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What games do

Interaction, Design, and Actor Network Theory

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Abstract—**When interacting with computer games, users are forced to follow the rules of the game in return of the excitement, joy, fun, or other pursued experiences. In this paper, we investigate how games achieve these experiences in the perspective of Actor Network Theory (ANT). Based on a qualitative study we conclude that both board games and computer games are actors that produce experiences by exercising power over the user's abilities, for example their cognitive functions. Games are designed to take advantage of the characteristics of the human players.**

Keywords: computer games; board games; Actor Network Theory; interaction; game research; game design

I. INTRODUCTION

Using computer software usually means the user is the active part, which controls the interaction by input and direct manipulation [1]. Interaction with computer games is a different experience, because the user acts in a game world, where the game content has excessive influence on the gamer's behavior. Game figures and other game items are not just passive objects, they can be manipulated as the gamer pleases. If a game is to come alive, the gamers have to follow rules and act as the game indicates. Playing a computer game like *Counter Strike* [2] or *World of Warcraft* [3] is not just a question of manipulating an avatar. The game is forcing the gamer to react to events in the game by acting in a certain way, if the gamer wants to survive and prosper in the game, i.e., the gamer is placed in a role he or she has to fulfill. In other words: games do something to and with people who play them, and, in a certain way, games are just like actors who have an agency. What this agency consists of and how it is engineered is of interest for designers.

In this paper, we will show how games can be seen as actors and as organizers of actors and actions on the basis of Actor Network Theory (abbreviated to "ANT") [4]. ANT is well suited for the analysis of user interaction with games because ANT offers an approach to agency that does not assign power only to human actors, but allows the possibility for objects and rules to be studied as actors. Also, ANT opens a way of seeing design as a social enterprise. As Yaneva stresses: "…design has a social goal and mobilizes social means to achieve it" [5].

ANT has received some attention in game studies during the last decade. Several scholars have studied games on the basis of ANT [6], especially focusing on the interchange between humans and technology [7] or on the development of social networks in online games [8]. In this paper, we will take a different approach and show how the ANT perspective can explain which forces are at work, when games are actually played. Thus, our focus is on what the immediate effects of using games are.

The paper is the result of a research project where we studied gamers in different ages playing computer games as well as board games. Our point of departure was that computer games are games before they are anything else [9]. Therefore the study focused on studying games as a genre rather than just digital games, and our main example in this paper is a board game.

In the next section we will introduce the ANT focusing mainly on the concept of "translation", which is employed as our main analytical foundation. After this, the paper will present the used research methodology for collecting data. In the following sections, the selected case of game playing will be presented, followed by a presentation and a discussion of the results of our investigation.

II. ACTOR NETWORK THEORY

ANT was first developed by science and technology study scholars Michael Callon and Bruno Latour [10] as a new approach to social theory. ANT is of interest to any analysis of technology, which goes beyond the assumption that technology is a mere instrument that we, as humans, utilize. ANT holds that any element of the material and social world (nature, technology, and social rules) can be an actor in the same way humans are. Agency is never only human or social, but always a combination of human, social and technology [11]-[13].

ANT is not a theory in the usual sense of the word, according to Latour himself, since ANT does not explain "why" a network takes a certain form or "how" this happens [4]. ANT is more a method of how to explore and describe relations in a pragmatic manner, a "how-to book" as Latour calls it [4], and thereby offers a way to describe ties and forces within a network.

The main idea in ANT is that actions always take place in interaction between actors in networks, where the actors influence each other and struggle for power. We usually see social interaction between humans this way, but ANT differs

from traditional social theory by stating that the actors are not only humans but can be other elements as well.

A. The traffic example

ANT can be hard to grasp, and even counter-intuitive [11], because it reverses our common understanding of actors and agency, for instance when it cuts across the subject-object division underlying our thought about the world, we live in. In an attempt to clarify ANT, Hanseth and Monteiro [14] use traffic as an example to explain the implications of seeing something in the perspective of ANT. We find their example very usable to give a better understanding of ANT and, hopefully, what we later have to say about what games do. The following is a short presentation of their attempt and afterwards we will use it to explain the process of translation: When you are driving in your car from one place to another, you are acting, but your acts are heavily influenced by technology and the material world (the car's maneuvering abilities, the layout of the roads, traffic signs, traffic regulation), the immaterial (traffic rules, traffic culture) and habits (your own experience as a driver) [14].

According to ANT, these factors (including you) all function as actors and should be understood as forces of agency in a linked network. Human and non-human, technical and non-technical elements are part of the network, and none of the elements are per definition granted special power over the others [11], [14].

Expanding the thoughts of Hanseth and Monteiro, we can add that, in the traffic example, you want to move from place to place, but you are dependent on technology and forced to act in accordance with both social rules and physical conditions. Even though you are the driver, you will clearly feel the forces of other actors when acting out the driving. For instance, the road forces you to follow a certain route, the traffic light forces you to stop and start. One can say that in order to reach your goal safe and fast, you have to "give in" to the network and in a way "hand over" your acting power and control over the car, so that the vehicle will move in accordance with the demands of traffic network. You have to "delegate" [11] power to the traffic network, and, in return, you will reach your goal fast and safely. Of course you are not handing over the control of yourself to the network. To delegate is more to act as prescribed by other actors. According to ANT, this is what happens in an actor-network relation.

B. Translation

The way delegation is done is through the process of *translation*. This process requires the actors in a network to accept roles, a worldview, rules of acting, a path to follow etc. Michel Callon [15] describes the process of translation as a process of "persuading" with four distinct phases, he calls "moments": problematization, interessement, enrolment, and mobilization. These moments are inter-related overlapping steps that describe how stable actor-networks come to be established [16]. We will introduce them briefly in the following, and later use them in our game analysis.

The first moment, problematization, is where some of the actors in the network in question bring forth a definition of the problem and present a viable solution to it for the other actors. This is also the process in which the actors' roles are defined (both human and non-human actors). To use the traffic example above, this is where the car and the traffic network are presented as a solution to the transport problem.

As part of the problematization process, a so-called obligatory passage point (OPP) is defined, i.e., a practicable solution, which the actors have to accept to achieve their goal. An OPP "is viewed as the solution to a problem in terms of the resources available to the actant [actor] that proposes it as the OPP (…) It controls the resources needed to achieve the actant's outcome." [17] By defining an OPP, other possibilities are closed [15]. In the traffic example, the OPP is literally a passage, since it's the roads and the current traffic rules etc., which have been established as a solid, reliable network.

The second moment, interessement, is where the main objective is to convince all the involved actors that the proposed problem and solution is the correct one so that they will accept to use this solution and not another one. In the traffic network, this is done by the use of sanctions from traffic rules, signs, and, not the least, by the learning processes human actors go through to get a driver's license.

When the interessement of the actors is successful, the third moment, enrollment, is happening. This moment is important since it is here that support and allies are created, and the process by which actors become part of a network. The process can happen in many ways: "To describe enrollment is […] to describe the multilateral negotiations, trials of strength and tricks that accompany the interessements and enable them to succeed." [15]. In relation to the traffic network, one can think of all the things that support cars and their moving along the roads.

Finally, the last moment, mobilization, is where the actors are mobilizes in such a way that they act in accordance with the prescribed roles and thereby they maintain the established network. This happens when the drivers drive their cars following the rules and pathways of the traffic network.

C. Design as inscription

The effect of translation is delegation of power and agency. I relation to design of objects, e.g. computer games, translation is about how to construct an object in such a way that users are convinced to delegate agency. This is described as *inscription* and *description* by Madeleine Akrich [18].

Inscription is the process where a designer embeds a special way the user has to interact with the designed object. The designer is envisaging a user and a use case for the object and develops an intended use, which is inscribed into the object by use of, for instance, physical shape, GUI, behavior of objects, and affordances in general.

Akrich compares inscription with a movie script, and calls the result a script for how the user should use the object. We see this, for example, in the design of the iPad's user interface, where users are compelled to use finger

movements to interact, which is a more intuitive way of interacting and quite different from using a computer mouse.

While inscription is the designer's idea and framing of the interaction, Akrich uses the term description to describe the actual usage of the objects. This is where the script build into and drawn upon in the design process, meets the user in an actual user setting. Coming alive is the central part of description. It is central to ANT that a non-human actor can have agency and perform actions, and this is what we see when the scripts embedded in designed objects comes to live and the objects engage in a network with other actors.

In the perspective of ANT, a game can by studied as a designed object with inscriptions that has agency and does something with the user, because the user invokes a network of actors and agency when he or she starts playing a game, i.e., following the rules of the "game world". A game designer has to be aware of the network of actors the specific game design can invoke if he or she wants to be able to use it in the process of inscription. Networks of actors are the unit of analysis in our study presented below.

III. RESEARCH METHODOLOGY

Our research method relied on qualitative data collected through observation, both non-participatory observation and active participation [19], [20]. We collected data from 12 game sessions where we observed informants, recorded their behavior and interviewed them before, during and after playing. To ensure recordable data, we used games, where players had to be social and communicate with one another and board games was especially well suited for this, since people tend to talk more when playing such games. We observed children as well as grownups and mixed age groups playing games in natural settings at home, in the family, or with friends.

The purpose of our study was to investigate and describe agency and actors at work when gamers play games. As our framework of analysis, we employed the concept of actors and agency and the four described moments of translation, being careful not to differentiate between non-human and human actors. We recorded spoken language as well as body language and gestures, and managed data using theoretical coding as described by Uwe Flick [21]. We analyzed agency by following what people did with games, extracting actors and ties, and described the translation process in the actual game situations, as we will demonstrate in the next two sections.

IV. CASE: THE GAME "QUACKLE"

The case of playing the board game "Quackle" in a mixed age group is exemplary for our observations in general and in the following we will use our analysis of this case to present our interpretation of what the game actually does.

A. Quackle! The game

The game, which was awarded "Game of the Year" in Denmark in 2006, is a typical funny board game for the ages 5 and up. In short, the game consists of 12 different animal figures, 8 barns and 97 playing cards with pictures of the

animals and one arrow card (see Figure 1). The game starts with each player pulling an animal figure from a clothed bag, showing it to the others and then hiding it in his barn so the

Figure 1. Photo of the game Quackle! with animals, cards, and barns on the left.

others can no longer see it. The cards are dealt and placed in a pile in front of each player face down.

The objective of the game is to get rid of all the cards you have in your pile. Each round of the game consists of the players in turn turning a card and placing it for all to se. If two players have the same animal on their card they enter a *battle*, where the players compete on being the first to loudly say the sound of the *other* player's animal hidden in the barn. The player that looses the battle needs to pick his own and the others pile of upwards facing cards. The game continues until there again are two identical animals in the cards, or one of the players gets rid of all their cards [22].

The game seems pretty simple, but requires that the players can remember and quickly mobilize the correct sounds when two identical cards are turned, which is more difficult than one might think, even for adults.

B. Game inscription

As we see in the above description of the game, there is a special way, players are expected to interact with the game (the inscription), and, as we will argue in the following, by this the game uses the learned scripts that the player brings along and the player's physical and psychological abilities. Among other things, the game takes advantage of the players' knowledge (i.e., scripts) about animals and animal sounds, and the game utilizes the fact that in pressured situations most humans have a tendency to react automatically. It is precisely this automatic reaction that makes the game fun, because the players' makes a lot of mistakes trying to be the fastest, which often result in weird sounds that is a mix between different animal sounds.

The game designer has created an inscription that can be indicated as follows: We must say a particular animal sound, while we see and try to remember a lot of other animals. These many inputs are combined with the stress factor that the game introduces by stating we must respond faster than our opponents! Thus, the inscription creates a special way the player has to act, i.e., a way the players have to use their abilities.

In the perspective of agency it is noteworthy that the game forces the player to make mistakes and thereby produce a mishmash of sounds, which the player would not normally produce. When we asked our informants about the experience most of them said their tongue was "out of control". In that sense, it is apparent, that the game has agency and does something to the player.

C. Translation

The inscription plays an important role when considering the whole situation as a translation. As previously described, the translation consists of four moments that we will now outline in relation to the game scenario.

The first moment is the problematization, which is where we are presented with a problem. In our case, the game is played in natural situations on a Friday evening in a family of four (parents and two children, son age 12 and daughter 21). For the family, the problem is the need for entertainment understood as a peaceful and enjoyable social time together. In this case, the game of Quackle is set up as a solution. Like any family game and most entertainment products, it promises that playing the game will lead to the experience of fun. Thus, the game is put forward as an actor who can do a piece of work (give us fun) through the way other actors treat it. This happens when one of the family members says, "Let's play Quackle, its fun. We always laugh so much when we play it." (quote from the daughter from the case).

The game is put forward as a solution and as the obligatory passage point (OPP) to social entertainment. The solution simultaneously suggests roles and organizes relations, i.e., a specific network where the family members will become game players, and the living room table and chairs will facilitate that the family can sit close together. No less important is it that the games will establish equality between the players, regardless of age and family position.

In the next moment, the interessement, which actually takes place in parallel with the problematization, the family members are convinced the proposed solution is the right one, and barriers for alternative solutions to the problem are added. One of the things that are cut off is television, a frequently used source of entertainment in the family, when one of the adults says: "We shouldn't watch television, we always do. We should do something together instead." (quote from the episode).

Enrollment is the third moment where the players are enrolled and this entails that we must accept the roles of participants as players of Quackle! and accept the terms of the game.

In the last moment of translation, mobilization, the solution is executed, when the family members sit down with the game and start playing. If the mobilization works and translation process is thus successful, then it becomes possible to experience fun and laugh together. This is exactly what happened to the family via the interaction with the game, which created a lot of laughing, especially when the parents made weird sounds.

The game re-organizes the family's social connections and in so doing builds a new network of actors and agency. The game is what Latour has named a "mediator" that "transform, translate, distort, and modify" relations [11]. But the game does more than alter the social relations. It mediates the body and mind of the individual players. In the following we will address how Quackle! accomplishes the mobilization of the players physical and cognitive abilities.

V. WHAT THE GAME DOES

A game cannot do much itself, but is dependent on other actors, and this is, of course, especially true for board games. Nevertheless, games have agency that makes game players act in a manner they would not have acted without the game. In that sense, the game "does" something in line with Latour's concise statement on what defines an actor: "anything that does modify a state of affairs by making a difference is an actor [...]" [4].

Latour stresses that, when we are studying a network in ANT, we are focusing on the circulation between the connections that make up the network [16]. When we look into the Quackle game, we are looking at how agency is floating between the involved actors, which we will try to demonstrate through an analysis of a play scenario.

First, the scenario in bullet points of the family playing the game:

1) The game is placed on the table and the players sit down around it.

2) The game is opened, and the game elements are displayed. There are animals, barns, and cards and a cloth bag.

3) The animals are hidden in a cloth bag and all players get a barn.

4) Each player pulls an animal from the cloth bag: Player 1 gets a snake, player 2 a dog, player 3 a donkey and player 4 a frog.

5) After all animals and sounds have been introduced, they are stored out of view in the barns.

6) The cards are shuffled and dealt.

7) Everyone is ready and turn their first card.

8) A horse, a cow, a duck and a pig is turned, so there is no match.

9) Next cards are turned: a snake, a pig, a frog and an owl appears, still no match.

10) The third cards are turned: A mouse, a donkey, a rooster and an owl appear.

11) The game gathers speed and the cards are turned a bit faster.

12) The fourth card is turned: a cat, a dog, a cat and a frog.

13) Player 1 shouts "Qu..iau" [sounds a combination of a frog sound and a cat sound] and player 3 "Vu..sh"[a combination of dog sound and snake sound] followed by a grinning "Oh no, uh" and finally player 1 says "Miau" just before playing 3 said "Sssshh".

14) Player 3 must gather player 1's card and the game continues.

This is the basic structure of the game, which continues in a similar manner for a long time (about 30 minutes) before a player wins.

Points 1 and 2 are of practical character, but they help to create the framework for what is going to happen. Thus, the following activities are framed and the game's inscription starts to become clear, especially in the form of the rules. The agency is still with the players. This is also the case in point 3, but here the game starts to gain agency. It starts to have an effect on the players, as it prescribes their actions in the next steps.

Our observations show that at the same time the players build up anticipation about what is going to happen, which is seen by the body movements and heard by the tone and pitch of voices. This anticipation started when the players accepted the game as an OPP. It was especially noticeable in point 4 and 5 where the joy of hiding the animals in the cloth bag and pulling one provides a form of excitement that is particularly evident in the youngest child. Thus, we see here that the agency is distributed to the game as a kind of pre-disposition of body and mind [5].

In point 5, the players need to remember all the animals, the other players have. The individual player has to establish links between the different animals, the barns and the players around the table. In point 7, the number of links is expanded by the creation of connection to the cards and in point 9, the game is made even more complex as more animals are introduced and it makes it harder to remember the animals hidden in the barns, which is of course part of the game designers' inscription.

We continue to point 13, where we see the first match of cards. When this match appears, a special script appears which is part of the inscription of the game. The script forces the player to act as prescribed by the game rules and thereby it functions as a type of mechanism that governs players' actions. The mechanism *re-organizes* the connection between the players body and their cognition in a special way by means of rules and materials (cards, animal figures, barns) and in this manner the game utilizes the faculties of the player. As mentioned earlier, the player is driven to make mistakes when pronouncing words, and it is this "drive" that shows an agency from the game.

What the game does can be described as follows: First, it mobilizes the individual players memory, but overstates the demands of remembering. There is a wide range of images, sounds, figures and places that are in play, and the player will have to revive all of these objects and connections when the match of card appear. There are different animal figures and their sounds to choose from, and several sounds become actualized, before the players say the correct sounds.

Second, the game cuts across the usual connection between the players mind and body. In point 13 it is clear that the game disrupts the normally well-controlled connections between the player's cognitive ability and their ability to control their tongue. The inscription provides a procedure for a specific requested response to certain signals where the player has to use specific cognitive functions, i.e., perceive, remember, associate the images and sounds as well as mobilize the organs of speech, and it all has to happen as quickly as possible. It is a simple task that the players do not usually have problems with, but by adding a wide range of signals in the form of different images and sounds, and by forcing the players to compete with others, the result is that cognitive and bodily functions responds in an incorrect manner, and the players end up saying the wrong sounds. The game has, in a way, taken over body and mind.

The case of playing Quackle! is an example of a translation process in action, where agency is delegated to a network. The case is also an example of how such a network is comprised of human, material, and social actors. The translation is only happening because the players have allowed themselves to be enrolled as players and fulfill their roles, using the material, and following the rules and thereby delegate agency. In return they are entertained.

B. Playing a computer game

Earlier, we stated that we consider computer games to be games before anything else. Thus, our thesis is that computer games do something to the players when played, just as the case of Quackle! What we have attempted until now is to establish a framework for analyzing what games do, and, in the following, we will briefly show how the framework could be applied to computer games.

The setting, which we observed, are three boys 12, 12 and 14 years old playing Grand Theft Auto V (GTA) on a Playstation 3. Grand Theft Auto has become very popular with its mixture of racing and adventure, where the players can follow a story already inscribed in the game, but they can also just go racing around in the game city.

The boys take turns at controlling the game, while the two others comment and talk about what is happening. In one scenario, the 14 year old is controlling the game. He gets an assignment from the game where a tough looking guy on the screen tells him that he needs to win a race with a computer-controlled opponent to progress. Then the game begins.

The setting we are analyzing is a network that consists of the interior (couch, table, etc.), the Playstation (consisting of screen, game console, controller and DVD), the three boys, and the game. The game itself consists of multiple actors of which some are activated coupled with the other actors of the network. We do not have room here to analyze all actors and possible networks the game can initiate and will only take a short look at how the game impacts the players' bodies.

When playing, the boys have to follow the rules of the game. They are complicated, but for our example here we can just point to the traffic rules in the game and how the car is driven via the controller. In the same manner as in a real traffic system, the player has to delegate agency to the system. Just as in the real traffic, there is police in the form of multiple cars and helicopters, roads, houses, pedestrians and the normal traffic on the road, which has to be avoided during the race. All of these actors become active as the boy starts the race, which lasts for a few minutes.

It is apparent how the game influences the player's body. First, of the boy presses hard on the controller and swings it forward, and the next second he and the controller are leaning heavily to the left side, almost leaning into one of the

other boys. Next second all of the boys shout "Wow, that was close!", while they all jump a little in the couch. At the end they are all standing up and leaning forward and to the side as they follow the movements of the car on the road it tries to follow.

If we look at this scenario as a translation, we can see the problematization is set forward, the boys need to win the race and this is also the OPP. In the interessement, the game builds on the fact that the boys are already enrolled in the game (emerged in it) and thus they need to progress to keep playing. The enrollment is made more stable by the use of a character in the game and adding a storyline to the race (why they have to win), thus agency is transferred to the game. This also builds up the tension for the next moment, where the boys are mobilized to play. The term "boys" indicated that all three boys participate even though two of them don't control the game.

When the race begins, the boy controlling is leaning forward and swinging to the side with his body. This is where the game uses some of its agency, and the bodily action of the player shows that the game is mobilizing the player's ability. In our observations, we saw this again and again, the players could not help it but move their body to the side as they turned a corner, even though in this game it wasn't needed, as the controller doesn't react to it.

The game further uses its agency when it makes the boys shout and jump. This happens as the car almost hits a wall that would have crushed the car, and made them lose the game. This kind of danger is present all the time in the race. Here, the game is exercising its agency by using the player's body and mind, including his imagination that allows him and the other boys to experience danger, which in the real world would have produced fear, but in the framework of the game produces excitement.

VI. CONCLUSION AND FUTURE WORK

In the introduction, we stated that games from our point of view could be regarded as actors because they function as organizers of other actors. Following Latour, quoted above games are actors because they make a difference, not because they are human or non-human, social or material. We have tried to show how such "difference" is created when games do something with players. This view represents an understanding of interaction where the subject-object dichotomy is dissolved and agency is distributed in a process of reorganizing, recreation and modification of actions in networks, which even stretch into the mind and body of the individual player and take advantage of abilities and faculties.

If one accepts this way of viewing, this has implications for game design, because design is not just a question of creating game worlds and interfaces, but a question of how to design social actors that can take agency and thereby initiate and guide the building of social networks, which can bring human and non-human actor to act together in such a way that the players can achieve an experience, they find pleasant, joyful, funny or alike. As we have tried to point out, this does not only involve organizing social relations, actions and material, but also requires utilization of the

player's abilities, for instance of physical and cognitive kind. We believe game design should be done on the basis of knowledge about how human abilities can be organized and influenced, including knowledge of the abilities of different user groups. In the analysis, we showed how the games orchestrate actions by humans and non-humans that resulted in experiences the players find engaging, joyful and entertaining. From our point of view that is prototypical examples of what games do. They organize the acting of actors in order to achieve certain kind of experiences. Through the inscription the designer assigns agency in such a way that the game can take advantage of the characteristics of the human players. The games are examples of how the design render agency to a non-human object, and this object they perform a job by getting the players to do a job.

A. Future work

The main theme of this paper has been to establish an understanding of what games do in the perspective of ANT. We believe that ANT is beneficial when we look into computer game design. While it can seem trivial that games do something to users, it is highly important for game designers to understand how games do this. We have demonstrated that using ANT as a tool for analysis can give us a new understanding of the interaction between games and users. We believe that game designers can advance interaction design by "following the actors" and by understanding how agency in games works. We are fully aware that our analysis has shortcomings due to only covering two games and, thus, only a few examples of the kind of actor network, which creates play. There are numerous other examples of this kind of network operating in many different ways in games. Future work should focus on identifying, characterising, and possibly systemizing actor networks in different games.

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