sensations that come with the intensiveness of it. Csikszentmihályi’s book Creativity [8] is based on detailed interviews with creative individuals.

The generally accepted, rule-of-thumb conception of creativity also states that products that are considered creative must be new and useful. One might expect that creativity scholars would then use measures that consider novelty and utility. In practice, however, use of these measures has been difficult. The results of tests that use the criterion of lifetime achievement, for example, can hardly be compared to those of using word fluency as the measure [6].

5. CREATIVITY MEASUREMENT AND ASSESSMENT

As the concept of creativity has been challenged and revised numerous times, it should come as no surprise that the methods for the assessment and measurement of creativity have not been straightforward, either. There is still considerable criticism of the instruments and tests that have been devised to measure creativity [cf. 33].

This criticism is partly directed toward the purposes of measurement—for instance, whether the tests are used to give constructive criticism to support the development of individuals, or whether they are used to single out valuable and meaningful personal expression for some external purpose. Some researchers suggest that creativity investigations should be related to specific tangible products [12], others see that as an impediment.

The most commonly used measures of creativity are Divergent Thinking (DT) tests, such as the Torrance Tests of Creative Thinking (TTCT). These are based on the work of the pioneers in the field, such as J. Paul Guilford and E. Paul Torrance, whose contributions have been republished in an edited collection by Gerard J. Puccio and Mary C. Murdock, Creativity Assessment [28].

Guildford’s original collection from 1967 included tests such as “quick responses,” a word-association test scored for uncommonness, and “unusual uses,” where subjects were used to find unconventional uses for common everyday objects. E. Paul Torrance
was building on Guildford’s work when he was developing his famous tests in 1966. The TTCT include simple tests of problem-solving skills, which are scored on fluency, originality, and elaboration.

A preliminary taxonomy of modern creativity measures has been presented by Hocevar & Bachelor [12] and Lubart [18], and it consists of eight categories: 1) Divergent Thinking tests, 2) attitudes and interest inventories, 3) personality inventories, 4) biographical inventories, 5) ratings by peers, teachers, and supervisors, 6) judgments of products, 7) ratings of eminence, and 8) self-reported creative activities.

Clearly the range of creativity measurement and assessment methods is rather overwhelming. In practice, it may be very difficult to objectively choose from the hundreds of available tests. Furthermore, there is a distinction between measurement and assessment in creativity testing. Measurement refers to the practice of assigning numbers to phenomena, meaning that assessing reliability of these assignments and meaningfulness of the numbers (norms) and the predictiveness of the numbers to another set (validity) all become key issues. Assessment, on the other hand, consists of processes of appraisal and comparison, too. Creativity assessment entails ranking or ordering performances on a variety of scales (comparison). [13]

6. WHAT IS THE ROLE OF CREATIVITY IN ORGANIZATIONS?

Today, creativity is recognized and valued at the level of individuals, groups, and society, and it is considered an important element in participating in and contributing to the wider social context of life and culture. Creativity is also considered as a cornerstone of scientific development and progress, which are quintessentially dependent on the social context [10]. The role of the social environment, however, presents problems for creativity research, as it has not traditionally figured as the focus of investigation.

In order to review the research on organizational creativity, a multicomponent perspective of creativity assessment is used here. In this paradigm, creativity at the individual level is seen as the result of a complex interaction between the individual and the environment. This interaction finally leads to a creative product [cf. 7].

Contrary to the traditional assumption of creativity as a supernatural, individual trait, there is growing agreement on the idea that creativity is the result of a synergy between multiple components. These include cognitive ability and style, personality, motivation, knowledge, and the environment [2, 3, 11, 21].

As the environment in which creativity is being manifested is an important component of the evaluation process, examining creativity in isolation can be misleading or it can produce equivocal results. However, despite the complexity and multiplicity of variables, there is considerable agreement among the studies on individual difference correlates of creativity.
The influence of organizations in encouraging or impeding creativity in the workforce has become an important research topic in the past years. It has been acknowledged that organizations need to create a climate that enables the creative thinking of their employees [cf. 3]. In an organizational context, individual creativity is not necessarily the focus of attention: The social and technological processes that enhance the common factors supporting creativity instead receive focus.

Five major organizational dimensions have been identified—organizational climate, organizational culture, organizational structure and systems, leadership style, and resources and skills—that promote or inhibit creativity in a work environment [4]. There is recent meta-level research directed at identifying and explaining the characteristics and behaviors under each of these dimensions that enhance organizational creativity.

For instance, Hülsheger et al. [14] present a meta-analysis, based on over 100 primary studies, of 15 team-level variables and their relation to creativity and innovation in organizations. The variables that showed the strongest relationship in these studies with creativity were support for innovation, vision, task orientation, and external communication. Another key finding from their meta-study was that these relationships depended considerably on the measurement method (for instance, self-rating) and measurement level (individual or team innovation). They conclude that team process variables were more strongly related to creativity and innovation at the team level than at the individual level.

7. CREATIVITY RESEARCH, TECHNOLOGY AND EDUCATION

The relationship between creativity and technology has attracted some recent attention, especially from the viewpoint of education. It has been argued that digital technology exhibits features of provisionality, interactivity, capacity, range, speed and, most of all, automatic functions that enable users to accomplish things more effectively than might otherwise be possible [cf. 15].

Even though technologies may not promote creativity per se, they educate their users to make informed choices and evaluate their impact, which in turn aids them in creative thinking, decision making, and problem solving. The interaction between the characteristics of creativity and the features of technology paves ground for new perspectives on the development of creativity in education. [10]

Technology also provides its users with opportunities for reflection and sensitivity to the values of education, as well as awareness of the ways in which creativity could be manifested and encouraged across the curriculum. It also promotes play and exploration with information, ideas and materials, as well as resourcefulness and resilience when encountering change, unexpected situations, and problems. Flexibility in time and space are also likely to enhance creative practices [cf. 17].

One of the important issues here consists of using digital technologies creatively. For instance, simulation and strategy games can be used in educational contexts to
explore what-if questions in a creative way. Technology can be utilized in developing and representing ideas, making connections and associations, creating and re-creating media content, bringing a dynamic, collaborative aspect to the ways of working, sharing knowledge and best practices, and aiding the development of communication and feedback systems.

8. CONCLUSION
In this article, I have mapped out several different levels of understanding and studying creativity, from the history of creativity through creativity measurements and creativity definitions to understanding the role of creativity in organizations. Contrary to the traditional assumption of creativity being a supernatural, individual trait, there is growing agreement on the idea that creativity is the result of a synergy between multiple components. This consensus should be considered when thinking about creative industries.

It should be acknowledged that organizations are complex systems consisting of social, political, and technological components, and it is evident that there is no simple solution to suddenly make them more creative. However, research has shown that organizations that exhibit a playful attitude toward ideas and the work environment, and that are adaptable and flexible in their organizational structures and systems, are more likely to benefit from creative processes.

Organizational climate, culture, and structures, as well as issues of leadership and resources, are among the most important dimensions of creativity research at the moment [20]. Although the range and scope of variables in creativity assessment may seem overwhelming, perhaps it could also be considered as an advantage: There is no single determining factor for a creative organization or environment, but many small and interdependent components that comprise a climate that encourages creativity. Significant change can, therefore, be kicked off starting from small details rather than large changes.

REFERENCES


CHAPTER 2: INNOVATION AND DESIGN


LOOK WHAT I FOUND...
FLOWERI
Method

Annakaisa Kultima

WHAT IS FLOWERI?
Floweri is a concept for a brainstorming room. It imitates the interior design trends seen in locations such as the Google offices at Zurich, the Skype offices, the Three Rings office at San Francisco, or the Pixar office at Emeryville. Modern office interior design uses playful and unusual solutions to foster the creativity of the workers and strengthens the image of the company or organization to attract pro-play type of personnel.

HOW DO I SET UP FLOWERI?
The main principles for creating a brainstorming room are:

1. Use playful conventions
   The presence of play communicates to personnel that the solutions that one seeks are acts of play: exploration of the new and no fear of failure.

2. Break the current conventions of the rest of the workplace
   The space needs to set a different tone for the environment. The room communicates to participants that things are different in this particular space and that it is okay to think differently. The restrictions of everyday life are left outside the room.

3. Everything is modular or easy to change (e.g. Figure 1)
   Furniture has no ideal place and is not set. The participants can change the way the room looks and also break the conventions of the room itself.

4. Think about stimuli
   The surroundings of a brainstorming session matters. If you put posters on the walls, prepare to meet the poster characters in many ideas produced in this space. It is best to provide general enough stimuli to get the process rolling.
5. Provide suitable technology
   Can you easily use your own laptop to project? Are there collaborative tools that are easy and fast to use? Use technology that works. Sometimes new and innovative solutions are clumsy and nobody is used to them. Let the focus be on the subject matter, not the equipment.

WHY CREATE A SPECIFIC PLACE FOR CREATIVITY?
If you want to bring creative ideas to the surface, you have to encourage people to share them. Unusual, playful spaces welcome new and creative ideas. Floweri supports the creation of the right atmosphere and gives the space and tools to organize brainstorming sessions. Even though one of the functions of playful elements at workplaces is the image of the company or organization, one should also think about the other functionalities. It is not enough to verbally communicate to potential talent that this office welcomes creative people, the space itself should support the work done there.
I was thinking...

Is there any point to using design models when analyzing the game design process?

Sorry?

Yes! Models can be used as a way of raising the designers' own awareness of how they are doing the design itself. They can reveal activities, design situations, and design choices that could have otherwise been lost in the analysis of the design.

Hey, that's pretty cool!

It is, isn't it?
**ABSTRACT**

In the current game design literature, not enough attention is given to the various kinds of activities and thinking involved in the actual process of game design. Instead, books that were reviewed by the authors were rather focused on the content of the design, with an emphasis on the mechanisms of entertaining gameplay.

In order to improve our understanding of game design and to improve design methodologies, game design should be studied by using models of designing from the general design research. In this article, we apply that premise to a concrete case: an experimental game design process of the game Noone Can Stop the Hamster (NOCSH). The game was a multi-player competition where players obtained points by capturing “wormholes” represented by fiducial markers placed around a convention area. The game was played with regular Nokia N95 mobile phones using cameras, marker recognition, and 3G communications.

We look at the game design process of NOCSH in light of two distinct but complementary models of designing: Stolterman and Löwgren’s three abstraction levels and Lawson’s model of designing. This approach allows us to both evaluate the suitability of the models for researching game design and improve our understanding of the design process itself. Instead of attempting to create a prescriptive model of game design that describes the activities a designer should do in order to arrive at a satisfactory result, it is more useful to come up with a model that describes and explains the activities designers actually do in real-world game design projects. By understanding how designers work and why they do what they do, it is possible to support their work with methodologies.

Bodystorming, sketching, and prototyping methods were used in an iterative manner, allowing us to test different interaction modes and mechanics in a dynamic fashion. Data gathered during the design process include entries in a design diary, notes from playtesting and bodystorming sessions, user interface sketches, and a series of software prototypes. The two complementary models of design were used to analyse the design process; the result is that the models give a good overview of an experimental game design process and reveal activities, design situations, and design choices that could have otherwise been lost in the analysis.
I was talking with my friends...

They are still calling Doom the biggest innovation ever, but I know that type of game existed before Doom, so doesn't that mean it's not actually an innovation but a copy?

Innovation is often defined as the first successful implementation of an idea. In this sense, those actually doing something new but for one reason or another are not successful, are not acknowledged as innovations. Doom was the first game to make the first-person shooters a really big hit; therefore, it achieved innovation status. Only with the passage of time can we see which games and consoles become the acknowledged innovations.

When you put it like that... I guess.

Yeah, that's a bit backwards.
II. INNOVATIVE GAMES: THE HISTORY OF WINNERS
Work in Progress / Content Analysis

Kati Alha

ABSTRACT
In this article I present findings of a text analysis conducted on game history books and game guides. Seven books are used as data for the analysis, and a list of the most acknowledged innovative games is formed based on the books. The books are further analyzed to see what makes these games innovative. Different areas concerning each game’s innovativeness are the game itself (i.e., the quality of the game), the game compared to other games (i.e., the originality of the game), context, reception, and influence. I will use the results to discuss the concept of innovation in the game industry.

1. INTRODUCTION
Ever heard the phrase “this is the most innovative game ever?” The odds are pretty good, as innovation has always been something of a necessity in the game industry. Recently, the term “innovation” has become a buzzword throughout society, but especially in the game industry you cannot stay at the top without innovating [13].

All of us have a view about which are “the most innovative games ever.” The opinions differ depending on whom you ask, and there may even be some conflicts regarding what innovation means as a concept. The industry as well has mixed definitions for innovation and people use the term to refer to different things [8].

The purpose of this article is to discuss what is required for a game to become acknowledged as innovative and what innovation is in the realm of games. To achieve this, the article goes through the most acknowledged innovative games in digital history, and discusses why and how certain games are brought up more frequently while others are not. Innovation and its understanding in current society is discussed and challenged.

2. METHOD
There is still not much research focusing on game innovations, but innovative games are discussed in different terms especially in game history literature, which brings up many innovative games as their time’s most notable games. Therefore, the method to examine past innovations is to conduct a text analysis on game history literature. There are seven books that are used as source material:

- Steven L. Kent: The Ultimate History of Video Games [7]
- Rusel DeMaria and Johnny L. Wilson: High Score! [4]
- Van Burnham: Supercade [2]
- Mark J. P. Wolf (edit.): The Video Game Explosion [15]
- Bill Loguidice & Matt Barton: Vintage Games [9]
- Matt Fox: The Video Games Guide [5]
The first four books are game history books: Supercade concentrates only on the early years of digital games, while others take in at least the first three decades of game industry. DeMaria and Wilson’s as well as Kent’s books are widely quoted in academic literature, and are valid choices for this list. Mark J.P. Wolf in turn is a notable game researcher, and a game history book edited by him is a good addition to the literature. Van Burnham’s history book concentrates on the beginning of the industry, but depicts the games of those years in detail.

Vintage Games introduces 25 games that the authors describe as having had “the most potent influences on both the videogame industry and the culture that supports it” [9, p. ix]. At the same time, most of them are innovative as well. 100 Videogames and The Video Games Guide are game guides with a lot of games with short descriptions of them. It should be noted that most of the authors of these books are gamers themselves, and the books reflect more or less subjective views. I try to tackle this problem by bringing together several books from different perspectives. The history books are a bit more objective than game guides while the guides bring out more personal views and opinions about games. Then again, the history books tend to bring up the same games with each other, and by bringing in game guides I attempt to bring some fresh perspective into the picture. Most of the books have been published in the United States, and thus the emphasis is on the US game industry.

The games were selected based on the style in which they are discussed in the books. Some of the games are directly called innovative, but most games have to be chosen on different grounds. Some are described to have taken something to a new level, defining something, or been the first to use some technology. The amount of text devoted to a single game or naming chapter titles after a specific game also influences the selection. The selected games, including the year of publication, the developer, the publishing year, and the developer’s country were listed in table. The games that were picked only from 1 book were dropped out for 2 reasons: to make the list a bit easier to handle, and because games that are mentioned more than once can be thought as more widely recognized. The final list consists of 168 games. These games and what is said about them were used to further examine the nature of innovation. In the following sections the results of these examinations will be explored in more detail.

3. Results

3.1 The Most Innovative Games

Of the games that were picked from the books, 168 games were selected at least twice. When looking at games that were selected from more books, the amount decreases quite rapidly. 69 of the games were selected from three or more books, and 30 from at least four books. The 15 games selected from five or more books are listed in Table 1. Only two games were picked from all seven books: Pac-Man (1980) and Space Invaders (1979).
Table 1: Innovative games from literature

<table>
<thead>
<tr>
<th>GAME</th>
<th>YEAR</th>
<th>DEVELOPER</th>
<th>COUNTRY</th>
<th>PICKED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Invaders</td>
<td>1978</td>
<td>Taito</td>
<td>Japan</td>
<td>7</td>
</tr>
<tr>
<td>Pac-Man</td>
<td>1980</td>
<td>Namco</td>
<td>Japan</td>
<td>7</td>
</tr>
<tr>
<td>Pong</td>
<td>1972</td>
<td>Atari</td>
<td>USA</td>
<td>6</td>
</tr>
<tr>
<td>Asteroids</td>
<td>1979</td>
<td>Atari</td>
<td>USA</td>
<td>6</td>
</tr>
<tr>
<td>Donkey Kong</td>
<td>1981</td>
<td>Nintendo</td>
<td>Japan</td>
<td>6</td>
</tr>
<tr>
<td>Dragon's Lair</td>
<td>1983</td>
<td>Advanced Micro-computer Systems</td>
<td>USA</td>
<td>6</td>
</tr>
<tr>
<td>Street Fighter II</td>
<td>1991</td>
<td>Capcom</td>
<td>Japan</td>
<td>6</td>
</tr>
<tr>
<td>DOOM</td>
<td>1993</td>
<td>id Software</td>
<td>USA</td>
<td>6</td>
</tr>
<tr>
<td>Myst</td>
<td>1993</td>
<td>Cyan Worlds</td>
<td>USA</td>
<td>6</td>
</tr>
<tr>
<td>Battlezone</td>
<td>1980</td>
<td>Atari</td>
<td>USA</td>
<td>5</td>
</tr>
<tr>
<td>Defender</td>
<td>1980</td>
<td>Williams Electronic</td>
<td>USA</td>
<td>5</td>
</tr>
<tr>
<td>Pole Position</td>
<td>1982</td>
<td>Namco</td>
<td>Japan</td>
<td>5</td>
</tr>
<tr>
<td>Robotron 2084</td>
<td>1982</td>
<td>Vid Kidz</td>
<td>USA</td>
<td>5</td>
</tr>
<tr>
<td>Super Mario Bros.</td>
<td>1985</td>
<td>Nintendo</td>
<td>Japan</td>
<td>5</td>
</tr>
<tr>
<td>Tetris</td>
<td>1985</td>
<td>Alexey Pajitnov</td>
<td>Russia</td>
<td>5</td>
</tr>
</tbody>
</table>

The resulting games are not surprising as such, as they are well-known, successful games. Even though many of the top games are seemingly very different from each other, they have much in common as well. They all have distinguished themselves from the games that existed before them. Space Invaders for instance appeared when most games were Pong (1972) variants while Pac-Man was published at a time when most games were about space shooters. Tetris (1985) was invented when games were starting to evolve and get complicated and story-driven - Tetris, however, pushed through by being really simple and without a real story, but with very addictive gameplay.

Street Fighter II (1991) and DOOM (1993) both popularized game genres, which are still extremely popular today. Street Fighter II took fighting games a giant leap forward, introducing the use of various game characters with unique combos and made the game a good example of the “easy to learn, difficult to master” mindset. DOOM popularized perhaps the most popular game genre of all time: first-person shooters.

The fact that there are no games from the last decade in the list is because the books mostly cover the earlier years. Another thing that catches attention is that among all of the games, there are almost no other countries in the developers than USA and Japan. The almost complete lack of European games is a bit surprising. The United Kingdom is one of the largest game software markets in the world [6], and still only one game made it into the top list.
As said, the selected books are mostly American, so it may influence the emphasis on American games. However, an even bigger reason is that the video game industry was born in the US, gradually growing into a big industry. UK came into the picture later, with background in computing and “bedroom coders,” and it was not until 1990s when the UK game industry started to grow substantially [6].

Japan, on the other hand, came strongly into the picture in the late 1970s. The Japanese video game industry drew its creativity and technological talent from the toy industry, and was influenced by the well-developed manga and anime industries [6]. This has resulted in very different types of games than the games from anywhere else in the world.

3.2 WHAT MAKES A GAME AN INNOVATION?
This section discusses the factors that seem to make a game an innovation. There are numerous things that are mentioned when describing the innovative games in the books. Roughly they could be categorized in five main groups: game compared to existing games, game as such, context, reception, and influence. These categories are not clearly distinct and have a lot of overlapping and interaction between them. Basically, only two of these aspects are covered when compared to the usual definition of innovation from the academic literature: being something new (game compared to existing games) and being something successful (reception) [cf. 3].

Game compared to existing games
It is important to note that a game does not become an innovation just by being as different as possible from the games before it, not even when the changes are seemingly good ones. It is important to balance the familiar with the new. When Computer Space (1971) was released, it was the first arcade game and people were not yet used to playing such games. It was new in many ways, and it also had rather complicated controls and instructions, and that was a big reason why it was not successful. When Asteroids (1979) arrived a few years later, it had a similar control scheme as Computer Space. However, the audience had meanwhile played other arcade games and become more accustomed to them, and more complicated controls were no longer an obstacle for success. [7]

A product is not an innovation, however, if it does not bring something new to the picture, and the actual core of the innovation is the novelty factor. Many of these games are described somehow as the first of their kind. However, when you dig deeper, they usually are not the very first to achieve something, but rather the first ones to achieve commercial success.

Many of the games examined here represent improvements to previous games. Area where improvement happens can vary: it can be graphics, gameplay, technology, or essentially any part of the game. Especially in the beginning of the industry, when gaming was still a niche market, many innovative games rise to their stature by attracting new audiences. The same phenomenon has happened later on a larger scale with the success of casual and social media games, which have made playing games something that almost everyone does.
Game as such
The category of "game as such" describes the game's intrinsic properties, which are not necessarily new or even better than other contemporary games. For an innovative game, it is not only important to be a pioneer in some area, but the game needs to be good enough in other areas as well. It is also important that the whole game supports the innovative part. The quality of a game is of course an important factor, and may be the one thing that stands between a game becoming an innovation or not. The quality can be, for example, the quality of the graphics or of the gameplay.

Most innovative games were top quality at the time, but there are some exceptions as well. If the game was exceptionally good in some area, it could be successful even though it did not do that well in other areas. Dragon’s Lair (1983) was mentioned in most books, and it was a huge success. Its graphics and animations were completely above the standards of the games of the time. However, its gameplay is described as being quite poor, consisting merely of making choices of what the on-screen character would do next. If the player chose correctly, the game continued and a bit more of the story was revealed, otherwise the game ended. The story of the game was described as not very original either. [4]

Many of the games are described as having certain values, making them stand out or making the game experience better. It can be simplicity in some games, depth in others (sometimes even both in one game!). Other value features mentioned are variability, modifiability, challenge, humour, cuteness, excitement, beauty, tension or even brutality, violence, and anxiety. Of course, it depends on the game which features are seen valuable and which are not.

Context
Even though the environment into which the game is launched is not something a game developer can affect that much, it is in many cases a crucial factor for a game to be considered innovative. Basically, environment is a factor influencing the success of the game, and an important factor for any game. Especially for innovations it is crucial, as - being somehow different than contemporary games - they involve risks and may have higher chance to fail. The contextual factors may be at least cultural, as an ongoing trend, economic, such as the state of the game industry, or political, for instance a negative view to game violence.

The timing of the competitors is a big factor as well, as can be seen when Mattel Intellivision came out in 1979. The console was superior in graphics, had the best sports games and was on its way to become the number 1 console. Then Atari released Space Invaders for the VCS, and the game company Activision was formed, releasing great third-party games for the VCS. These events guaranteed VCS’s place as the most successful console [15]. A changing environment gives challenges for innovation, and on the other hand, constant innovation is needed to keep up in the changing business of games.
Another widely known example of timing is from the beginning of 1980s, when the industry was blooming and a lot of new entrants came to market. The good games were soon buried among the mass of low quality games, and in the end, the industry crashed in 1983 [15]. It took a while to get the industry back to its feet, and Nintendo played a big part in this. They took into account the environment and the console was marketed more as a toy than as a gaming console. It was named in Japan as Famicom and renamed outside Japan as Nintendo Entertainment System to further press this impression. It had accessories such as Robotic Operating Buddy (1985), a moving robot controller that could be used to interact with the television screen in two games, and a glove shaped controller, The Power Glove (1989), to make the system more toy-like. [7]

Larger media trends of the time can have an effect as well: Space Invaders would not have been as successful if Star Wars (1983) had not been so popular at the time, creating a science fiction mania [4]. Similarly, many sports games are tied to real-world sports events such as championships or seasons.

By doing market or trend research companies can affect the innovations they are producing. The publishers may have more resources to do market research and so influence developers’ innovation processes [13]. In different areas different types of innovations get acknowledged more easily. In Japan, the genre of role-playing games has evolved, as its market is much bigger in there, while in Europe the strategy games tend to do better than elsewhere.

Reception
Even though not always seen so, the reception of the game is part of the innovation’s definition. All the games picked are more or less successful in some way. The game does not have to be successful necessarily in sales, but can be otherwise distributed widely or critically acclaimed, for example. There are of course many things that affect the success of a game. On the one hand, being successful makes the game have a greater influence on the other games and the industry.

To be a success, a game must usually be widely distributed. Especially in the days of the arcade industry this was essential. However, distribution channels and methods are important in other games as well. DOOM was distributed as shareware on the Internet, and it would never been so popular if it would have been sold only off the shelf. This has happened more recently as well, as the new distribution channels of Xbox Live, Steam, AppStore, and many others are changing the way innovations occur today, making it possible to spread games more easily among players.

Even if people have not played a certain game, they may have heard about it. This is the case of many innovative games. Everyone recognizes the characters of Pac-Man or Mario even if they have not played any games. If a game rises to a certain status in the gaming community, it is more likely to be remembered as an innovation as well. Some terms describing a high status are an archetype, an icon, a classic, or a symbol.
Influence
One important element that innovative games have is influence. Influence can be recognized on various levels: how certain game mechanics function, how a story is told in a game, more generally on the development of a certain game genre or even the whole game industry itself. When the industry was still young and not yet as popular as today, individual games could have a critical role in the survival of the industry.

When a new, innovative game comes to the market, it is bound to attract followers. On one hand, people start to copy something that sells, and on the other hand, a successful game often produces sequels. Really strong innovative games may popularize a whole genre, evolve it substantially, or set other standards that future games will follow.

3.3 What is innovation?
Even while the most acknowledged innovations listed in this article have been forerunners from many aspects, it is interesting to note that not one of them has actually pioneered a game genre. Although some have popularized genres or evolved them significantly, they all have had forerunners. The game that is ultimately remembered as bringing something new to the industry is usually not the first of a kind. Pac-Man was not the first maze game and Street Fighter II was not the first fighting game. Tetris was very different than any game before it, but it was not the first puzzle game. Sometimes the acknowledged game is not even the first widely known game. For instance, DOOM is often stated as the founder of the first-person shooter genre, while many remember Wolfenstein 3D (1992) as the first one. In reality, the roots of the genre begin much earlier than that.

This gives some interesting notions to the concept of innovation. The pioneers of genres have many times become lost to history as mediocre games or outright failures. This reflects several things about innovation. First of all, when doing something very new, there is a big risk to fail. It is something never done before, many things can go wrong. The pioneer may not have enough marketing power to make the product widely known or it may not be a good game, although it may be something very original. It may also be too original or the audience may not be ready for it, and the game may fail because of that.

This is not a completely new issue. In his list of 50 greatest game innovations, Ernest Adams tries to correct the tendency of forgetting the original innovator by mentioning both the well-known innovators as well as the original innovators [1]. Trying to find the original innovations can be hard, however, if not impossible.

Furthermore, if we attach the most radical innovation to new genre creation [14], then not one of the collected innovations is indisputably a radical innovation. This view would not seem reasonable. The genre aspect is insufficient also in the sense that many influencing innovations may innovate on technology or other aspects instead of the actual design of the game, and may not as such evolve the genre. Game genre is also problematic as a metric as there are no established genre classifications. A game
rarely anymore belongs to one specific genre; instead, games tend to combine elements from several classifications. Therefore I would suggest separating the game innovation concept from new genre creation, and try to look at it as more generally breaking away from used conventions.

On the other hand, it has been suggested that the first instances of new types of games are the radical innovations while later games that have popularized the genres are the refinement innovations to those genres [12]. Many times innovation is defined as the first successful implementation of something new [3], and therefore the view could be exactly the opposite, meaning that the games popularizing the genres and bringing them to the big audience for the first time are the ones that are the radical innovations, while the first instances would not be innovations at all, being perhaps a part of the innovation process at most.

4. DISCUSSION
How we understand the concept of innovation, as said in the beginning, varies between individuals. Even game professionals have mixed and conflicting conceptions of it [8]. If we do not know what innovation is or have a shared understanding of it even while its importance is stressed everywhere in the society, how can we achieve it? From this viewpoint, it is no wonder that some game professionals have nihilistic attitudes towards innovation [8].

After finding these challenges in the concept, perhaps we should try to build a more suitable definition for game innovation. On the other hand, it is the nature of the history books to write the history of winners, leaving the first pioneers to receive less attention. The games mentioned in this article are the games that are acknowledged, and not necessarily the best or most important innovations. Therefore, this list gives only one viewpoint. It is, however, a very valuable viewpoint, as these are the games that we will remember and value as innovations.

The pioneers are still crucial for the game industry by trying new concepts and making the way clear for the innovations. Writing and studying the history of games is challenging [10], but we need more effort around describing how games evolve. Seeing only the games that make major breakthroughs and are found as the biggest innovations gives a distorted view of how innovations evolve. The original games, the stepping stones that pave the way and may make these breakthrough games possible, are too easily forgotten.

5. CONCLUSION
This article presents a list of the most noted innovative games in the history of digital games. As said, the list misses most of the contemporary games, and should be viewed as what it is: a historical examination. The list offers interesting considerations of the composition and practice of innovation. The purpose here has been to discuss some of the various points of view that the concept of game innovation can be approached from, and to seek a deeper understanding of games as innovative products.
Generally, innovation can be seen as the first instance of creating something new. The games that are acknowledged in the industry are, however, frequently the ones with the greatest success. The definition of innovation discussed in academic literature somewhat supports the former view: innovation is the first successful instance of an invention. It sometimes might even feel unfair that the first instances do not get the credit for their visionary ideas or products.

When looking at how they have become the respected innovations they are known as today, five areas which are crucial for innovation were identified: game compared to existing games, game as such, context, reception, and influence. It is not only the originality of the idea or even the quality of the implementation that matters, but other factors influence as well. It is necessary to find the right time and right place to develop the game, as well as seeing what has already been done and learning from other games that have existed before it. It is not necessary for a game to be strong in all of the areas, as even some of the most acknowledged innovations listed here did not achieve superiority in all of them. However, to become the “biggest innovation ever,” it does take a whole lot of things going right - including having a great big bunch of luck.

REFERENCES


12. History of Game Innovations

I played some retro games and was thinking... How have game innovations changed in the past?

Well, in the beginning the games were pretty simple and the markets were much smaller, but the few innovations from that era are very widely acknowledged. The beginning of the 1980s was acknowledged. The time of perhaps the richest innovations and the time of perhaps the richest innovations were more presentation and narrative elements were more important. In the 1990s the innovations were focused on the technology, and in the 2000s the gameplay elements rose above other innovations.

That's interesting! Can't wait to see what will come next!

Yeah, me neither!
**12. HISTORY OF GAME INNOVATIONS**

Work in Progress / Content Analysis / Interview Study / Survey

Kati Alha

**ABSTRACT**

This article goes through the history of digital games and reflects the amount of different categories of game innovations during each decade to historical events. The different categories used here are technical, gameplay, presentation, and narrative innovations. When examining the evolution of game innovations, each of the decades so far seem to have their own characteristics. The 1970s, the beginning of the industry is the time of scarce but very well known innovations, concentrating on technological and gameplay innovations. 1980s was the time of the industry crash, but also the richest decade for game innovations, and the narrative innovations were on the rise while technological innovations diminished. The technology aspect came back in the 1990s stronger than ever, but dropped again in the 2000s.

**1. INTRODUCTION**

Even though innovation is an important part of game development, the game industry is infamous for using existing intellectual property to publish a great deal of licensed games and sequels. This is exemplified by the best-selling console games in 2009: of the top 20 list, only 2 games are not sequels or based on existing game characters [13]. The reason for the use of tried and trusted concepts may be the maturation of the industry [14]. Game publishing has also become more and more expensive, and the publishers do not want to take risks when so much money is at stake.

This has not always been the case, however. In the early years of the industry there were many highly innovative solutions. Of course, even then a lot of copying occurred, seen for example in the amount of various Pong (1972) clones and variants that were distributed at the time. In spite of that, a lot of original games were made, and the roots of most of today’s main game genres trace back to the 1970s and the 1980s.

Then again, considering the last few years, the rise of casual and social media games and new distribution channels has brought up many changes. These changes have once again shuffled the deck, as the easy and affordable ways to create games have made it possible for many independent game companies to develop and distribute innovative games. Meanwhile, the big games are more successful than ever as well.

This article examines these changes by observing the nature of innovation in digital games from a historical perspective. This history is explored with the help of game history books supported by interviews and a small survey.
2. DATA AND METHOD

2.1 SOURCES

Game history books
The digital game history has not been yet systematically studied in the academic field, and generally the preservation and documentation of digital games has been scarce [8]. This article uses the game history books and game guides as its main research data, as they bring up many innovative games as their time’s most notable games. There are seven books that are used as source material:

- Steven L. Kent: The Ultimate History of Video Games [6]
- Rusel DeMaria and Johnny L. Wilson: High Score! [3]
- Van Burnham: Supercade [1]
- Mark J. P. Wolf (edit.): The Video Game Explosion [17]
- Bill Loguidice & Matt Barton: Vintage Games [7]
- James Newman & Iain Simons: 100 Videogames [9]
- Matt Fox: The Video Games Guide [4]

A content analysis was conducted on the books. A list of the selected games, including the year of publication, the developer, and the developer’s country was produced. The games that were picked only from a single book were dropped out to make the analysis a bit easier to handle, and because games that are mentioned more than once can be thought of as more widely recognized. The final list consists of 168 games.

Game professional interviews
As the book selection mostly consists of game history, more recent years naturally receive less attention. To cover this deficiency, two other sources are used here: interviews with game industry professionals and a survey for game players.

The interviews were conducted as part of the Games and Innovation (GaIn) project, and the interviewees were selected from the speakers of three game conferences in 2009: Game Developers Conference (GDC) in San Francisco, USA, Nordic Game Conference (NGC) in Malmö, Sweden, and Game Developers Conference Europe (GDCE) in Cologne, Germany. A total of 28 game industry professionals were interviewed. Interviewees’ experience in the industry varied from 1 year to over 20 years. Almost all platforms and game genres are represented, from casual browser-based games to core computer and console games, either as their current development focus or in terms of their domain experience. The interviewees’ positions in their companies are mainly leadership and development, although the publisher, education, and consultation sides of the industry are also represented.

The interviews were semi-structured and consisted of various themes, including thoughts about innovation, tools for innovation process, possible tensions within game design teams, future sights, and interesting future research topics. Interviews lasted from 20 to 90 minutes each. For this article, only the games mentioned as examples of innovative games have been picked and listed, resulting in 51 mentions of 40 separate games.
Survey
A small, Internet-based survey was conducted to ask game players what they see as innovative. The survey link was shared across 9 Internet forums selected from various sites connected to gaming. The objective was to select different types of sites: hardcore gaming sites, general gaming sites, as well as casual gaming sites. However, the casual sites were quickly dropped from the list as they either did not have a forum, or the administrators denied survey links. In the end, there were 27 answers, from which 3 were removed from the analysis due to their inappropriateness. The forums that provided at least some informants are:

- http://www.mobygames.com/
- http://www.ign.com/
- http://www.gamezebo.com/
- http://www.retrogamer.net/
- http://store.steampowered.com/
- http://www.ugoplayer.com/

As many of the responders mentioned more than 1 innovation, in the end there are 50 different games or consoles, and another 39 answers that mention an innovation but not a game or console featuring it. To place the answers on the same level with other data, the specific games mentioned were picked and used for the analysis. There were 45 mentions of specific games and 39 different games.

Considering the informants’ backgrounds, the material is biased as expected. Only 1 of the respondents is over 40 years old, and only 1 is female. One third of the respondents are from the United States and another third are from the United Kingdom. With regard to game genres, clearly the most popular among the respondents is first-person shooters (FPS) with role-playing games (RPGs) close behind as the second-most popular genre. The respondents are also more active gamers than the average player, as 10 of the respondents report that they play games more than 10 hours a week and 7 play between 5 and 10 hours each week.

2.2 Sorting the Innovations
All of the games, including the ones picked from the books, interviews, and the survey, were listed in a table. The ones mentioned at least in three separate sources (books, interviews, or survey answers) were included in the analysis. In that way, there were altogether 83 games under further examination. To view the distribution of innovation types, five categories of game innovations were formed on the basis of a text analysis on the books considering the selected games. Four of the categories are treated as the main game innovation categories, while the fifth category of so-called extra-game innovations was added to include all the innovations concerning the features not directly included in the game design.

Most of the reviewed games have multiple innovation types. On the basis of the analysis, one game has innovations on average in a bit fewer than 2.5 categories. When there are
4 categories, the number seems quite high. This suggests that to get widely recognized, the game has to innovate in many areas. However, the number of occurrences of different innovation types in a game does not straightforwardly tell how many or how big the innovations of a single game might be.

The most important thing that can be examined with the help of the analysis is the distribution of the innovations into categories as a whole and separately in different decades. The change from one decade to another is especially interesting and allows us to consider what has caused the different distributions.

3. RESULTS

3.1 THE CATEGORIES

Technical Innovations
The technological innovations can basically be divided into two subcategories: hardware and software. Hardware innovations include concrete machinery, such as game innovations such as Auto Race (1976) by being the first handheld, or The Legend of Zelda (1986) for having a battery inside the game cartridge to allow game saving. Software innovations includes graphics (e.g. Tempest (1981)), physics (e.g. Half-Life 2 (2004)), audio (e.g. Berzerk (1980)), or artificial intelligence (e.g. Half-Life (1998)).

Gameplay
The games analyzed could also be divided into many gameplay categories, as there are many gameplay features described among them. To avoid too detailed categories, I divided the gameplay innovations into mechanics (e.g. Space Invaders (1979)), controls (e.g. Dance Dance Revolution (1999)), level design (e.g. Super Mario Bros (1985)), and play style.

“Play style” innovations means new ways or strategies of playing made possible by the game design. The different styles of play, such as stealth in Metal Gear Solid (1998) or killing frenzy of God of War (2008), are instances of play style innovations. Adding seemingly simple game mechanics, such as allowing inputting three letters when you got a high score in an arcade game Asteroids (1979), created a more competitive style of play because people wanted their initials at the top of the list.

Presentation
Game presentation includes how the player sees and hears the game. Presentation innovations further divide into visual innovations (e.g. Ico (2001)), audio innovations (e.g. Myst (1993)), and view innovations (the perspective the game is viewed from, including the in-game perspective, for instance isometric perspective in Zaxxon (1982) and the screen solutions, for instance a view through a physical periscope in Sea Wolf (1976)). In principle, presentation innovations could cover other perceptions than just visual and audio, although this does not come up in the data as it is still very rare. Some games can present game states in smells [2], touch (e.g. vibrating of controllers), and pain [10].
Narrative
Narrative innovations are elements that mediate the story and are further divided into story (e.g. Final Fantasy VII (1997)), characters (e.g. Donkey Kong (1980)), game world (e.g. The Hobbit (1982)), and theme. The theme in a game can be thought to be less constructed than a whole story, being more like a topic. It can be the naval theme of Sea Wolf, eating in Pac-Man (1980), and the morality in Black & White (2001).

Extra-game innovations
In addition to the innovations that are tied directly to the game design itself, there are innovations that are spawned outside the actual game development process or outside the gaming experience. The different extra-game innovations found are modding, distribution, and marketing.

Modding means that the game players themselves modify the game afterwards by adding, editing, or removing content from the game. It has become more common as the game developers have handed out more and more game editors to be used by the players. The end results of modding innovations can actually be innovations in other categories.

Distribution innovations consist of new ways of bringing games to the players. A classic example of efficient distribution comes from Wolfenstein 3D and DOOM. These games were released as shareware, meaning people could download a free, playable version and upgrade to the full game later. Recently, online distribution has been revolutionizing the industry as anyone can put up a game for anyone else to download and play. This however also leads to a mass of low-quality games and often low payments for the developers.

Developers may also have difficulties bringing their game to the public without big investments in marketing. Marketing innovations came up only rarely when analyzing the list of innovative games. The marketing innovations are in a world of their own, and are not so much discussed in the game history books. However, the use of famous stars in games came up, and was first used in 1984 in the Dr. J and Larry Bird Go One-on-One basketball game. Endorsements and games designed around celebrities are now much-used marketing tactics.

3.2 AMOUNT AND DISTRIBUTION OF INNOVATION TYPES
As mentioned earlier, an innovative game has innovations in 2.5 categories on average. In the 1970s, the average number was 2; this number keeps growing as the industry develops, from 2.3 in the 1980s to 2.6 in the 1990s. Considering how games have become bigger productions, this increase makes sense. In the 1970s the games were small, simple, and similar to each other, while in the 1980s games had more content in them, making it natural to have innovations in several areas. The same growth of game production continued in the 1990s and into the 2000s. However, during the 2000s, the average of categories per game is 2.1, almost as low as in the 1970s.
There are a few possible reasons for the drop of innovation types in the last decade. One of the clear reasons is the different source material: Many of the history books do not cover the last decade, and the interviews and the survey answers presented here have an emphasis on the last decade. Because of this, the data may describe only some sides of the games while the books cover more aspects. Other reason could be the almost complete lack of technical innovations, which can be seen more precisely later in this section.

There can, however, be other explanations for the drop in the number as well. For example, the time of the most radical innovations may be over at this point. Thus, innovations are more incremental and only the biggest innovations in a game are considered. On the other hand, the rise of casual gaming and new distribution channels has provided a basis for the rise of smaller games during the last years.

The overall distribution of innovation types can be seen in Figure 1. The pillars represent the relative amounts of innovation occurrences in each category among all of the reviewed games. Each of the pillars is formed by counting the overall number of the instances in that category and dividing it by the number of games. As many games have innovations in multiple categories, the sum is over 100%. However, if one game has multiple innovations in one category, it still counts as one occurrence in that category. As seen from the chart, gameplay innovation category is the most prevalent, with about four out of five games in the list being mentioned in this category. Presentation innovations are the second-most frequent, and technical and narrative innovation categories are substantially smaller.
This observation reflects a number of insights. First, technical and narrative innovations may actually be scarcer than innovations in presentation and gameplay. Gameplay innovations might also be valued in the source material used here more highly than the other innovations. In the case of narrative innovations, the story has not played such an important role in games until later in the industry’s history. This insight possibly reduces the total amount of narrative innovations.

The extra-game category is by far the smallest one, but not many conclusions can be drawn from this. The extra-game innovations are not brought up in the source material in a similar manner as the more closely game-related innovations, and very few (only five games) belong to this category. This does not mean that there would be so few innovations related to distribution, marketing, or modifications. Because of the underrepresented occurrences of the categories, they are left out from the more precise examination of the historical evolution of innovations. The following sections will, therefore, concentrate on the four main categories of the more closely game-related innovation types.

3.3 The Development of Innovations

To see how innovations have changed throughout the decades, the relative amounts of innovations in each innovation category are reviewed by decade (see Figure 2). The numbers for each decade were counted by taking the instances of innovations in a category and dividing it by the amount of all instances of innovations during that decade.

What is most striking in the chart is the steady but considerable growth of narrative innovations. This goes along with expectations, however, as games have become more massive and complex as the industry has matured. This has made it possible to create more complex stories and game worlds. The growth further supports the prior interpretation of the smaller portion of narrative innovations. Other categories have not changed as consistently, but there are some other points to be noted as well. The division of the categories in each decade and the factors influencing it will be considered in more detail in the following sections.

The 1970s: The beginning

The 1970s have more gameplay innovations and fewer narrative innovations than any other decade. The relative amounts are presented in Figure 3. The very small amount of narrative innovations is the consequence of the simple fact that games were not yet very narrative. There were not that many story elements in games, nor were there real characters. Furthermore, the characters were mostly impersonal, such as cars, spaceships, or nameless stick figures. The only game from the list that is recognized as a narrative innovation is Sea Wolf (1978). The naval theme of the game was described as innovative at a time when most games were still Pong variants or space games.
Almost half of the 1970s innovations are categorized as gameplay innovations. This does not come as a surprise, as the games are minimalist by today’s standards. The games were more about core game mechanics. Although there actually were not that many different types of games yet in the 1970s, many of today’s game genres have roots in that decade.
The performance and the graphics were developing in big steps as well, which is indicated by the relatively large percentage of technological innovations. The first color games and vector graphics-based games are from the 1970s, as are the first handheld games. The high number of presentational innovations may come as a surprise as the games were still so crude and simple. When we take into account that many of the technological innovations are related to their graphics, however, it begins to make sense. The innovations of graphics technology often indicate innovations of visual representation. Even if they may seem crude today, many of the games looked and even sounded impressive to the players of that time. For instance, the sound world of Space Invaders (1978) is widely recognized as a big part of the intensive gaming experience [3].

Even if the sample is small (only 14 games from the 1970s are on the list), it seems to describe the development of the early game industry quite accurately. The industry was just forming, and there were a lot of clones around, but the few games that broke out of the mold became instant classics. Those games are quite widely recognized as innovations, as 3 out of those 14 games are mentioned on the broader list of innovative games 6 or 7 times, which is 25% of all the frequently picked games, yet the 1970s games altogether comprise only 10% of the list.

**The 1980s: The industry spreads**

In the 1980s, the gameplay innovations and presentational innovations have relatively similar portions of the innovations as in the 1970s. The portion of technological innovations has diminished, however, and that of narrative innovations has grown. The amounts are shown in Figure 4 below.

The growth in narrative innovations is easy to explain. The first “personal” game characters (Pac-Man and Mario) were introduced, and the first female protagonist appeared in Ms. Pac-Man (1981). The game worlds were more complex, giving the possibility to innovate more within them. The stories became an important part of games as well.

The text adventures, that had a predecessor in Adventure (1979), started to have more complicated game worlds in Zork (1980) and The Hobbit (1982). The game worlds grew significantly with games like Super Mario Bros. (1985), The Legend of Zelda (1986), and Metroid (1986).

The drop in technological innovations is harder to explain. Perhaps the emphasis was turning from the technological aspects to the content of the games. Still, there were many innovations on the technological side as well. Similarly to the 1970s, many of them were in graphics technology. The first “3D” games came to market in I, Robot (1983) and in Elite (1984), and game animations took big leaps forward in games like Dragon’s Lair (1983) and Prince of Persia (1989).

On the broader list of innovative games, 35 of the games are from the 1980s. This is a larger number than that of any other decade. This was the time when the game industry started to move from niche markets to wider audiences, and new genres were
still forming. One more observation can be made related to the distribution of those innovations: 27 of them are from the first half of the decade, and there is a big drop after 1984. A big contributor to this is the video game crash in 1983. The video games industry was producing more and more games, but many of them were of poor quality. This mass of poor quality games has been said to be the major reason for the crash [3, 6].

Even considering the crash, the drop is quite steep, and the number of innovative games does not rise to the same level again later. If the 1970s is characterized by a few widely acknowledged “big” innovations, the 1980s—and especially the early years—could be characterized as the “mass production” of innovations.

From the end of the 1970s to the crash, the firms in the game industry were rapidly growing and, as can be seen from the large number of games, there were a lot of different types of games available. According to the industry lifecycle theory, the crash followed by a shake-out of companies signals that the peak in the number of the producers in the field had been maximized and would drop in the future [15]. After the shake-out, however, the industry recovered and by the end of the 1980s the number of innovations rose again.

The 1990s: It’s all in the looks
In the 1990s, the portions of each category are distributed more evenly (see Figure 5). The most striking thing about the 1990s, when compared to other decades, is the peak in technological innovations. After diminishing from the 1970s to the 1980s, they represent a bigger portion of innovation in the 1990s than in any other decade.

The rise in technological innovations is partly due to CD-ROM technology. By making it possible to have much more content in a game than cartridges or floppy discs ever allowed, CD-ROM technology enabled many technological innovations especially in
graphics and audio. The extra space on CD-ROMs brought impressive graphics to home computers and consoles in the form of 7th Guest (1993), Myst (1994), and Final Fantasy VII (1997). There were other technological advancements in graphics as well, as the first proper 3D games, Super Mario 64 and Tomb Raider, were released. The technological improvements in graphics are reflected in the presentational innovations as well. On the basis of the data it seems clear that the look and sound of games was especially important in the 1990s.

Some games were distributed over the Internet, and this distribution method along with networked play made games such as DOOM much more popular than they would have been without the Internet. Wolfenstein 3D and DOOM popularised the FPS genre, which has been one of the leading game genres ever since. During the 1990s one FPS game came out after another and quite a few of them innovated in graphics and physics, taking the technology rapidly forward. Many of them innovated in gameplay and even in story as well.

Looking at other innovation categories, there were relatively less gameplay innovations than in other decades. This can be a result of greater emphasis on more realistic graphics and physics and overall on how the games looked and sounded. Even with the emphasis on the technology, narrative innovations kept growing from the previous decade.

The game industry crash was long gone by the 1990s and games were more popular than ever before. The industry sales were far higher when compared even with the best years of 1980s [16]. Still, the amount of innovative games selected for the broader list is nowhere near the 1980s: 21 games from the 1990s were included compared to 35 from the 1980s. One reason is that one of the books only covered the earlier years of the industry and did not reach the 1990s. However, it does not explain the drop completely. A more likely reason is the maturation of the industry. It is normal for industries, even creative ones, to become more market driven as they mature [14]. Even if the
developers still want to make original games, it might be hard to convince the publishers to fund them [5]. Economic aspects, difficulties in predicting product acceptance, short product lifecycles, and the hits-oriented nature of the game industry have fostered incremental innovations over radical ones [14]. Therefore, while there have still been a lot of innovative games, they have probably been more incrementally innovative, and not as widely recognized and not brought up in the source material as a result.

The 2000s: The new beginning
The last decade’s innovation distribution can be seen in Figure 6. Extra caution should be used when comparing the first three decades with the 2000s, however. Most of the games from the three first decades are from books, while games from the last decade have a stronger contribution from the survey and the interviews used to build the broader list. As the people who participated are from different backgrounds and the situations of describing innovation are different as well, it might affect the types of games that are mentioned. Nevertheless, it is useful to examine the distribution of innovations in this decade.

There is quite a drop in technological innovations in the 2000s, which deserves closer examination. The focus of what is important varies across different source materials, diminishing the technological side of innovation. Still, it should be noted that in the earlier years of the industry there are striking technological innovations, and still in the 1990s the graphics and physics were developed in substantial steps. In recent years the technological progress is subtler and more incremental.

During the 2000s, we reached the point where games already looked so advanced that it was not so important or even possible to constantly have big technical advances in that aspect. At the same time it still matters how the games look: The visual innovations are no longer so much technical than artistic. The minimalist visuals in Ico (2001), the goofy ones of Katamari Damacy (2004), or the simplicity of World of Goo (2008) are examples of these innovations.

From narrative innovations, powerful experiences such as Ico and Shadow of the Colossus (2005) have made it to the list, as have Deus Ex (2000), Halo (2001), and Half-Life 2 (2004) with original storylines as well. It seems that stories and games as emotional experiences are valued more than ever.

Innovations in gameplay seem to have diminished a bit over the course of the three first decades, whereas their role has grown again in the 2000s. This shift may signal the rise of smaller and more independent games in recent years. However, as true as this may be, there seems to be only one independent game, World of Goo, on the broader list. This is somewhat related to the small amount of games in the list from the 2000s: Only 13 games made it to the list, and only 3 of them are from the last half of the decade when the rise of independent game companies has had the biggest impact on the industry.
The independent companies are more likely to bring radical innovations and influences from outside the industry, whereas the majors concentrate more on incremental innovations [11]. Whereas the 1990s was dominated by big game productions, both major and small-scale games seem to have their role in the 2000s. On one hand the industry is still growing with big game productions and incremental innovations, and on the other, smaller games are on the rise, bringing back the importance of gameplay innovations. Games like Wii Sports (2006), SingStar (2004), or FarmVille (2009) have massively increased the number of people playing games.

When comparing this evolution to the industry lifecycle theory, even at the end of the 2000s, the theory’s predicted low exit and entry rate of firms [15] does not seem to be actualized. Instead of a few established dominant designs or genres, the game types are still getting more versatile and diverse, with whole new genres still forming.

5. DISCUSSION
The growing emphasis on narrative innovations and the diminishing of technological innovations during the last several years is interesting. It does not necessarily mean that technological innovations are decreasing as such, but other innovations in games are getting more attention, respect, or acknowledgement while technological innovations have become more discreet. At the time of writing, there are some interesting technological innovations in progress. Microsoft has published controller-free gaming with its Kinect and the next generation of 3D technology in games has been brought to market in the Nintendo 3DS.

In a similar manner, the growth of narrative innovations can be seen as a signal that games are respected more as stories too, not just simply as game mechanics. The
results also suggest that the history of game innovations has not been a straightforward evolution, but each decade has different characteristics in innovations as well.

It is impossible to predict where this will lead us in the future, but the last years have shown us the power of game experiences in both small and big packages, with games such as Braid (2008) or Heavy Rain (2010). Of course, the games on the iPhone or on Facebook, for example, have been rapidly spreading. CityVille (2011) on Facebook managed to gather over 100 million players at its peak. The possibilities for independent game companies to innovate through small games have provided a lot of fresh games.

In the future, however, as the new distribution channels see more and more games pushed through, it may be that the big companies will take more control of them as well. This is already the case with Facebook, where there are so many games that new games need to put big amounts of money into marketing to get enough players to make the games profitable. Game companies like Zynga have the consumers and the money to bring their games to the top easily, while companies just starting out may have difficulties to find players for their games.

It seems we might be going through another phase as in the 1980s with a lot of games being published, and the industry might be facing another shake-down of companies. The future will show whether we will have another “1990s” moment with regard to the new distribution channels’ game innovations. In any case, the latest decade has given a lot of fresh points of view to gaming.

The research material has its limitations, as has been noted. The history books combined with game guides yield a certain picture of the games and stress some periods of times and individual games more than others. The supportive material partly helps to cover this lack of parity. There is however no way to get completely objective material about the history of game innovations, as such a thing could not exist.

Although I have used an approach that uses various resources to find the innovative games, there are still some perspectives that could be enhanced. The survey considering players’ views of the biggest innovations is small in scale and should be explored further. The different aspects of how innovation and innovative games are perceived is intriguing, and the players’ and professionals’ views should both be examined more deeply in the future.

One aspect that has not been touched in this article, but would be useful and interesting to see, is the attitude and perspective of the media regarding innovation. What are the games that are regarded as innovative in game reviews, for example, and are those games the same ones that are remembered several years later as well? How soon can a game be considered a landmark innovation? Looking through the history of innovations from this angle and comparing that data with the history books would give answers to these questions.
The properties of innovative games would be interesting to study from other perspectives as well. One relevant issue is sales, and how many of the commercially successful games are innovative. From an historical aspect this analysis may be problematic, as dependable and comparable sales statistics are hard to find.

6. CONCLUSION
In this article the history of game innovations has been examined by using innovation categories and their occurrences in the source material. The game history books were used to see how innovation has changed throughout the game industry's history. Interviews of game professionals and a survey of game players were used as supporting data.

To summarize the decades, the 1970s were a time of niche markets and a lot of cloning, but also with a few exceptionally big innovations. The 1980s, or at least the beginning of the decade, was the time for industry growth and mass production of innovations. The 1990s could be characterized by maturation, incremental innovations, and a seeming excess of technological advances. The last decade, however, shakes this maturation by taking the emphasis away from the technological innovations and bringing new possibilities for radical innovations in smaller-scale games.

REFERENCES

13. AN EVOLUTIONARY APPROACH TO THE GAME INDUSTRY

I WAS THINKING ABOUT THE GAMES OF THE FUTURE...

ARE WE GOING TO HAVE BIGGER AND BETTER GAMES IN THE FUTURE AS THE GAME INDUSTRY EVOLVES?

Evolution is all about adapting to the current environment, to the markets and cultures. That is, whether this phenomenon is good or bad is a whole different question. Today “the fittest” game can be a polished FPS, tomorrow it might be a free-to-play farming game with micro payments.

HMM, SO EVOLVING DOESN’T NECESSARILY MEAN GETTING BETTER AND BIGGER.

EXACTLY.

JUNO VARVINEN
13. AN EVOLUTIONARY APPROACH TO THE GAME INDUSTRY

Work in Progress / Theoretical Framework

Juho Karvinen

ABSTRACT
The term “evolution” is often used when describing the change of economies or industries. There is also an approach inside economics called “evolutionary economics,” which borrows concepts straight from evolutionary biology. This text is principally a theoretical and conceptual look at the games industry, and evolution as a metaphor is taken seriously and it is reviewed as a representation of economic phenomena. First, the basic mechanisms of biological evolution are revised, followed by a review of certain concepts of evolutionary economics. Finally, the games industry is examined as a special combination of cultural and technological industries.

1. INTRODUCTION
Studying players and games (as end products) can rightly be said to be the core areas of game studies [cf. 7]. This perspective, however, hides the fact that a significant share of games have their origins in circumstances and conditions set by profit-oriented businesses. The picture of game cultures is unnecessarily incomplete without a broad understanding of the industry and economic actors. The markets fuel cultural changes and some trends are strongly dependent on changes in the economic environment. The developers willing to keep their jobs need to think about where consumers are ready to put their money [cf. 1, 14]. Consumers, on the other hand, are highly dependent on the markets to supply them with the games they play. Of course the dependencies between game cultures and markets are mutual, but in this paper I am mainly interested in the economic reality that the game companies have to face, and how it limits and enables certain paths they can take.

The games industry is interestingly situated at a crossroads of other cultural industries, in the style of the film industry, and engineer-driven fields such as the computer software and hardware industries, with important junctions also with the toy and sports industries [11]. Understanding the dynamics of the games industry requires detailed analysis of the similarities and differences from these related industries. It is clear that the games industry has its own particular characteristics, and it is equally clear that it carries with it features that are common to all related industries, if not across all industries.

This paper approaches the games industry from a general perspective, reviewing some theoretical conceptualizations used when studying the industry and its change. The ultimate purpose here is to understand the workings of general industrial mechanisms, particularly as they relate to the games industry, even though these are only preliminary steps towards that goal.
There are many approaches in economics, management studies and economic sociology that are interested in industries and their dynamics. In particular, the field of evolutionary economics addresses the transformation of industries as related to technological change and innovation. As its name suggests, evolutionary economics draws conceptual tools such as "variation," "selection," and "adaptation" from evolutionary biology, implying that there are similar systemic properties in biological entities (populations) and economic entities (industries). To ensure that the biological concepts are not borrowed only for the sake of plausibility and rhetoric, it is necessary to look into the mechanisms of evolution, evaluate how well they are transferable to economic phenomena, and explicate the analogies in these two domains. This is the first step taken in this paper.

The second step is to introduce basic ideas and concepts of evolutionary economics. Innovation is undoubtedly the most important and oft-used concept, and it has found its way from academia to the policy makers and become a central means for maintaining national competitiveness. The political pursuit for innovations or "innovation policy" has created a need to find the best way to produce innovations and has resulted in ambiguity in the word’s meaning. When looked at from the evolutionary framework, innovation is not something that is done but something that happens. Whether a given activity can be called "innovating" can only be evaluated afterwards, when the success of the activity is known.

Acknowledging this, something can be said and learned. Besides innovation and concepts borrowed from biology, evolutionary economics utilizes concepts like Schumpeterian creative destruction, national innovation system (with direct implications to national innovation policies), and path dependence, or the fact that past developments constrain future possibilities, that "history matters." While dealing with these economic phenomena I will try to carry the evolutionary vocabulary and concepts throughout the paper. Finally, utilizing the evolutionary framework described, I make some remarks on the games industry and its dynamics and evolution. Although there is no systematic empirical analysis, some secondary data from industry sources will support these statements. To benefit the research on the games industry in the long run, it would be necessary to gather the already existing research results and formulate a systematic and comprehensive research program.

2. THE MECHANISMS OF EVOLUTION

Evolution is a process whereby a species tends to adapt to its surrounding environment. Also, evolution means the change of a certain population and its gene pool, even though the changes are based on individuals' features. The three basic mechanisms of evolution are heritability, variation, and selection. Heritability means that individuals of the next generation inherit their genetic features from their parents. Variation in turn means that there are differences in genetic traits among individuals in the population. Finally, under conditions of limited resources, selection tends to limit variation in favor of traits that benefit survival, thus, "the survival of the fittest."
Variation and selection work as counter mechanisms to each other. Mutation and recombination cause increasing genetic variation, while natural selection decreases variation. Differences in inherited traits (genotype) cause differences in physiological and neurological features, which in turn limit and enable behaviors (phenotype). It is ultimately the behavior that determines whether an individual is suited to its environment and capable to reproduce. In the long run, natural selection also leads to genetic adaptation, or changes in the gene pool. Typically the successful traits are useful in protecting against threats, securing nutrition, or reproduction. While many traits benefit only the individual, some of them help the whole population to survive, especially traits connected to social interaction and cooperation.

In theory (in a fixed environment), the traits that benefit adaptation increase over time, generation by generation. In reality, of course, the environment can change, which can lead to ecological crisis and stress on the population. This in turn leads to a stronger selection process. When the changes in the environment are fast and radical, the existing gene pool might not be able to adapt, resulting in the population becoming extinct.

3. USING THE METAPHOR
To be useful as a metaphor for economic phenomena, evolution needs to be abstracted away from some of its biological details. The broad interpretation could be as follows. First, the features of an entity (population) are relatively stable (inheritance). Second, new features are generated more or less randomly (variation). Third, the features are systematically selected so that the ones best suited to surviving and adapting remain. These kinds of processes can be found all around and on many levels. When this framework is used to understand technological or economic change, the phenomena must be placed in the formula, so to speak. Evolutionary economics is interested in industries or large techno-economic systems instead of populations or species. The biological organism is replaced by the company. There are many potential equivalents for the gene, but perhaps the most reasonable is "practice" [cf. 4].

Using this metaphor, the games industry (population), for example, includes a certain number of companies (individuals) and a plethora of practices (the gene pool). The relevant environment includes different national laws and international treaties, consumer demand, available labor force and raw materials, and competing industries (such as the film industry). With these elements in mind the concrete activities within the industry can be structured in evolutionary terms. Over time the practices adapt to the economic environment; on the other hand, the industry itself is active within its surroundings, utilizing different marketing and lobbying strategies for example.

The changes in the "practice pool" of the industry are quite slow. One example of this is the long-lasting failure to address the non-hardcore gamers, when the potential mass markets were there long before the recent emergence of casual games, rhythm games, and social network games. The games industry has nevertheless been relatively flexible in terms of "ecological crises," the IT bubble and peer-to-peer networks for example, and has even broken through the traditional consumer segments. Industries
have to face the crises by trying to prevent unwanted developments, as well as changing their own pools of practices or risking the collapse of the whole industry. The more institutionalized the industry, the harder the change.

The metaphor ("changes in an industry resemble changes in a population") is supposed to aid in understanding the phenomenon currently under scrutiny (changes in the games industry), but it should be treated with scientific awareness. It is in any case essential that the other side of the metaphor (changes in a population, biological evolution) is understood well enough. The danger is that the metaphor is used to justify beliefs set beforehand. Natural sciences are generally more descriptive than the social sciences, and it is possible that the normative beliefs are cloaked as descriptive facts. Some keen proponents of sociobiology or evolutionary psychology could be charged with this. Communicating the metaphor, on the other hand, is impossible if the listener does not understand biological evolution and the related language. This is possible, for example, if evolution is misunderstood as progress or something morally desirable.

4. Emergence and diffusion of innovations

The proponents of evolutionary economics claim that neoclassical economics is unable to consider technological change, even though it is admitted that it is a key factor in economic growth [cf. 3, 11]. Joseph Schumpeter (1883-1950), a classic scholar of evolutionary economics, criticized the neoclassical economics of his time and contributed to the theory of institutional and economic change. The systematic utilization of evolutionary vocabulary was started by Nelson and Winter in their book An Evolutionary Theory of Economic Change [8]. The concept of innovation, along with its causes and consequences, are all at the core of evolutionary economics. In theory, innovations can be divided into product and process innovations. The former are new products in the market, while the latter are new means of production. On the other hand one can distinguish radical from incremental innovations based on the rate by which they differ from earlier innovations. In practice the distinctions are vague. It is in any case useful to separate the concepts of innovation and invention. To be called an innovation, an invention has to be useful and most of the time successful in economic terms. [4]

Companies strategically seek innovations to create successful products. Intellectual property rights grant the developer of a new product or production process a competitive advantage. This advantage is only temporary, however, and sooner or later the competitors will also have access to the new technologies. New practices (variation in evolutionary terms) are the result of intentional pursuit of innovations or other managerial actions and new workers with their know-how. Competition drives other companies to adopt the successful practices and abandon the obsolete ones (selection in evolutionary terms). This way the "practice pool" of an industry gradually changes and it maintains its competitiveness. The Schumpeterian concept to describe this kind of techno-economic process is creative destruction [4]. If all others adopt new practices, the inflexible firm is in trouble.
These mechanisms are somewhat different in cultural industries, where technological solutions are not the primary competitive factor, quality criteria vary a lot among consumers and, thus, the markets are fragmented. The ecological niches are more complex and harder to recognize. This limits the possibilities of the evolutionary framework of variation and selection, but does not undo it. There are established conventions and configurations even in the cultural industries. If a new game is a clear break from the existing conventions (radical innovation), its success is uncertain and there are many possible paths it could take and many possible styles of play that the developers would never have thought about. If it succeeds, the new conventions are gradually integrated to the game culture and gamers become familiar with its mechanics and styles of expression. Take, for example, Wolfenstein 3D or Doom. The FPS genre was not established when these games were released and their success was only partly due to the quality of the games; the more relevant factor was perhaps a new kind of marketing strategy: shareware [2]. After Doom several similar games appeared and the conventions settled. The long and glorious history of FPS games has made it significantly harder to change the core features of the genre as gamers’ expectations are also relatively settled. It is clear that all creative games do not succeed in the same way.

5. Path dependence and national innovation systems

In the social studies of technology and evolutionary economics the concept of path dependence illustrates that changing practices is slow and, once a path is settled, it is relatively hard to deviate from it [cf. 4, 6]. The parallel phenomenon in biological evolution would be inheritance. Earlier developments in the FPS genre limit current possibilities to some extent, but at the same time make it possible to further refine it. Changing practices is hard because the developers’ competences and the gamers’ expectations change slowly. Path dependence is a relative concept to specialization, which means focusing the available resources but at the same time it shuts out other possible courses of action or makes them too cumbersome. Pathological specialization leads to problems seen for example in countries that are dependent on only one exportable commodity. In the same way, a game developer who is too focused on one niche is vulnerable to sudden fluctuations in that market.

The fact that the actors trying to innovate are in many ways dependent on other actors and social structures is in turn illustrated by the concept of the innovation system. It is observed that different national economies are variably capable of producing innovations. Aside from private companies, public funding organizations (such as Tekes in Finland) and universities are essential parts in innovation systems. This is, of course, a politically relevant topic, as national innovation policies are largely based on these kinds of theorizing [4]. If the change in practices is slow within industries, it is certainly so among public actors. This also means that the idea of path dependence can be applied to whole innovation systems.

When looked at in more detail, the innovation system concept does not seem to be that well defined. It can include companies’ internal communications, quality management systems, circulation of labor force, interaction between producers and consumers,
technological possibilities, education systems, rewarding systems besides the intentional research and development done in companies, and universities and research centers [4]. The concept is nevertheless useful in recognizing that the different kinds of actors and institutional configurations affect the ability to produce innovations. In evolutionary terms the innovation system could be called ”ecosystem” or ”selection environment,” which are equally complex concepts themselves.

6. THE GAMES INDUSTRY AT THE CROSSROADS OF CULTURE AND TECHNOLOGY

The economic significance of the games industry approaches that of the film industry. It also has a growing cultural significance, as an increasing proportion of people grow and live their lives surrounded by games. Due to its cultural nature there are some central differences between the games industry and the neighboring fields in technology industries. The value of cultural products can be described as aesthetic, semiotic, cultural, artistic, or entertaining [cf. 11]. The use of games is not primarily oriented towards some narrow instrumental gain like the use of utilitarian goods. The success in cultural markets is very unevenly distributed and a small number of hit products generate a large share of profits. The products are differentiated into genres. There are often tensions between business and artistic motives and, finally, the innovations in cultural industries are more often stylistic than technological. [11]

Among other cultural industries, the games industry is an exception precisely because of the importance of technological innovations. The development of computer processing power and computer network infrastructure, as well as various mobile devices, influence game development directly. Game companies are proud of new technological solutions and new technology not only makes it possible to draw more detailed graphics but also affects the designs and mechanics of games. However, the causal relations are complex and from another perspective: the demand side, that is, gamers who are interested in high performance hardware and willing to pay for it could be seen as the engine of progress in information technology. Most utilitarian software does not require the same kind of hardware performance as games require [2, 7].

To connect back to biological concepts one could say that the cultural industries tend to have more variation than other industries. There are a great number of different games in the market and a great number of different practices in the companies that develop and publish them. Correspondingly there is variation in consumers’ preferences and relevance structures. Mateos-Garcia, Sapsed, and Grantham describe game genre as a kind of institutionalized structure of relevance to which both gamers and developers relate their activities [6]. A company needs to evaluate what kinds of features the consumers generally find attractive, take into account its available resources, and decide which conventions to follow and where to deviate. The established conventions are here analogous to inherited traits, which direct the choices in a path-dependent manner. Moreover, establishing a genre is analogous to speciation and adapting to a certain ecological niche.
Tschang operationalizes the innovativeness of a game by the degree it deviates from the conventions of an established genre [13]. One could add that to be innovative by definition, the game also has to be successful. It is not enough to break conventions, and the wrong kind of deviation is certainly harmful to the company. It is not simple to break just the right conventions to be successful, of course. The importance of publicity and the hits-oriented nature of cultural markets make it even harder for a developer to be innovative: Early success and fame tend to bring more success. It seems that, in addition to strong variation, the selection mechanism is also strong in cultural industries. The fluctuating nature of those industries seems to reduce the use value of evolutionary concepts, as it is often hard to give more than ad hoc explanations about the success of a certain cultural product. That makes it hard to talk about systematic selection and adaptation to the environment. The games industry however, is again an exception because of its technological character.

7. Conclusion

The strong relationship with technological change means that the environment of game companies is in constant change. With that in mind, it is not that surprising that the games industry seems to adapt to new situations much better than other cultural industries. The spread of computer networks and the digitalization of content has led to a situation where the costs of copying and distributing cultural products are nearly non-existent. Both the industries themselves as well as the legislators have been slow to react to the new situation. The traditional cultural industry is cornered and seeks to reinforce the old copyright system. Following Lessig [5] this could be said to be a fight against the windmills.

The games industry is, by contrast, relatively advanced in figuring out new practices and business models. There is a gradual movement from the retail of physical copies toward digital distribution, monthly subscriptions, and the so-called “freemium” model where the base game itself is free but includes separately purchasable content [cf. 1, 14]. The development of new models has begun in emerging markets where the traditional model has been impossible due to organized piracy (e.g., Eastern Europe, Brazil, China, Southeast Asia). These new models are based on the customers having network access, and the games industry has been quite optimistic about the growth potential in the emerging markets because the network infrastructures in those areas are relatively underdeveloped [cf. 9].

The overall change that is going on can be called the rise of the service paradigm [12], and it is likely to push the games industry into a phase of Schumpeterian creative destruction and adaptation to a new techno-economic environment. The companies stuck with obsolete practices lose significance. The financial crisis and the ensuing recession have only sped up this process, when the established actors face problems and make room for new ones. The traditional retail of games is not likely to come to an end anytime soon, but the ecological niches are likely to be renegotiated.
One particular value of the evolutionary approach is a serious attempt to understand change while being aware of the interdependencies of different actors. It treats the complexity of economic phenomena with respect. There are, however, notable differences between the mechanisms at work in populations versus those at work in industries. For that reason, evolution should still be treated more like a potential metaphor than a valid model summarizing empirical evidence. As pointed out in the introduction, the empirical research and comparisons between related industries is essential when trying to understand the functioning of the games industry.

REFERENCES


I was at a conference a while ago...

I heard a game developer saying that she's sick of everyone talking about innovation. I thought innovation was a good thing, doesn't everyone want more of it?

There are a lot of different attitudes toward innovation. Actually, we found seven different attitudes to innovation from game industry professionals: artists, universalists, followers, evangelists, nihilists, realists, and scarecrows. The game industry is still rather innovation-centric, but different people might see it differently.

Oh, I see. Thanks!
14. Seven Innovation Attitudes: From Universalists to Scarecrows

Conference Paper / Interview Study

Annakaisa Kultima
Kati Alha

Abstract

Innovation has become something that everyone seems to be striving for. Instead of separating themselves through the measures of quality, businesses are seeking to differentiate by using new ideas and exploring new audiences. In this article, we present the findings of an interview study, which collected data on 3 major game industry conferences in 2009.

Seven different attitude profiles were identified from the data. The profiles were: artists, universalists, followers, evangelists, nihilists, instrumentalists, and scarecrows. These views reflect the current state of the game industry as it undergoes changes and heads toward incorporating more rationalized, fine-tuned processes and appropriate tools for innovation, as predicted by previous studies. The views still uphold the echoes from the past: game developing as a purely artistic endeavor that relies on a handicraft approach and mystical perspectives on creativity, idea creation, and the management of creative processes.

The perspectives stated in the present study show that even though there is much talk about user-centered approaches to game design, the industry is still very personal. The value of innovation seems to be intrinsic to the field. The next several years should determine whether game development companies can still merely trust the talent of their innovative game developers, or whether they will need better processes to beat the competition, processes that encompass quality and innovation.
15. The Four Innovation Philosophies Guiding Game Development

How do game developers ground their development processes in innovation?

ExCUSE ME?

Well, it is not that complicated. For one, they think that good ideas will do the trick, but on the other hand, one needs creative and visionary personnel. Finally, there is a need for some kind of review process that come either in the form of iteration or in the form of getting some kind of approval. Together, these approaches guide the development processes.

Well, those all sound important to me!

That they are.
15. THE FOUR INNOVATION PHILOSOPHIES
GUIDING GAME DEVELOPMENT

Annakaisa Kultima
Juha Köönikkä
Juho Karvinen

ABSTRACT

In this article, we examine game innovation practices and the emphasis of different elements within game development processes. We were interested in what is critical for game development from the point of view of innovation. An experimental research approach was used. In total, 24 interviewees were asked to describe their innovation process with the help of a drawing exercise. The data were collected from 7 different Finnish game companies and the analysis was performed using a grounded theory approach supplemented with content analysis. Four different approaches that we call innovation philosophies were identified: idea, human, evaluation, and iteration-centric approaches for innovating new games.

1. INTRODUCTION

Games are touted as idea- and innovation-centric products [18] and innovation intrinsic to the field [11]. However, the depth of the innovation processes within the game industry has not been rigorously explored. In what way are games idea- and innovation-centric products and how does that show in their production processes? On the other hand, it is also noted that game ideas are bound to be changed throughout the production [10]. Developers claim that “ideas are cheap” and the magic is in the execution [18]. How can we reconcile these contrasting viewpoints? How about the process itself? What is the role of innovation within the game production process and how does the generation and application of ideas relate to this process?

Tschang [18] claims that game companies use certain kinds of balancing acts in order to survive the pressures of execution complexities and innovation-seeking consumers. There is a need to have more secure products with less experimentation to keep the money flowing as well as to experiment more in order to stand out and keep consumers interested. How does this show on the level of the process itself?

The game industry is characterized by a volatile business environment resulting in constant changes within the industry [2]. Over the past five years, for example, several major changes have molded the processes that game companies need to consequently update.

Change provides possibilities for new innovations to thrive, but it also creates instability among pre-existing actors. Innovation processes have to be flexible enough to react to the merging of new trends and the change of the platforms. Even though new ideas are touted as the critical part of innovation processes [3], game developers needs to emphasize and
support creativity not only during the pre-production and idea management stages of a project, but throughout the whole production process. Creativity is a vital part of that process from the idea phase all the way to the maintenance of the game.

Games are highly challenging targets of design and creativity: The subjective and experiential nature of game experiences [16] molds the design process. This is also acknowledged in the literature of game design handbooks. For instance, Salen and Zimmerman talk about game design as “second order design” [14], which means that one cannot directly design the game experience or how the experiences will turn out. Games can only be indirectly designed by designing the game system. Oftentimes the idea is possible to evaluate only after a playable demo is made. Fullerton [5] speaks about the importance of iterative processes and the playtesting of the game concepts. It is different to imagine the game than to actually engage in the activity.

The way that games are innovated in practice is not thoroughly studied. Several design books have been written by game professionals to record the game design practices [cf. 1, 5], but there is a lack of rigorous academic perspectives on this issue. The design books look mostly at the target of the design: games themselves. The practice of making games as a design activity is left untouched [9]. The body of game innovation studies is also slim. From the perspective of management studies, Tschang [15, 16, 17, 18, 19] has published several studies that are relevant to the investigation of innovation practices. He has examined games as a cultural industry and the manner of their development processes.

Our previous studies have dealt with the practice of coming up with new ideas [10], the ways that such processes could be enhanced [12, 13], and the tools for recording ideas [8]. Hagen [7] has studied the influences that games may have. However, previous studies do not really look closely at the level of execution. The more important part of the game innovation process is the process of making the ideas alive. The role of a game idea is to provide a starting point for the design process [10]. In this way, innovation processes and activities cannot be studied separately from the production process and its nature. Thus, the purpose of the present study was to examine innovation in the context of everyday development processes.

Based on previous experience, we did not want to rely solely on interview data, which produce quite abstract notions. On the other hand, although ethnographic approaches would be better suited to this kind of examination [cf. 15, 16], such approaches and methods were not in the scope of our resources. The timeframe provided us only two separate two-week observation periods of two companies. We were interested in exploring the nature of innovation process on a micro-level and wanted to see how the production itself was formed to suit the innovation needs of the game companies.

2. Method and Data
The research was conducted as part of the Games Industry Innovation Processes (GIIP) project. During spring and summer 2010, 7 Finnish game companies were examined
with an experimental approach. The basis for the study was thematic semi-structured interviews with 1-2 interviewers at a time. We mixed the interviews with a drawing exercise. The informants were asked to describe their production process from the point of view of innovation at the same time as they answered thematic questions and concretized their views by producing their model. This approach allowed us to get deeper with the practice of game innovation without having to witness several production processes from beginning to end through direct observation.

We interviewed 3 to 6 people from 7 different Finnish game companies taking part to the experimental study case. In total, 24 interviewees representing different roles on the production process were included in the study: hands-on (game designer, junior game designer, artist and writer), mid-level (senior game designer, producer, lead graphic artist, lead programmer, team leader, project manager, and community manager) and top-level (CEO, creative director, VP of technology, artistic director, and art director) employees took part in this study.

The selected Finnish game companies varied in size, age, and domain of design. The smallest company in this study had 6 people, the biggest had 300. The companies were designing for various platforms (mobile, iPhone, Facebook, different game consoles, hand-held devices, PC, and Linux) and genres (casual, social, shooter, platformer, sports, puzzle, and racing games). All the interviewees were male, 54% of them were 26-30 years old, 38% were 31-40 years old, and 8% were over 40 years old. Most of them had some level of university education, but 13% had only high school or basic education. The interviewees experience in the game industry varied as well, 8% having less than 3 years of experience and 13% being veterans of the industry. The roles were divided quite evenly, having slightly stronger emphasis on the top level.

A specific mixed approach method was designed for the needs of this particular study. The approach included themes for the interviews and set of words and elements for the drawing exercise. We ran an evaluation workshop (see Figure 1) with a handful of game professionals and researchers to iterate the form of the method. In the workshop we used three different variations to this approach and based the final research tool for the feedback and observation at the workshop.

The drawing exercise was structured with a set of words written on small papers slips and other elements to help participants focus and get inspired. The final set of words was purposefully quite large to prevent the drawing session becoming an organizing exercise (see Figure 2). We wanted to prevent screening the whole word set, so that the tool would provide a common ground but encourage the interviewees to use their own words. We also noticed that the large set of words overwhelmed the informants and we paid specific attention in how we grounded and directed the whole exercise. The pen-and-paper (see Figure 3) variation was not successful in the testing workshop because of the difficulties of interpreting the composed, complex picture. The test interviewee was given only pen and paper and some sticky notes to help the drawing. The resulting pictures reflected very different levels of detail.
Figure 1. Testing the different variants of the research tool.

Figure 2. Test interviewees organizing the word sets.

Figure 3. The pen and paper approach resulted in too complicated picture.
The initial word set was formed based on the game design and innovation literature [4, 6, 14, 15, 18]. The words were chosen to represent the most basic components needed in a game development process.

The word set was developed during the interviews, but the amount of words was kept approximately the same from one session to another. If there was time between the interviews, the word set was stripped down to its approximate original set. Sometimes the sessions were so tightly scheduled that this was not possible.

The set of words was purposefully hand-drawn to lower the threshold of the interviewees to add new words to the set. The interviewers asked if they could assist with drawing a new word, if a suitable word was not found fast enough. In the end, the initial word set worked as an inspiration and as a starting point for the discussion and picture drawing, and many words were added during the interview sessions. Naturally some words were overlapping and some words were used by only one or two interviewees.

In total there were over 600 words used, with almost 300 unique words. The initial word set was only 134 words, from which 42 words were not used at all. By the end of the
study, the amount of added words was 191. Thus, enough words in the pictures were added by the interviewees themselves to validate the pictures as their own conceptions.

The sessions were audio and video recorded, the final state of the pictures was also photographed (see Figure 4). The interviews were later transcribed into text and the pictures were clarified by redrawing them with drawing software and adding elements such as arrows and texts to help lend context to the video material. The questions addressed in this paper were only of partial interest to the whole study.

This method provided a set of rich data to examine. There were at least three different levels of data representations for analysis: 1) the pictures produced by the interviewees (the innovation process models), 2) audio material (discussions during the drawing exercise), and 3) video material (sometimes the interviewees were pointing at the pictures and explaining the complexities that were not possible to capture by drawing).

We based our analysis on the grounded theory approach and performed a content analysis. Whereas the pictures provided us with a concrete reference for comparison, the discussions provided the possibility for triangulation of the data. However, the lack of previous research led to relatively shallow interpretations. The main purpose of the study has been to provide an outside view into the companies themselves. On the academic level, this analysis could be further elaborated by using related theories and studies from the areas of management studies, creativity research, social psychology, and design research, to name a few relevant areas of study.

After collecting the data, a content analysis using the words on the formed pictures and transcriptions of the study was conducted and four types of underlying philosophies for game innovation were discovered. After this we analyzed the emphasis of the different philosophies in the pictures and compared the emphasis on the individual and corporate levels.

3. Innovation Philosophies

Our initial hypothesis was that the data would include statements on the importance of the ideas, their selection processes, the right kind of atmosphere or other human factors, user studies, user inclusion and other R&D practices, as well as an emphasis of iteration, prototyping, and experimentation. Centrally, the topics were concentrated around four different themes. The accumulated topics were: importance of personnel, importance of ideas, importance of the selection process, and the iterative practice of making games. Other views were weakly highlighted.

We refer to the emphasis of certain aspects in the innovation process as an innovation philosophy. This is the set of beliefs behind the process, or what is thought of as being central, critical, or important for innovation itself. As these beliefs might not necessarily be hand in hand with an intentional emphasis on production, we do not call them innovation strategies, even though the strategy might be in sync with the proposed innovation philosophy. From our data it became evident that the principles
that guide the innovation process are not very complex in practice. The overall view could essentially be formulated as a game innovation process: Game innovation is the process whereby game ideas are created, selected, and iterated by creative people. Based on the data, we formulated four different archetypes of innovation philosophies:

1) Idea-centric innovation philosophy reflects the belief that ideas are central to innovation: The original idea is the key to an innovative end product. The core idea may be modified during the development, but it always exists and guides the development process. This could also include the notion that ideas come before production and they stay somewhat unchanged. Production is about the implementation and refinement of the idea. In this kind of process the original idea is critical and consequently the production process is about how well it is implemented and preserved. This is the way that game production is sometimes characterized by players or industry outsiders.

2) Human-centric innovation philosophy reflects the belief that people and human resources are central to innovation: Being able to generate innovative products is about having the right people do the right things. Recruiting and management are important. This could also denote the belief that innovation emerges from the (collaboration of) people, for which reason the production process is heavily about labor division, collaboration, and communication processes. In this sense it is critical to the company how they select and attract talented people. This is often seen as a way that people from within the game industry talk about innovation processes.

3) Evaluation-centric innovation philosophy reflects the belief that evaluation and selection processes are central to innovation: There is always more than enough ideas. What is essential is the skill to pick the right ones to produce. Evaluation is present throughout the development process and unsatisfactory features are cut. Evaluation is often done both internally and externally, e.g., by the publisher. This philosophy reflects the belief that production should be controlled so that the high quality ideas are surfaced and used, and the resources are not wasted for something that is not at the core of the company. Critical to innovation are the selection and filtering processes and the development of such practices.

4) Iteration-centric innovation philosophy reflects the belief that iteration and flexibility are central to innovation: What matters is the execution. While one cannot know beforehand how the idea works in practice, it is important to keep iterating and testing different solutions, allowing the product to change its direction flexibly. Ideas are only the starting point: Production molds ideas into the right creation.

Even though these views should be treated more or less as Weberian ideal types, as none of the interviewees represented only one type of innovation philosophy, it is interesting
that neither other philosophies nor more sophisticated thoughts arose from our data. For instance, there was barely any mention at all of user-centered design or systematic R&D practices. If such mentions occurred, they were often disengaged from the production process itself. The innovation models and production models should not be considered separate from each other. At the same time, regardless of whether the discussion is about the production model or the innovation model, they do reflect one another.

It is also notable that even though only the first view states that ideas are central, the following two views are also somewhat idea-centric. The picture of the game industry as idea-centric could be challenged, but only at the level of rethinking about the actual role of the use and usefulness of ideas. The innovation process associated with making games is not solely based on one overarching game idea, but different idea acts: producing game ideas and further ideas to design problems, nurturing creativity within the company, and selecting and molding ideas throughout the whole production cycle.

Many interviewees did talk in terms of ideas or about the first idea and its variations. One company used the term “idea 2.0,” representing the second version of the game vision that was done after the initial idea was reworked by the creative director or CEO. Even though some of the companies had somewhat person-centric processes with one dominant creator, in general ideation was described almost entirely as a democratized process. Many of the pictures formed by the interviewees were human-centric. They told the story of game production from the perspective of labor division or group dynamics.

The selection processes were guarded by the top management or the designers, depending on the company. Sometimes this role was also the publisher’s role. Evaluation of ideas was also present in the pictures: Some interviewees were describing the practice of pitching the game ideas internally or to project sponsors. Some companies referred to special meetings where the ideas were presented. Further checkpoints were also included in the process. It was also mentioned that a concept could be discarded after pre-production or even in the production state, as the project stages were not so clear. Iteration was mentioned usually without any strong emphasis. This reflects the everyday role of iteration within the game companies rather than the absence of it.

We looked at the emphasis of certain word groups in the pictures to highlight the differences in the processes. For this study, we were mostly interested in the composition of the whole process. What were the most dominant factors in the processes and how were they emphasized in different pictures?

We were interested to see whether these views were differently emphasized in different companies and by different personnel. The target of the analysis was the word set presented in the drawing exercise pictures. The words were interpreted to reflect the philosophies flowingly: All words referring to the production roles, such as “designer” or “programmer,” were interpreted as reflecting human-centric innovation. Some words were not so easy to interpret, for instance “idea” was regarded as a reflection of idea-centric philosophy, whereas “demo” could reflect both the idea and the iteration-centric process and was placed in both categories. There were also other words in the pictures,
such as “development,” that were so general that they were put into the category of “other.” This fifth category did not seem to bring about any new themes, as it stayed relatively small. However, its presence seems to indicate a substantial difference in the understanding of the process, if the person’s picture was characterized by words from this category.

In general, there was a balance in the division between the different innovation philosophies. The human factors were usually a little bit higher than the other factors and evaluation was slightly less emphasized (see Figure 5).

![Figure 5. The division between the innovation philosophies among all companies.](image)

On the level of individuals, the pictures varied (see Figure 6). Many interviewees (10) had more human-factor emphasis; some had more emphasis on ideas (4), iteration (3), or other factors (5). Some pictures did not have one of the factors present at all and there were also some relatively balanced pictures (4).

![Figure 6. Differences on the emphasis of innovation strategies.](image)
There were a couple background issues that seemed to explain the differences in innovation philosophies: interviewees with the producer or project manager role had more emphasis on human factors, for example (see Figure 7). Conversely, the lack of higher education correlated with a notably smaller emphasis on human factors (see Figure 8). Also, industry experience correlated negatively with an emphasis on other factors (see Figure 9). This was also visible on the level of the maturity of the company: the younger the company, the more factors were included (see Figure 10). The size of the company did not remarkably affect the balance between the approaches, nor the object of design or platform.

Figure 7. Producer and project manager posts correlate with human factors.
Figure 8. Education correlates with human factor emphasis.

Figure 9. Industry experience seems to correlate with other factor emphasis.
4. Discussion
By analyzing the emphasis of the elements in the innovation process models we were able to examine the core of the innovation processes more profoundly. The different levels of the data in this study helped us to interpret the interview results. For instance, in one of the companies the discussions during the drawing exercise concentrated a lot on the evaluation practices of the company. However, the emphasis in the pictures was more human-centric than average. Compared to the other companies, in this company human factors were more central to the whole process. The company seemed to be currently seeking to develop their evaluation practices and the interviewees were eager to express opinions about them. Some opinions were mildly negative; frustrations were expressed toward the complicated evaluation and review processes. This might be an indication of tensions between the innovation philosophies.

The dynamics of a game innovation process may not be unique to the industry, but it certainly gives us a view of what the developers see as central. Despite the archetypes presented in this analysis, there is no one archetype that represented one view only. The average pictures are somewhat balanced and there are also individuals that build their own pictures with a balanced set of the elements. All four innovation philosophy archetypes seem to be important to the production process and it would be interesting to see whether there is an optimal emphasis for each. What we were able to tackle with this study is more of a descriptive level of the processes. Some of the background
data may give an indication of a normative theory for the emphasis of the different philosophies. Experience seemed to be in connection with the level of “other” factors in the picture. However, a deeper analysis would be needed in order to actually form a theory based on these data.

The analysis of the innovation philosophies was conducted only by looking at the words in the pictures. However, iteration loops were strongly present with arrows, spirals, and twirls in the pictures. Also, as the iteration loops were sometimes considered so difficult to describe that the interviewees felt more comfortable to point at the pictures during the exercise and describe different loops from one part to another. Thus, it is probable that the emphasis on iteration would have been higher with most of the interviewees had we included the arrows and other graphical elements in the analysis.

5. CONCLUSION
In this article, we have discussed the emphasis of different “innovation philosophies” within the innovation processes of game professionals. The data are part of the GIIP project study, where the state of innovation processes within the Finnish game industry was examined with an experimental research approach. The informants described their developmental processes from the perspective of innovation with the help of a drawing exercise specifically designed for this study. The resulting innovation philosophy archetypes are idea-centric, human-centric, evaluation-centric and iteration-centric. The content analysis of the pictures formed as a result of the drawing exercise gives us a generally balanced picture of these four archetypes, with a slightly stronger emphasis on the human-centric elements. The deeper analysis gives us reason to believe that the processes could be more iteration-centric than what our analysis at the word level could expose. The seemingly simple view of innovation within game production is actually a composition of different approaches that might be different from one individual to another.

REFERENCES


16. EXPERIENCES WITH SCRUM IN GAME DEVELOPMENT

Hey... What’s all this fuss about Agile and Scrum in game development? What does it do? I thought Scrum had something to do with rugby?

Yes, Scrum is originally a term used in rugby and now the term is used to describe an agile, agnostic framework used in software development and more recently in game development. Scrum and other agile variants offer tools for better project management and hope to bring the “fun” in the game to an earlier stage of the development process.

Hmmm, so I was right about the rugby!

Yup, that’s right!
16. EXPERIENCES WITH SCRUM IN GAME DEVELOPMENT

Work in Progress / Interview Study

Juha Köönikkä

Abstract

Scrum and agile methods are gaining more ground in modern game development. At the Nordic Game Conference 2010 (NGC 2010), four game development professionals were asked whether they use Scrum in their development process and what benefits or disadvantages they observe when using agile development methods. Similar kinds of questions were asked during Games Industry Innovation Processes (GIIP) project interviews. Scrum was mostly seen as having positive effects on the company’s development process but some negative aspects were also presented. It seems that Scrum works best with programming, for example, but not so well with design and asset creation. The most typical development model used was an adapted model of the basic Scrum framework; some called it “common-sense Scrum.” In many of the companies Scrum was not completely adopted, but bits and pieces were assimilated to the development process.

1. Introduction

Agile development methods have carried over to game development from software development. One of the most popular agile methods in game development is Scrum, which has been quite widely adopted among game companies. This paper examines game professionals’ perceptions of the advantages and disadvantages of using Scrum in their development processes. A small study sample was collected by interviewing four industry professionals at the Nordic Game Conference 2010 (NGC 2010); the data were enriched through the Games Industry Innovation Processes (GIIP) project interview material gathered during the summer of 2010. The four interviews collected during the NGC 2010 served as a background study for the more extensive study about the state of innovation processes conducted as part of the GIIP project.

2. Data

As a part of the GIIP research project at the University of Tampere, four interviews were conducted face to face among game development professionals at NGC 2010. Participants were asked whether they have adopted Scrum into their development processes, and what their experiences are after adopting agile methods at their companies. The interviews were semi-structured with open questions that could be elaborated further if the participant had more detailed opinions about the subject. The interview sessions lasted 15 to 40 minutes.

The participants were selected from among the speakers of NGC 2010. The nationalities of the four participants were Canadian, Swedish, Danish, and German. The participants’ professional roles included lead designer, lead producer, chief communications officer (CCO), and audio director.
The aim of the GIIP project was to study the state of innovation processes at Finnish game development companies and how innovation is positioned in their development processes. Seven Finnish game companies, with 24 individuals from different developmental roles, were interviewed during the summer of 2010 [5]. During the interviews the participants illustrated their development processes through a drawing exercise; a semi-structured interview was conducted while each participant depicted the process. During the interviews, one of the questions asked whether the company uses any specific development methods. If a development method was mentioned, participants were asked to elaborate on the subject and describe the impact that the method of methods had on their development process. The data were collected using audio, video, and pictures. After collection, the data were transcribed and modified for analysis.

3. Scrum in game development

3.1 Scrum and a mix of methods
During the interviews conducted at NGC 2010, three of the participants said that they used Scrum in their development process, while the fourth used a “Scrum-like” method. Scrum, however, was not always the only method; the process was often a mix of Scrum and more traditional, rigid methods, such as the “waterfall model.”

All participants said they modified the textbook Scrum method to match their own needs. One of the participants had tested different methods but Scrum was the most suited to the organization’s needs. For one of the participants, Scrum was adopted to make project management easier.

Iteration was mentioned many times in the interviews. Iteration is considered vital in game development. Iteration is very important if a game is service based: development is continuous after initial release and is constantly iterated. If the game is not successful then iteration rates decline. Keith suggests that Scrum adds iteration in game development [3], but one of the participants said that after adopting Scrum the amount of iteration declined and there became a clearer focus on which work items to complete next.

All of the participants said that the adoption of Scrum had positive effects on their development processes. One of the participants used it as a project management tool only and used only parts of the framework. Three others had adopted Scrum more thoroughly with uniformly positive results. The stated benefits of using Scrum were that it works better with a scaling organization, it makes the development process much more efficient and concentrated, it has a positive effect on the final product, keeps out extra work, helps prioritize, reduces crunch, reduces feature creep, and elevates employee morale.

However, Scrum is not the solution for all problems. It was said that an ideal process would be a hybrid of different methods. Two of the participants mentioned that even though they were using Scrum, there were still more traditional and rigid methods used
as well. One comment was that Scrum does not work well with design and asset creation, and suggested using something already familiar that works with these areas. Two of the participants mentioned that adopting Scrum had a positive effect on the outcome of the final product, but one stated that it had no effect on the outcome and said that interaction in game development is more important than specific methods. One of the participants felt that using specific methods would have a negative effect on creativity and would make development more complicated when dealing with inspiration.

3.2 Making iteration more central with Scrum

The GIIP project participants were asked whether they used a specific method. If they did use a certain development method, most of them mentioned that they used an adapted model of Scrum or parts of the framework. One participant used extreme programming, but the other participants at the same company mentioned Scrum. This difference of opinion might be a communication problem or a sign that there was no specific method in use, which would indicate a need for a process that all developers share.

Participants mainly described processes as “Scrum-like,” or said that parts of Scrum were adopted to their processes and made to fit their needs. Only two from the seven companies included in the GIIP project had adopted Scrum more extensively; in one company, the method used was producer-dependent. In many cases if the participant described using an agile development method without elaborating on the subject, it usually meant that the development process was iterative, without further specific methods.

The companies that had adopted Scrum more extensively saw its benefits to their company and processes. Scrum brought clarity to their work, made iteration cycles and dependencies more visible, and made iteration more central to the whole development process. Scrum was also considered very flexible and transformable to suit different kinds of needs.

One comment was that team empowerment had worked well for the company’s benefit. Stated differently, if the company adds personnel, Scrum allows the company to adjust better to those modifications within the company and team structures.

According to the participants, Scrum is more practical for coders and does not work well with design or asset creation. Scrum was seen as too strict for asset creation: The time boxing does not work for these areas of development.

In general, the mentions of Scrum in GIIP interviews were mostly vague notions and did not provide deep or detailed opinions of the methods. Maybe this was because Scrum is a fairly new addition to game development processes. Another possibility might be that not everyone in each company has paid much attention to their development process. It is also possible that the lack of general usage and information about Scrum might be because a company’s development process is not shared by all of the employees in the companies, or the process is not yet fully deployed [5].
4. DISCUSSION
Adopting agile methods into a company’s development process takes time and effort. Adoption is not the only problem since many of the modern game publishers do not support the use of agile methods. Publishers need extensive pre-planning and design documents, and this convention leaves little room for different kinds of approaches such as Scrum.

Modern developers should look into agile and Scrum principles, however. Experiences using Scrum have mostly been positive and some of our study participants noted its positive effect on the final product. Scrum allowed one company to make a superior product under budget and with reduced schedule crunch.

Keith [4] did a survey in January 2010 of 50 different development companies where he collected data on how the adoption of Scrum has affected the companies in the areas of:

- Game quality
- Planning effectiveness
- Quality of life
- Project management
- Design practices
- Art practices
- Programming practices

According to his survey there were usually some benefits seen in all areas when using Scrum in the development process, especially in project management, programming practices, and game quality. The areas that benefited less from using Scrum were art practices, design practices, and quality of life. Keith’s survey’s results are somewhat similar to the results of the data gathered from our own study, indicating some consensus that Scrum is good for programming and project management, but is less effective for asset creation and design.

There is software made to suit the needs of an agile development company. One example is Hansoft [1], which helps companies to adopt and execute Scrum practices. One of the participants said that Scrum has allowed for better project management and auxiliary software might make the process even more efficient.

Based on our data, it seems that there might be need for a specific variation of Scrum for game development. Perhaps this variation could be developed by mixing different methods. One way to approach this is to spend some time reviewing Lean production principles, which are meant to have a positive effect on asset creation. Keith has suggested that lean development principles would work well alongside Scrum practices [2].
5. Conclusion
In this article, I have explored the use of Scrum in the game development process and discussed the benefits and disadvantages of using similar approaches. The study is based on interview data collected at NGC 2010 and through the GIIP project. Overall, Scrum was mostly seen as having positive effects on a company’s development process, but some negative aspects were also present. It seems that Scrum works best with programming, for example, but not so well with design and asset creation. The most typical development model used was an adapted model of the basic Scrum framework; some called it “common-sense Scrum.” In many of the companies Scrum was not completely adopted, but bits and pieces were assimilated into the development process.

References
I WAS THINKING...

HOW DO GAME DESIGNERS END UP WITH ALL THOSE IDEAS? HOW DO THEY BRAINSTORM?

HUH?

Do you mean Brainstorming or brainstorming? Brainstorming is an actual technique that needs a skilled facilitator as well as trained users. It is difficult to say what game developers mean by brainstorming when they talk about it, but game developers also have other approaches for ideation. Some approaches are more organic and some more formal. But it is not all collaborative. Most of the initial ideas come about in solitude.

OH... SO BRAINSTORMING IS JUST A SMALL PART OF IT ALL?

Yes!
17. THE ORGANIC NATURE OF GAME IDEATION
Conference Paper / Interview Study

Annakaisa Kultima

ABSTRACT
Producing new game ideas may feel like an easy and automated task, or it may appear mysterious, whereby ideas seem to come out of thin air. Based on the interviews of 23 Finnish game professionals from 8 different companies, it is quite clear that ideas do not come about by accident. Game ideas have demonstrable origins and designers have different means and ways of affecting the ideation process.

In this article, I present the findings of an interview study and discuss the possible implications for the development of systematic approaches to game idea generation. Game industry professionals seek their inspiration from different sources, either using formal techniques or by approaching the issue from a more informal direction, such as what makes them feel relaxed. However, experiences of formal techniques vary among game companies and game designers. For some there are hardly any techniques and the ideas are produced by the ways and means that are intuitive to them, or that they have found efficient according to their personal experiences. The use of formal techniques, like brainstorming, may generate negative experiences if suitable training is not devised. Group processes may be highly beneficial for innovation, but at the same time these processes are slow to facilitate and difficult to manage.

Ideas are generally seen as a starting point for potential game production and are prone to change throughout the process. One of the most important factors for game ideas is the reactions that ideas produce in the designers themselves and among those who select the ideas. It is considered beneficial for the process to involve as few changes as possible to the idea, but even dramatic changes can be made for the sake of quality.
LOOK WHAT I FOUND...
**IDECARDS**

Tool

Annakaisa Kultima

**WHAT IS IDECARDS?**

IDECARDS is a deck of cards for playful idea generation. It can help facilitate any brainstorming session, whether you decide to ideate products, services, or events. It gives you a direction and the structure for a fast-paced ideation session and helps you break the thinking patterns of participants.

**HOW TO USE IDECARDS**

IDECARDS can be played in various ways. You can design your own game or follow the rules of example games. One possible game is to choose three different decks of stimuli and go through rounds of ideation on a shared idea. You can also design your own special deck that breaks a particular design problem into its most essential pieces. By combining the elements together with the general stimuli cards, you can find new ways to approach your design target.

**WHY WOULD I PLAY IDECARDS?**

IDECARDS can be used for facilitating blue-sky ideation, but it can be also used for a specific design problem that you want to address. Asking friends or colleagues to participate, you can explore ideas in an easy and entertaining way, resulting in the generation of ideas that might not come up otherwise. It can help you in time-constrained situations and give you inspiration to solve your design problems. You can use IDECARDS as a supplement for your creative practices, but it does not replace your natural creative processes.
I was wondering...

How could you study the emotional and social aspects of a design process?

Huh?

Well, we used a design diary. It provided us with a good view of how game designers think and feel. In fact, we learned that the social aspects of the process are very important indeed. Unclear roles and different individual approaches to game design can cause lots of challenges for the team.

Sounds familiar...
18. THE BLOODY MONSTER PROCESS – ANALYZING DESIGN DIARIES
Work in Progress / Empirical Study / Content Analysis / Exploratory Research

Jussi Kuittinen
Annakaisa Kultima

ABSTRACT
This article describes the results of an exploratory study of the emotional and social aspects of the game design process. We kept individual design diaries during two game development processes conducted during the Games and Innovation (GaIn) and Games Industry Innovation Processes (GIIP) research projects. Two teams engaged in design activity in order to provide qualitative viewpoints to support the empirical data collection of the projects. The design activity that occurred during these projects was reflected in the personal diaries in rich detail. We also evaluate the suitability of the design diary as a research tool.

1. INTRODUCTION
When the Games and Innovation (GaIn) project started in 2009, we wanted to develop a qualitative perspective on the various facets of the game development process. Not only were we interested in understanding the mechanical nature of the process but also the cognitive and social aspects involved in the process. Therefore, we decided to start our own game development project to gain a deeper understanding of game design and development, and to provide context for evaluating the research conducted within the GaIn project.

To capture the data relevant to our process, we modeled our qualitative design on the research through design experiment conducted by Pedgley [6], in which he documented his own process of designing a guitar. His approach was to document and analyze his own design activity using a design diary to record all pertinent thoughts, sketches, ideas, emotions, and other related matters during the process.

2. DATA AND METHOD
A total of 140 diary entries from 6 participants were made during the development processes. Entry lengths ranged from 10 to roughly 1,000 words per entry. All participants were instructed at the beginning of the study to follow the guidelines of keeping a design diary set by Pedgley [6]. No other set of instructions was given. Diaries were kept for 2 separate game development processes: The Monster Confidence game from the GaIn project, and the Bloody Sausage game from the GIIP project. Participants from the Monster Confidence process began to keep the diary using a template A4 stationary similar to Pedgley, while the participants in the Bloody Sausage group used digital documentation. The participants of the Monster Confidence group were more active in keeping the diary, resulting in 113 entries, but that is also partly due to the project lasting longer.
Monster Confidence is a concept for a platform game initially planned to be implemented by XNA. In the game an unconfident but cute monster tries to gain confidence by conquering obstacles by jumping, swimming, climbing, or digging through them (see Figure 1). Players control the monster indirectly by giving orders to him. The more orders the player can give at a time, the more confidence the monster gains. The concept underwent different variations during the concept phase and is currently a Facebook game.

Bloody Sausage is a concept for a pervasive game located in Tampere (see Figure 2). The players take the role of an elite group of intelligence operatives sent to figure out a conspiracy concerning “mustamakkara” (bloody sausage) and deadly viruses. At least that's what they think. The truth is unveiled using smart phones with satellite positioning and semacode readers.

The way in which the diaries were kept with regard to content and form varied somewhat between the two processes. The Monster Confidence participants used the diary more as a means of reflecting on the various parts of the process and also as a tool for introspective self-reflection. In addition to recording their design activity, they also documented their emotions toward the design issues and other participants in the project. An additional collaborative blog was set up to record the design solutions made during the session [9].

The participants in the Bloody Sausage process, on the other hand, used the diary more as a tool to document the process itself, recording mostly the design decisions and the reasoning leading to them. Although there were passages describing social and emotional aspects from the Bloody Sausage diary entries too, the difference between the two sets of diary entries was quite clear.
Each participant was responsible for writing an entry every time he or she was involved in any kind of activity relating to the development process. Basically, each participant had to write an entry every time the game was discussed or thought of sufficiently to be considered design activity. Participants were instructed to write down the entries as soon as possible, but not later than 24 hours. Participants followed this instruction for the most part, although some admitted they had submitted some entries even weeks after the actual event and that sometimes they had forgotten to write an entry.

Before handing over the data for analysis, 4 of the participants went through their own entries and added short reflections on the entries. The time that had passed between the entries and these participants’ recollections was roughly between 5 months to almost 2 years so many things could have affected the accuracy of the recollections. No one was given specific instructions on what the recollections should contain. Typically the reflections provided context to the entries, such as describing the situation in which the entry was made, but they were also used to describe and explain feelings related to the entries and the process in general.

Due to the differences in data collection, we conducted a high-level content analysis of the entries. Had the data been uniformly entered and had there been strict control over writing the entries in time, it would have been more informative to analyze the entries with more rigorous means, trying to quantify the entries through a classification system, for example. Instead, we focused our analysis on uncovering and explicating issues we had encountered during the project in a theoretical context.
3. Analysis
The most evident issue in the diary entries was the impact that social processes had on the development process. Both groups reported problems regarding the roles of the participants, even though all had more or less assigned roles during the process. In one group, all were acting as game designers from the start, and in the other group, all were given explicit roles such as producer, lead designer, and so on. The previous group revised their roles later in the project and also adopted more specific roles for each member. Apparently this helped the process, but it did not totally mend the situation as lack of leadership and uncertainty of roles were explicitly reported in all diary entries from the group members.

The other group was not as explicit in reflecting on the problems of their assigned roles, but it was clear from the entries that during the concept design phase this was a problem that contributed to clashes between the team members. Roles were not explicitly changed during the process, but once the project had agreed on the concept and started the prototyping and implementation, it seemed that roles fell to people naturally according to their own strengths and abilities.

Both groups had problems resulting from the varying personal approaches to games and game design. What Schön describes as the designer’s appreciative system [7] and Lawson as the guiding principles of a designer [3] seemed to have a strong effect on the social process. Naturally all designers were putting forth ideas that were the result of their own gaming history and combined elements that were to their own liking. Similarly, group members had their own preferred ways of working. When these preferences were too far apart or incompatible with those of others, tensions and misunderstandings ensued. As an example, in one group a participant had a working method of using the ideas of others as a stimulus while another liked to build ideas based on feedback from others. These two approaches were initially incompatible as the latter group member felt that the former was pushing ideas and not paying attention to others’ ideas. This led to a conflict, which in turn caused awkwardness with others in the group and apparently had a negative effect on the efficiency of the group for a while.

Interestingly, as the vision was finally set and agreed, the number of conflicts seemed to drop dramatically. This decline gives an indication of the vision phase of a design process being emotionally intensive, whereas the further stages may witness less emotional issues. The game industry does draw from the creativity of individuals [4] and the ways that game professionals situate themselves with regard to the concept of innovation reflects how personal the design process can be [5]. Even though the personal differences in tastes and preferences with designing games can bring about interesting design solutions, it is obvious that these differences have an effect on group dynamics. Eliciting creativity and innovation is a complex process involving many different factors. The division of roles within the game industry is known to vary widely [2]. The industry is fast-paced and individuals may have different combinations of expertise that they bring to the development and design processes.
Additionally, it is not always clear how the design process is organized. Sometimes the developmental process revolves around one person; sometimes it is successfully team-oriented [8]. Cadin et al. [1] describe how the volatile nature of the game industry has an influence on HRM practices. Where movie production teams can work more efficiently with strangers, game development teams may have to work on two or more projects before reaching an optimal level [1]. The organization of a group forms around the expertise of the individuals and the group dynamics of the team.

In a way, the agreement on vision seemed to be a sort of social contract between the group members who wanted to move from the more volatile phase of the design process to the more stable concept phase. In fact, although others agreed with the vision, they also stated in their diary entries that they did not necessarily understand it. However, once the agreement was made, the vision became the organizing principle for the design process and the key criteria used for evaluating individual design decisions.

One point of interest was how the designers wrote their entries. It is customary to keep a diary using a conversational approach where the writer is having a kind of dialogue with the diary. Most of the participants wrote their entries in this manner: They were asking and answering questions, discussing their feelings, drawing pictures, and so on. In a word, they were describing a reflective process, which according to Schön [7] is the nature of the design process. Therefore, it seems that a diary format is a very natural way of recording one’s cognitive approach to the design process. It allows the designers to record their actions and thoughts without forcing them to summarize only the results of these actions. Looking back at the decisions made during the process, it is easier to understand the rationale behind the design decisions if one can understand the process leading to them.

**4. Evaluating the method**

Studying a design process is a challenge. As a lot of the activities occur within people's heads, and the work is performed while sitting at computers, it might be difficult to observe what is actually happening. Collecting data with design diaries is one way to tackle this challenge. The reflections of the designers can provide rich insights that expose situations that one cannot directly observe.

However, the design diaries can be quite laborious to author. Writing an entry at the end of the day can be a chore that takes a relatively long period of time, especially if the design has evolved quite a lot during the day. Also, relevant occurrences are easy to forget even when written in the same day, and an unknown number of potential entries were lost as a result of people’s forgetfulness or lack of motivation. Additionally, writing an entry during the design phase can affect the design itself and the tool and the research topic may be intertwined.

As a tool for background study, diaries that reflect on the personal design process can be very successful. The first-hand experiences these diaries afford can elicit new research questions or refine existing ones. The design process itself gives context to the analysis of other data. Our experiences with the design diaries varied; depending
on the point of view of the participants, their entries were different and not always directly comparable. Even though the writing of the entries felt rather laborious at the beginning of the projects, participants fell into the habit of writing entries as the projects continued. However, several potentially interesting occurrences were left unrecorded. Also, keeping a diary channeled the activity into bigger chunks instead of simultaneous ongoing processes, as it felt less cumbersome to write one longer entry rather than many shorter ones.

If the diary entry method was kept informal enough, it would provide a very natural way of recording crucial aspects of the design process, such as the social process, design rationale, and emotions. It could be also used as a designer’s personal tool for reflecting on design activity. Design diaries can help designers better understand and, thus, improve on their design processes for future projects. Design diaries also allow designers to catch a glimpse of their own personal guiding design principles, which can often be unconscious by nature.

5. CONCLUSION
A design diary is a good tool for analyzing the social processes and teamwork of design projects. Even though it is difficult to apply design diaries for studying cooperation or interaction between members of a team, we found that the design diary entries we collected provided us with unique and subjective descriptions of participants’ emotions during their design processes. Design diaries could be used as a research tool and as a personal tool for the designers themselves as they develop their own professional understandings of the design process.

REFERENCES

19. The Anatomy of a Game Design Session

Can you tell me... What do game designers really do during concept design? Are there any really interesting things?

Yes, there are! Game designers use plenty of references to other games, movies, books, and other such cultural objects to describe design knowledge regarding existing design solutions. It also seems that designers first produce lots of different design alternatives without really evaluating them; once the vision starts to solidify, they start evaluating and weeding out the weaker ideas.

Oh, okay!

Yeah, that’s how it really is.
**19. THE ANATOMY OF A GAME DESIGN SESSION**

Work in Progress / Protocol Study

Jussi Kuittinen
Jussi Holopainen

**ABSTRACT**

This article presents the results from a protocol study conducted with game design professionals. We recorded, transcribed, and analyzed three design sessions. Each session had 2-3 game designers working on a game concept for 1-2 hours. The transcripts were classified with a simple model for describing game design activity.

**1. INTRODUCTION**

One of our main goals in the project was to study the requirements of a game design tool that would support the designer’s normal way of working instead of trying to force the designer to adopt new methodologies. The actual cognitive and physical activity involved in game design has really not been researched much during the last twenty years that game design itself has been a major topic of research. As we already discussed in our previous paper [6], literature concerning game design has treated design activity as a sort of black box in which the design magically happens, without really paying attention to how and why designers come up with the design solutions they generate and what is it that they actually do during the process. This has been quite adequately addressed in the general design research, but the results are not necessarily generalizable to game design research. All the various design disciplines such as architecture, engineering, fashion, and so on exhibit a number of common aspects, but each has distinctive features [11]. Therefore, in order to get a better understanding of how game designers work, we wanted to focus solely on the activity involved in the work of professional game designers during a concept design session.

In general design research, a method known as protocol analysis was adopted widely during the 1990s. Essentially, protocol analysis is a method where the subjects, in this case designers, are asked to think aloud while working on a design task. The experiment can involve only one designer or multiple designers working together on a common task. The experiment is recorded with audio and/or video recording devices, transcribed, and analyzed by the researchers. The key aspect of a protocol study is that it allows the researchers to control the environment and complexity of the experiment while gaining access to the designers’ cognitive and social processes. While protocol analysis provides a very rich set of data and the possibility to study the thought processes of the designers, it is by no means unproblematic. As pointed out by Cross, Christians and Dorst [2], the method does not provide complete access to non-verbal design activity and it is very prone to influences from the experimental setup and subjective interpretations. Three game development companies were partners in our project and agreed to take part in the study. We were willing to sacrifice some aspects of control over the experiments in order to get as close to authentic activity as possible, so we held the experiments at the respective companies. This meant that the recordings would be subject to errors...
and that we would not be able to record all aspects of the design activity. However, as our research goals were not specifically aimed at some distinct features of the design process, we feel that our approach provided good data. After analysis, we were able to get a better understanding of design thinking in game design and also raise some very interesting points about how game designers use design knowledge and handle constraints during design activity. These findings affected greatly the design of GADETO [5], which is a concept for a tool designed to support game designers as they perform concept design.

2. EXPERIMENTAL SETTING AND METHOD
The model used to explain the data was developed gradually by working with the data. We started out with two initial models we found to be interesting: Baya’s design information framework [1] and the ingredients of design process by Dwarakanath and Blessing [3]. Our aims were partly similar to these models as we wanted to understand what game designers actually do during a design session. It was, however, clear from the beginning that we could not directly apply either of the models as they were too complex for our purposes.

After going through the data set a couple of times, our model evolved into a very simplified version of the models mentioned above:

• Alternative: Possible course of action generated to resolve a design issue. Basically a new game design solution offered during the design session.
• Evaluation: Evaluation given of an alternative. This could be the designer evaluating the possibilities of the given solution, but it could also be formulation of the design situation itself.
• Precedent: Reference to an external design alternative/product, such as books, movies, games, or real-life events. Basically, a precedent is an explicit reference to design knowledge that could be applied to the design situation.
• Criteria: Design guidelines or constraints used to generate and evaluate alternatives. In essence, these are higher-level constraints that guide the whole design situation.
• Process reflection: Statements concerning the design process.

Our model attempts to capture the essential game design activity leaving aside the subtle variations of the codes and social aspects of the process, such as arguments between designers. Our goal is not to fully explain each sentence uttered during the session, but to get a firm grasp of the actual game design activity practiced by game design professionals.

3. EXPERIMENTAL SETTING AND METHOD
Three of our project partners, all commercial game companies, agreed to take part in the research. A design session was organized at each company and the session was recorded with a video camera or an MP3 recorder. Our purpose was to get as close to
the authentic design circumstances in each company as possible, which meant that we could not record and control all aspects of the experiment as we could have done in a laboratory setting, but we believe that our approach resulted in a more authentic view of the design activity.

Each session lasted between 1.5 to 2 hours. The participants were instructed to vocalize their thoughts and were informed that the session was to be recorded, transcribed, and later analyzed by us. They were asked to create a pitchable game concept. This meant that they would be working with a game idea suitable for their companies and would aim to produce a concept with a level of readiness typically required of pitches in their own processes.

All participants were game designers in their respective companies. One was a creative director. The format of the sessions was not tightly fixed as we wanted to let the companies use the means best suited to them. In the first case, the designers started out with a list of game ideas created before the session, in the second the designers used about half an hour at the beginning of the session to create the game idea using an ideation method called VNA, and in the third session the designers started out with a given set of design constraints. After the session was over, the participants were asked to reflect on the session in terms of how far away from a pitchable concept they were and how close to their normal design work the session had been.

Table 1. Example of classification.

<table>
<thead>
<tr>
<th>TIME</th>
<th>SPEAKER</th>
<th>COMMENT</th>
<th>CODE</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:21:09</td>
<td>M2</td>
<td>So it would be like a Park Tycoon, or you would play as the park attendant or whatever and.</td>
<td>Precedent</td>
<td>Alternative</td>
</tr>
</tbody>
</table>

After the session recordings had been transcribed, the data was time stamped and segmented in to suitable chunks of text (see Table 1 above). We tried a number of different segmentation methods ranging from segments containing only one classifiable element to combining sentences with contextual similarities. In the end we decided to keep the sentences intact and simply classify all elements within a given sentence. This approach was most flexible and would still make individual classifications easy enough to identify. Segments containing only one element would have resulted in us having to essentially make the classifications already while segmenting and larger chunks than a sentence would have led to difficulties in identifying the classified elements.

The segmented data were coded by the authors of this article. Every time we encountered information relevant to game design activity within a comment, we marked a corresponding classification code to the right of the comment. In the example shown in Table 1, the part "it would be like a Park Tycoon" would be coded as PRECEDENT and the part "you would play as park attendant or whatever" as ALTERNATIVE. When there was clearly a relevant piece of information that didn't fit our model, we gave it the code OTHER, allowing us the chance to evaluate the suitability of the model.
We first trained ourselves in the classification model by simultaneously coding a smaller portion of the data and comparing and adjusting our approaches afterwards. Once we were satisfied that our approaches were similar, we coded the rest of the data. The third session could not be transcribed and analyzed in time, so our results are from the first two sessions alone. The third session will be analyzed and included in a future article.

4. RESULTS
We discovered that, even though our model is very simple and aims at describing the rudimentary design activity, it also covers the data quite well. Of the total of 1398 classifications only 145 were coded as OTHER. Mostly these were related to social interaction between the participants, such as designers asking for clarification or confirmation from each other, or making comments on the environment they were in.

Figures 1 and 2 show the breakdown of the activity corresponding to our model. It is clear that most of the time during the design activity, our participants were constantly creating new design solutions, evaluating them, and accessing design knowledge through precedents. This in itself is no surprise, as some notable theorists in general design research [cf. 9, 10] have described design activity as a constant looping of making new design solutions and evaluating them through representations, which in this case are mostly verbal descriptions. The designers also drew some pictures and browsed relevant games and images in the Internet, but for the most part they worked with verbal descriptions.

Another quite interesting, if not totally unexpected, finding is the high use of precedents (156 total classifications). After going through each comment where a precedent was brought up, it became clear that game designers use explicit references to games, books, and movies, for example. In fact, the different categories of references seem to be quite similar to the ones presented by Hagen in his article concerning where game ideas come from [4]. References in our protocols were used especially in connection to
the thematic elements of the idea or to describe a certain gameplay mechanic. Typically the precedents shared at least some similarity with the game concept on those two levels: either by theme or by some common activity presented. As an example, during one session the designers were working on a game idea that had technical surveillance as a mechanism available to the player. They brought up precedents such as the classic Hitchcock movie Rear Window, book 1984 by Orwell, and so on.

![Figure 2](image.png)

**Figure 2. Breakdown of activity in Company 2.**

As is notable from figures 1 and 2, designers do not actively and explicitly reflect on the design process while designing. Even though it seems like the designers in Company 2 were active in that respect, the high activity during the first 30 minutes of the session is due to the ideation method used. The activity corresponded only to the methods structure and consisted of comments such as "Let's take another card" and "Should we move on to the next card." After purging the first 30 minutes from Company 2's data (see Figure 4), the process reflection becomes as non-existent as in Company 1.

Also evident from the data is that designers do not explicitly discuss the criteria and constraints for the design. During Company 1's session, the designers were free to design a game of their own choosing and in the other session, the designers were tasked by their superiors with a somewhat limited set of design constraints. During the design sessions, these criteria were mostly discussed at the beginning and the end of the sessions, as one can see in Figures 3 and 4. It is really interesting that the designers who could come up with their own design constraints did not have to discuss them; instead, they seemed to be evident to all. Similarly, the group that already had a set of constraints did not explicitly compare their design solutions against the given constraints, nor did they discuss any design guidelines concerning the given constraints and criteria.
Looking at Figures 3 and 4 also raises an interesting notion. Figure 3 shows how the designers clearly use the first third of the session to generate new design solutions and then mostly evaluate during the last third of the session. The data from Company 2 (Figure 4) does not seem to exhibit similar behavior as there are lots of evaluations during the first third of the session. However, the evaluations are mostly due to the ideation method used, where the designers need to evaluate each generated idea and then choose one.

5. Discussion
Even though we need to be careful in generalizing the results of this study, we believe that we have gained some valuable knowledge about how game designers actually think. Certainly, the limitations of this study need to be addressed in greater depth and their effects on the results must be considered more. It is clear that the experimental setting may have influenced the designers’ attitudes toward the design activity and resulted in behavior that is not totally authentic, and it is also possible that our own attitudes and aims have affected our interpretations of the data. However, in our view, the most interesting
result from this study is the way designers used precedents and references to other games, books, movies, and the like. The data indicate that designers used precedents in a very similar manner to what Lawson describes [7], bringing complex conceptions of design knowledge to the design situation with short and concise descriptions. This also often led to designers adopting different elements from the precedents than those that were obviously similar at first. Therefore, the precedents were also a creative stimulus for the designers. The explicit nature of the precedents made them easy to classify and the connections between the idea and the precedent were easy to interpret, making it possible for us draw the conclusion that this is very likely how game designers work. This finding opens up interesting possibilities for a game design support tool, which we have explored in the GADETO tool.

The lack of reference to design constraints and criteria is also interesting but would require more research in order to produce general conclusions. In both of our experiments, the companies were very specialized in terms of the games they were developing. This high level of specialization could lead to designers internalizing the design constraints well enough for them to be automatically included in the design reasoning. It was also the case in at least one session that the designers had very similar frames of minds about the kinds of games they wanted to design, indicating common guiding design principles that produced uniform, non-articulated design constraints. This may also have been the reason why designers did not really discuss processual issues. Maybe the designers have such similar views on how to do concept design that they do not need to discuss it. Then again, in line with previous studies [7], all designers reported in the informal interviews that they do not normally work as a group, so one would expect at least some discussions on the matter. This topic also requires more research.

It is interesting that the design flow is so clearly divided into a phase of high solution generation activity followed by a calmer phase of designing, which finally turns into a high evaluation activity. Even though it cannot be conclusively stated based on the present data, this behavior could indicate that while creating a vision or fleshing out the idea, designers tend to clear their minds by freely generating new solutions and possibilities, and once the vision is solidified and the alternative generation loses its momentum, they start to weed out the weaker solutions. This notion could also have consequences for the design support tool. It could be that some precedents would be better suited to vision creation while others would be better suited to evaluation. It would also be interesting to provide designers with evaluation heuristics for the last phase of the design session.

6. Conclusion
All in all, the experiment was successful in that it really broadened and enriched our view of how designers actually work during concept design. It was also a natural continuation from the themes we laid out in the beginning of another project [6]. The purpose of this paper has been to elaborate the central questions and findings related to other work conducted in the project. While the brief nature of this paper does not permit us to deal with all the relevant issues, such as the background of the researchers, related work,
and fully detailed experimental setups, these topics will be explored in detail in a future article that also adds an analysis of the third session data.

REFERENCES

LOOK WHAT I FOUND...
**GADETO**

Tool

Jussi Kuittinen

**WHAT IS GADETO?**

GADETO is a collaborative, conceptual game design tool for writing and analyzing game design documents. It has a creativity support mechanism that analyzes design text for semantic similarities within a large collection of game, film, and book descriptions. References to similar works are offered as a stimulus to the designer.

**HOW TO USE GADETO**

Using GADETO is very straightforward. It is essentially a Web page that wraps a Google Docs view on an iframe. When requested by the user, the server software analyzes the text written on it in the background and offers references in three categories: books and movies, games, and game concepts. All that users need to do is to write the design document using a suitable template and when they want to have new references, select Refresh. After that, the program will offer a number of suitable references for each section of the document.

**HOW COULD GADETO HELP DESIGNING?**

One of our research goals for the Games and Innovation (GaIn) project was to create tools that would support game designers in their work without forcing them to adopt new design methodologies. Game designers use references to games, movies, books, and other cultural artifacts actively and explicitly to create new design solutions and to evaluate existing ones. These references are typically triggered by clearly identifiable similarities with the design situation, often connecting with thematic aspects or gameplay mechanics. While addressing a similarity, the references also act as stimuli to creative new design solutions. By providing game designers with a wide variety of references that have some common element with the design situation, creativity of design can be enhanced.
LOOK WHAT I FOUND...
eVNA
Tool

Jussi Kuittinen

WHAT IS eVNA?
eVNA is a Facebook version of the original VNA ideation game developed in the GameSpace project. eVNA adds new qualities to the concept. First of all, it allows designers to work asynchronously: They don’t need to work in the same place at the same time. Second, it allows more than three people to take part at the same time. All users can offer ideas based on all the words drawn. Third, eVNA allows users to create their own decks that, in contrast to the original, are contextual. A deck is created from any text written in English, allowing the users to have decks tuned for different purposes.

HOW TO USE eVNA
After authorizing the application in Facebook, users are taken to the application’s main menu where they need to first create a word deck. This is a very simple task of giving the deck a name, description, and source material, which is a text document uploaded from the user’s computer. After a deck has been created, the user can create new ideation sessions. Each session is defined by the word deck it uses and the Facebook friends who are invited to take part in it. After the session has been created, the first word (verb) is revealed and each participant can create a game idea inspired by it.

The creator of the session controls the ideation by choosing favorites from the ideas offered by other participants. The creator chooses only one idea for each word; once an idea is chosen, the ideation continues with a new word. Finally, when all words have been used, the session creator writes down the final version of the idea.
HOW COULD EVNA HELP DESIGNING?
An asynchronous ideation method that allows users to collaboratively create ideas without having to be in the same place at the same time gives more freedom to users and makes it possible to tap into the creativity of a larger group of people. This format could also be used to add game-like features to the method. The most important feature, however, is the contextual deck creation. The server application analyzes the texts and selects the most commonly used verbs, adjectives, and nouns, allowing the users to focus their ideation efforts on the given context.
I wanna be a game designer. I could go all day and make new ideas on whatever I want to...

Well, actually the game development process usually starts with some sort of design constraint. For instance, the theme might already be decided when you start ideating around it. And sometimes there is a character or a storyline that one has to create a game around. Technology or resources might also restrict the ideas that can be used. But a constraint is not bad as it gives direction that can be used. Constraints can be also broken if there is something intriguing enough to go forward with instead. It is a flexible process in the end.

OK, sounds challenging...

It can be.
20. GAME DESIGN CONSTRAINTS
Work in Progress / Workshop Study / Interview Study

Annakaisa Kultima
Kati Alha

ABSTRACT
In this article, we examine the different design constraints of the game development process. In 2009 we organized design workshops and conducted thematic interviews afterwards. We asked participating game developers to explain the everyday practice of directed creative processes. Various different constraints and restrictions arose, e.g. thematic elements, genres, target groups, platforms, and other technological factors. The factors that restrict and direct the design process can be divided into inclusive and exclusive, as well as internal and external constraints. These axes help us examine the context of game developers’ everyday creative practices.

1. INTRODUCTION
A “design constraint” is a requirement of the design process that might restrict the space of the solutions for a certain design problem. For instance, in architecture such constraints can be legislation, the provided material, the particular requests of a client, or even the personal preferences of the architect [4]. Constraints are often the starting point for design, as without constraints the design has no clear purpose or direction.

Game design does not differ in these matters. Even though games are often celebrated for their creative input and innovative solutions, the everyday practice of a game developer is filled with factors that constrain which ideas can be executed or even explored.

This has implications for the kinds of idea generation methods that can be utilized during game production. Our experiences with VNA, a domain-specific ideation game [1, 2, 3, 5], led us to examine the field of game design constraints more closely. VNA was touted as a blue-sky ideation tool that helped its users generate interesting ideas, but those ideas were not always suited to the idea needs of a company. If one wants to support the everyday practice of game ideation, one should be aware of the context of that activity: the purposes for which the ideas are created.

2. DATA
During autumn 2009, we organized four design workshops at four Finnish game companies. The workshops were part of a series of design workshops where we examined the use of game-based idea generation tools as a part of the creative work of game developers. During the last four workshops the attendees used special ideation games that were designed to include chosen design restrictions. The restrictions were based on the game companies’ own wishes and starting points. There were four workshops with about two to six people attending each of them. The ideation sessions used two to three of the ideation games, which functioned as stimuli for a thematic group interview. The
interviews lasted for about an hour each and the topics that were discussed included the ideas produced in the sessions, feelings during the workshop, the use of the tools, and the restrictions game designers face. The interviews were audio recorded and thematically analyzed. In the following sections we explore the emergent examples of constraints that can manifest during the game development.

3. PRECEDENTS AND RESTRICTIONS

The interviews discussed that almost any aspect of a game can be a design constraint. Game content is a usual constraint, for example, and can include a specific theme, a name for the game, or a game world. Many times the restrictions around existing intellectual property consider these contents of the game. However, the intellectual property constraint may work the other way as well, requiring that a certain game mechanic or set of mechanics must be used.

Game mechanics as a design constraint may restrict the designer to use certain conventions, for instance the conventions of a genre. On the other hand, they may be used as guidelines to help avoid those conventions when wanting to create something new or experimental. The conventions may come from the publisher, or they may be dictated by a technology, such as the platform.

The platform may constrain the development process in several ways. For example, when designing a game for a mobile phone, the design has to take into account the screen size, the controls, and the low memory and power use. The programming language may be also a restriction for the design.

The selected programming language may be a restriction that is defined by the platform, but also by the skills of the people. The expertise of the personnel is an asset but may also restrict design in many ways. Other resources that can restrict the design processes are money and time. Game companies may restrain themselves from exploring game ideas that require complex game environments and dynamic character AI. The available resources may be better suited to smaller scale, mobile game development or less experimental titles.

Time and money may preclude certain elements from the game; similarly, the audience or focus group for the game may also impose constraints. If the company decides to target players of all ages, that decision most likely rules out concepts that may have violence, substance abuse, and strong language. Just as choosing to target certain audiences may restrict the themes, so the developers may also create the positive constraint of including topics that attract members of that group.

Designing games for a certain audience may be the main focus for some game companies. Depending on the vision of the company, the design focus can be almost anything. For instance, a company may focus on creating experimental games, creating games for the masses, concentrating on certain platforms, and so on. Sometimes the portfolio influences constraints in the opposite way, such as when a company wants to diversify
and may specifically try to supplement its portfolio with different types of games. The opinions and preferences of company employees may influence the games produced as well. Furthermore, constraints may come from the publisher, the results of focus groups and play testing, the company portfolio, or the available resources. However, the constraints are not always definitive restrictions. Most of them can be bypassed if interesting enough ideas are found that deviate from the initial direction. Constraints can also be set from the beginning, or they can arise later during the development process.

4. TWO AXES OF CONSTRAINTS
The constraints may be divided into groups based on whether they are inclusive or exclusive, and whether they are internal or external constraints. An inclusive constraint is a positive constraint, for instance if the game has to have a specific theme or it has to use a certain programming language. The constraint works as a precedent for the design. An exclusive design constraint is a negative constraint, also known as a restriction. These occur when, for instance, strong language cannot be used in the game or when there are no resources to model 3D graphics.

Furthermore, restrictions and precedents may come from within the company (internal constraints), such as the skills of the employees or the company portfolio, or from outside of the company (external constraints), such as from the publisher or because of platform-specific features.

These four dimensions create two axes that describe the space of game design constraints. An example of an inclusive internal constraint could be a separately designed character that creates excitement among the team, such as in the case of Angry Birds [6]. The

![Figure 1. The axes of game design constraints.](image-url)
design process of the successful iPhone game started with a single character that the team considered appealing. The game mechanics and the rest of the characters were built around that very same bird that made its first appearance in a screenshot of one pitch document.

5. DISCUSSION
From the point of view of creativity, the way that constraints are posed in the design processes matters. For instance, it can be more difficult to generate ideas for exclusive constraints since avoiding a target is much more difficult than aiming at one. One solution is to reformulate exclusive constraints as inclusive. Or, instead of focusing on the exclusive constraints, one could create inclusive constraints that support the exclusion of a given topic. For example, by targeting a game for a casual audience, the design process could be focused on commonly shared interests. Instead of concentrating on the limitations that the age groups may pose, the concepts could be built around themes such as gardening, pets, travelling, sports, music, or other topics of general interest. Also, internal resource restrictions, such as skills or expertise, could be formulated into inclusive constraints by exploring more closely the resources that are available and building ideas around those features.

The most common source of external constraints is a client or a publisher. The division of internal and external constraints can be extended further: internal constraints can be individually imposed, whereas external constraints can be inflicted on the individual. For instance, within a team the artist could be able to design 3D games, but the programmer’s expertise might be with 2D games.

The different design constraints create challenges that are different by nature. The internal and inclusive design constraints may be easier to explore and solve than the external and exclusive constraints. However, the design process often includes several simultaneous constraints, making the design challenges much more complex.

In practical terms, the axes of game design constraints can be used for examining and comparing different game design situations. It would be interesting to study how different companies or individuals formulate and impose constraints on the design and whether this act has a negative or positive impact on the design process itself.

6. CONCLUSION
In this article, we have explored the space of different constraints that game developers face in their production processes. The various constraints can be different from each other on at least two axes: 1) whether the constraint includes or excludes given elements, and 2) whether the design process is internally or externally constrained.

REFERENCES

CHAPTER 3: PRACTICES


21. EXPLORING GAMES AS FORMAL MODELS

Hey, enlighten me...

Why would I ever want to create a formal model of a game?

Well, with a model created within a suitable specification environment, it is possible to realistically model game rules and events. A highly abstract formal model can, given proper visualization techniques, provide comprehension and help communication in the development process. That is, when the techniques mature and proper guidelines are ready.

Sounds a bit complicated... but I am really looking forward to it!

Me too!
This article was presented at the 2009 Fourth South-East European Workshop on Formal Methods and published as: Nummenmaa, T.; Berki, E.; Mikkonen, T (2009) "Exploring Games as Formal Models" in proceedings of the 2009 Fourth South-East European Workshop on Formal Methods (SEEFM)

21. EXPLORING GAMES AS FORMAL MODELS
Conference Paper / Theoretical Framework

Timo Nummenmaa
Eleni Berki
Tommi Mikkonen

ABSTRACT
Computer games have become increasingly complex. Modern game specifications need to accommodate many detailed design documents, which results in increasing complexity. Complex games are difficult to understand, maintain, and update. However, their software must be understandable to the player.

Using a formal specification language, probabilistic behavior principles, and two game environments, this article demonstrates that there is real potential to integrate formality into the game development process. This article also introduces the idea of utilizing multiplayer games for model building, with the use of formal methods. The emphasis is put on the assumption that a software-based game together with a number of its players constitutes a formal system that can be described in a computational, probabilistic, and deterministic manner. On another level of abstraction, the purpose of a game as model in the traditional software development process is presented.

We believe that formal methods can provide a suitable specification environment to formalize static and dynamic game aspects and realistically model game rules and events. At a higher level of abstraction, a formal game model can communicate and make understandable the activities within a development process. Considering game systems as realistic models of communication, with their dynamics formally and computationally specified, a whole new world opens to guide toward many desired quality features in the software development process.
I spent hours doing a prototype last night...

Is it somehow possible to test ideas without implementing a prototype?

Sure! One way is to use simulations. Simulations allow designers to view system behavior at a higher level than prototyping would comfortably allow, even at a very early design stage. They are not, however, a replacement for prototypes!

What?

Oh, so we still have to prototype too...

Yeah, that’s the way it goes!

Timo Nummenmaa
Jussi Kuttinen
Jussi Holopainen
22. SIMULATION AS A GAME DESIGN TOOL
Conference Paper / Exploratory Research

Timo Nummenmaa
Jussi Kuittinen
Jussi Holopainen

ABSTRACT
In this article we suggest using gameplay simulations on a logical event level as a design tool already in the early stages of the development process. Our approach is centered on abstracting all unnecessary gameplay details to produce a highly simplified model of the game system. We demonstrate the approach with an experimental simulation of the system behavior of Tower Bloxx, a mobile game by Digital Chocolate. Our goal was to abstract as many aspects of the game as possible, leaving us a highly simplified and flexible model that would allow us to simulate the gameplay accurately enough. Instead of exactly modeling all agent behavior in the system, we treat agents by way of modeling probabilistic object behavior. We abstracted all user interface and control details from the simulation and reduced the user actions to only five possible outcomes. We used a modified version of a simulation environment called DisCo to create and simulate the model. This highly simplified model provides an excellent base for exploring various design choices and their effects on system behavior. To complement our findings on a single-player game, we provide some comparative examples from previous work simulating a massively mobile multiplayer game called Mythical: The Mobile Awakening.

We believe that, as a design tool, simulation complements prototyping by allowing the designer to view system behavior at a higher level than prototyping would comfortably allow. The process of building the simulation model provides a better understanding of the design situation and allows the designer to explore it more efficiently. The high level of abstraction and the focus on the essentials of the gameplay are likely to enhance the designer’s overall vision of the design process. We also believe that the formalized model of the game improves the programmer’s comprehension of the game as well, and provides a common ground for discussions between designers and programmers. Compared to other forms of intermediate design representations, such as sketches and prototypes, simulations can reveal problems and opportunities in the longer-term dynamics of possible gameplay.
23. EVALUATING THE EFFECTS OF IDEA GENERATION METHODS

I WAS JUST THINKING...

HOW DO I KNOW WHAT KIND OF BRAINSTORMING METHOD WORKS BEST FOR ME?

The effects of the method can actually be quite difficult to measure. First of all, there are the most tangible results: the ideas themselves, whether there were lots of interesting and feasible ideas produced within a given time period. On the other hand, there is a need to look at less tangible effects: inspiration and learning. Using different kinds of methods is the key, since they give you new perspectives.

OK, THAT IS GOOD TO KNOW! THANKS!

GO AND MAKE SOME CRAZY GAME IDEAS!
23. EVALUATING THE EFFECTS OF IDEA GENERATION METHODS
Think Piece / Theoretical Framework

Annakaisa Kultima

ABSTRACT
In this article I will examine the effects of idea generation methods in the context of game design as creative work. I will provide a three-level framework for evaluating methods used for creating new ideas that acknowledges not only (a) the immediate effects of an idea generation session, but also how much (b) inspiration the methods can provide and whether they help the creative people to develop their own practices by (c) learning new ways. This framework is potentially relevant to different domains of creativity, but is especially focused on supporting the nature of game design as a creative process. Game design processes emphasize the larger context of ideas: The production process is iterative [8] and the initial ideas are always susceptible to change. Evaluating methods used based only on their immediate effects can be misleading in developing the practices of creative work.

1. INTRODUCTION
The game industry is one of the “creative industries,” which means that it is characterized as a “new” industry grounded on the creativity of individuals, and that it has different properties and higher future growth prospects than some of the traditional technology industries [23]. However, competition between game companies is getting more and more intense as fewer games per year will be profitable [6, 15]. This competition drives game industry professionals to seek the ways and means to enhance and develop their production processes to get a competitive edge. One way for a game design firm to ensure creative output in the form of successful products is to gather versatile and talented teams of people, or provide a supportive and inspiring atmosphere that will foster creativity. These are some of the core values of game design companies, but more could be done. Even the most creative person can struggle to fight against repetition.

Furthermore, games are said to be idea-based products [25]. One of the strategies to stay fresh, creatively speaking, is to enhance the processes of idea generation, a task that is generally recognized as a critical part of innovation [2], and the ability to generate ideas is one of the characteristics of successful business ventures [16]. Generating new ideas may feel like an easy task that does not require enhancement or a systematic approach. However, studies show that creativity training has the highest impact on originality of the ideas [2, 7]. As the mind is very efficient at creating patterns of thinking, there is a need to purposefully alter the processes in order to change the course of the ideas [1].

Idea generation is relatively structured and explicable [17, 20]. This structure enables the use of systematic approaches for enhancing creative processes. Importantly, systematic approaches to the creative process make a difference in the broader game design process: A study of game design post-mortems indicated that many of the difficulties with certain game productions were due to the lack of systematic approaches to their
design processes, while other game productions gained an advantage by rationalizing their design processes [23].

One of the most popular systematic techniques for generating new and creative ideas is Brainstorming, and it is known to be used among game designers. Unfortunately, this technique does not necessarily lead to innovation [16], and there are reports about disappointment with brainstorming within the field of game design [5]. Brainstorming is a relatively broad concept, however, and has become such a popular technique that it can nowadays refer to many different forms of group ideating.

Brainstorming has a long history that dates back to the 1930s. During the years since, several studies of the effects of this particular technique have enumerated both the benefits and the problems of brainstorming [4]. One of the most important findings suggests that, for the successful use of brainstorming, the conduct of the brainstorming session is crucially important because an experienced facilitator is required, as he or she prepares and guides the process [21]. But despite the known problems with brainstorming, such as production blocking and social loafing [4], pivotal virtues of the technique have been transferred into variants such as Brainwriting and original approaches such as SCAMPER. Studies indicate a strong relationship between the number of idea generation techniques and the number of successful products [19, 22].

The experiences with brainstorming in the context of a seven-day prototyping experiment by young game designers also reported disappointment with formal idea generation techniques. They stated that “Formal Brainstorming Has a 0% Success Rate” [5]. This statement can be evaluated on a few different levels. First, it is difficult to tell what actually happened and how the team behaved during the sessions. Second, the results of an ideation session are not straightforward and it might be difficult to actually draw conclusions based solely on the immediate effects of the sessions. The ideation methods often work as an initiator, as the presence of the ideas inspires more ideas and variation of different ideas. It might be difficult to track down the “first” source of a given idea.

2. Previous Studies

This article references previous studies and brings together different thoughts that have been developing throughout the GameSpace, Games and Innovation (GaIn), and Game Industry Innovation Processes (GIIP) projects conducted from 2006 to 2011. The thoughts emerging in this paper utilized the findings of GameSpace project workshops for ideating new game concepts, the results of the GameSpace Idea Generation Package study, the results of GaIn experiments on idea generation games and restricted idea generation, GIIP process models, as well as the relevant literature on this topic.

The GameSpace workshops indicated the importance of stimuli and the effects of the environment [18]. In terms of impacting the ideas generated, the methods of the workshops and how they are designed matter, as do the kinds of inspirational elements they provide. The GameSpace Idea Generation Package study, where we sent a compilation of different idea generation tools for the companies to use independently,
indicated the importance of usability and approachable tools. VNA, a simple game-based ideation method, was the favorite of the participating companies [12, 13, 14].

The restriction workshops of the Galn project suggested that one has to consider the special idea needs of creative work when evaluating idea generation methods. Ideas are often built on top of already existing ideas, or there may be other constraints for the design [11]. The ideation tools always have to be evaluated against the purpose and the use of the tool in the real world (beyond the laboratory). However, there is also a need to educate game developers about brainstorming and other creativity techniques. An interview study conducted during the GameSpace and Galn projects [10] suggests that these developers need more education to understand the main principles of the idea generation and creative thinking processes. In the following section, I discuss a framework that emphasizes the wider context of the effects of idea generation methods.

3. Three levels of effects

The evaluation of the effects of the creativity techniques becomes more difficult as the effects should be measured on the level of the whole, not only in workshops or laboratory settings. The immediate effects can be measured with set experiments, whereas inspirational and learning effects are not that easy to measure, but important to take cover, as the use of the technique may be seen as unimportant if the immediate effects are not there. On the other hand it is still important that the methods have immediate positive effects on the participators, sine the threshold for the use of such approaches may already be rather high. In the following sections, I will explain the three levels of the effects (see Figure 1).

3.1 Immediate effects

An obvious value of a selected method lies in its effectiveness. When using fast-paced idea generation practices, it is important to know how many solid ideas can be produced in a given time period: the more ideas, the better chances of finding excellent ideas. The most visible and also relatively easiest to evaluate products are the ideas themselves. The ideas can be evaluated based on their “uniqueness” and “feasibility,” meaning that the ideas should be fresh and something that can be easily taken forward. However, measuring these properties can be misleading, since the role of an idea is rarely a fundament [10]. In game development, ideas are more or less starting points of production rather than the foundations of the design. Ideas are prone to change [10].

It is also important to note that ideas are usually recorded as whole entities, but when they are revisited they are used partially for inspiration [8]. In this way, judging the ideas as such seems to reflect a misunderstanding of the role of the ideas, which are best used as fuel for (personal) creative processes. This can be problematic for the open innovation practices, as evaluating ideas from outside can be rather unnatural if the ideas are not considered as inspiration to the evaluators. Ideas need to be thoroughly explained and made explicit before they can be conveyed to others in the way that the initial creator imagined them.
Considering this need, the evaluation of the idea generation sessions becomes more complicated. However, the approaches can be softened: For instance, one could measure how inspiring, interesting, or refreshing the session or the ideas were, or one could example evaluate the partial properties of the ideas.

![Image of the “echo” of an idea generation session.](image)

Figure 1. The “echo” of an idea generation session.

It is also very different to participate in the sessions themselves compared to reading the descriptions of the produced ideas. We have observed that collaborating (or even observing) on shared ideas creates a deeper understanding of those ideas among the contributors, which may pose a challenge when it comes to conveying the excitement to outsiders. The reasons that the group may be excited over an idea might be hidden in the implications that were brought up in the session, but that are challenging to express without reworking of the vision. Part of the popularity of VNA, a game-based idea generation tool [12, 13, 14], can be explained by the emotionally positive experience that sharing a vision born from an egalitarian session brings about for the session’s participants.

### 3.2 Inspirational and Activating Effects

In this way, even though the inspirational effects are very difficult to track down, the effects of a used method fall outside the ideation session itself. The ideas that were born in the session stay in the heads of the participants, sometimes on a conscious level and sometimes on an unconscious level. The natural ideation processes are then affected shortly after the formal session and ideas are turned into food for thought. The method may also inspire new solutions to the problems outside the session even though the problems are not identical.
Successive, rather than immediate, effects are hard to track, but the sessions where a certain method is used could be compared by examining the excitement level at the moment of the session. Instead of looking only at the ideas born from these sessions, one could observe emotional responses, increases in physical activity, laughter, and similar occurrences within the sessions. These factors could work as indicators of a successful and effective idea generation method.

### 3.3 Learning Creativity

It is probable that the more different methods people use, the better ideas they get, since their cognitive processes are challenged by these different approaches. The core of a game design process as creative activity is natural and varies from one person to another [10]. Successful creative strategies are born from experience and personal experiments. Positive experiences with certain methods are repeated and further molded to fit future idea needs in the natural ideation processes by creative individuals.

Even failed experiences may yield ideas. In this way, the effects of a session move even further away from the session itself and its inspirational, idea-centric effects are even harder to detect. The methods used also affect the processes after the sessions. Creative potential can be supported and further exposed with workshops that in themselves do not always seem useful, but that may be part of individual learning processes. Even with sessions where a method was used but did not elicit ideas that were interesting and relatively easy to implement, those sessions could function as a support for the everyday practices of creative work. In this way a good method for ideation would be the one that is drastically different than those that people are used to. Formal methods are supposed to affect our natural processes and eliminate the stagnation that people may feel regarding their existing approaches to ideation. For this reason, anything new or alien can be valuable.

### 4. Discussion

Idea generation methods should also be evaluated in the context of their use. The laboratory setting in particular, and experiments in general, do not capture the whole context of an idea generation setting and its long-term effects. There are certain thresholds for use, for instance the methods need to be taught to participants, there is need for preparation, a time slot has to be organized, and the right tool for the specific idea need and innovation level has to be chosen or developed. In this way, the “best” method is the one that works within the context of the current creative work. The best method is the one that is used.

Our experiences with the ideation method VNA suggest that game-based idea generation methods tackle some of these problems. However, our experience also indicates the need for simpler approaches. The game or other tool must be flexible and simple enough for the users. Simple approaches are easier to adopt and flexibility of method provides space for the users to further develop the approach.
The effects that are not immediate on the development process can be difficult or impossible to trace. Whether the game ideas arise from playing other games, discussing with friends and peers, conducting research on a design topic, walking around your living room, or travelling on a train, formal methods are there to supplement those approaches. The role of idea generation methods is to provide such ideas that one would not otherwise come up with. However, the role of such sessions should also be considered: The ideas that emerge from these sessions might not be interesting initially, but they can work as building blocks for better ideas. It is important to understand that idea generation methods provide new perspectives to enhance organic and personal practices: Session participants learn new ways of thinking from ideation sessions if the approaches themselves are fresh.

5. CONCLUSION
In this article, I have examined the wider effects of the use of idea generation methods in the context of game development. The model proposed here is a general model that could be used in other contexts as well. But to understand how idea generation works, it has to be examined within the practices that a given method is supposed to support. The wider context of ideas becomes more important in the context of game productions. The iterative nature of game development emphasizes the role of an idea as a starting point. Valuable ideas can also be the ones that are only partially interesting when first proposed. The value of an idea generation method is equally fragmented: It can produce interesting ideas immediately during a session, inspire further ideation, and work as a fresh approach for creative work. Looking only at the immediate effects of an idea generation session may miss resulting positive practices because the effects are difficult to perceive. It is equally important to recognize that methods using to gain fresh ideas for games are not limited to brainstorming methods, and the whole process should be supported with various approaches.

REFERENCES


ABOUT VNA...

I HAVE TRIED IT, BUT THE IDEAS ARE SOMETIMES DIFFICULT TO USE. THEY DO NOT ALWAYS FIT TO MY DESIGN CONSTRAINTS. SHOULD I USE SOMETHING ELSE?

Well, you can actually modify the same approach to fit a given theme, for instance. But be careful: the "out-of-the-blue" ideas might be the ones that are more interesting. It is a delicate business to tailor your stimuli. However, a structured ideation session, like that with VNA, seems to do more reliable job than the natural ways or open-ended approaches.

WHAT?

REALy? THAT'S INTERESTING!

IT IS, ISN'T IT!
24. USING THE VNA IDEATION GAME AT GLOBAL GAME JAM

Work in Progress / Empirical Study

Annakaisa Kultima
Kati Alha

ABSTRACT
In this article we present the findings of a game idea experiment run at the Global Game Jam (GGJ) 2010 and 2011 events in Tampere, Finland. We were examining how well the game-based ideation method Verbs, Nouns, and Adjectives (VNA) and similar approaches fit the constrained game design processes. GGJ 2010 and 2011 both had a theme for which ideas were produced. Our previous studies indicate that the VNA ideation method is well-suited to blue-sky ideation, but it is harder to use the ideas in ongoing design processes. In this study we compared four different approaches and the ideas resulted by using these methods. This study shows that the theme-tuned VNA variant performed best both in theme-related and interesting ideas, indicating that the method for coming up with new ideas matters.

1. INTRODUCTION
Game ideas are produced with various approaches and techniques within the game industry practices. The natural ways are evolved by different experience and educational backgrounds. Game designers and other game professionals come up with ideas in various ways, not only by mistake or by trivially combining existing patterns. Designers do not only trust the occurrence of ideas but engage in purposeful acts to produce more interesting ideas or ideas with a certain theme or topic [3].

Experiences with more rigid, formal methods vary [3]. There are some reports that using brainstorming techniques with game innovation processes can be a waste of time [11]. It is difficult to analyze the different experiences without actually knowing what was done, as ‘brainstorming’ is often regarded as a trivial method, usually denoting any kind of group ideation activities. However, it is acknowledged that brainstorming does not always yield innovative ideas and the way that the session is set up is critical [10]. Additionally, the use of brainstorming techniques can be difficult for practical reasons. Good sessions need preparation and education of the participants. Game professionals report that if only one person does not know how to behave, it can destroy the experience of the session [3]. On the other hand, exploring the different formal methods can be a cumbersome process if the only way to acquire the understanding of the techniques is through brainstorming literature [cf. 8].

For the GameSpace and Games and Innovation (GaIn) research projects, we have examined the use of game idea generation games for brainstorming new game ideas. We designed a couple of game based brainstorming techniques to facilitate the ideation processes of game professionals. Our varying experiences have led us to examine the effects of such tools in more detail. We already know that the methods and the stimuli of the methods matter, and that game-based methods are a potentially efficient part
One approach in particular that we designed gained more popularity than the others: a simple card game called Verbs, Nouns, and Adjectives (VNA) [5, 6]. VNA is a simple yet relevant tool for designers to use to supplement their creative processes and to help them work under time-pressured processes. However, the VNA game is reported to help producing ideas that do not always fit with the original design problem. As the tool is already somewhat domain specific, we were interested to design an experiment that explores how well the deck itself would actually be suited to restricted game ideation, and how it could be modified in order to help focusing on the constraints of the design, mainly on this occasion to the theme of the design.

2. THE EXPERIMENT

We chose the Global Game Jam (GGJ) [1] event as the setting for the experiment because it provided a game development process fast forwarded, where ideas are nurtured into full games within one weekend. The event also has a set theme every year, giving participants a starting point for their design processes. As game development processes are usually constrained with a set theme, mechanic, or technology [4], we saw GGJ a good fit to our purposes. We were interested to see how well the VNA method was suited to ideation sessions with a set topic. The themes of GGJ 2010 and 2011 were open enough to have possibilities to utilize such a high-level tool as VNA.

As a part of the GaIn project, we organized the Finnish Game Jam at Tampere (FGJ Tampere) both 2010 and 2011 as a part of GGJ. We facilitated the ideation sessions at the beginning of the events both years by providing game-based tools for some of the participants. The rest of the participants worked as a control group for the methods. We gathered the ideas they produced and analyzed them according to their content.

The first-year experiences with VNA indicated that a game-based tool designed at a general level might not be optimal for theme-constrained ideation. The theme “Deception” was released only two days before the event for the local organizers and we had no time to prepare a variant VNA for the theme. For the second year we were able to work closely with the GGJ’s constraint team to know the theme far enough in advance to design a VNA variant for the second year topic “Extinction.” In this way the methods used between the events varied. In the first year, half of the participants were using VNA decks, half used the “Au Natural” method. In the second year, we divided the participants into three groups, where one group used VNA, one the “Extinction” VNA variant, and the rest a more free approach that we called “Keita’s Way,” which worked as a control group for the second year.

2.1 THE CONTEXT: GLOBAL GAME JAM

Game Jams are game development events, where the purpose is to create new, innovative games in a very short time, for example during a single weekend. The roots of game jams are in the Indie Game Jams, which have been held since 2002 [7]. Since then there have been several different events such as the Nordic Game Jam, which later inspired the GGJ [1].
GGJ is a worldwide event, held for the first time in the year 2009. It takes place all around the world during the same weekend. It is open for students, professionals, and amateurs alike. Each year the event has a single theme for all sites, with which all of the resulting games must abide. In addition, there may be separate constraints and achievements. The achievements or diversifiers are voluntary and have included things like “Both Hands Tied Behind My Back: The game is meant to be played without the use of a player's hands” or “One Hit Wonder: The game can only be played once (e.g. per computer, per IP address, etc.).” The achievements give no score but help the games to stand out later from the mass. They also give extra challenge for experienced jammers. [1]

In 2010 and 2011 we ran sites in Finland under the label “Finnish Game Jam” (FGJ), Tampere being one of the sites. The global theme was “Deception,” and in addition there were different constraints for each time zone. For instance, the time zone for Finland had three constraints—fire, wire and lyre—from which each group had to choose one to be somehow included in the game. In 2011 the theme was “Extinction,” and this time there were no additional topical constraints. In both years there was a set of voluntary achievements.

The game jams have a very limited timeframe for developing the game; thus, there is not much time to be used for ideation itself. Our ideation experiment was run only on the Tampere site of the 2010 and 2011 GGJ events.

2.2 VERBS, NOUNS AND ADJECTIVES (VNA)

VNA is a simple brainstorming technique developed as part of the GameSpace project [9] at the University of Tampere. It has three decks of cards: verbs, nouns, and adjectives (see Figure 1). Each of the cards has one word printed on it; this word functions as a stimulus and inspiration for shared ideas. The words have been collected from both digital and non-digital casual games, as the original purpose was to produce casual game ideas.

The game is usually played in small groups, where the first player picks a random verb card from the verb deck and uses the word to ideate the basic idea for the game. The next player then picks a random noun card and adds to the game idea described before. Finally, the third player (or the first if there are only two players) draws an adjective card and closes the game idea. The idea is documented and the procedure is repeated by a different initiator.

The words in the cards should be used for free mental association, meaning that the game idea is not based solely on the combination of the three words. The rounds are kept fast and responsive, and are less analytical or critical. VNA rapidly produces high-level game ideas and as it offers random and surprising stimuli, it results in ideas that the users might not have otherwise ideated [9, 5, 6]. VNA was used both at GGJ in both 2010 and 2011.
2.3 “Extinction” VNA Variant
For the second GGJ we designed a variant of VNA to fit to that year’s theme: “Extinction.” The game consisted of the same game mechanic used in VNA, where the decks of cards are laid on the table and each participant takes one card at a time ideating on the shared idea, which means the second and third participants always add to the idea that was initialized by using verb from the deck. The second deck was identical to the “Verbs” deck of VNA. The two other decks were different: The first deck was based on the theme “Extinction” including words, sentences, and quotes or other concepts relating to the extinction in one way or another. These were, for example: “Death”, “Only a handful of individuals survive”, “Extermination”, “Capacity to breed and recover”, “Poor health or old age”, “Loss”, “Birth”, “Creation”, “Beginning”, “Half of presently existing species may become extinct by 2100.”, “Don’t forget this club nearly went out of extinction last year.”, “Freedom is never more than one generation away from extinction.” And “The problems of this world are only truly solved in two ways: by extinction or duplication.”.

The third deck was a deck with figures that we call non-symbols (see Figure 2), since they look like they could be symbols, but are open for interpretation. This latter deck was produced in connection with another ideation game where we found the non-symbols promising enough to test them in this experiment. The reason we wanted to provide three decks was that it seemed to work well in the VNA process, providing fast rounds with different stimuli affecting the ideation process. Our previous experiences with game-specific ideation games [9] led us to avoid using only the specified stimuli, since that could lead to mechanical additions to the ideas based on the given stimulus.

2.4 “Keita’s Way”
One of the three “methods” used in the FGJ 2011 was called “Keita’s Way.” This was an approach inspired by the thoughts of Keita Takahashi’s keynote for GGJ 2011. In his videokeynote titled “How to Find Good Ideas,” Takahashi advised the participants to (told in his own unique style): 1) Think, 2) Think until the explosion in your brain, 3) Talk to friends, 4) Play with the Theremin, 5) Focus on it, 6) Relax, 7) Clean a room up, 8) Shout, 9) Sleep soundly, 10) Look at from various angles, 11) Make a funny face, and 12) Go out [12]. His keynote was presented for all the participants of GGJ 2011 and was supposed to be an inspirational and personal greeting for the whole event, not necessary a tool or method for actually coming up with ideas for the intense weekend.
However, we decided to include his thoughts in the experiment and molded the control group instructions to refer to the keynote. As Takahashi’s keynote was somewhat cryptic and artistic, we modified the instructions a little bit and included the following note (see Figure 3) to the 2011 control group participants.

KEITAS WAY (the keynote)

or

you can try these:
- find interesting objects, put them on the table and take turns by using them as an inspiration to the ideas
- use random pages of wikipedia, flickr or google/google img to spark ideas
- exquisite corpse: fold paper in three and each person writes one piece without reading the others: first a game mechanic, second a game character, third the environment, then the paper is read out loud. Repeat!

We have no official record of what the participants giving this instruction were actually doing, but we saw some of them taking a nap or using the alternatives stated on the slip, such as bringing different objects to their ideation session. The main thing connecting all of these approaches is that they are more vague approaches to ideation instead of just trying to squeeze ideas from your head by discussing with others or using the combinative tools such as VNA and “Extinction” VNA variant.
2.5 CONTROL GROUP – “AU NATURAL”
At FGJ 2010, half of the participants used VNA and the other half was left with whatever they thought was best for them. However, the amount of VNA decks was limited, so they did not have access to that method. What we observed was the teams of pairs talking together trying to figure out what kinds of ideas they would want to explore during the game development weekend. The “Au Natural” approach was only utilized in 2010, whereas the “Keita’s Way” worked as an alternative to the game-based approaches in 2011.

3. COMPARING THE IDEAS AND METHODS
We asked all the participants to write their ideas down in the notebook that came with the rest of the materials. Participants were supposed to put their names on them and write one idea per page. We then transcribed the ideas into the database, marking the participants of that particular session, method used, and the order of the ideas.

We ran an evaluation round within the group of researchers of the project consisting of seven researchers. Each researcher marked independently from each other which ideas they saw as interesting, their favorites, whether the ideas were fitting to the theme, or whether they seemed incomprehensible to the researcher. Based on our previous studies, we have found that ideas are usually seen as a starting point for development [3] and that ideas are usually used as an inspiration or partially [2]. For this reason we wanted to rate the ideas differently. Each researcher marked whether they agreed that certain statements were true of the ideas. We wanted to know if the ideas were interesting: “There is something interesting in this idea” or related to the theme: “I can see the connection between this idea and the theme.” To supplement the analysis of the excitement factor of the ideas, the researchers also had to mark the top 3 personal favorites from both years, giving some ideas the possibility of rising above others. Some of the markings were so short that the idea could not possibly be evident to the readers, so we included the “incomprehensible” category to make the ranking easier and more transparent.

There were 188 ideas recorded, ideated by 42 people, in different groups. Some groups had overlapping members since some of the 2010 participants of FGJ returned also in 2011. 150 ideas were marked as interesting by at least 1 researcher; 10 ideas by 5 or more researchers. 32 ideas were marked in the personal top 3, 43 ideas as incomprehensible by more than 5 of the researchers. Only 2 ideas were interesting to 6 out of 7 researchers and there were no agreed favorites, the highest ranking was 3 votes from different researchers. There was only 1 idea that earned 3 votes. In total, there was no clear consensus about the ideas, which is natural for games as they fit into a domain of subjective opinions. Consensus was easier to achieve in ranking ideas based on how well they fit with the theme. For example, 125 ideas had a connection with the given theme by at least 1 researcher and 26 ideas were labeled as theme-related by all of the researchers.
The data were not symmetrical, as we got more ideas with VNA than with the rest of the approaches, since they were only used in either 2 of the events. VNA produced 100 ideas, the “Extinction” VNA variant 24 ideas, “Keitas Way” 32 ideas, and “Au Natural” 28 ideas. For 4 ideas, the origin was lost during the recording phase. As already experienced in previous studies [5, 6], VNA seemed to be more efficient in producing the higher amount of ideas in a given time period.

However, this experiment was not entirely controlled as it was conducted under the game jam setting. We were not observing the differences in interpretations of the methods, how many of all of the ideas were really recorded, and how many of the ideas were recorded that were not produced by these provided methods. Participants were given a notebook to record their ideas, but were not provided with instructions of how the ideas were supposed to be written. We also know that some of the ideas were not recorded and returned to us as participation in the research experiment was voluntary. However, the results of the comparison raise interesting speculations and hypotheses for further experiments.

3.1 Differences between the methods
In general, the “Extinction” VNA variant outperformed the other methods. All the ideas produced by the “Extinction” VNA variant were regarded as interesting by at least one of the researchers. However, as unanimous agreement increased, the differences among the methods decreased (see Figure 4). Quite obviously, the superiority was more visible when comparing the theme relatedness of the ideas. The tool that was fitted for the theme produced relatively more theme-related ideas than any other methods. In this way it was a success. However, when we checked the top 3 of the favorites, VNA itself scored slightly higher.

All in all, “Keita’s Way” performed the worst, except in how well the ideas related to the theme, whereas VNA performed even worse than the vague instructions given in “Keita’s Way.” The comparison between VNA and “Au Natural” was almost identical on the performance of interesting ideas, which was surprising. In total VNA produces the ideas faster, but they seemed to be as interesting as without any methods. However, this result seems to confirm the experience of VNA as a blue-sky ideation method that may not be suited to constrained situations. It still seems to work as a tool to spark interesting game ideas. And where the relative results might be similar, the amount of ideas within a time period becomes more relevant.

3.2 The effect of creative individuals
This study cannot report on the effect of creative individuals. It might be that some of the users of the methods were simply better in producing interesting ideas. Taken the different combination of the people and the methods, the results could possibly vary. The groups of the first and second year were not identical, as we did not regulate membership. The effect of a single person could not be thoroughly examined, as the ideation was a group process. However some people seemed to have more ideas marked as favorites and more interesting ideas than others.
We ran a small analysis on the occurrence of interesting and favorite ideas and their creators. As previously stated, one cannot designate one single person to one idea, but we could see a pattern of some individuals gathering relatively more (compared to the total number of the ideas that they produced) “good ideas.”
We found eight individuals who scored higher than average on both categories, but interestingly two individuals as well who scored higher than average on interesting ideas, but lower on favorites, and two who scored higher on favorites but lower on interesting ideas. This kind of an approach could lead to interesting future studies, where we could
compare the performance of the interesting and favorite ideas to how creative these people consider themselves and what their usual roles are in the innovation processes.

3.3 The Order of the Ideas
We were also interested to see whether the order of the ideas would effect how interesting the ideas are. Are the first ideas really “crap?” However, we found that the interesting ideas may occur at any time during the session, even though the very first ideas seem to be less frequently great. As this study was not set for comparing the order of the ideas, the data were not completely fit for analyzing this factor. All sessions had 4 or more ideas recorded, but some sessions had even 15 ideas in them. In Figure 7 the last parts of the picture seems to reflect a greater difference (as there were practically no interesting ideas on the lucky number 13), but this was due to the asymmetric data.

4. Discussion
The highlight of this experiment is the “Extinction” VNA variant, which seemed to work well with a theme- and time-constrained game design process in the context of GGJ. The deck of the “Extinction” VNA variant included only one third of the theme-related stimuli, leaving two thirds as domain-specific stimuli and general stimuli. The combination seemed to work well and could be further elaborated as a more extensive tool for constrained game design processes.

It is also important to note that the themes “Deception” and “Extinction” are not narrow topics and benefited from these rather open-ended methods. In practice it might be difficult to refine the method for more restricted ideation processes or settings other than theme-constrained sessions. As the constraints within the game development processes vary and because there are complex combinations of different constraints, there is an additional challenge for designing tools for such purposes.

It is still evident that the methods matter. Some approaches are more efficient within a given time period, some provide more feasible ideas, and some give more space for excellence than others. However, it seems that vague methods could be working against the creative process. Even though the process of coming up with new ideas is in the context of different influences, it seems practical to force the creative process with the help of specifically-designed approaches for certain processes.

This study has also indicated interesting directions for potential future studies. The approaches tested here are all heavily affected by their users, and the creative game professionals and the stimuli are not limited to the methods provided: the previous idea affects the next one and there could be reason to believe that the order of the ideas could have an impact. A more controlled experiment could be designed to explore the different variables within such practices.
5. Conclusion

Based on our findings, an interesting hypothesis can be formed. Where the themespecific “Extinction” VNA variant method was providing the balanced combination of both interesting and theme-related ideas, the industry-specific VNA may have more potential towards strong ideas. Interestingly the vague approach inspired by Keita Takahashi did not succeed in generating interesting ideas and performed only on average rate on theme-related ideas. Even the natural way of doing the ideas—probably just trying to force it under a time limit—produced better results. As expected, the VNA method performed worse on theme-related ideas, further supporting the role of the suitable stimuli.

This leads to the conclusion that an ideation tool that is tailored for the given purpose and structured for fast-pace activity can enhance the ideation session in three different ways: interesting ideas start flowing immediately making the process faster, higher than average amount of the ideas are interesting, and a bigger portion of the ideas are suitable for the purpose. This is not to say that natural ways would not yield to great ideas, such approaches are just less reliable. Acknowledging the limitations of the data, this hypothesis should be tested with a more commensurable and larger body of data.

If this hypothesis could be further elaborated, it might have strong implications for the education of game designers and game professionals on their ideation processes. This study also shows great potential for designing tools that help the everyday practice of constrained game design processes.

References

[7] Indie Game Jam Website: http://www.indiegamejam.com/


LOOK WHAT I FOUND...
GAME JAM
Method

Tuuli Saarinen

WHAT IS A GAME JAM?
A game jam is an event where game professionals and hobbyists alike gather to develop a game in a very short period of time. The most common time span for game jam is 48 hours, and they are usually held over a weekend. The teams are formed on site, and they tend to be small, usually consisting of 3-5 people. Everyone is required to start and quit at the same time, and follow a common theme. The theme is usually decided by the organizers and kept secret until the jam begins.

HOW TO HOLD A GAME JAM?
First of all, you need a group of people with whom to organize the jam. Once you have your group, you need a venue that can cater to the participants with a proper Internet connection, easy access to power, and food stores or restaurants within a reasonable distance. The venue should have decent toilet facilities, basic kitchen equipment, and it should be available all throughout the event since many teams work through the night or sleep at the venue.

Figure 1. Game Jam in Tampere 2011: One of the teams working on their concept.

To give the event a great start, it is good to have a talk or two on topics such as idea generation or rapid iteration. After the theme is revealed, it is also a good idea to have some group formation and brainstorming activities to make getting started easier. The rest of the event should be reserved for developing the games. At the end of the event, it is good to let the teams briefly demo their game and then give a closing speech. Additionally, you can hand out an award for the best game of the jam, for example, or have a party with all the organizers and participants.
WHY ORGANIZE A GAME JAM?

It might seem like an absurd idea having game development students and professionals use a whole weekend on something they already spend all their weekdays on, but as counterintuitive as it may sound a game jam is an excellent way of keeping up motivation and eliciting creativity. It allows people to work on a game they themselves want to make, with people they might not usually work with, and without having to worry about the usual constraints they face in their normal lives. Game jams also allow participants to practice rapid iteration and learn how to cut that extra fat all game ideas tend to gather on the way—in other words, learn how to focus on what’s important. Finally, game jams are great for strengthening the team spirit of your company’s employees, or creating interaction between students and different industry actors—and game jams are easy to organize too!

For more information on organizing a game jam, please refer to the wiki of the Global Game Jam Web site: http://globalgamejam.org/wiki/ggj-wiki
Idecards…

Is it a set of cards full of ideas?

Sorry. But yeah, Idecards is actually a concept for a modular ideation game. It has a general deck of cards that one can use for stimulating any ideation or brainstorming session. They are like the playing cards for ideation games: one can create new games and play by different rules. One can also make decks that fit certain purposes, for instance a deck for designing more emotional game experiences or a deck for social games.

Sure, why not!

Oh… let’s play something!


25. A MODULAR IDEATION GAME – THE CONCEPT OF IDECARDS
Concept Paper

Annakaisa Kultima

ABSTRACT
This article explores the concept of the ideation tool IDECARDS. IDECARDS is a modular ideation game that can be used for different kinds of design problems. It is a card game, where the deck is designed so that it affords different kinds of games, just like with regular playing cards. With the help of special IDECARDS decks, idea generation sessions can be directed to different topics. IDECARDS is a design game that facilitates brainstorming sessions by endorsing playful conventions, giving direction for the ideas that arise, and emphasizing equality among the players.

1. INTRODUCTION
IDECARDS is based on the experiences and findings of the studies of the GameSpace [8], Games and Innovation (GaIn) [1, 4], and Games as Services (GaS) [10] projects. In these game research projects we experimented with playful ideation in the form of different idea generation games. In total, more than 15 prototypes on game-like or otherwise playful ideation methods were tested at various workshops from 2006 to 2011. The focus for most of the workshops has been games or game services, but other topics have also been explored with the help of these prototypes. The main constraint for the game design workshops has been digital games, but several workshops have included more specific restrictions and themes. One of the experiments was organized as a part of the Global Game Jam (GGJ) 2011 at the Tampere site, where we facilitated the idea phase providing a game tweaked for the theme “Extinction” [2].

Our most positive experiences have been with an ideation game called Verbs, Nouns, and Adjectives (VNA) [5, 6]. VNA is designed for generating new ideas for casual games. The strongest character of this card game is its simplicity. The game has three decks of different words that participants of the brainstorming session use for shared ideation. VNA has proven to be very popular since it is fast to start and interesting ideas emerge right from the start. The sessions are entertaining and full of laughter. The drawback of the game is that it can be difficult to use VNA together with a given design constraint. Ideas produced in the session may not be about the selected topic. However, this is also a sign of a successful ideation game—it sucks you into exploring the topics that are written into the stimuli and structure of the game.

Our studies showed that the stimuli of a brainstorming session matters. There seems to be a “magic spot” that one has to seek for the ideal stimuli. The right kind of stimuli depends on the design constraint and the level of innovation. The stimuli have to be related, but yet abstract enough not to provide direct links to previous products. The closer to existing products and ideas the stimuli are, the less creative are the thoughts that seem to arise in the sessions. However, this principle does not seem to scale in a linear fashion: If the stimulus is abstracted too far, the session might be slowed down
and the ideas become too abstract [5, 6].

With VNA, the stimulus was designed to match the high-level structure of any game. There were three different decks: the deck of verbs, the deck of nouns, and the deck of adjectives. The words themselves were derived from children’s games and currently popular casual games in such a way that the individual words did not give away the identity of the original game [5, 6]. This formula proved to be successful. The VNA sessions provided the ideal structure and stimuli for simple ideas that could be utilized for designing mobile games, for example. However, it seems that the VNA cards could be used in other domains as well.

2. General Idea behind the IDECARDS
As creative work usually revolves around different constraints [cf. 3, 7], we wanted to explore the possibility of designing a modular and flexible ideation game that could be molded to fit any given idea need. This lead us to develop the IDECARDS concept, a play deck for creative professionals.

2.1 Importance of Stimuli
On one hand, it is important to have stimuli that guide the ideation process on a proper level. On the other hand, the stimuli also have to allow and arouse different interpretations. The stimuli have to be something that people can easily react without thinking too much first. Single words are naturally good for this as most of the words have several meanings without a given context. But there are also other options: We found that random doodles of different shapes and figures work equally well. Photos and pictures may work, but their value depends on the design focus.

2.2 General Decks and Special Decks
A combination of general and specific stimuli seems to be a good match to support brainstorming sessions [2]. While general stimuli work as the fuel for free mental associations, specific stimuli can direct the ideas toward the desired topic. For instance, it is possible to create specific word sets for specific design challenges. Some designers may use this approach intuitively by posing questions about the nature of the specific design. Certain words can work as memory activation triggers [9] and push ideas in certain directions. This can be also done in the form of the structure of the ideas. Some domains have reoccurring frameworks for an idea: For instance, every game idea describes the actions that the player can take. The special decks always have to be designed keeping in mind the special features of that certain design domain.

2.3 Rules and Games
The amount of idea generation techniques used correlates with the success of the companies [11, 12]. This could be explained by various factors, but it seems clear that variance in the idea generation processes is beneficial. Instead of searching for a single best approach, there should be several different ideation approaches. Variability can also be included into the game-based approaches: Instead of designing one game per
idea need, there could be several games in one deck. IDECARDS has a system of rule cards that communicates the principles of design games to the players. These cards can also be used for brainstorming new games and rule sets for the deck itself.

3. THE DECKS
3.1 INSTRUCTION CARDS
IDECARDS is designed as a modular playing card deck. This means that the deck can be supplemented along the way. Special decks can be designed so that the base deck stays the same and special cards support the specific design space. Each individual deck includes cards that describe the deck itself and also possible games that one can play with that deck. This way, there are always easy examples for how to use the deck, yet possibilities abound to mold the game to fit a certain idea need.

3.2 STIMULI CARDS
Words
The word cards can contain different words, either related to the design focus or not. The general deck of IDECARDS contains the most commonly used verbs and adjectives.

Example words: forget, destroy, supply, reflect, happy, full, pretty, serious

Non-symbols
The general deck of IDECARDS includes cards bearing figures that look like symbols. They possess different kinds of iconic representations that can mean various things (see Figure 1).

Other
Other stimuli could include pictures, photos, sentences, quotes, partial design solutions, and so on. This depends on the given design focus and one can test different combinations.
3.3 Structure Cards
The structure cards provide different frameworks to ground the ideation session. For instance, one can decide that a session should target high-level, simple ideas, placing limited structure slots on the table where one can place the stimuli cards. One can also direct the participants to always include certain element into the ideas being generated. This structure guides the sessions but the participants do not necessarily have to stick to the rules. As with to the stimuli cards, the structure cards can serve as reminders of the design focus.

![Structure Card Image](image)

Figure 2. An example of a structure card.

3.5 Other Cards: Principles, Conventions, Trends, etc.
Special decks can also contain cards that describe certain domain-specific principles, conventions, or the design space. These cards can be used as a starting point for the brainstorming session. It can be easier to ideate if the design constraint is broken down into several pieces so that participants can focus on one aspect at a time. Such sets can be, for instance, design conventions for a specific domain, principles that lead to better design outcomes, ongoing trends in a particular design area, and so on.

4. Summary
IDECARDS is an ideation tool for playful idea generation sessions. It provides decks of cards that one can use to design a product, service, or event. IDECARDS is a modular card game that can be supplemented with special decks to facilitate brainstorming sessions with focused idea needs.
REFERENCES

I was wondering...

There must be more to game innovation than just rocking with pens, papers, and programming languages. But what?

Game companies have plenty of different practices to keep it all together. For instance, ideas can be collected from sources such as books and films, while more ideas arise when people discuss them together or just relax. Many ideas are thrown away or left to collect dust, while other ideas are revisited. The main usage of the ideas is partial or for inspiration purposes, mostly they are not used as whole parts. There is no single approach to all this, it varies a lot among individuals and companies.

Must be hard to know what works.

Yeah, people find their own ways.
26. GAME DEVELOPMENT PRACTICES AND DEVELOPERS’ ATTITUDES - AN INTERNATIONAL SURVEY

Juho Karvinen

ABSTRACT
Presented here is a report of a survey directed at game developers about different aspects of game development. Practices for idea generation and idea management vary quite a lot at different companies and also among different individuals. This applies among other things to sources of ideas, creativity techniques, and recording practices. The second part of the survey is about developers’ attitudes towards innovation, measured with a set of Likert-type statements. Generally it seems that their attitudes are mostly positive and even enthusiastic, even though some feel skeptical in one way or another.

1. INTRODUCTION
Innovation is born from creativity, and a playful attitude is an important ingredient for creativity. As the games industry produces artifacts that are essentially playful, it stands out as an interesting example of creativity work. While general cognitive and social mechanisms of creativity are shared, the concrete practices in each field or industry vary. To contribute to the understanding about specific creative practices in the games industry, this paper presents empirical results from a survey administered to game developers during spring 2010.

2. THE DATA
Gathering representative survey data on game developers or game company employees is quite challenging, as the actors are scattered and heterogeneous, ranging from employees of large conglomerates to independent developers. Being aware of this, our goals are a bit more humble: to get a quantitative view on game development processes, particularly idea generation, idea management, and the developers’ views on innovation. These data support the understanding gained through more elaborate interviews [1, 2] while also leaving the door open for surprising findings. Without systematic sampling, generalizations to the whole population of game developers are problematic, but the results are valuable and useful regardless.

The data were collected with a web form with 60 questions about respondents’ demographics, gaming history, work history, idea generation and management processes, and statements about innovation. Using snowball sampling, we approached existing contacts in the industry to answer the questionnaire and asked them to forward it to other employees at their companies.

The final number of respondents is 79, ages ranging from 23 to 47 years, 33 years on average (see Figure 1). Over 9 out of 10 were male; thus, only 6 respondents were female. Their experience in the games industry varies from 0 to 23 years, 7 years on average (see Figure 2). Education level of the respondents is quite high (see Figure 3),
but half of them report not having any game-related education. 37% have some game-related education and 14% have earned a related degree (see Figure 4). The respondents hold quite high positions in their companies (see Figure 5): 33% of them are top-level managers (CEOs and creative directors); 27% hold a mid-level position such as project manager, producer, and lead designer; 28% are primarily hands-on developers, such as programmers and artists. The remaining 13% are independent developers, consultants, researchers, and so on. Company size matters here (see below): It is quite different to be a creative director in a small studio with a few people compared to an in-house studio of a multinational corporation. In small studios, management positions are often combined with hands-on development. In any case the emphasis on management was not intended, and it must be kept in mind when reading the results. On the positive side, management naturally has more power inside the companies so their views matter quite a lot. The data also allow comparisons between different levels.

Figure 1. Respondents' age distribution.

Figure 2. Respondents' experience distribution.
The majority of the respondents work in small companies: 55% in companies of 1 to 10 employees, 18% in companies of 11-20 employees (see Figure 6). The small size of the companies is probably connected to the kind of games that they were producing: console platforms were not as popular as PC, browser or mobile platforms (see Figure 7); as for the genres, casual/social games and puzzle games were most popular (see Figure 8). This focus is somewhat contrasted by the respondents’ personal game preferences. The seventh-generation consoles, Xbox 360 and PlayStation 3, are preferred for personal gaming (see Figure 9), as are genres like strategy, roleplaying, and shooters (see Figure 10). It is likely that this kind of situation is common in the industry: The average person developing games is more hardcore than the average gamer. Geographically the data are skewed toward Europe: 74% of the respondents work in Europe and 42% in Finland alone, while 24% are based in North America. South America, Asia and Australia are heavily underrepresented (see Figure 11).
To conclude, the respondents can be generally described as young and relatively inexperienced people working in small European game companies producing small games. The results should be interpreted accordingly. The results below are compared in relation to some independent variables, which include education, working experience in the games industry, number of employees in current company, position currently held in the company (top management, middle management, development), and platforms and
genres the company is working with. All reported differences are statistically significant ($p \leq 0.05$) unless otherwise mentioned.

![Company domain: platforms](image)

**Figure 7.** What kind of games are the companies producing: platforms.

![Company domain: genres](image)

**Figure 8.** What kind of games are the companies producing: genres.
Figure 9. What kind of games the respondents like to play: platforms.

Figure 10. What kind of games the respondents like to play: genres.
3. Generating and Managing Ideas

Ideas are born more or less randomly in a variety of situations and the ideation process is certainly not limited to working hours. Roughly half of the respondents reported having new ideas outside working hours (e.g., at home, in bed). Also half of them said they get ideas while at work. The most common answer to this question was “while discussing with someone” [see also 1], although “while playing games” was also popular (see Figure 12). Of course, when a game developer needs ideas, he or she also actively seeks inspiration. The most common sources of inspiration are other games, followed by movies, novels, non-fiction books, and television shows (see Figure 13). As additional and supporting ideas are always required to complement the original idea (if there ever was one), we also asked the inspiration for those. References for additional ideas seem to come from similar sources, as similar games and other similar forms of entertainment are the top answers (see Figure 14). While the game development process is always iterative, managing changes has become even more important along with the emergence of the service paradigm and perpetual beta model of the games industry [3]. Iteration, agile development, and experimenting are the most popular answers when developers are asked how change is managed in their company (see Figure 15).

A bit less than a half of the respondents like to ideate alone, while the rest of them like someone to discuss with (see Figure 16). Crosstabulations indicate that the more experienced, educated, and high-position respondents prefer discussions more than others. Of specific idea generation techniques, brainstorming is the most popular, followed by hands-on approaches such as rapid prototyping (see Figure 17). The practices of collaborative idea sessions in companies varies quite a lot. While some respondents report that they never have such sessions, others say that sessions are held every week (see Figure 18).
Figure 12. Situations and circumstances where game ideas are born. Respondents were asked to select all that apply to them.

Figure 13. Sources where inspiration is sought. Respondents were asked to select 1-3 most important sources.
Figure 14. Sources where inspiration to additional ideas are sought. Respondents were asked to select 1-3 most important sources.

Figure 15. Ways to manage change during the development. Respondents were asked to select 1-3 statements that describe them best.
The average percentage of working hours used to generate new ideas is 16%, although this of course varies across different roles. For those respondents who said that their job was to generate new ideas (“ideators”), the average number is 21% and for others 12%. It is also worth noting that the percentage of the ideators varies much more, ranging from 0% to 100% (standard deviation 23), when for others the range is from 0% to 50% (standard deviation 16). Median for the ideators is 10%, for others it is 5%. 5% was also the median for the whole data and overall the most popular answer for this question. This indicates that while some developers use most of their time to generate new ideas, it is more common that this is only a small proportion of their working hours.

If the ideas are not immediately used or processed further, they need to be recorded and stored for later use. People seem to use quite traditional tools to record their ideas (see Figure 19). As for the companies’ general recording practices (see Figure 20), there are two clusters by company size. Small companies (10 or less employees) favor easy
and versatile third-party systems that usually need no maintenance (e.g., Google Docs, Dropbox). When there are more people and resources, it is possible to employ more complex, internally-maintained systems, such as wikis or network drives. Both verbal and functional (like playable prototypes) documentation is used (see Figure 21). Another question is how the stored ideas are used after they are created. The results show that ideas are rarely used on their own to create new games, but are more often partially used or serve as an inspiration for further ideas (see Figure 22).

Figure 18. The frequency of collaborative idea sessions in companies.

4. PERSPECTIVES ON INNOVATION

The part of the survey concerning attitudes toward innovation is based on qualitative analysis of interview data of prominent game professionals on the same topic [2]. During the analysis, seven distinct “innovation profiles” were constructed to illustrate different attitudes towards innovation: nihilist, artist, evangelist, scarecrow, follower, instrumentalist, and universalist. Of course, these profiles are not mutually exclusive. Each interviewee expressed opinions falling into more than one of these categories. It should be noted that these profiles do not categorize people but ways of thinking and speaking about innovation.

Artists consider it important that they are innovating and creating something new. They are characteristically more motivated by things other than money, such as respect in their field. Universalists see innovation as an intrinsic value for games and game development. They believe that everything they do is always somehow connected to innovation. Followers keep an eye on other innovative games and trends within the industry, and are more focused on incremental innovations that improve on existing games. Evangelists see the potential of innovative games as well as the room and the
need for them. They look forward to new innovations and have a positive attitude toward innovation. Nihilists have a more negative attitude toward innovation. There are a few sub-types of nihilists: those who do not believe in innovation; those who do not want innovation for innovation’s sake; and those who want to innovate, but for some reason feel that they cannot. Instrumentalists have a more concrete understanding of the tools and processes associated with innovation. They explain how innovation can be managed and what tools are useful in their opinion and what kinds of tools they would like to see more of. Finally, scarecrows see and warn others about the risks or difficulties of innovating. [2]

In the survey these profiles were operationalized as five-point Likert-type statements, each profile containing more than one statement. The value of a profile variable is the mean of the statements in it. When the relation of a statement to the profile was thought to be negative, the value was inverted (see Figure 23). A quick look at the key figures shows that nihilist, universalist, and follower attitudes are least common among the respondents while evangelist and instrumentalist attitudes are most common (see Table 1).

Quantitative data makes it possible to abstract a bit more and look for the core axes that are latent in the aforementioned profiles. This also means that the new data is allowed to influence the theoretical views formed earlier. In practice we began with explorative factor analysis including all of the Likert-type statements. The results were not used as such, but in a suggestive way so that in the end the two clusters of variables

![Figure 19. Personal idea recording tools.](image)

The respondents were asked to select 1-5 most frequently used tools.
had a meaningful interpretation. One of the new variables measures the overall view that more innovation is needed in the games industry, and the other that it is possible to control the innovation process. On average, the respondents seem to think that more innovation is needed, whereas they are uncertain whether the process can be controlled (see Table 1).

![Company practices for recording ideas](chart1.png)

**Figure 20. Company practices for recording ideas.**
The respondents were asked to select 1-5 most frequently used tools.

![Company practices: Type of documentation](chart2.png)

**Figure 21. Company practices: Type of documentation.**
The respondents were asked to select 1-3 most important forms.
Figure 22. How recorded ideas are used later. The respondents were asked to select 1-2 most common approaches.

One way to grasp the developers' attitudes towards innovation is to compare these profile variables and the new broader sum variables with each other (see Table 2). The fact that the profile variables correlate with these new attitude variables is not surprising, as they are both based on the same set of Likert-type statements. However, this examination shows how the profiles formed earlier revolve around these two more fundamental attitude axes.

Table 1. Means and standard deviations of the sum variables.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MEAN</th>
<th>STD. DEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evangelist</td>
<td>3.80</td>
<td>0.70</td>
</tr>
<tr>
<td>Instrumentalist</td>
<td>3.41</td>
<td>0.55</td>
</tr>
<tr>
<td>Artist</td>
<td>3.24</td>
<td>0.69</td>
</tr>
<tr>
<td>Scarecrow</td>
<td>3.19</td>
<td>0.79</td>
</tr>
<tr>
<td>Follower</td>
<td>2.87</td>
<td>0.86</td>
</tr>
<tr>
<td>Universalist</td>
<td>2.73</td>
<td>0.60</td>
</tr>
<tr>
<td>Nihilist</td>
<td>2.61</td>
<td>0.50</td>
</tr>
<tr>
<td>Need</td>
<td>3.39</td>
<td>0.54</td>
</tr>
<tr>
<td>Control</td>
<td>2.94</td>
<td>0.71</td>
</tr>
</tbody>
</table>

The correlations indicate that the Evangelist and Artist attitudes occur together, and they both also correlate with the general opinion that game developers should innovate more. Nihilist, Scarecrow, and Follower attitudes correlate negatively with the Need-variable, but do not correlate with each other in any significant way. The other cluster is about controlling innovation. The Control-variable is nearly the same as Scarecrow inverted, which explains that their negative correlation is strong. Control occurs together
with Instrumentalist views, and there is also a quite strong negative correlation between Instrumentalist and Scarecrow attitudes.

Table 2. Correlation matrix of the sum variables. Statistically significant correlations are colored.

<table>
<thead>
<tr>
<th></th>
<th>NIH</th>
<th>ART</th>
<th>EVA</th>
<th>SCA</th>
<th>FOL</th>
<th>INS</th>
<th>UNI</th>
<th>NEED</th>
<th>CONTROL</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIH</td>
<td>1</td>
<td>-0.322</td>
<td>-0.714</td>
<td>0.077</td>
<td>0.152</td>
<td>-0.002</td>
<td>-0.415</td>
<td>-0.41</td>
<td>-0.062</td>
</tr>
<tr>
<td>ART</td>
<td>-0.322</td>
<td>1</td>
<td>0.485</td>
<td>-0.099</td>
<td>-0.417</td>
<td>-0.334</td>
<td>0.036</td>
<td>0.589</td>
<td>0.075</td>
</tr>
<tr>
<td>EVANGELIST</td>
<td>-0.714</td>
<td>0.485</td>
<td>1</td>
<td>-0.107</td>
<td>-0.245</td>
<td>-0.086</td>
<td>0.105</td>
<td>0.892</td>
<td>0.094</td>
</tr>
<tr>
<td>SCARECROW</td>
<td>0.077</td>
<td>-0.099</td>
<td>-0.107</td>
<td>1</td>
<td>0.166</td>
<td>-0.639</td>
<td>-0.002</td>
<td>-0.234</td>
<td>-0.935</td>
</tr>
<tr>
<td>FOLLOWER</td>
<td>0.152</td>
<td>-0.417</td>
<td>-0.245</td>
<td>0.166</td>
<td>1</td>
<td>-0.121</td>
<td>0.008</td>
<td>-0.408</td>
<td>-0.151</td>
</tr>
<tr>
<td>INSTRUMENTALIST</td>
<td>-0.002</td>
<td>-0.334</td>
<td>-0.086</td>
<td>-0.639</td>
<td>-0.121</td>
<td>1</td>
<td>-0.151</td>
<td>-0.025</td>
<td>0.73</td>
</tr>
<tr>
<td>UNIVERSALIST</td>
<td>-0.415</td>
<td>0.036</td>
<td>0.105</td>
<td>-0.002</td>
<td>0.008</td>
<td>-0.151</td>
<td>1</td>
<td>0.068</td>
<td>0.018</td>
</tr>
<tr>
<td>NEED</td>
<td>-0.41</td>
<td>0.589</td>
<td>0.862</td>
<td>-0.234</td>
<td>-0.408</td>
<td>-0.025</td>
<td>0.068</td>
<td>1</td>
<td>0.206</td>
</tr>
<tr>
<td>CONTROL</td>
<td>-0.002</td>
<td>0.075</td>
<td>0.094</td>
<td>-0.095</td>
<td>-0.151</td>
<td>0.73</td>
<td>0.018</td>
<td>0.206</td>
<td>1</td>
</tr>
</tbody>
</table>

The attitudes were also analyzed in light of some background factors, including age, nationality, position, and experience. These were divided into two-class variables and then analysis of variance was conducted. It seems that generally the younger and less experienced developers are more enthusiastic about innovation. Both the respondents of ages 30 and under and experiences of 5 years in the industry and under have significantly higher values in the Need-variable than their older and more experienced colleagues. Also, developers who have experience with console development have significantly smaller values. The differences in the Control-variable are harder to interpret, although people in project management positions have more faith in controlling innovation than others, which is possibly because it is part of their job to keep things under control and they might even have some concrete tools to help with that process.

4. Conclusion

The survey at hand complements the earlier qualitative study [1] by giving a hint of the scope of the ideation practices utilized in the games industry. The same benefit of quantitative data applies to the innovation attitudes [2], where this survey also suggests broader variable axes for further analysis (namely, innovation need and innovation controllability). To get a more comprehensive view on the idea and innovation processes in game development, more research is needed, both qualitative and quantitative.

References


I'm thinking of starting to use an idea management system. Which should I choose?

That depends on your needs. There are a lot of different systems out there! The biggest problem in the beginning may be to find a suitable application for you among them all. Testing the commercial systems may be hard, as not all give full free trial versions, and in the end there may not be a perfect system. Check out the iDelar concept for more thoughts!

Oh, I will, thanks!

No problem!
27. IDEA MANAGEMENT SYSTEMS REVIEW
Work in Progress / Exploratory Research

Kati Alha

ABSTRACT
This article describes the results of a review of existing idea management systems on the market. The motives behind the review have been the earlier indications and wishes from game professionals to enhance the recording and selecting of ideas. Several systems were reviewed, of which six were tested more closely. All of the reviewed systems differed from each other substantially. As there are different idea management needs, different systems are needed to meet those heterogeneous needs. However, as there is so much variability among the systems, the challenge may be to find a suitable one among all of them. The tools are not game-specific, and the review suggests there is space for improvement with the tools on a general level as well, as their quality is variable at best.

1. INTRODUCTION
One of the Games and Innovation (GaIn) project’s goals has been to examine tools and methods to record and manage ideas. The motivation for this approach has been the obvious need for research and improvement in the area. In a previous research project, GameSpace [11], it was indicated that more attention should be given to tools that record and manage ideas. While generally the idea processes were seen as fluid, the recording and revisiting of ideas were seen as cumbersome practices.

While the process to manage ideas had space for improvement, ideas themselves are still a central part of game development [15] and the game industry is expected to innovate [3], highlighting the importance of the process. The game industry poses a unique blend of creative and technical industries [12], and in a sense game ideas differ in many ways from the ideas usually needed in other industries. Therefore, game development processes may have different needs for the management of ideas as well. The lack of suitable tools may force game companies to tailor tools for their needs [7].

Idea managing can be seen as a part of new product development (NPD), which may have the following steps: 1) exploration, 2) screening, 3) business analysis, 4) development, 5) testing, and 6) commercialization [4]. The idea management system usually covers at least the first two steps, but some of the systems handle steps 3 and 4 as well. The rest of the development is typically handled outside the systems [10]. According to Schwarz [13], the basic steps of an idea system are:

1. Problem or opportunity observation
2. Idea generation
3. Idea review
4. Idea implementation
5. Idea recognition
6. Idea follow-up
In this article I use the term “idea management” to refer to the tools and methods used to gather, record, and manage the recorded ideas, leaving aside the implementation of the idea. The tools used for managing ideas may be more general as well; any tool that is capable of storing ideas may be used as an idea management system. The terms that are used to refer to it may vary; they may be called idea systems, idea management software, innovation tools, idea storages, and so on.

In Schwarz’s [13] definition for an idea system, there are five points that are more like guidelines for a good idea management system. The points are as follows and give a good view of the properties and purpose of more advanced systems:

- An employee (associate) idea process openly invites ideas from individuals or groups in an organization.
- Each idea is treated with respect and fairly evaluated. Every effort is made to work towards its timely closure, striving to implement every idea possible.
- Feedback and mentoring is invested with the participants so they can clearly define their ideas and the future ideas they develop.
- All people involved in the process are appropriately recognized and acknowledged for their efforts.
- Results of the process improve all aspects of the organization, and it is a rewarding experience for participants.

The focus of this article is to review the situation of existing tools on the market. This point of view was selected as we consider it important to map out the situations that a starting game company may face when trying to find tools to help the innovation process, for example. To get a view of what kinds of solutions are available, we conducted a review of current solutions, looking more closely at several tools in particular. The purpose is to evaluate the systems’ suitability both in general and specifically for game companies’ needs.

2. Overview of the Tools
The starting point was to dig into mapping the situation on the market: what kinds of systems exist, how many exist, whether they are easy to find, and so on. As the terms are not established, there were several different search phrases that were used, such as “idea management system,” “idea system,” “idea management,” and “innovation tool.” There are so many systems that it is hard to quickly get a proper view of them. The systems located included:

- Accolade Idea Management (Sopheon)
- AllMyNotes Organizer (Vladonai Software)
- BrightIdea.com (Brightidea)
- Do-Organizer (GemX)
- Engage ThoughtTree (Engage ThoughtWare)
- Evernote (Evernote Corporation)
• Goldfire Innovator (Invention Machine)
• Inova (Inova)
• Id-Force (IBYKUS)
• Idea Central (Imaginatik)
• Idea Exchange (Nosco)
• Idea Management (Version One)
• Idea Organizer (Nanaimo Studio)
• Idea Reservoir (Axiom)
• IdeaBox (PHPOutsourcing)
• Idealink (BrainBank)
• Idealyst (Applied Marketing Science)
• IdeaNet (Innovation Factory)
• IdeaScale (IdeaScale)
• Incubator (OVO)
• Ingenuity Bank (Idea Champions)
• iDS (INCENT)
• Jenni (JPB)
• Kindling (ARC90)
• MindCruiser (Akiva)
• NextNet (General Ideas)
• Orchidea (Orchidea Innovations)
• PrIsM (ISDE)
• Qmarkets (Qmarkets)
• Sensible Note Taker (Dekisoft)
• SimNet 8 (TQS SIM)
• Spark (OVO)
• Spigit (Spigit)
• The Brain (The Brain Technologies)

The list is not comprehensive, as there are certainly numerous other systems not listed here. In addition to these systems, there are other, more general tools that may still be used in idea management, such as DropBox, Google Docs, and their equivalents, as well as general blogs, wikis, and forums that companies use for this purpose.

The systems were looked through to see how they differ from each other in order to develop an overview. One obvious aspect is price: There are both free and commercial systems, and some of the commercial systems offer free versions with fewer features in use. Some offer trials and demos to test out before purchasing the product. Many of the commercial idea management systems are services: There is a monthly payment that may vary, for instance, based on the number of end users of the system.

The purpose of use further divides the systems into different types of groups: there are systems designed for personal or collaborative use. Collaborative systems can be collaborative on different levels, while personal tools can have some features allowing collaborative use. Some of the tools are based on open innovation and outsourcing ideation to customers as for instance Starbucks has done with their idea management [14].
Another aspect is the size of companies these systems have been designed for. There are systems designed for single users and small groups all the way up to systems designed for large companies. The systems may simply support entering, browsing, and editing ideas, serving as a sort of note-taking software, while some of the more advanced systems provide tools to rate or evolve ideas or a proper process to analyze and select ideas or concepts for production.

Some of the systems provide alternative forms. For instance, BrainBank [2] offers three solutions: open innovation, an off-the-shelf solution, and a specially tailored version for different companies’ needs.

Finding which system to select depends on the needs of the company, and that narrows the amount of possible solutions. There is still more than enough digging and choosing to be done. Furthermore, sometimes game companies have to try out several tools before finding a satisfactory one [1], which further stresses the importance of getting started quickly with a system to test it out.

From the mass of systems listed earlier, several were selected for a closer examination. One criterion was that a free version or a trial was available, as this was seen as an important aspect when a game company is choosing a tool. Many of the commercial systems had to be contacted by mail or by filling a form to get a free test version. Eleven companies offering commercial systems were contacted by mail or form: Kindling, Goldfire Innovator, Spigit, Idea Exchange, Qmarkets, Idea Central, Jenni, BrightIdea.com, Ingenuity Bank, SimNet8, and Orchidea. Even though all of these companies advertised free versions or demos on their net site, only 4 out of 11 companies answered the query and 3 of them provided a test version of some sort: Kindling, Idea Exchange, and Jenni. Orchidea was asked later than the others and it would have provided a test version but there was not enough time to set it up.

Table 1: The tested systems.

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>COMPANY</th>
<th>SYSTEM TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindling</td>
<td>Arc90</td>
<td>Idea management system</td>
</tr>
<tr>
<td>Idea Exchange</td>
<td>Nosco</td>
<td>Stock market system</td>
</tr>
<tr>
<td>IdeaScale</td>
<td>IdeaScale</td>
<td>Open innovation system</td>
</tr>
<tr>
<td>Jenni</td>
<td>JBP</td>
<td>Innovation process management software</td>
</tr>
<tr>
<td>EverNote</td>
<td>EverNote</td>
<td>Note-taking software</td>
</tr>
<tr>
<td>Ideabox</td>
<td>PhpOutsourcing</td>
<td>Suggestion box</td>
</tr>
</tbody>
</table>

In addition to these systems, free versions of three systems available on the Internet were added to the examination, resulting in a total of six different systems under review (Table 1).
As reflected in Table 1, all of the systems were different types. They were not purposefully selected to be different, so this suggests that there are many different types of systems. The system type descriptions included in Table 1 either represent how the company itself describes the system, or how the system is defined through observation and testing.

3. COMPARISON

3.1 KINDLING

Kindling is a commercial idea management system by Arc90. The first impression with this system was good, as I received a prompt answer to my query via a phone call and got set for a trial account. I could use the trial as a full version for a short while, inviting up to 100 people to use the system.

The system has quite a simple user interface (UI), and it is easy to find all the features. All of the ideas are saved into rooms, of which administrators can create as many as needed. There could be, for instance, separate rooms for general ideas, new game ideas, feature ideas for a certain game, ideas for process, etc. There are campaigns as well, which are for asking specific ideas for a limited time.

Users can give votes for ideas (see Figure 1). There is a limited, pre-defined amount of votes for each user. Administrators can decide how many votes users have in each room, and users can spread that amount among ideas in any way they seem fit.
Administrators can approve ideas, set who is responsible for taking some of the ideas forward, and set ideas as completed. They can also hand out permissions to other users, such as administrative rights and the rights to see and add ideas to rooms. Therefore, you could have rooms that only a selected group has the right to see. All users could set which notifications they get when ideas are added or edited.

The system seems easy to use and the addition of new ideas and commenting them is simple. Editing them afterwards seems a bit problematic, however. One user could not find a way to edit his ideas afterwards, which the user found irritating, when you could not easily correct spelling mistakes, for example.

All in all, the system seems reasonably good. However, it does take some effort from the administrators to go through the ideas and select the ones to produce. The idea rating process can be of some help here. The system was not very customizable either, and as it is commercial product it cost at the time of testing $4 per user per month. In that way, a small company with 10 people would pay $40 a month to use the system, and a 100-person company would have to pay $400 a month. The cost is perhaps the biggest barrier to adopting the system; however, it can be tested as a free version first.

3.2 IDEA EXCHANGE

Nosco’s Idea Exchange has a different approach to motivate people to submit their ideas: They have turned the ideation process into a stock market game. People can both submit ideas and buy shares in them. The ideas that have the most shares purchased grow in value and users can “make money” by choosing the ideas they think will prosper. At the end of an ideation cycle or a campaign, the stocks are bought back at the current price.

I got an account to try a shared demo of Idea Exchange (see Figure 2). It was on the Internet where people could suggest ideas to make Idea Exchange better and simultaneously test the product. It was a bit confusing to start using the system. I started by looking for existing ideas and found this surprisingly difficult. It seems that the search does not work properly. I tried a couple of times with different search words, coming up with no results. I even looked up an idea and tried to search with the title of that idea, and still got nothing as results.

Similarly, browsing ideas seems to be inadequate. I could not browse or see all ideas, but could only see the 14 most popular ideas, or the 14 newest ideas (from a category or all ideas). This functionality raised questions, such as what happens to the rest of the ideas. Because this system was a demo on the Internet with other users, I could only test it as a normal user and did not get to test the administrative properties. I had an idea about adding images to a post because this was possible only through hyperlinks. In comments, however, you could add images within the text.
I bought some shares in a couple of ideas. It seems that not many people use the demo very actively, as I rose with my investments quite high in the statistics. You could see the people who currently had the most “money.”

Even with its weaknesses, the Idea Exchange is intriguingly different from the other tested systems. Using this kind of approach raises some questions: Will it promote the best ideas more easily, or do users start to buy shares in ideas that others already have invested in? Will they invest in what they think is the best idea, or in those ideas that they think others will invest in as well? The game-like approach surely has both benefits and drawbacks.

![Figure 2: An idea in Idea Exchange.](image)

It is difficult to say based on the demo how this system would work in practice. I could not use it to record game ideas, for example, as the focus was on the Idea Exchange system itself and how to make it better.
3.3 Jenni

Jenni by JBP describes itself as innovation process management software. It is a wiki-based system and seems to be more complex than other systems. Jenni is based on idea campaigns, in which for a limited time users are invited to work on a certain problem or an idea need. The manager sets the campaigns and invites people to generate ideas. After the ideation round is over, the ideas are evaluated by a certain number of trusted people. There is a SWOT analysis tool to be used, for example.

As with Idea Exchange, I received access to a demo version that was open to other test users as well. The problems here as well were that I could not see other features beyond those of a basic user, and as the users were not that active in testing the system it did not reflect how it would work in a real corporate environment.

In the demo environment that I was invited to use, the task was to give ideas about how to make work meetings more effective. I wrote one idea and added an image to it. I also browsed other ideas and added some points to an idea that I liked.

It did not feel very motivating to use the system, but the situation might be different with more active users and if you could get feedback on your own ideas. There were some collaborative tools too, and you could edit anyone’s ideas (see Figure 3) or similar ideas could be merged into one wiki entry. It felt a bit doubtful to do so, however, because there were warnings about not deleting anyone’s ideas. Does this mean that any user could delete any of the ideas?

![Figure 3: Editing an existing idea in Jenni.](image)
3.4 IdeaScale

IdeaScale is a Web-based idea management system that collects ideas from a company’s customers. The idea is simple: Give a voice to customers, who will in turn give you ideas and vote on their favorites, and you collect the highest-rated ideas and promote them. IdeaScale has different costs depending on the version. There is a completely free version, a basic version for $15 per month, and a corporate version for $99 per month. The free version is fully functional and enough to get started. In addition there is a 30-day trial period for the full version, so companies can decide whether the full version is worth paying for.

The adding of ideas is quite simple: You can add tags but you cannot use HTML code in ideas. Ideas are saved to categories, which administrators have created. Commenting and revising ideas is also possible, and there is a possibility to vote for the best ideas. The administrator can decide how users can vote: There can be a simple “like/dislike” feature or a point-giving system. The administrator can customize the system in other ways as well, as adding custom fields to idea forms (see Figure 4). There is also support for iPhone, Facebook, and Twitter, though only Twitter support is included in the free version.

Figure 4: Adding a custom YouTube video field to the idea form.

Even though IdeaScale’s purpose is to collect customers’ ideas, it could be used inside a game company to collect ideas from company employees. The free version and the possibility to upgrade later lower the barriers to entry required to give the system a try.
3.5 IDEABOX
Ideabox is a free, PHP-based suggestion box system. They do modify the system when requested, and charge hourly payment of the coding of those changes.

The first problem that was encountered was that the system has to be installed on a server. It required PHP4 to work, which is not supported anymore on most servers. In the end the system was placed on a virtual server to be tested.

The experiences I had with the system were not very positive. The system is very simple, missing a lot of necessary features, which might be because of the payment model of extra features. However, the system is so simple and crude that it does not make you want to keep using it, nor would you want to pay for it even if you would get some extra features.

You can add ideas (see Figure 5) and comment on them and if you are an admin user you can set the state of the ideas. But you cannot add tags to ideas or modify ideas afterwards, nor is there sorting of ideas. Therefore, the use of old ideas becomes somewhat impossible, particularly if there are a lot of ideas. It seems doubtful that corporations would start using the system, as there are many other free, general tools with better features.

![Figure 5: Adding an idea in IdeaBox.](image)

3.6 EVERNOTE
Evernote (see Figure 6) differs from the other tools in that it is more of a personal tool. The purpose of Evernote is to function as a note-taking tool, in which you can write down notes, to-do lists, save Web pages, photos, screenshots, or dictations, for example. One
account can be reached from multiple platforms, from separate computers, via a Web browser or a mobile phone.

Figure 6: Evernote’s interface.

The basic version of Evernote is free to use; the premium version costs money but has more features. The premium version also offers more space, more supported files, and better collaborative tools. Collaboration support is perhaps the weakest spot in the free version, where you can share notes with others but you cannot edit other people’s notes, just view them. In the premium version editing is possible as well. The price tag of the premium version is either $5 per month or $45 per year.

Evernote is a useful tool as a personal notebook, but misses the evaluation tools of some of the idea management systems. Its strengths are ease of use, multi-platform support, and multiple purposes of use. It could be thought of as a personal tool that will work alongside the actual idea management system, a place where you insert your ideas initially when they come to mind and then transfer them to the shared idea management system.

3.7 Overview
All six tested systems differed from each other substantially. There seems to be a lot of different types of software as there are different idea management needs as well. The quality of systems ranges as well, as there were both very poor and very promising systems. Table 2 sums up the strengths and weaknesses of each tested software or service.
Table 2: The strengths and weaknesses of the systems.

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>PROS</th>
<th>CONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evernote</td>
<td>- text parser on photos</td>
<td>- no evaluation of ideas</td>
</tr>
<tr>
<td></td>
<td>- multi-platforms</td>
<td>- some features only on premium version</td>
</tr>
<tr>
<td></td>
<td>- easy to use</td>
<td>- not that good for shared idea management?</td>
</tr>
<tr>
<td></td>
<td>- mobile version</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- basic version free</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- strong tool for personal use</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- can share notes with other users</td>
<td></td>
</tr>
<tr>
<td>Kindling</td>
<td>- quite simple and easy to use</td>
<td>- how to motivate people to submit ideas</td>
</tr>
<tr>
<td></td>
<td>- simplified mobile version</td>
<td>- administration takes time</td>
</tr>
<tr>
<td></td>
<td>- Web based - can be accessed from anywhere</td>
<td>- costs money</td>
</tr>
<tr>
<td></td>
<td>- people see what happens to ideas</td>
<td>- cannot edit ideas after they have been submitted, just comment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- not very customisable</td>
</tr>
<tr>
<td>Idea Exchange</td>
<td>- adding ideas easy</td>
<td>- search does not work?</td>
</tr>
<tr>
<td></td>
<td>- different kind of approach</td>
<td>- can’t find where to browse all ideas? I can see 14 most popular</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- ideas, or 14 newest ideas (from a category or all ideas), but where</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- can I see all ideas?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- If a new idea doesn’t float to the top, is it gone?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- where to see if your idea is already made?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- can only add images in comments, not in idea description</td>
</tr>
<tr>
<td>IdeaScale</td>
<td>- different price tags, also free version</td>
<td>- aimed to customers</td>
</tr>
<tr>
<td></td>
<td>- customizable</td>
<td>- more advanced versions cost money</td>
</tr>
<tr>
<td>Jenni</td>
<td>- process for idea evaluation</td>
<td>- complicated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- for big companies only</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- costs money</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- takes time to evaluate ideas</td>
</tr>
<tr>
<td>Ideabox</td>
<td>- free</td>
<td>- too simple, misses important features</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- uses outdated PHP4 and looks and feels dated</td>
</tr>
</tbody>
</table>

4. DISCUSSION

Because the systems are so different, it is not possible to directly compare which system is better than another. The type of system one should use depends on the need. For instance, for personal idea storage, EverNote is the best. For a cooperative, centralized place for ideas where they can be edited and modified, Kindling may be the best. Furthermore, the test versions or the test settings were not completely comparable to the full versions. Especially with the systems designed for large companies, the use of each system with only a few other passive users does not reflect the full potential of the system. However, this is also the reality at every company when choosing and testing different systems. Furthermore, it may partly be the reality in the actual use of some implemented systems if the company employees are not motivated to use the system.

In addition to these systems and the like, there are many various tools that can be used as idea systems even though they are not necessarily designed as such: various wikis, blogs, forums, Google docs, and Dropbox, to mention a few. The good side of these tools
is that they are more familiar to everyone, making them easier to start using. However, they may have serious deficiencies in some important areas, such as search functions or evaluation and editing of existing ideas. Operating in this kind of environment is unbearable; ideation processes cannot be systemized if there are no proper tools available to help. Finding one is a challenging task in itself. The most common tools for recording ideas are still general tools, and some companies rely only on employees’ personal recordings [6]. This is no surprise in light of this review.

Some help may be available, as there are some sites mapping out the situation in the market listing different systems and giving instructions how to select the systems as well as other information about idea management [5, 8]. There are even reports on sale about the market situation, and different systems [9].

5. CONCLUSION

All in all the present review suggests that one clear challenge is to find the best solution among all of the choices out there. None of the systems found for this review were designed for game companies, even though their idea needs may be different from those of other industries.

It may also be very difficult to know which system will work for a company without testing it, and many times trial versions are not available. Even from the system manufacturers that answered and gave access to a trial version, two were very limited trials and could not have been properly tested with a company’s actual use scenario. As there are free solutions as well, commercial versions of these systems must provide real benefits to compete.

And in the end, whatever the system, one real challenge is to get the company employees to use the system. Getting the employees motivated is hard, and if finding the right solution means trying out many different systems the problem is even more challenging. More information about which systems work best for specific needs would narrow down the search, although given the present review it is clear that better systems are generally required. This review has shed light on the reality that game companies face: enhancing idea management processes is a challenge partly because there are no good solutions easily available, and because it takes tremendous time to search for a suitable system or develop one internally. Even though there might be special challenges for recording and managing game ideas, clearly there is a need for better idea management tools in general.

REFERENCES


**Tested Systems**

Evernote: http://www.evernote.com

Idea Exchange: http://www.nos.co/software

IdeaBox: http://ideabox.phpoutsourcing.com

IdeaScale: http://ideascale.com


Kindling: http://www.kindlingapp.com
I'M CURIOUS...

WHAT KINDS OF IDEA MANAGEMENT SYSTEMS DO GAME COMPANIES USE?

EXCUSE ME?

You know, it varies quite a lot. Some use nothing except various pieces of paper. Some have very comprehensive commercial systems. More common management systems include general tools, like blogs, wikis, forums, and stuff like that.

HMM, THAT'S A LOT OF DIFFERENT STUFF.

Yep, there's a lot of different needs too.
28. IDEA MANAGEMENT SYSTEMS AT GAME COMPANIES
Work in Progress / Interview Study

Kati Alha

ABSTRACT
In this article, I will explore the methods and tools to harvest, store, and manage ideas. The practices of six game companies were examined, where a contact in the company introduced the systems and practices used to save and handle ideas. All of these solutions differ from each other substantially, partly because the needs of different kinds of companies are different. However, this can also be a sign of idea management not yet having very established conventions in game development. We found that companies settle for systems despite their weaknesses and lack of fitness. The solutions were: using no centralized system, a file server, forums, a blog, the idea management system Orchidea, and the idea management system Idea Central.

1. INTRODUCTION
One of the Games and Innovation (GaIn) project’s goals has been to examine tools and methods to record and manage ideas. In a previous research project, GameSpace [7], it was indicated that more attention should be given to understanding the tools used to record and manage ideas. Furthermore, ideas are a central part of game development [10] and the game industry is expected to innovate [2]. In addition, the game industry poses a unique combination of creative and technical industries [8], and ideas and idea needs may differ from other industries substantially.

So, what happens to all of the ideas? If good ideas cannot be used instantly, are they stored and returned to later? At least it seems there are no specific tools for managing game ideas, and the tools that are available have deficiencies as well [1]. The lack of suitable tools may force game companies to tailor the tools to their needs [5].

This article review the current state of idea management at game companies. Idea managing is a part of new product development (NPD), which may have the following steps: 1) exploration, 2) screening, 3) business analysis, 4) development, 5) testing, and 6) commercialization [3]. The idea management system usually covers at least the first two steps, but some of the systems handle steps 3 and 4 as well. The rest of the development is typically handled outside the systems [6]. According to Schwarz [9], the basic steps of an idea system are:

1. Problem or opportunity observation
2. Idea generation
3. Idea review
4. Idea implementation
5. Idea recognition
6. Idea follow-up
According to this view, idea management systems may cover the whole process of finding the idea need all the way to implementation of the idea and follow up [9]. In this article the emphasis is on tools and methods to gather, record, and manage the recorded ideas.

To understand the kinds of solutions that game companies have for idea management, “walkthroughs” were conducted at game companies. The walkthroughs consisted of someone from the company introducing the system in use during a thematic interview. There were 17 questions or themes that covered, for example, system description, system users, the process of collecting and recording ideas, how ideas are utilized after recording, and the benefits and drawbacks of the system and its features. The sessions lasted between 30 to 60 minutes. The interviews were audio recorded and analysed. Six Finnish game companies were selected for these walkthroughs. In the following section, I will describe the systems in use and the thoughts that arose during the discussions.

2. SOLUTIONS

2.1 NO IDEA SYSTEM

One solution is to have no specified idea system. One of the companies did not use any organized method or tool to capture ideas. Ideas from ideation meetings and such were recorded, but they were recorded wherever appropriate using whatever was at hand at the moment. Different tools used were, for instance, text files, phone memo, paper and pen, e-mail, and whiteboard with photos taken of it. Therefore, ideas were scattered across multiple sources.

When it comes to feature ideation during projects, one team usually developed one game at a time. Things were discussed among the team members, and ideally the ideas were written down in the design document. It did come up, though, that tools during single projects might be useful, and could encourage people outside the core team to suggest ideas. It was, however, seen as the decision of each team to use whatever tools they saw fit.

The lack of a specified tool was not seen as a very big problem. When ideas were needed, everyone had plenty of them. However, some kind of generated idea resource was seen as useful to have ready when needed. Something like this had been in use in the form of a single document with game ideas. The use of it had died out, however, and it had been a long while since anyone had touched the file.

If there was to be a tool, the requirements for it differed among the employees. In the discussion there were two company representatives: One thought a personal tool would function better, while the other wanted a shared one. The threshold to record ideas should be low, while still getting the ideas into an understandable form. Enough idea mass would make filtering with tags possible. It was also noted that there are already many tools out there that could meet the company’s needs, such as Google Docs, Skype, blog services, or even Twitter.
2.2 FILE SERVER
One company had one long game project going, and the most relevant idea system was the file server, which was used during the projects. The file server was an organized system of folders and files. The files had mostly textual data, initially text documents and then more sophisticated documents. There were different kinds of files, such as general basic proposals, world synopsis, game prefaces, and character descriptions. There were templates for each file type, which helped to add the required data for new ideas. The files evolved as the project advanced.

In addition to the textual data, there were mind maps, meta language files, and images, for example. There were also files to manage the project, such as spreadsheets with tasks and timetables. The system was used mostly by two designers who worked on their own files but who also collaborated and ideated together.

The system seemed to be working well, and the users were content with it, although there were some issues with it as well. The linking of files was difficult; this functionality would be much easier with a wiki, for example. The system could not be accessed from anywhere else except at the office; if it would be Web-based, remote collaboration would be possible, although it is questionable whether that would be desirable since working together in the office is potentially more fruitful.

Other systems had been in use before the file server system. A wiki-based system had its own advantages but people’s different styles of writing and different levels of availability made communicating more difficult. However, it was more important that people use and want to use the system compared to selecting a specific system. Similarly, multiple overlapping systems make managing ideas more difficult.

If good, new game ideas came to mind, they were recorded but there was no specific system to harvest these ideas. Some of the ideas were written on paper, some were saved to a file on a computer. Recorded ideas were saved for future use.

2.3 FORUMS
Forums were used in one company as the main idea recording system. It was a place where more thoroughly considered ideas were written, but it also served as a platform for general discussion and as a company management tool.

The forums functioned well during development projects, and the use of the forums substituted for some parts of the design document. However, combining the design document from the forum afterwards is troublesome.

Forums were good when discussing ideas but there were several issues with using them. The discussion tends to ramble and it may be hard to find relevant posts afterwards. Even if all the ideas are saved in the forum, their archival value suffers. It would require proper moderating to get the forums in good order and keep them that way.
Due to an insufficient user account control in one forum, the company used two separate forums. One was open for all employees and some customers, but the other one was closed and only company management had access to it. This was due to discussions concerning company’s finance issues, for example, that were meant only for the management.

The other forum, even though there was a better user account control, was not as good from other aspects. Furthermore, with two systems in use there were overlapping data. The optimal situation would be that there would be only one good system with proper user control.

The forums had been in active use. New game ideas were added actively when the company was young, but had diminished since. Not many ideas had been brought to production, and most of the earlier ideas were not seen as relevant anymore. When considering whether ideas were lost and forgotten in the forums, one point of view was that good ideas were not forgotten, and that those that were lost deserved to be lost.

2.4 Blog

One of the companies was using a blog to harvest new game ideas. Anyone in the company could use it, and it could be accessed from anywhere. The ideas could be very simple and short or more thoroughly developed. It was possible to add images or even Flash prototypes in addition to text. Anyone could comment on the ideas, but there was no specific evaluation of ideas.

Optimally, the management should actively read and comment on the ideas to motivate people to add their own ideas. A selected person found ideas from the system to be pitched by their inventors in a weekly meeting with directors. The ideas were discussed and some of them were given the go-ahead for production. In principle, all of the company’s executed ideas should come through this process.

The blog had been used for a couple of years. During that time the focus of the company had moved from downloadable games to social media games. Before the need for new game ideas was much greater, the blog had been working well; when the span of the development projects was substantially longer, the need for new game ideas decreased. This decline was reflected also in the number of new ideas inputted in the system.

The blog was a good, centralized place for ideas, but it was not that good for searching and sorting existing ideas. For feature ideas, there had been a commercial wiki in use that functioned as a wiki-structured design document. In theory, the blog system could have been moved to this system as well.

Before, there had been an intranet site that had a more game-like approach. However, it would have needed the full time investment of one person, and the approach died quickly. Some PowerPoint pitches and mock-ups had been in use as well, but they disappeared in time and had no visibility from the process perspective.
2.5 COMMERCIAL SYSTEM
Two of the companies had a commercial system in use. One of them was Imaginatik’s Idea Central and the other was a tailored version of Orchidea from Orchidea Innovations Oy. They both differed from all the other approaches and had similarities with each other. It should be noted that the descriptions here are descriptions of particular use cases of these two systems, and they can be modified and used in other ways as well.

Both of the systems had a process where ideas were first entered and then evaluated in different stages and with different criteria by certain individuals. Finally, some of the ideas were chosen for production. There were specific persons who had responsibility to evaluate the ideas from certain viewpoints. This type of process was in use in at least one of the other companies as well, but in these products the process is intrinsic within the system. The systems had a lot of features and could be modified on request. They were both Web-based and could be accessed from anywhere.

There were differences in the use of the systems as well. With regard to adding ideas, in Orchidea anyone could add ideas about anything, game-related and other ideas alike. There were special “challenges” that could be opened for a limited time and were used to get certain types of ideas or solutions, but otherwise anyone could add ideas about anything. The purpose was for evaluators to go through all of these ideas. Once a month an idea was rewarded with a small cash prize, and the person behind the idea could have some visibility with a small story in the company intranet.

The biggest problem with Orchidea’s system was that it was too complicated and ideas dwelled in the process for too long. Therefore, it had been the intention of the company to modify the system to be simpler and make the process more transparent. There were also other experiments going on, such as including a concept phase into the system.

In Idea Central, there were different areas of ideation. The games part, which was under review, was open for a limited number of users; about 50 to 100 people had access to add ideas. This way, the amount of ideas was controlled. There were still many irrelevant ideas, and to limit this, the scope of the ideas was restricted too and there were clear boundaries for the ideas. The restrictions stemmed from marketing research. There were no cash rewards; getting your idea published was seen as motivating enough. Idea Central seemed to have been working quite well. One of the biggest challenges had been changing employees’ style of working as there were people in three countries who had been accustomed to work in their own circles. The tool was a way to get visibility among the circles. The process was used only when a lot of new game ideas were needed; at the time of the study, this was not the case.

2.6 OVERVIEW
As seen, all of the main solutions differed from each other, and the solutions ranged from using no system at all to using a comprehensive commercial system. The used system seems to have a correlation to the company size, as no system, file server, and forums were used by small companies, a bit more comprehensive blog system by a
medium sized company, and the full commercial systems by big companies. The systems and their pros and cons are listed in Table 1 (below).

Table 1: Pros and cons of idea systems

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>PROS</th>
<th>CONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>No system</td>
<td>No need?</td>
<td>No centralized place for ideas</td>
</tr>
<tr>
<td>File server</td>
<td>Templates</td>
<td>Linking between files</td>
</tr>
<tr>
<td>Forums</td>
<td>Free</td>
<td>Bad for archiving</td>
</tr>
<tr>
<td></td>
<td>Good during projects</td>
<td>Two overlapping systems</td>
</tr>
<tr>
<td></td>
<td>Distant working</td>
<td></td>
</tr>
<tr>
<td>Blog</td>
<td>Free</td>
<td>Search and sorting tools weak</td>
</tr>
<tr>
<td></td>
<td>Works when people are active</td>
<td></td>
</tr>
<tr>
<td>Orchidea</td>
<td>Modifiable</td>
<td>Heavy process</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Costs money</td>
</tr>
<tr>
<td>Idea Central</td>
<td>Clear process</td>
<td>Getting people to use the system</td>
</tr>
<tr>
<td></td>
<td>Making sure the best idea</td>
<td>Costs money</td>
</tr>
<tr>
<td></td>
<td>goes forward</td>
<td></td>
</tr>
</tbody>
</table>

2.7 PARALLEL TOOLS

In addition to the main solution, the companies and individuals had other, parallel approaches. A memo in a mobile phone was typically for personal use and was used to write down ideas as they came to mind so they would not be forgotten. Other tools could function similarly, such as a notebook, paper and pen, or e-mail. These ideas are ideally read later, thought through, and possibly added to the main system. In many cases, however, the ideas are not taken forward but are forgotten.

Skype discussions came up in a couple of companies. They were used to discuss ideas, and because it is easy to save the log, the discussions were recorded and could be checked later. The custom, however, is not to go back and systematically go through the discussion; instead, it was more of a backup that one could check if needed. Other shared tools included a whiteboard or a bulletin board used together and photographed after ideating.

3. WHAT IS A GOOD TOOL LIKE?

One of the common reactions with ideation processes is that more ideas are not wanted since there is already enough of them [6]. This could be at least partially explained by the lack of tools to ease the process of selecting and reusing ideas. In addition, if the ideas a person inputs into the system are never used, it may discourage and reduce system use. Another problem is that the process itself is too heavy and it may take a person’s full time and attention to get it done properly.

Among the things that need to be considered when choosing the system is whether the tools should be personal or shared. Most of the main systems explained here are shared, and many of the parallel tools are used as personal tools. Some of the systems
allow everyone in the company to use them, while some are restricted either because the system has some information not to be shared with everyone or because allowing everyone to add ideas would generate more ideas than could be processed.

A survey conducted of game developers shows that whole ideas are not used if they are returned to later. Instead, parts of ideas may be used [4]. This procedure is not supported by these systems, as most of the systems handle ideas as whole concepts only. Some tools, especially forum types of solution, may support discussion and evolution of an idea, and in this way the earlier ideas may be used as inspiration.

When discussing good features of the tools, how the tools could be enhanced, or what would be the ideal features of an ideal system, several concepts arose. The main points are summarized in the following list:

- Easy/flexible/multi-platform input
- Good search/sort properties
- Account/User rights control
- Attachments, good file management
- Good moderating properties
- One system with all of the required properties
- Transparency of the process to users
- Motivators to input ideas
- Idea mass to use as inspiration
- Good security

4. CONCLUSION
This article has described a few use scenarios of idea management solutions and practices in Finnish game companies. All of the solutions differed from the others substantially, and there are no established procedures in this area. There had been previous systems in several of the companies before the current systems, and some companies are considering options other than their current systems. This signals that it is not at all clear which way is the best way to save and process ideas, and companies may have to try out more than one system to find one that works for them. Companies may also have to settle for a system that works at least on some level, as there are weaknesses in most of the current solutions.

REFERENCES


**USED COMMERCIAL SYSTEMS**

Idea Central: http://www.imaginatik.com/webdoc_home
Orchidea: http://www.orchideainnovations.fi/eng/index_eng.asp
29. The Ideal Game Idea Management System

I am wondering...

What are the features that game developers wish to have in their idea management systems?

It depends. Different people may have different needs and beliefs. For instance, some want the easiest possible input, some want more structured input that is easier to handle later. But everyone seems to want better search and sort tools and linking between the ideas. That is not even too much to ask for. The current tools are not that amazing.

Somebody better go and make better tools!

I hope they do!

Kati Alha
ABSTRACT
This article examines the needs, hopes, and wishes for a perfect idea management system for game developers. The concept was explored in a design workshop, where five game developers and three researchers from the Games and Innovation (GaIn) project participated by designing idea management systems. The properties that were covered in the systems include forking of ideas into different versions, linking of ideas, easy input, structured input, account control, a big mass of ideas, good search, and variable views.

1. INTRODUCTION
One of GaIn project's goals has been to examine tools and methods to record and manage ideas. Ideas are a central part of game development [10] and the game industry is expected to innovate [4]. While generally the idea processes have in previous research project been seen as fluid by game companies, the recording and revisiting of ideas were seen as cumbersome practices [8]. Our previous review on idea management systems has shown that while there are a lot of existing tools for managing ideas, there is a lot to improve in them [1]. Finding a suitable system among all of the choices is a challenge in itself. Furthermore, not all game companies have any tools in use or the ones used have flaws [2]. Because of this, we wanted to identify the features that game developers would themselves want to use if there were no design constraints.

Idea managing is a part of new product development (NPD), which may have the following steps: 1) exploration, 2) screening, 3) business analysis, 4) development, 5) testing, and 6) commercialization [5]. The idea management system usually covers at least the first two steps, but some of the systems handle steps 3 and 4 as well. The rest of the development is typically handled outside the systems [7]. Furthermore, Schwartz [9] defines idea management or idea systems as covering the whole process of finding a problem or need for an idea need all the way to implementation of the idea and follow up. In this article I refer to idea management as the set of tools and methods used to gather, record, and manage ideas.

To understand what kinds of features and solutions the game developers would want, a design workshop was arranged. Five people from four game companies and three game researchers took part in the workshop. The results of an earlier review of existing systems and walkthroughs performed at game companies were introduced, after which attendees were divided into small groups to create “a dream concept.”

The instructions were to think some aspects of the concept instead of creating a whole, complete concept, and not think about how easy or hard (or even impossible) the implementation would be in order to map out the real needs of the companies without
restricting what is possible to do. In order to inspire and facilitate the design process, possible problems and features were listed on paper slips. Other material included paper, pens, and printed screenshots of the reviewed systems.

There were three groups with two to three persons in each group. The groups had an hour to conceptualize the systems, after which the groups introduced and discussed their concepts. In the following section the main points of each concept are explained.

**2. THE CONCEPTS**

**2.1 FORKING CLOUD**

The first concept’s main points are structured input, forking of ideas to different versions, and visualized cloud searching possibility. The concept was named “Forking Cloud.”

Structured input was selected to make it easier to handle data. When ideas are entered, a form is presented. Ideas have structured details: For example, a game idea could have details such as name, story, characters, and mechanics. There would be different forms with different details for different types of ideas (e.g., for game ideas, story ideas, and audio ideas).

The benefits of structured ideas include easier handling of the data and similar format of ideas. In addition to the structure there would be tags, and the system would suggest tags as well help verbalize the ideas. The drawback is that when the input is not simple enough, the threshold to insert ideas is higher and fewer ideas would probably be entered.

The structure would be wiki based, where ideas could be edited as a whole or by any structure detail. A new edit would create a new version of the idea, and the idea would fork at each edit. Ideas or their parts could be commented on or reviewed, and an explanation of why an idea is good or bad should also be given. Users would see which ideas are most liked and most frequently developed further.

The search could be a normal search or a cloud search and the results could be sorted by primary and secondary options. Advanced search would allow searching by versatile options.

**2.2 NEVERNOTE**

The second concept was named NeverNote and it concentrates on easy input, linking of ideas, and account control. The ideas could be entered from multiple platforms, similar to EverNote. User could save ideas locally at first, and choose whether they should be shared right away or kept private. When decided that they should be shared, the ideas could be uploaded to a server.

The important feature of NeverNote is there are different databases for different user groups: general, which all the users can see; customer A’s database, which customer A and company personnel can see; a similar database for customer B; and a company
database, which only company personnel can see.

The ideas would be linked, so there would not be the same ideas in several databases. From a general database, everyone could link ideas, and from customer databases, company database users could link ideas.

2.3 **SPLIT**
The third concept was named Split (see Figure 1), as one of its ideas is to develop ideas further and split them in different versions. Here too, a simple input was considered important; the system would be always on as a widget and any type of data could easily be added.

It was not considered an issue that a lot of different types of data would be provided without a user being able to sort through all of the ideas. The point is to have a lot of content to be used for inspiration; nobody actively has to handle each and every idea that gets entered.

From this idea mass the system can draw random ideas, best rated ideas, newest ideas, and other kinds of idea lists that help users find inspirational or useful ideas. Users could also find ideas from those lists and take them forward, or start from scratch and make a new idea.

3. **DISCUSSION**
Even though all of the concepts are different, there are some similarities as well. The main points of each concept are included in Table 1.

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>MAIN POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forking Cloud</td>
<td>Structured input, forking of ideas</td>
</tr>
<tr>
<td>NeverNote</td>
<td>Easy input, linking of ideas, account control</td>
</tr>
<tr>
<td>Split</td>
<td>Easy input with a widget, mass of ideas, forking of ideas, views</td>
</tr>
</tbody>
</table>

All of the participants saw search as an important feature and all of the concepts have some linking and evolving of ideas as new versions. This idea of reusing ideas is supported by a Web query for game developers: parts of recorded ideas are typically used, rather than whole ideas without changes [6].

Two of the systems required an easy input whereas one established a structured input where users would have to think more about what would be entered. Which one is the better solution depends on the purpose of the system. Easy input will most likely yield a greater number of ideas. A large number of ideas is not automatically seen as a good
thing, as the handling can be more difficult. One could also assume that easy input would yield a bigger portion of poor ideas, and forgetting “bad” ideas was seen as positive.

Properly structured ideas also make handling much simpler, and it is easier to search and sort them. However, structured input might leave out a lot of good ideas as well, as it will take an effort to get the ideas in it in the first place; therefore, it might decrease system use. The purpose of one of the systems is to create a lot of ideas, not to get in only the best ideas, which are all reviewed.

Figure 1: The concept of Split.

Other thoughts were brought up in the end discussion as well. Using existing conventions is one aspect that could be used in idea systems. Many use other games as inspiration and
often games are used as references. Therefore, it would be justified to record existing games into the system to be used as inspiration. A database of existing mechanics and other game ideas could be useful when ideating new games.

4. CONCLUSION
As there have been many deficiencies in existing idea management systems, the purpose of the workshop was to get some ideas about how to build a better system. Workshops exposed some refreshing thoughts on the matter. Different people want different things from the systems as expected, but some shared perspectives were represented as well. It seems that reuse and edits of old ideas is quite desirable, as well as linking ideas inside the database. What separates the systems most is the conflict between easy input and easy ways of finding good ideas. These thoughts were considered when a new type of system for idea management was designed [3].

REFERENCES


SO...

IF YOU COULD DECIDE, WHAT KIND OF IDEA MANAGEMENT SYSTEM WOULD YOU MAKE?

I WOULDN'T WANT IT TO ONLY FUNCTION AS A REPOSITORY BUT ALSO AS A SOURCE OF INSPIRATION. YOU KNOW, NOT THAT MANY STORED IDEAS ARE USED AFTER THEY ARE CREATED. SO, WHEN YOU INPUT A NEW IDEA, IT WOULD INSTANTLY SHOW YOU SIMILAR IDEAS. YOU COULD ADD NOT ONLY YOUR OWN IDEAS, BUT EXISTING ONES AS WELL, SO YOU WOULD SEE WHAT HAS BEEN AND USE WHAT ALREADY EXISTS AS INSPIRATION. OF COURSE, IT WOULD INCLUDE GOOD BROWSING FUNCTIONALITIES AND VERY EASY INPUT. THE IDEAS COULD BE MODULAR AND EDITED PARTLY OR AS A WHOLE.

HEY, THAT SOUNDS GREAT!

GLAD YOU THINK SO!
Towards Better Idea Management Systems
– The Concept of iDelar
Concept Paper

Kati Alha
Annakaisa Kultima

ABSTRACT
In this article we explain the concept and motivations behind an idea management system named iDelar. iDelar is a conceptualization of an application that tackles the shortcomings of existing idea management tools and renews the way ideas are produced. The main features of iDelar are a big database of ideas, which can be used as inspiration; a low threshold to input ideas; and the modularity of ideas as well as many ways to search and browse the existing content. iDelar does not exist as a real product, but we have had some positive experiences with a partial prototype.

1. Introduction
There are a lot of systems to store and evaluate ideas, everything from free general tools to complicated commercial systems. The first problem when choosing which system to use may be exactly this: the massive amount of choices [2]. In addition, you may want to try out the systems before adoption, but not all of the commercial systems are available for testing before the purchase, making the selection process even more difficult. Even when there are versions available to try out, fully testing a system and moving to another may be laborious. Making your own system might be the only option to get an optimal system, but this is obviously a laborious process as well.

The tools that game companies use vary from one company to another. Sometimes there is no centralized place for ideas at all; instead they may be saved just on pieces of paper or anything else within arm’s reach. General tools such as blogs or forums are often used, but some companies use more comprehensive systems specifically developed to store and evaluate ideas [1]. Old, saved ideas may be not be returned to later and if they are returned to, they are usually used partially and not as whole ideas [6]. This suggests some challenges for the systems, which usually do not support this kind of use. In addition, many applications either have no evaluation mechanisms for ideas, or the process of evaluating ideas is heavy and time-consuming [1, 2].

If one examines the role of an idea for the game development, the way we see the ideas requires a reconceptualization. Ideas are at their best as the fundament for the production process, but rarely is this so. Instead, ideas seem to act more as starting points for game ideas, and are prone to change during production [7]. Due to the nature of games as experiential and highly interactive products [9], the production processes are usually based on constant iteration of the concept [4]. The role of an idea is more of an inspiration than a fundament [7] and gathered ideas should be treated accordingly. The tools that would support natural ideation processes should be flexible enough to not only collect starting points but also provide ways to use ideas throughout production. If
tools do not afford different uses, their role during production diminishes.

This article will describe a concept named iDelar (see Figure 1), which tries to address these challenges. It should be noted that although the application as a whole has not yet been implemented, there is a working demo with some of the functions described herein. The images are mockups of the possible final product.

Figure 1. Concept art of the package of iDelar.

2. THE CONCEPT
2.1 THE INTERFACE
First and foremost, submitting and revisiting an idea should be a smooth process. iDelar is a widget and is always visible on the desktop (see Figure 2). Users can drag the widget around the screen to a suitable place. The motivation behind this solution is to make the application quickly reachable, which will lower the threshold to use the system. There are shortcuts on the widget, and you can add an idea directly by clicking the “add idea” button.

The other shortcuts under the button link to corresponding places in the application, for instance “new ideas” shows a list of the most recent ideas. The number in brackets after the links shows how many corresponding new ideas or edits there have been since the user’s last visit. Some of the shortcuts are modifiable, and the user can select the ones that need to be quickly reachable.

When opened, there are two main areas in the iDelar interface: one for search and addition of ideas, and the other for browsing ideas (see Figure 3). The search simultaneously functions for the addition of ideas, while the other area offers various ways to browse the content. The user can switch between the two at any time, and the changes the user has made will persist: For example, writing text on the add/search text box is not erased if the user visits the browsing section in the meantime.
Figure 2: The widget on the desktop.

Figure 3: The interface.
Figure 4: Simultaneous search.

Figure 5: Advanced input.
2.2 SEARCH AND ADDING NEW IDEAS
There should also be possibilities to label ideas differently and options for more elaborative idea descriptions, if for instance the user wishes to record an idea that is already there on a concept level. Ideas can be searched or added through the “Add/Search” tab. When users search existing ideas, they start to write search words or phrases in the box. The application simultaneously searches the database for similar ideas and shows the results in real time on the right (see Figure 4).

On the right side, in addition to showing results from all of the ideas, they are separated depending on whether they are company-internal ideas, external ideas, or the user’s own ideas. When double-clicked, the idea is opened.

To add a new idea, users act similarly as when searching for an idea: They write the idea description in the same input box as in the search, and similar ideas are shown on the right. When the idea description is ready, the user selects “Save.” At this point, the user is asked to input a name for the idea and whether the idea is company-internal or external. After this, the new idea is saved.

If users want to save more than a simple idea description and name, there is the “Advanced input” button, which takes them to a form where they choose the parts of the idea they want, and where it is possible to add and remove modules (see Figure 5).

The different modules can be dragged and dropped into the form, and it is possible to add new ones if the current modules do not have all of the required options. In addition to textual data, it is possible to add pictures, audio, video, attachments, and even playable Flash demos.

2.3 THE IDEA DATABASE
An idea management system that supports the game development process should also make it easy to use existing ideas and provide context for new ideas when they are recorded. The idea database of iDelar is an important part of the concept. Our studies suggest that saved ideas are reused only in part, not as whole, intact concepts [6]. The modular structure of ideas supports this finding, and iDelar is designed such that the ideas in the database are used more as inspiration than as whole units of thought.

It is possible to add existing games the user has played, the previous games the company has made, or games from a database like GiantBomb [5] to see what has already been done. These ideas could function as inspiration or as references to existing conventions.

The purpose is that there would be a large mass of ideas in the database, so adding large amounts of ideas easily to the database is important to support. The databases could also be shared between separate users, for instance a group of companies could edit and use a shared database of existing social media games and their conventions if they are designing games for Facebook.
2.4 BROWSING IDEAS
Following the stream of the ideas produced in the system brings it alive for the users as they take different roles during the ideation process: Some users may generate a lot of new content, some may collect ideas from elsewhere, and some may only follow what is happening in the system. There are two main functions to find existing ideas: the search, as described earlier, and the browsing functions. These functions offer an unlimited number of lists of ideas. There are some pre-existing lists, such as the most-viewed ideas, newest ideas, and most-liked ideas, but the user can create more lists. A list could be comprised of, for example, the most-viewed ideas for a certain platform, the newest ideas containing certain words, the most-liked ideas of a specific user, or even random ideas.

The lists are principally the results of more elaborate searches, but in addition to finding the results for a query once, the frequently used searches can be saved and later accessed with one click. Several lists can be saved, edited, and removed, and they are shown as buttons on the browse side. In addition, some of the lists can be saved as quick selections on the widget, so they can be opened straight from it.

Figure 6: Multiple windows.

2.5 VIEW AND EDIT IDEAS
Ideas should be able to take parallel directions as well. It should be possible to further elaborate ideas without losing the initial idea itself. The ideas may be used only partially and taken in directions that are completely different from the original intention. The original intention should not be valued over the iterative processes of game development.
When an idea title is double-clicked, it will open in a separate window. Depending of the idea, it may include only a short description or a more elaborate structure, as well as media other than text. If there are pictures, demos, or other media with the idea, they are shown in the window but can also be opened in a separate window. There can be several ideas or media from ideas open on the desktop simultaneously. These windows can be moved and resized (see Figure 6).

Users can use these ideas as inspiration or see what has been already made or ideated, or they can edit an existing idea to advance it. The user can, for instance, open several inspiring ideas on the desktop and use parts of each of them when writing a new idea.

Ideas can be liked, which is a simple evaluation method that highlights interesting ideas from the broader idea mass. Anyone can also edit anyone else’s ideas, and iDelar automatically adds all the contributors to the ideas. All instances of an idea are saved and linked to each other, and users can navigate between older and newer versions of a particular idea.

If an idea is modular, users can also choose to edit only some parts of the idea, or copy a part of an existing idea to a completely new idea. This further supports the partial usage of old ideas.

3. SUMMARY
iDelar is a concept for a (game) idea management system application that would ease the processes of idea recording and reusing. The described system differs from existing systems and tries to tackle some of their shortcomings. It also tries to answer the specific ideating needs of game companies, but usage is not limited only to the game industry. A system similar to iDelar could benefit any company that needs an idea system.

An iDelar demo has been made and is described as one of the tools in this report [8]. The demo has been distributed to the Games and Innovation (GaIn) project partners who can use and develop it further to suit their own needs. In the future the purpose is to develop the iDelar demo to better match the concept described here, and it is also intended that the demo could be published as an open source project. The principles described here are open for others to use if they are seeking to develop better tools for managing ideas.

REFERENCES


LOOK WHAT I FOUND...
**IDELAR PROTOTYPE**

Tool

*Timo Nummenmaa*

*Jussi Kuittinen*

**WHAT IS IDELAR?**

iDelar is a concept of a system for saving and managing ideas. A prototype version was implemented as a Python application based on that concept for research purposes (Figure 1). The prototype version of iDelar was implemented with a restricted feature set and the aesthetics of the user interface were not emphasized.

![Figure 1. The iDelar prototype.](image)

**HOW TO USE IDELAR**

In the prototype, the user can save ideas by writing them in the large text area. While the user is writing, the system searches the database for similar ideas and shows the similarity percentage. The user can open any of the ideas shown in the right side view in a pop-up window. To edit an existing idea, the user copies it to the editing area and saves it as a new idea.
Existing ideas and game descriptions can be easily added to iDelar using a maintenance script. We used this feature to add a game reference database using a number of short descriptions of existing games. This allows users to also match other games instead of just ideas.

**WHY MAKE THE IDELAR PROTOTYPE?**
Creating a prototype was the best way to test certain aspects of the iDelar concept. Development using Python made it easy to create the prototype quickly and it was possible to conduct user tests for the features implemented in the prototype. Give it a try!
FLOWERI is a concept for a brainstorming room. The idea is to have a specific room dedicated for collaborative creativity within small groups. You can arrange brainstorming sessions there or just go and relax and gather your thoughts. It's supposed to be a different place, where you can switch your mind to another mode. But if you design this room for yourself, you should check what we experienced with our own room first.

OH, OK. I LIKE THAT IDEA!

THANKS!

ANNA KATJA KULTIMA
31. ROOM FOR CREATIVITY - EXPERIENCES OF FLOWERI
Exploratory Research

Annakaisa Kultima

ABSTRACT
This article presents the concept of Floweri and analyze the initial experiences of using it in the context of a university. Floweri is a room designed to be used for brainstorming sessions or small creative workshops. The design principles for the room were as follows: 1) it is unconventional, 2) it is modular, 3) it is playful, 4) it provides non-specific visual stimuli, and 5) it provides proper tools and technology. The experiences of the room were mainly positive but the concept should be taken further by examining the specific nature of the context of creative work. It is important to explore what kinds of tools and affordances the room should provide in practice in order to support the sessions better.

1. INTRODUCTION
Creative office spaces have gained a lot of attention recently. Unconventional office spaces (see Figure 1), such as the Google Zurich offices, Three Rings office at San Francisco, or Pixar offices at Emeryville, are well documented around the blogosphere. Modern office interior design uses playful and unusual solutions to foster the creativity of the workers and strengthen the image of the company or organization to attract the creative and pro-play types of personnel.

![Figure 1. From left to right: The offices of Google Zurich, Three Rings, and Pixar utilize unconventional elements to foster the creativity of personnel.](image)

Creativity can be supported in office environments in various ways. First of all it is important to create the right atmosphere that supports creative thinking and welcomes new ideas. To emphasize this, one can do various things: relaxed and bottom-up organizational structures emphasize the input of the individuals and unleashes the creative potential; specific creativity training sessions or workshops stimulate personnel to think differently and inspire people to take advantage of their full creative potential. It is also important to attract talented and creative people to work at your company or organization. The latter can actually be one of the most important reasons why flashy interior design solutions are chosen for a particular company. “The jaws of the best applicants have to be dropped” when they step into your office for a job interview. But is there more to it? What are the actual effects of a space on creativity?
In previous studies [1, 2], we examined the role of stimuli for an ideation session in the context of game idea generation games. The workshops that we ran for the GameSpace project indicated that stimuli matter. Certain kind of stimuli increase the number of certain types of game ideas [1]. Also, if the method used for brainstorming lacked specific stimuli, participants’ eyes wandered around the space and picked posters on the wall and coffee mugs on the table as sources of inspiration. [2] Just as the stimuli matter, so does the environment.

2. FLOWERI
Based on experience gained during previous projects, we decided to try out ideas in practice and designed a room specially designed for brainstorming and ideation sessions. The space was to be a place for collaborative work, prototyping, and idea generation in the context of academic work. The room was set at the department of information sciences and interactive media and it was available for use with a different research projects, e.g. those studying game design, social media, and learning environments.

The room was equipped with one projector that was not possible to turn from one wall to another, one whiteboard, one chalkboard, VGA cables at three corners of the room to connect to the projector, beanbags, stackable chairs, brainstorming literature, toys and building blocks, pens and papers and other office supplies, stackable tables, and a big round carpet. The space was designed to be as homelike and comfy as possible. It was planned with a small budget, so no fancy technological equipment was possible for this particular experiment. Different research teams used Floweri eagerly, but it also attracted a lot of attention from visitors. It was also something that personnel seemed to be pleased to show off whenever they had visitors. As most of the rooms lacked these elements, the room was perceived as rather unconventional in the context of a university.

3. THE PRINCIPLES OF FLOWERI
The principles behind the design of the room are as follows:

1. It is unconventional. The room should break the existing patterns of meeting rooms in the context of that particular workplace. By just glancing at the room, one can tell that it is targeted for a different kind of use. The room supports thinking and acting differently or changing to a different mood.

2. It is modular. Everything, or as much as possible, should be changeable. There should be possibilities for different floor plans and different settings of the room. One can move things around easily and set up the room to suit different purposes. This way, one can also keep the conventions of the room unstable and new.

3. It is playful. The room affords play. The presence of toys and games tells the story of a playful environment. The participants feel more relaxed and the
threshold for experimenting and play is low.

4. It provides non-specific visual stimuli. The room should encourage active participation by having colorful and varying elements in the room. However, any specific stimuli, such as thematic posters or pictures, should be temporary elements and only brought to the room when necessary.

5. It provides proper tools and technology. The room is used for work. The technology in the room should support the minimum requirements of the collaborative effort: big areas for information visualization (at least whiteboards or chalkboards), possibilities to project your own desktop view to others, wireless network access, ability to play audio, several points to plug your own laptop in, enough sockets for equipment, storage places for brainstorming tools, games, and literature.

Figure 2. Different floor plans of Floweri.

4. THE EXPERIENCES OF USE
The room was utilized in the Games and Innovation (GaIn) project design processes. The experiences with the room gave us ideas about how to elaborate the design principles of such environments.

With regard to the function of the creative and unconventional spaces as building the image of the department as a place for creativity and innovation, Floweri was quite successful. Even though the room would have not been used by others, it created interest outside the department. A meeting room where one can relax on the beanbags with blankets helped create a relaxed atmosphere inside the office.

However, the experiences with using the room generated additional ideas and thoughts. For instance, the room was relatively small and did not enable a lot of variations for the use of space. The room plan was almost always the same, varying between the use of coffee tables and beanbags, and regular tables and stackable chairs. The chalkboard
and whiteboard were also insufficient for data visualizations. For instance, in one session researchers used all the walls and even the windows to examine the data of one interview study. The windows still bear the marks of the adhesive paper.

Despite the fact that the furniture was often set up to be more suitable for group work, with people facing each other around the tables, the projector faced one wall only, which forced some of the participants to turn around. This made the session more passive than we would have liked. A simultaneous view from several directions of the same projected image was a frequent topic of discussion as an advancement for a future version of the space.

Surprisingly, the beanbags also lost their popularity after a couple of months using the room. If there were some tangible activities, such as playing idea generation games [2] or drawing, the big beanbags were uncomfortable. It was difficult to find a good position and then almost impossible to change it. Sitting on the floor was also quickly discontinued because of bad ergonomics. If the space was used for purposes other than discussion, it proved to be impractical. The use of the room easily turned back to office conventions.

5. DISCUSSION
Designing office spaces that afford creative work is not trivial. The tools and solutions need to be practical and yet they must function as a mediator of creative thought
and atmosphere. Even though the principles of Floweri seem to work, the solutions need more thorough investigation. When seeking the right solutions, one has to address the actual use of the room and support the special nature of the domain’s creative processes, in this case the work of university researchers. Even though there are a lot of areas in which Floweri could be improved, it seems that there is a growing need for spaces like Floweri. Instead of creating the whole environment to be unconventional and playful, one can create spaces for different kinds of work modes.

6. SUMMARY
In this paper we have presented the design principles of Floweri, a creative room at the University of Tampere. The initial experiences with the room confirm the need for such spaces, but also reflect the need for different solutions and tools to be provided in the space.

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Cover: Cocoon Offset 300 g
Inner pages: Cocoon Offset 140 g
Cocoon Offset is 100% recycled