Game Prototyping – The Negotiation of an Idea

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ABSTRACT
This is a study on the function of the prototyping process in game design. It is based on interviews with 27 game designers in leading positions at companies of various sizes. Prototyping is an important part of game design with which design ideas are explored. One central purpose of prototypes is to serve as a communicational tool. As such it is used to negotiate design problems. Rhetoric has a long tradition of analyzing communication and negotiation. In this paper a number of concepts from rhetoric, (topos, hodos, pistis, partes and to some extent synecdoche) are applied to game prototyping based on data collected as interviews. The results indicate that rhetoric concepts are useful when talking about the prototypes as they grasp the qualities of a prototyping in a good way. By applying the findings using negotiation theory to real practice the game prototyping process would likely become clearer without diminishing its creative qualities. As presented here negotiation theory could serve as a conceptual framework for game prototyping, which the design team can make use of in their design process.

Keywords
Game Design, Prototype, Rhetoric, Negotiation

INTRODUCTION
Game studies can roughly be separated into three fields: design/engineering, humanities and social science. This study focuses on the design perspective and more specifically on game prototyping as it is being performed in game development today.

Design practice and research have been expanding their boundaries during the last decades. Prototyping is a well-studied activity in interaction design, but its role in computer game design is relatively unexplored. Earlier research in game design has presented ideas for how to proceed when prototyping, but what practicing game designers actually do in terms of prototyping and what role a prototype fulfills in the design process has been unaccounted for in empirical studies. Prototyping is in this context viewed as a tool that mediates the designers' activities. A prototype's audience ranges from the individual designer and the design team to beta testers and publishers. However, this paper the focuses on the prototype's role as part of the design process; where the design team is the primary audience. The empirical data has been collected by conducting interviews with 27 game design practitioners in Sweden and Poland and structured using qualitative content analysis. The data collection and analysis method will be described in more detail in the Method section.

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Prototyping in a wider field

Prototyping is used in many areas. The area closest to game development for computers and consoles is *software development*, including *HCI,(human computer interaction),* and *IxD (interaction design)*. In software development a prototype is seen as a model or a simulation of the system that allows you to experience the system (Warfel 2009). In interaction design, prototypes have been conceived as early versions of the final product. Distinctions that exist are whether they have high-fidelity or low-fidelity and whether the prototype is made as a physical or digital artifact (Lim et al. 2008, Arvola et al. 2007, Buxton 2007, Walkers et al 2002, Buchenau et al. 2000). The prototype is also seen as something completely different from a sketch; based primarily on that its role is to define rather than explore and the amount of time and money put into it (Buxton 2007). Other conceptions of prototypes are more inclusive, viewing them as any kind of representation, in any medium, that is designed to understand, explore or communicate what it might be like to engage with the product, space or system. This notion is sometimes referred to as *experience prototyping.* The audience of a prototype is supposed to be actively participating when using it (Buchenau et al. 2000), lean-forward in a McLuhan sense, (i.e. actively consuming the media) (McLuhan 2004).

In the early ideation process of game development however, prototypes can take the form of sketch-like games made in, if not minutes, at least hours (Agustin et al. 2007). The aim of such early sketches in traditional software development and interaction design is to open the design space for new alternatives. Although in HCI and IxD sketches are not called prototypes (Buxton 2007). Early prototypes can be put together swiftly, preferably using existing technology to get a feel for the idea. This is valid in general (Arnowitz et al. 2007, Buxton 2007, Snyder 2003) as well as for games in particular (Brathwaite et al. 2009, Fullerton 2008, Schell 2008, Salen et al. 2004). Both physical prototypes using paper, game boards, miniatures, or actors and software prototypes can be useful. When choosing prototyping method, game designers need to consider the purpose of the prototype, the game type, the project type and the phase of the project (Ollila et al. 2008) The audience of the prototype and the design teams familiarity with different methods are also important factors (Warfel 2009).

Conceptions of prototypes in game design

It is a common understanding in the literature that prototyping is an important part of game design (Fullerton 2008, Fullerton et al 2006, Glinert 2010, Salen et al. 2004, Schell 2008). New game technologies are developing rapidly, which means that new game design possibilities arise. These possibilities can be explored in short iterations through prototyping (Schell 2008). Games are a very complex piece of software to develop and games are furthermore, more than other software, a piece of art (Tavinor 2009, Smuts 2005, Costikyan 2002), although this issue has been heavily debated outside the academic field, (Moriarty 2011, Ebert 2010). These characteristics of game design puts prototyping in a different perspective when compared to prototyping in other software industries.

Practicing game designers share the view that prototyping is very important. They conceptualize game design prototypes in many different ways. Game designers conceive prototypes as sketches, visualizations, communication of a function, tests of a function, design aids, specified parts of an intended outcome and an experience of an idea. The prototype is a filter that focuses attention on certain aspects of the design idea and on a specific region of a design space. A fundamental characteristic of a prototype is that it is a manifestation or externalization of an idea or a design problem (Manker et.al. 2011). If game prototyping is considered to be an activity, it could be described as a part of the

design which is externalized where the object of the activity is to modify it through evaluation until it can be internalized into the evolving game (Manker 2011).

Prototyping is an exploration where the designer gets too test their idea and learn about how it functions. The prototype is a playable version of the game or a part of the game that assists in understanding and enhancing the player experience. (Braithwaite et al. 2009) Normally several people in the design team take part in creating and using the prototype and contribute their different thoughts on how they experienced this. A continuous valuation and negotiation of these experiences takes place during this work. The team members work out how the prototyping experiences will change the course of the game design, based on their respective professional roles. Using experience as a starting point and focusing on how different views play a part in the process, game prototyping can be viewed as a process in which the team learns how to evolve a specified part of the game based on their individual experiences from using the prototype. Prototyping is here seen as a process since the focus lies on the team members' development of knowledge (Manker 2011). In game development, communication of an idea is important. *Rhetoric* is a term that has had many interpretations over more than two millennia but it is among other things a science that takes an interest in and analyzes our communication (Jasinski 2001). In earlier analysis of game design prototyping I have found rhetoric to be useful and promising. In these studies I have found that a prototype highlights an element from the game design that needs to be negotiated or explored, since a controversy has occurred around that element. The prototype used for this does not necessarily resemble the whole game. Transforming this element into a playable prototype is a process in which the understanding of the element increases. It can be modified until it is operating as (at the moment) intended or the understanding of it can be evolved so that the controversy transforms into a consensus and a trust for it is established (Manker 2011). Game prototyping can be viewed as a negotiation where a part of the design is communicated using an interactive artifact until trust in that part is restored. Prototyping is in this context seen as a tool of communication. (Manker 2011) Negotiation is here viewed in a broad sense including negotiating within one's own mind (Wolrath Söderberg 2008, Mendelson 2002, Billig 1996). It is also important to point out that *controversy* and *consensus* in this papers context refers to the view of the design problem and not to group dynamic within the design team. I.e. a controversy refers to when a part of the game is found to be malfunctioning and a consensus is when this problem is solved. Whether or not there is a consensus in the sense that everyone agrees in the design team around this is not relevant since hierarchy-based roles and/or democratic decisions almost always are the basis of design decisions rather than consensuses.

Research question

Since prototyping solve design problems through communication I will explore this using rhetoric. The aim is to shed more light on prototyping as a process and to answer the question: How could the prototyping process benefit from being seen as a form of communication in game design?

THEORY

A challenge in design of games, electronic as well as analogue, is that they are rule based and that changes in rules produce emergent effects that are difficult to predict (Salen et al. 2004). This calls for short iterations and frequent prototyping. Early testing of game play and game ideas, on the first versions of a game, is recommended (Koivisto et al. 2006). Electronic games, in addition to these emergent qualities, have all the complexities of

software development, often at the brink of hardware and interface evolution. Prototypes are valuable tools in this complex process (Fullerton 2008). AAA- productions of today also engage a multitude of professional disciplines such as storytelling, art direction, visual effects, motion capture, sound design, voice acting etc. in an art-oriented production setting. This adds complication and size, comparable to that of a major film production, to the complexity of software development and the emergent nature of a game. A form of communication that bridges the gap between the different disciplines, as well as different individuals is needed. Game design is an art of experience design (Schell 2008) and gameplay elusive in nature so that you need to play a game, to experience it, in order to understand its gameplay (Rouse et al. 2005). Communication around game design problems need to include as much of the idea of the game through experience as possible.

Game design resembles the Heraclitean quote, *Ever-newer waters flow on those who step into the same rivers*. In game design practice a multitude of disciplines create something elusive and emergent and a game is typically designed in small iterations. All these disciplines need to communicate around the complexity of the design practice. In other words, communication is vital and the object that needs to be communicated is complex. A communication is a process, it spans over a length of time. Prototyping plays an important part in this process. To communicate the idea of an experience is one of the prototype's primary functions (Manker et al. 2011). The suggested definition of prototyping as a communication, mentioned in the introduction only pinpoints a function or a conception. If prototyping largely serves as a mean of communication its quality as a process is central. The process of communication can be studied through rhetoric.

Rhetoric

Rhetoric has a wide variety of analytical tools and terms. Some are chosen and used in this paper on prototyping practice although they were initially intended for spoken language. However this approach has been rewarding. The prototype works as a vehicle for communication in game development processes (Manker 2011). The prototype also works as a language in itself where our normal language falls short. Experiences can be difficult to describe in a way that transfers the experience of one person to another. It is quite different from information or facts for which our language is well suited to communicate. The prototype can be described as a language if we view language in a broad sense, (such as languages of images, films and music). A prototype is a language of experience. To prototype is an activity of communicating experiences. Designers in the data confirms this notion

[important to prototype interface] We don't have the words, I think, to explain that even, so you need to ... all the things you [as a player], the movement of your hand and stuff, it's, it's, it is important to prototype this. To check if it is too hard to press four buttons at the same time. (A Lead Designer at an Indie-developer)

Negotiation and Design Problems – Topos

It is in the creation and the use of the prototype that its value occurs. Often this is linked to the design problem needing to be solved. The negotiation can arise because of different views on how to solve the design problem, different conceptions of what is possible to do or other issues. Issues, or viewpoints, are in rhetoric named *topos*. It is defined as a recurring and familiar way to describe, understand and communicate something within a specific culture. It can be described as a perspective, an approach or belief. The term topos originally means "place" and the notion departs from a spatial epistemology where

topoi (plural for topos) are places in a cognitive landscape that describes what is important for the group. A topos is a way to structure our thinking. A topos works as both an aspect and a way to negotiate this aspect. The understanding of a specified aspect of a game in a game design process constitutes a topos. A topos works as a node in which both consensus and controversy can exist (generally not at the same time) (Hellspong 2008, Jasinski 2001). Or in other words, a design problem concerning a specified issue is not a problem anymore if consensus has been reached. This means that to work with topoi is a way of exploring an area of interest. It can serve three major purposes, to make an inventory of a certain design problem, to discover new views on a certain aspect and to be creative and inspire to new designs by using one or more topoi as a material for combinations. To be creative by using a topos is to use it as a tool for provoking your own thought to move further (Wolrath Söderberg 2003).

The way to understand and transform different topoi is sometimes referred to as a *hodos*. Hodos, which in Greek means "way" exist in rhetoric literature but is not a widely used term. Hodos stands for the road that bridges different topos in the mental landscape. This includes bridges between present and resulting topos of the object. In other words, the landscape of topoi has a dimension of time. A topos linked to a design problem is one topos *before* and another *after* the design problem that is linked to it is has been solved. The process or "road" that leads between them is the hodos. (Other terms that have a similar meaning as hodos are *topoi enthymematon* (Aristoteles 1991) and *argumentation techniques* (Perelman et al. 1969). The road provided may be meandering but the result is improved by a process oriented view. That the road to knowledge is not straight and that it can't be. Both the result and the process, in particular the process, is important for the knowledge created (Wolrath Söderberg 2003). To achieve knowledge through solving design problems and eventually develop the finished game through a meandering creative process connects well to the iterative process typical for game development.

Negotiation and Trust - Pistis

So, I see prototyping as a tool for the negotiation which takes place in a topos, which is a node of controversy. In a game design process countless design decisions are made, all perceivable as topos. When a topos is negotiated it is transformed from a node of controversy to a node of consensus. *Pistis* is a rhetoric concept that can be translated into trust. When something is turned into consensus the participants get pistis relative to this. Pistis is needed in negotiation in order to be convinced. At the same time a negotiation develops pistis among the participants which also gives it a social importance. (Hellspong 2008) One example could be an object in a game design process, such as an operating mechanism, a level layout or a characters ability etc. When the object is prototyped due to a design problem it does not have pistis within the team. When the design problem has been solved the object has reached pistis within the team. The team has a consensus around that the object it is functional and good and trusts it enough to move along. Pistis may exist in relation to various objects such as a person, company, state, tradition or an idea, etc. (Jasinski 2001).

The Negotiation Process - Partes

Any production process contains a number of steps and there is a terminology for them in rhetoric theory. In rhetoric this process is called *partes* and is abstracted from observing how production processes work when they are functional. Typically five steps are identified as part of partes. Below I will use a model that contains six steps, splitting *inventio* into *intellectio* and *inventio* (Hellspong 2008). I have chosen this version of

partes since it describes negotiation. Here the six steps are presented in relation to the context of prototyping:

- *Intellectio* is a planning stage in which the design problem is identified. (The purposes and goals are stipulated, possible difficulties and possibilities are evaluated and different facts needed are collected).
- *Inventio* is a preparation stage in which the prototype is defined. (This is a phase where ideas are allowed and created. It concerns whether the prototype is supposed to affect its users through evidence or convincing, how this best will be prototyped in relation to the design problem, which aspect/aspects or topos are to be in focus and how they in turn affects the view of the design problem).
- *Dispositio* is a sorting stage in which the prototype is structured. (Concerning how the user connection is established and what level of game play is needed in order to get the prototype to serve its purpose)
- *Elocutio* is a construction stage where the prototype is developed. (The prototype's specific content is created and its functions are implemented. In this stage lie connections to different rhetoric figures, where *synecdoche* is the one closest to the function of a prototype. In short and in this context, a synecdoche is when something provides understanding for the whole game, through parts of the game.)
- *Memoria* is a documentation stage where the results from the prototype are generated. (This is spread over time including preparation for it in dispositio and elocutio, recording somehow during use and storing of results for later analysis).
- *Actio* is an interaction stage where the prototype is used. (This is affected by time, occasion, location, user role, preconceptions, the users' external goals etc.)

Of course this process is iterated over and over as the game development is iterated in steps. I will approach the data by analyzing how game designers, aware or unaware of it, work with prototyping in these six rhetorical steps.

METHOD

I have together with a research colleague conducted interviews with 27 respondents, 16 game designers, ten game design students and one game design teacher. All of the respondents work primarily with digital games. Eight of the 16 game designers were from AAA-game developers (six different companies, five in Sweden and one in Poland) and eight from indie game developers (four different companies, two in Sweden and two in Poland). The companies are:

- (AAA) Grin, Massive, Dice, Avalanche, Starbreeze and CD Project Red,
- (indie) Nitreal, Sleepwalker, Stunlock (former Bumblebee) and Immersive Learning
- (Students) Playground Squad and Stockholm University

The respondents were all lead designers, except for one participant who was a junior designer but he was interviewed under the same session as a senior designer at that company. No designer at the AAA-companies had any specific game related education. Most of them were autodidact and had no university degree. At the indie-companies, five

had game related university degrees (all in Sweden) and three were autodidact in the game field. All respondents were male and between 25 and 40 years old.

Four of the game design students study game design at a university and six in more practice-oriented school settings. The university students all study 3-year bachelor programs, the six at the practice-oriented all study 2-year programs. All students study in Sweden. The teacher interviewed worked at a practice-oriented school. All respondents were male and all in their twenties, except for the teacher who was mid-thirties.

The interviews were conducted during a little more than a year (May 15, 2009 through May 25, 2010) The interviews were semi-structured starting with more general questions concerning game design and game development in general followed by issues such as prototyping practice, ideation, documentation, communication, inspiration, game experience, design methods, the role of prototypes, kinds of prototypes and quality criteria for prototypes. These later more specific questions were allowed to be coloured by the response from more general first half of the interview. The data collection has been qualitative rather than quantitative.

Each interview lasted between one and two hours. The interviews were recorded and transcribed. Some were transcribed in their entirety, whilst from others only select sections of interest were transcribed. The empirical material was analyzed with qualitative content analysis (Graneheim et al. 2004). In the qualitative content analysis, the data has been structured into different categories of consecutively higher level of abstraction; *Quote, Meaning, Implied Meaning, Sub Category - Definition, Sub Category – Problem Solving, Area (related to the design Process), Theme, Recommendations, Positive Key Words, Negative Key Words*. In the subsequent analysis, the resulting material has been viewed through a lens of rhetoric.

Validity

The selection of respondents is representative for the practitioner base of today among senior game designers or equivalent. The questions used during the interviews has been open ended as they ought to be when doing conventional qualitative content analysis, (as opposed to *directed* or *summative* content analysis) (Hsien et al. 2005). The coding has been done only by initiated persons and the categories have been derived from the data without preconceptions. The coder has practical experience from game design and a deep knowledge of games in general, in theory and practice. The findings are not to be seen as theory development but rather as concept development. The interpretations have in broad terms been double checked with some respondents and other members of the game industry as well as members of the game studies society. The plan as next step is to make a more thorough investigation of how the interpretations (and findings) may correlate and contribute to the game design process.

RESULT

The results will be presented in sections linking to the steps of negotiation described in the Theory chapter. Different statements from the respondents will be used. This will be followed by a discussion chapter to elaborate on the findings.

Intellectio

This is a planning stage in which the design problem is identified. When the design team identifies a problem that needs to be addressed, a prototype is often a good solution. The

experience or feeling of the game is important when setting up the plans for the prototype. Another important factor is that a well-defined part of the game is chosen.

A game usually consists of several different mechanics and different features and a prototype can be good in this. Instead of trying to get everything to work, get everything in place, one chooses to look only on one thing. You make a prototype for a specified mechanic. Because one doesn't really know, this is difficult, one has to kind of feel the idea to see whether it may work or not. (A Game Director at an AAA-developer)

One example of a specialized prototype is a scalable visualization. Parts of the visualization are easily modifiable based on the game parameters that are tested.

For example if you are making a car game or something… and you want to see how much detail you have to put into the surroundings for example… We do a prototype where travel as a small ball through the thing in 250 mph for example so we can see… how much detail is needed at different speeds… that is a kind of prototype that doesn't need to be playable. (A Lead Designer at an AAA-developer)

In order to solve this design problem a specified function in the game is highlighted by a prototype. The understanding of how the player experiences the details in the surroundings can be developed through this prototype.

Inventio

This is a preparation stage in which the prototype is defined. When the need of a prototype has been identified one has to define how this should be realized in the best way. In this section you will find thoughts on how to get the prototype to test intended goals.

Many designers point out the usefulness of focusing on one specific function of the game in a prototype in order to address a design problem.

You can have… effect prototypes were you just have something that… is triggered again and again, just to see how things look…'that looks too bad to be our demolition system' maybe isn't good enough or something like that… and then you get to see what one… want to focus on or how to solve it. (A Lead Designer at an AAA-developer)

The prototype is not a representation of a whole game but rather a very small part of the game. It also acts as a link between inventio and actio in the sense that the use of a prototype generates new ideas and points towards the door of the next negotiation iteration.

Dispositio

This is a sorting stage in which the prototype is structured. This is not designing the prototype. The design of a prototype means how all aspects of it is realized, including different valuations and artistic decisions. The structure of a prototype is more formal and depends on the audience and the questions you hope to get answers to. This is addressed here and statements around game play and users of the prototype will be presented.

Games design is as stated before to a large extent experience design. Several respondents talk about how prototypes are useful when one wants to find out how the game

experience works in the moment and if the game is enjoyable. A prototype can test the moment of play.

You can have different goals with your prototype, but the most common, one might say, is to get what is going on during most of the playing, I mean, second to second. What is it that you do when you're playing the game? That is what you often want to find out through your prototype. (A Game Director at an AAA-developer)

One important question is the gameplay and how this works. Even an experienced game designer has difficulties to predict how a game system will emerge

And then the game. It is very physical. You should be able to play it, so you prototype it so you don't take any chances. (A Designer at an AAA-developer)

If the design problems are left unprototyped the design may diverge into something that is difficult to handle and pinpoint problems in. This is something you want to avoid.

Elocutio

This is a construction stage where the prototype is developed. When one has decided how to design a prototype it needs to be constructed. Here specific issues around implementation, content and construction of a prototype will be presented.

Participants stress that mutual learning between the content of the work and the possibilities of the technology is important in the process. Shared representations are, according to our participants, often used to support collaborative work. Several different tools are used, such as *white rooms* (i.e. prototyping in the game engine).

Let's say you want to test for example… a thing… do we have enough moves or have we stringed together enough things to make it fun to progress upwards. Then you can make a prototype, or a white room of a level for example, where we only place… almost everything is cubes. (A Game Director at an AAA-developer)

When a prototype is used to negotiate a topos it functions *synecdochically* as a tool in the game design process. A *synecdoche* is an understanding of the whole, developed by an understanding of parts that are associated with the whole (rather than parts that are similar to the whole, as is the case of metaphors). Conversely a developed understanding of the whole may deepen the understanding of an associated part of the whole (Dirven et al. 2003). Prototypes generally focus on a distinct part of a game and make this element playable. In itself, the part can be very different from the intended game as a whole, but the experience from playing with the prototyped part develops the understanding of the potential experience from playing the finished game. For example, a prototype that tests how a character in the game is supposed to jump may be done in order to understand how wide gaps are suitable to use. The goal of the prototype is to balance the difficulty of jumping, i.e. it has not much with the final game to do but to understand this properly in the game being designed may be vital to the design process.

The participants mention paper prototyping, though this seems not to be used to any great extent. Several participants also talk about using prototypes as a sketching board to refine their ideas before going to the team. Not unlike other practices but clearly defining it as sketching. They also call it a place were high flying ideas meet reality in terms of reality

checks; something that forces you to realize what can and cannot be done. Prototypes force vague ideas to transform from fantasy to reality and into something playable.

Memoria

This is a documentation stage where the results from the prototype are generated. A part of this is to decide on how the knowledge generated by a prototype is supposed to be collected. This is to some extent an underdeveloped practice among today's game developers, but it is sometimes done.

A strong trend in the game industry is to make shorter and shorter descriptions of an idea. Instead of a GDD, (The Game Design Document, a document where the exact content of the game is described in detail) one uses techniques that involve short statements, simple questions or inspirational content such as music or mood boards (Hagen 2010).

But, nowadays, and on the whole, if one has resources and if things are done right, one should never document for documentations sake, so it's much more, like, write as little as you can and show as much as possible by using images and prototypes.
(A Lead Designer at an AAA-developer)

Actio

This is an interaction stage where the prototype is used. The prototype is naturally also used and played with. How that plays out is dependent on who is using the prototype and when the prototype is used. Thoughts and experiences from this are presented here.

Games provide experiences but among designers, when talking about player experience there is often a focus towards what the player feel. Often the designers themselves base actio, i.e. their own feeling when playing the ideas through a prototype. Normally the whole team takes part in actio but sometimes a prototype is only made by one person, for themselves. The experiences give the design ideas meaning and evolve the game. Actio is needed to check that everyone has more or less the same idea of what the design vision is, or what a specific design solution implies. Prototypes often serve this purpose within the team that work with it.

Prototyping is a form of self-monitoring through externalization (Manker et al. 2011). This is achieved by using the prototype. In this context participants talk about to the notion of feeling, but more in the sense that they need to feel the idea rather than functions, as one designer says.

When you do a prototype, I guess it is connected a bit to…one start to prototype, not always but often, when you're doing your concept discovery and you want to start to feel the things right away. (A Game Director at an AAA-developer)

DISCUSSION

The result has shown examples of the six steps of negotiation. Let us put this in relation to the use and function of a prototype by discussing these in a rhetoric context.

The audience of a prototype ranges from the individual designer and design team, to beta testers and publishers, which sometimes make it somewhat unclear in traditional terms as to who the parties in the negotiation are. The broader the audience the more obvious the connection to negotiation, making it very clear in the case of for example a publisher.

Although applicable on prototypes for external reviewers, such as publishers, this study has focused on prototypes within the design process and for the design team. Let us view one extreme in this sense, the prototype as a tool for communicating the game design to a new team member. A prototype functions according to the data as a tool for getting the team on the same track and that includes introducing new team members to the work. A new team member enters a project with various preconceptions, but the game being designed is unknown to them. To explain the game may give some idea; but to play a prototype generates an experience of the game: This gives a new team member a much richer grasp of the game. They instantly become part of the process of gaining pistis for a design problem. The new members view on the experience from playing the prototype is as interesting as the experience of any other team members (in relation to their role of course).

When a designer is prototyping on their own, for themselves, who are the parties in the negotiation? This is in the other extreme of the team spectrum and it is interesting to examine, as we talk about prototypes in terms of communication and negotiation. As I see it the designer is negotiating the design with their own mind. A topos in the game design as they experience it has become a controversy relative to their vision. A design problem has risen. The designer no longer trusts this part of the game, their pistis is gone. Therefore, the designer makes a prototype in order to find a solution to the problem and transform it into a topos of consensus with their vision and so regaining pistis. The prototype may (likely) prove to show unexpected results and unveil emergent factors that had not been foreseen. The solution may not be what was anticipated. There is, even in this case, a need for negotiation; between the designers experience and vision. The negotiation per se will contain the different steps intellectio, inventio, dispositio, elocutio, memoria and actio.

Memoria may be the least developed part of partes when compared to the reality. Byt this also hints that there may be a good potential to find potential improvements to the prototyping process it that part is further elaborated.

Let's move from the use of a prototype to the function of a prototype. One common way to prototype something is to make a white room, several respondents mention this specific technique. It serves as a good example here, as it is extreme in the sense that it is something in-between a prototype and the game. It is usually not at all representative of the gameplay, but usually representative of the engine. The white room is a space in the game engine for which the game is being developed where objects can be placed and tested. A prototyping activity starts when a controversy on a topos arises and it ends when consensus is reached. The white room exists before and after this prototyping activity. Normally the elements used while prototyping are left in the white room and constitute traces of what has been done; of the topoi that have been parts of the design process. Over time the white room can become quite populated with old topoi. A topos is in rhetoric seen as a node in a mental landscape. This is unusually well manifested in the white room which becomes a landscape of topoi or design problems and thoughts for the design team.

In the white room there also remain traces of the hodos, the road that leads to the solution of a design problem. As there are possibilities to reuse things between different prototyping activities, old material and traces of old solutions and processes influence the ongoing design. A new topos generates a new hodos and the hodos is extended into a network of *hodoi* (plural for hodos). This network of hodoi exists within the design team.

When prototyping is performed in the white room traces of the hodoi network remains there. This hodoi network though, is usually not as well manifested in the white room as it is in the minds of the design team.

A prototype functions as a synecdoche. This is something which also could be exemplified by looking at a white room. As mentioned a synecdoche is the understanding of a whole through an understanding of its parts. In a white room a second layer of synecdoche is added since old material are left there. The understanding of the whole final game is generated through understanding of a chosen part, the part of the game that is being prototyped. The understanding of the whole is also generated through more or less uncontrolled, serendipitous influence from old material in the white room. These understandings eventually lead to the solution of the design problem, the transformation of the topos into consensus. This transformation takes place as a synecdoche. The topoi and hodoi network of the mental landscape of the design team is lit up by synecdoches. A form of symbiosis is generated when old topoi and hodoi have the possibility to affect the new topos introduced in the white room. This symbiosis is facilitated by synecdoches.

The evolution of the specific game topos is driven by a synecdoche. A game consists of several mechanics. Prototypes can test them one by one, each one in themselves not resembling the game as a whole. To summarize in rhetoric: Prototyping is the synecdochical hodos that leads to pistis by bridging topoi. Rhetoric terminology manages to capture the intricate functions game prototyping in a short and efficient way. This may contribute to the communication around prototyping in general and perhaps in scientific contexts and analysis in particular,

To view a prototyping process through a rhetoric lens clarifies how it functions and illuminates some benefits of prototyping. Prototyping practice as described by the respondents is quite uncontrolled, ad hoc and sometimes messy. In a creative process an element of chaos is needed, but also a framework that generates innovativeness. The negotiation taking place during prototyping is based on valuations made by the team members. The choices made are based on both intrinsic and extrinsic qualities. An intrinsic quality is something that is specific for the game being created. An extrinsic quality includes prior established game forms, art and traditions. Prototypes are coloured by the designers' and the team members' perception the prior art of games. These extrinsic valuations take part in an ongoing a conversation between the design solutions of games where innovativeness moves the field forward. This constitutes a design culture, and prototyping is the most significant dialogic element, more so than even the games themselves.

In many cases, according to the respondents' descriptions, the element of chaos is there but not always the framework. By applying the findings using negotiation theory to real practice the game prototyping process would likely become clearer without diminishing its creative qualities. As presented here negotiation theory could serve as a conceptual framework for game prototyping, which the design team can make use of in their design process.

FUTURE RESEARCH

A number of potential ways to continue is here presented in three groups.

On prototyping and rhetoric

- One obvious path would be to develop a formalized tool for how prototyping processes could be organized through a negotiation process, as inspired by the six steps stipulated in rhetoric theory. As good an idea as this may be, caution is advised. Overly rigid structures may damage the usefulness and it is possible that a conceptual framework is the best level to stop at. However, if one bears this in mind a further investigation into the possibilities of a more formalized tool for negotiating the prototype may prove valuable.
- To explore further how prototyping relates to collaborative work would be an interesting line of research
- If we look only at rhetoric, there is a tool called *topik for critical study*. This tool embraces critical thinking as an act of communication (Wolrath Söderberg 2003). To adapt this tool for a game development/prototyping context may prove fruitful.
- Another area of rhetoric that has shown potential in the work leading up to this paper is synecdoche. A further examination of that area could be interesting, perhaps in combination with the development of a more formalized tool for the prototyping process.

On prototyping, rhetoric and Activity theory

- *Activity theory* identifies a process called *externalization – internalization*. Seen through a lens of rhetoric the process between externalization and internalization is a negotiation of topos from controversy to consensus. When a controversy arises a part of the game is externalized as a prototype. When consensus in a topos is achieved the object is internalized in the game design again (Manker 2011). This link to Activity theory may be interesting to investigate further.
- Other links to Activity theory may also be of interest to include. When a team is prototyping they are sharpening their game development skills in general and their skill in developing the game at hand in particular. *Phronesis* is a term that connects to this, (phronesis is roughly the practical intelligence to make the best of available means). There is a possibly interesting link here between phronesis, the concept of a *zone of proximal development* (which means roughly the increased potential development generated by the use of some aid) and the quality of a prototyping process. (Kaptelinin et al. 2008, Wolrath Söderberg 2003)

On rhetoric drawn from prototyping

- Rhetoric theory has been used as on game design and prototyping. In that process it has become clear that the term topos would need to be refined. It would benefit, (at least in the game prototyping context) from a split into three views, as the topos of the subject (the design team), as the topos of the object (the game being designed) and as the way to understand and bridge different topos.
- In rhetoric conversations have been observed and categorized based on topos. A similar observation and categorization of prototyping and its common topoi may be a way to develop the knowledge of common topoi in both design studies and rhetoric.

- As it has been interpreted in this paper, a topos has a clearly temporal dimension. This four dimensional view on topos could be elaborated further.

CONCLUSION

The communicational quality of prototypes is obvious. One could say that as an image says more than 1000 words, a prototype says more than 1000 images. By viewing a prototype as a communication tool a large number of analytical models become available. The way a prototype works seem to resemble negotiation theory from rhetoric. In this a number of steps are stipulated. In rhetoric a number of other conceptions of communication exist. Partes, pistis, topos and synecdoche provide useful insights into the function of a prototype. They are also useful when talking about the prototypes as they are concepts that grasp the qualities of a prototype in a good way. By structuring a game design prototyping process into the six steps of negotiation will most likely be beneficial to the game development process.

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