WHAT IS LUDIC ABOUT LUDIC DESIGN? A BACK AND FORTH BETWEEN THEORY AND PRACTICE

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ABSTRACT

This paper focuses on ludic design as part of the paradigm of design research that explores new ways to implement computer systems. We want to further explore the specificity of ludic design using research through. First, we introduce Bill Gaver's definition and compare his claim to theories of ludicity that were developed in anthropology and psychology. Secondly, we analyze a portfolio of artifacts to better understand how ludicity is embedded in the designs and to reveal the underlying assumptions. We come up with three additional characteristics of ludic design: unconventionality, serendipity, and reflexivity through breaching experiment. Finally, we test our understanding of ludicity through a research artifact to validate our hypothesis.

Keywords: Research through design, ludic design, practice and theory, portfolios analysis, serendipity, reflexivity, breaching experiment

1 INTRODUCTION

Motivated in part by the quest for new markets, and in part by the progress of miniaturization in electronic components, "Ubiquitous Computing" described by Mark Weiser (Weiser, 1999) seems every year a little more real. New devices, digital systems, connected objects take place in our domestic environment. They range from refrigerators to scales and include toothbrush, home automation systems, picture frames, weather stations, medical devices…

Despite progress, many of these objects are too often thought of as machines for work and developed with the same criteria: control, effectiveness, efficiency… But these criteria and features are probably less relevant when artifacts are implemented in everybody's home and everyday activities.

This paper focuses on ludic design as part of the paradigm of design research that explores new ways to implement computer systems. "Design exploration" research, as defined by Fallman, explores how to expand the field of design outside of the current paradigms. Design exploration "often seeks to test ideas and to ask "What if?"—but also to provoke, criticize, and experiment to reveal alternatives to the expected and traditional, to transcend accepted paradigms, to bring matters to a head, and to be proactive and societal in its expression."(Fallman, 2008). Daniel Fallman points out that these approaches are good at "problem-setting" (Schö̈n, 1983).

Ludic design is defined by Sengers (Sengers et al., 2005) as belonging to design exploration. The goal is not only to create original systems but also to introduce a reflective practice. "In the context of HCI, ludic design explores the limits of

What is ludic about ludic design? A back and forth between theory and practice.

Cédric Mivielle

technology design practice - what it is we may design for, what methods we may use - by proposing a specific set of values that contrasts sharply with the values currently at the center of technical practice." Ludic design explores the values and aesthetics of a material with probably unparalleled plasticity.

In this paper, we want to further explore the specificity of ludic design using research through design (Gaver, 2012; Mackay and Fayard, 1997).
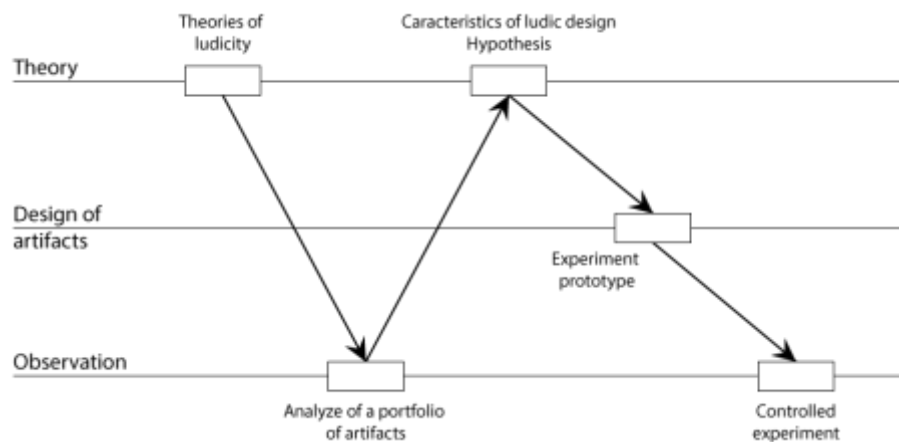
2 METHODOLOGY

Figure 1 – Model of the methodology used for the project

Figure 1 presents the model of the methodology we used in this project. This model is based on the framework described by W. Mackay (Mackay and Fayard, 1997). This study combines theory, design of an artifact and observations. First, we introduce Bill Gaver's definition (Gaver, n.d.) and compare his claim to theories of ludicity that were developed in anthropology and psychology (Caillois and Barash, 2001; Huizinga, 1955; Winnicott, 2005). Secondly, we then analyze a portfolio of artifacts (Gaver, 2006; Gaver et al., 2010; W. Gaver et al., 2004) to better understand how ludicity is embedded in the designs and to reveal hypothesis. Thirdly, we come up with three additional characteristics of ludic design: unconventionality, serendipity, and reflexivity through breaching experiment. Fourthly, to test our understanding of ludicity through a research artifact, we build a experimental prototype to finally validate our hypothesis through a controlled experiment with interviews.

3 DEFINE LUDIC DESIGN

In this section, we want first to address Bill Gaver's definition of ludic design. He has coined the word and, in a series of papers, develops and refines the concept. We will give only a short summary of his thoughts here. Secondly, we want to tap into theories of ludicity to relate ludic design to a broader field of studies that explore playfulness in individuals and society.

3.1 BILL GAVER'S PROGRAM OF LUDIC DESIGN

What is ludic about ludic design? A back and forth between theory and practice.

Cédric Mivielle

The claim of Bill Gaver's ludic design program is not to tackle issues of efficiency either technical (that is augmenting people's activity) or social (solving problems of coordination, or communication), or even psychological (identity). The focus is on meaning making. Ludic design is specifically deployed to support meaning making activities. This definition applies to the development of these artifacts – the design space itself and in particular the probes (W. W. Gaver et al., 2004) – as well as the reception and use of these artifacts. "If people are to find their own meaning for activities, or to pursue them without worrying about their meaning, designs should avoid clear narratives of use. Instead they should be open-ended or ambiguous in terms of their cultural interpretation and the meanings—including personal and ethical ones—people ascribe to them"(W. Gaver et al., 2004). Bill Gaver therefore describes artifacts with use scripts (Akrish, 1992) that are "under defined". The focus is not on the task but on the global aesthetics experience and how people make sense of it through gestures and comments.

In (Gaver, n.d.), Gaver defines these activities as based on curiosity, and sustained by exploration. They eventually support a reflexive state about our engagement with the world, its representations, and each other. While reflexivity can be brought about by readings, or discussions, Bill Gaver explores how objects can been designed with that purpose. "In other words, ludic design focuses on reflection and engagement through the experience of using the designed object."(Sengers et al., 2005)

Reflexivity could also be triggered by unpleasant and challenging experiences. But the objective is also to foster creativity. Ludic design therefore creates pleasurable artifacts and enjoyable and playful situations so that the users do not reject the experience but actually use it to explore the potential of technologies. Ludic design is geared to support design or at least meaning making activities in users. Bill Gaver tries to arouse curiosity and encourage an attitude of speculation through the original composition of contents (images, news, videos), the re-framing of information (from screen to viewport), the novelty of tangible artifacts (like a cross or a coffee table).Ludic design is a method that under plays the use scripts of its artifacts so that users have more leeway to find their own ways with them.

In the next section, we see how this program fits into a broader definition of ludicity in the literature of "play". We start with Huizinga as he is explicitly referred to by Bill Gaver.

3.2 WHAT IS LUDICITY?

Game is consubstantial with culture and society. Within this paradigm introduced by Johan Huizinga (Huizinga, 1955), a human being is not only defined as a "homo faber", who builds, but as a "homo ludens", who plays. In the context of homo ludens, we are characterized not only by our tasks but also by our ability to enjoy ourselves, to discover, to be curious, to invent...

Johan Huizinga defines play as follows: "Summing up the formal characteristic of play, we might call it a free activity standing quite consciously outside 'ordinary' life as being 'not serious' but at the same time absorbing the player intensely

What is ludic about ludic design? A back and forth between theory and practice.

Cédric Mivielle

and utterly. It is an activity connected with no material interest, and no profit can be gained by it."(Huizinga, 1955).

Huizinga describes ludic activities as playful experiences that are not organized as goal-oriented tasks where people optimize the means for an action on the world. The motivation is not to pursue an effective action on reality but to give some space to the the free expression of subjective tendencies.

Following Johan Huizinga, Roger Caillois definition (Caillois and Barash, 2001) bears several similarities with Huizinga's, however Caillois adds an important characteristic: uncertainty. Without an uncertain outcome, there is no surprise or possible error. Without uncertainty the game would no longer be pleasing. But more importantly it would fix the choices and prevent creativity and freedom. It is necessary to give some latitude to the player so that he can imagine and invent.

But playing is not just entertainment. Psychological theories of play in children (Piaget, 1962; Winnicott, 2005) show that playing is an essential practice and commitment to creativity, to learning and understanding the world. When we play with things and words, when we tell stories and when we dream, we find new perspectives for the world and ourselves, and new ways to address problems. We create new relations between things, discover new facets of our personalities, and develop new ideas. Ludicity is the human ability to get out of the fixed meaning of words, and fixed order of things. Playful activities are a deliberate approach to put into play the meaning of signs and the use of things.

While we can see that these definitions are the underlying principles in Bill Gaver's claim for ludic design and designing for Homo ludens, we still need to analyze objects that belong to the ludic design paradigm to get a more detailed definition of ludic design characteristics. First, we want to see how these characteristics are embedded in tangible artifacts and situations. Second we want to see if other characteristics appear and augment our definition of ludicity.

4 DESIGN CASE STUDIES

In the previous sections, we outlined why ludic design is a principle and outcome for technology design. In developing our stance, we have drawn from several foundations. At this point, however, it may be helpful to concretize our approach with the attempts to embody ludic design. The method and results are described only briefly here, see our former paper about these case studies to find more information (Mivielle and Gentes, 2014). We discussed three case studies (Gaver, 2006; Gaver et al., 2010; W. Gaver et al., 2004), united by underlying objectives but with different target audience and ultimate enactment.

4.1 METHOD: "ANNOTATING" A CORPUS OF LUDIC ARTIFACTS

Following Gaver's discussion about research through design, we proceeded to make a "portfolio" of artifacts. Gaver's concept of "portfolio" is a reformulation of what humanities call a "corpus"(Rastier, 2001). Corpus and portfolios are a selection of artworks (linguistic, visual, tangible) that belong to the same genre (Genette, 1979). Artifacts of the same genre share structural and pragmatic characteristics in so far as they are not only similar in style, narrative structure,

What is ludic about ludic design? A back and forth between theory and practice.

Cédric Mivielle

or visual organization, but also as they are discussed by social actors as targeting the same audiences, for the same purposes, with similar textual or tangible strategies. The constitution of a corpus does not pretend to be exhaustive. It is always but a segment of the actual production. The purpose is to gather enough material to answer a research question. Here the selection of Bill Gaver's artifacts is dedicated to an in depth analysis of a few objects to understand some qualities of ludic design.

We followed two methodologies: a semiotic analysis of the artifacts themselves, and a communicational analysis of the situations where the objects were "tested". One of the challenges of this type of analyses is that it is inductive and therefore the amount and variety of details of each artifact and experience tends to be overwhelming.

We choose to analyze only three artifacts "Prayer companion", "Video window" and "Drift table" (Gaver, 2006; Gaver et al., 2010; W. Gaver et al., 2004). We wanted to go into the details of these artifacts. Our interest was to find the rationale of such objects and to get a better understanding of how ludicity is embedded in the designs and to reveal hypothesis.

4.2 HYPOTHESIS

The analysis of these objects tends to open multiple dimensions of ludic design. In particular, Bill Gaver makes it very clear - and his objects testify to the fact - that aesthetics is a key to ludic design. In this respect, these ludic artifacts are very close to art as pointed out by Morrison (Morrison et al., 2007). This is to be related to Huizinga's analysis of aesthetics in ludicity (Huizinga, 1955). In the different experiments, what is striking is the amount of efforts that are necessary to achieve the perfect technical, practical solution as well as the desired aesthetic solution: fine details of color, shape, and text editing, quality and angle of image, composition, etc. were taken into consideration. But aesthetics encompass more than the image or the tangible artifact.

Bill Gaver describes a whole environment. He shows that emotions and enjoyment are related to the situation, locus, actors, objects, and representations as well as information. The aesthetics of ludic design is made of a space of experience including: Tinkering, maintaining, social sharing, relation to space and time of the tangible artifact, representations and in particular the poetic rendering of time and space, evocation / information.

Users are not only oriented by tasks, by cognitive interests but also moved by shapes, forms, affected by time and space. Information technologies move us. The question is how to design the way they affect us, how to design our action and passion.

We want to focus on only three aspects of ludic of design as they appear through our analysis. We think that ludic design is: Unconventional, serendipitous, reflexive.

4.2.1 *Unconventional*

Bill Norman describes the importance of affordance and conventions in efficient design (Norman, 2002). On the contrary, Bill Gaver theoretical stance is that

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What is ludic about ludic design? A back and forth between theory and practice.

Cédric Mivielle

designers always challenge conventions: aesthetic, political and social conventions. In particular, Bill Gaver - as well as other designers claiming ludic design like Tek-Jin Nam et Changwon Kim (Nam and Kim, 2011) – indirectly criticize mass media. While mass media convey a standardized, oversimplified, static, and complacent vision that masks the real complexity of things and implicitly deny the possibility of change, ludic designs encourage to question information, formats, media. Ludic design is a critical program that goes against another type of design that "may commodify personal experience, encouraging people to consume activities and meanings defined by others and alienating them from their own meaning-making."

Ludic pursuits may develop into more traditionally defined ones, but their self-definition and motivation is incompatible with the meanings and motivations implied by known genres. Bill Gaver maintains a stance against practical, work oriented, types of design, but he also builds his design against mass culture. His design is not expected in the sense that he offers an aesthetic research that deals with contemporary features.

4.2.2 *Serendipity*

In the systems that we analyzed, there are several spaces/concepts of serendipity. While the word "serendipity" is often used to mean chance, the ambiguous definition given by Walpole: "making discoveries, by accidents and sagacity, of things which [you] were not in quest of" (Walpole, 1857) points more to the "sagacity" of characters who are able to pay attention to a surprising event, to interpret it correctly, and - more importantly for design - to work something with it. Serendipity therefore seems to play a large part in the creative process. As a designer, Bill Gaver questions the possibility to plan for chance. While Van Andel considers that no computer can emulate serendipity (Andel, 1994), Gaver, along with other HCI researchers (Liang, 2012; Newman et al., 2002), gives another answer by developing one ludic design after another. As pointed out by Hatchuel (Hatchuel et al., 2012), designers either generate surprises (Schön, 1983) or use unexpected accidents as a resource - serendipity. In any event, the design practice can be described as a combination of intentionality and indeterminacy (Braha and Reich, 2003; Gero, 1996).

The analysis of Bill Gaver's different artifacts shows that serendipity is an essential part of ludic design in interactive systems. On the basis of the three artifacts described here, we can point out five inclusions of serendipity in ludic design: Information as event, random production of information, serendipity as access to information, serendipity of external reality.

Bill Gaver not only creates an artifact that plays with the unexpected, he also describes discussions and engagement that place a special emphasis on the whole experience and the way the artifact is perceived. Each time, the objects are qualified as experimental and to be played with. In these examples, this setting is obviously part of the ludic experience as a reflexive experience. This leads us to consider that ludic design also works as a breaching experiment.

4.2.3 *Reflexivity through breaching experiment*

"Breaching experiments", as Harold Garfinkel defines them in ethnomethodology (Garfinkel, 1991), are experiments - designed by researchers - to better

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What is ludic about ludic design? A back and forth between theory and practice.

Cédric Mivielle

understand how people adjust to each other and to circumstances in very elaborate ways. A "breaching experiment" disturbs situations of everyday life so as to get to some of its meaning, a meaning that is hidden under the guise of "naturalness", or of "obviousness". This concept and method have also been used by researchers in engineering to focus on the reactions of testers to a new technology. Scientists rely on users' ability to build a coherent interpretation of the situation and of the technology to improve the latter. In "techno methodology", to use the neologism defined by Crabtree (Crabtree, 2004) who describes ethnomethodology used in engineering, the meaning of the situation is at the intersection of the user's activity and the tangible object. Indeed, users understand the "scripts" that are embedded in a specific artifact, whether they are "enrolled" (Akrish, 1992) by the designer expectations of use (Davallon et al., 2003) or the objects show the general logic of communication (Jeanneret, 2008). Users also make sense of the object because they actively relate it to their activities, way of living, and environment and define how the artifact is relevant for them in context.

In the cases that we analyzed, the breaching experiment is actually for the benefit, first of the users themselves, and for the design and HCI team. Because ludic design introduces non conventional media and serendipity, the participants are led to manipulate and discuss the meaning of the artifacts. The user's reactions are both to correct and expand the meaning of the object. The benefit also goes to designers who want to develop new interactive systems.

5 EXPERIMENTATION

To test assumptions and reproducibility, we built our own research artefact. ~~So~~ we designed it to include the three characteristics in our scenarios. In this section, we first present the artifact and the experimental protocol. Secondly, we present some results provided by the users and by our observations.

5.1 ARTIFACT

In the experiment, objects can communicate with the users and between each other. The users can be "stage directors" of the objects. They can create stories, orchestrate contents and support the creation of new communities by connecting people. As directors, users choose the objects that they give life to. They create dialogues that humans and non humans will have.

In this first controlled experiment, we chose objects and interactions between them. We chose to build or/ and augment six different objects. All the electronic parts that connect the objects are hidden from the user. Three act as sensors:

— a seat that is able to recognize two positions and know the weight of the users.
— a teapot used as decoration that is able to know if it is open or closed.
— a teddy bear that is able to know the temperature and the air quality of a room.

And three act as actuators:

— a connected speaker system
— a tablet

What is ludic about ludic design? A back and forth between theory and practice.

Cédric Mivielle

   — a connected lamp

With these objects, we decided to script three scenarios:

   — The opening of the teapot allows you to turn on and turn off the lamp that adjusts to ambient light.
   — The tablet screen is used to display the temperature and air quality captured by the teddy bear. The information is not given in the form of numbers or curves, but as a character and a speech bubble ("I'm too hot", "It's stifling here", "I turn into ice" ...).
   — The seat starts music on the speakers depending on the weight and position of the user.

The artifact was tested by seventeen people divided into two sessions. The first (ten users) was conducted at a large public event. The second (seven users) took place in a relaxation area of an academic laboratory. In the first case, we invited people to manipulate objects present in the environment (Figure 2) without telling them what was going to happen. In the end, users were invited to complete a survey and have a 10 minutes discussion with us. In the second case, we have said nothing about experimentation. People used the place as usual and discovered progressively the interactions and possible scenarios. After a week, we gave them the surveys followed by a 30 minutes interview.

Figure 2 – Set up example

5.2 RESULTS

First, users described the experience as ludic ("fun", "funny", "ludic", "playful"). We were able to create a ludic experience based on the three additional characteristics. These characteristics are repeatedly expressed by the users in the discussions.

Unconventional: Experience has also been described as "surprising", "not usal", "not natural"... Some users were not familiar with this kind of technology or didn't think it was possible to create this kind of scenarios. For other, the system seemed strange because it was not only designed in a utilitarian sense. Questioning the fixed meaning of things was a part of users feeling of uncanny ("I don't understand the link between a teapot and a switch or a teapot and a

What is ludic about ludic design? A back and forth between theory and practice.

Cédric Mivielle

lamp"). It is unconventional in the sense that it introduces new types of interactions, not necessarily legitimate, logical or useful.

Serendipity: The first scenario of the teapot lamp has quickly shown its limits. Once the behaviour of objects understood by users, the non-conventional aspect decreasing and the serendipity aspect not being present, the script had no longer enough ludic characteristics. It was felt to be less or not ludic. So, we have designed an alternative scenario in which the colour of the light changes randomly each time you open the teapot. With this new scenario, we could sustain over time the ludic experience ("It was funny. The color was different each time. I was forced to switch on and off several times to find a colour I like."). In the other two scenarios, users appreciated the messages (teddybear) and the music (musical seat) was different each time. Overall, serendipity had a particular importance in the search for objects with which users can interact. Design this prototype has shown us that it was difficult to create, plan and manage serendipity. However this serendipity is essential to support in time part of ludicity of the experience. In the same time, serendipity has shown its limits because some users wanted to have control over the objects, other wanted to have more connected objects and more interactions, scenarios... The question here is how we can create new inputs or enough opportunities.

Reflexivity through breaching experiment: The artifact allowed them to "discover new technology and new types of connected objects". They especially appreciated the opportunity to manipulate and discuss them. They realized through trial and error approach what the implications of their interactions were and they began to create their own meaning and stories ("Spirit leaves the teapot and goes into the lamp"). Objects were also used as material to discuss things such as monitoring and surveillance ("who has access to data," "with the teddy bear, I'll be able to control the nanny who takes care of my child"), control ("objects do what they want"), embezzlement ("we can know who is sitting in the seat and when"), usefulness ("It's funny but it's useless")... Users enjoyed having a good time shared with other. This prototype had shown that is possible to create debate and have good time in the same ludic experience. For the designers of this kind of technologies, these debates reveal significant issues that users have in mind.

Ludic design helps us define more precisely what ludicity means. In particular it uncovers the critical, political dimension of playful activities based on unconventional ludic designs. It also reaffirms the role of serendipity in playful activities, while showing different forms of serendipity. Finally, ludicity can be defined as a breaching experiment in the two senses that this word holds. It creates an unusual situation that reflects both on the users and the technology. This development of the concept points to a move from personal quest (that is Winnicot and Piaget's standpoints) to a social quest: a redefinition of how we interact with the world in particular through media.

6 CONCLUSION

In this paper, we have shown our approach to reveal assumptions and to validate them by the creation of a research artifact. This study allowed us to reveal and validate three additional characteristics of ludic design: unconventionality, serendipity, and reflexivity through breaching experiment.

What is ludic about ludic design? A back and forth between theory and practice.

Cédric Mivielle

In this article, the selection of artifacts has helped us uncover several features of ludic design in an inductive way. The next steps of our research will consist in augmenting our corpus of objects, not only built by Bill Gaver but also by other designers. Other objects might fall in the ludic design paradigm while not claiming to be. We are thinking of Helen Evans (Evans, n.d.), Douglas Edric Stanley (Stanley, n.d.), Jean-Louis Frechin (Frechin, n.d.), Newman (Newman et al., 2002), to broaden our understanding of the range of ludic strategies and to come up with more recommendations for ludic design. It means that we will make a second iteration of the prototype to test these new features, but also to deepen the results of the first version. With more inputs, we want to explore concepts like openness, open-ended, poetry, freedom, usefulness that seem to be related to the playful.

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Cédric Mivielle

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Cédric Mivielle

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