

# Half way Evaluation

# EDITE

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Design activities and interactional mechanisms: an ethnographic study of a musical video game design

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The purpose of this ethnographic study is to understand how creativity is achieved through collaboration between designers and in which interactional frameworks. This will be done through an ethnographic study of a video game design.

In this paper, we will first define our theoretical background which is followed by the position we take in this research as well as our approach. In the following sections, we describe the context of the design we study and then, the method. The paper continues with an illustration of our type of excerpts and of our analyses. The last section is providing a planning of this research.

### Theoretical background

Most authors of design studies qualify design problem as ill-defined. The numerous degrees of liberty in the first phase of conception bring designers to define the problem and to elaborate solution in an interactive manner (Darses and Falzon, 1996; de Terssac, 2004). In design problem solving, solution is not unique nor optimal, but acceptable in regard to requirements and constraints can emerge (Darses and Falzon, 1996; Visser, Darses, and Détienne, 2004).

The design problem is characterized by its variables and their numerous interrelations which make the division of task into sub-tasks in an independent manner difficult (Détienne, Baker and Visser, 2009). A consequence of this complexity is that problem solving often needs to gather different competences to solve the problem, thus making collaboration emerging (Détienne, Boujut and Hohmann2004).

Most of the studies on collaborative design (e.g. Baker, Détienne, Lund, and Séjourné, 2009) concur to three central tenets in order to achieve collaboration in design: first, mutual comprehension based on communication processes second, joint problem solving task based on the mutual contributions and on argumentation and third, management of the group processes (group coordination).

In the conduction of a design project, there are often an interleaving between two types of design activity: routine or nor routine design, which can be also said as less creative toward moments that can be considered as more creative (Bonnardel, 2006). In design, many problems are stake. On the one hand, some problems have a predetermined process to reach to the solution or a predetermined solution. These problems are considered as a problem resolution by a routine. On the other hand, some problems do not have pre-existent solution or a pre-existent procedure, thus designers need to rely on more creative processes to reach the solution.

In a creative perspective, design consists to define the characteristics of an object that presents a certain novelty and that adapts to an evolutionary set of various constraints and that adapts to the context in which it occurs (Bonnardel, 2006; Sternberg, 1999).

Definitions of creativity related to the product highlight its novelty and its appropriateness. Novelty alone is not sufficient and the product need to satisfy constraints of the situation considered (Bonnardel, 2006).

Creativity can also be defined by its processes. Divergent thinking and convergent thinking (Milliken, Bartel and Kurtzberg, 2003; Paulus and Brown, 2003) are considered as critical steps

in creative design. Divergent thinking is manifested in a number of different ways in groups, including the number of perspectives and alternatives offered and the degree to which members share uniquely held information (Milliken et al 2003). Another way that divergent thinking promotes creativity is in the degree to which a group considers multiple alternatives before committing to any one decision or course of action (Fricke, 1999; Milliken et al. 2003).

In creativity design, the main point is to develop a new point of view, a perspective from which new problems are seen and old ones are in a new light (Gruber and Wallace, 1999). The adoption of new perspectives during problem solving activity enables to complete the progression's state of the elaborated solution in function of previous perspectives (Bonnardel, 2006). A way to enhance the number of perspectives is by diverging backgrounds of the designers. Diverse backgrounds may be more effective because participants can develop more perspectives on the problem and generate more unique ideas (Nemeth & Nemeth-Brown, 2003; Nijstad et al., 2003), but only if group members are willing to share their diverse perspectives.

Some studies on design focus on the roles of artifacts in creativity. Artifacts can be abstract, ambiguous and imprecise, that enables to postpone certain choice and to favor the emergence of new ideas (Bonnardel, 2006). Most creative processes extensively make use of visual imagery (Verstijnen, Hennessey, van Leewen, and Hamel, 1998) which is achieved through the use of artifacts. Different functionalities can emerge from artifacts. Vyas (2009) defined artifact in relation to their surfaces: personal, shared and live surfaces. Functionalities such as reminder, individual project management (Vyas, 2009), problem comprehension (Vyas et al., 2009) were defined in personal surface; communication and inspiration of design ideas, exploring design solutions, managing design project (Vyas, van der Veer, Heylen and Nijholt, 2009) were observed in shared surfaces; and live surfaces (e.g. smoke movement simulation, gestures...) which are the short-lived, temporary surfaces that team designers develop and use during their real-time collaborative group activities (Vyas, 2009) in as brainstorming, evaluating and so on.

### **Research directions**

At a macroscopic level, our research aims to understand how the design process unfolds in terms of design organization, in terms of social aspects of the team design and design artifacts. We will approach this aim with a macroscopic analysis of the whole design organization. This structural analysis of design organization will encompass three levels: prototypes, themes and iterative cycles. In social aspects of design, we will consider the various participants involved in design, their expertise, rights and access to design data and their affiliation to the design project. Finally, artifacts will be analyzed through the whole design organization in terms of characteristics as well as their uses and functions.

At a fine-grain level of specific interactions, our research aims to understand how creativity is achieved through collaboration between designers and in which collaborative interactional frameworks. From a design process perspective we will consider that collaborative processes involve symmetric contributions in information pooling, design ideas generation, evaluation and argumentation as well as regular exchanges in interactive positions (e.g. shift between idea generation and evaluation). One question will be to understand at a fine grain level these collaborative processes in a naturalistic project of creative design.

At this level, the originality of our approach will be to articulate a content analysis with an interactional analysis. The interactional mechanisms entailed in collaborative and creative design are sparely analyzed in the literature. However, an approach based on participation framework and production formats (Goffman, 1981; Goodwin and Goodwin, 2004) could highlight how participants guide their 'delivery' in design. For example this approach can serve as a structural basis for analyzing changes in footing regarding the production format: the animator (someone whose talking), the principal (someone whose position is established by the words that are spoken) and the author (someone who has selected words and sentiments expressed). One question will be to understand the different production formats involved in collaborative creative moments characterized by specific collaborative processes and specific uses of surfaces.

### **Context and method**

An ethnographic study, started in February 2009, is carried on in a small design studio in Paris. It aims to cover the whole design of a musical video game. The design group is composed of a creative director with one to three co-designers (depending on the needs) working in the studio. Other participants, externs to the studio, punctually join the group for brainstorming, playtesting or coding.

#### Data collection

Our data are collected during an immersion that started from February 2009 and is still under way. The collection of data, which encompass video-recorded sessions, informal discussions and interviews of designers, logs, printed screens, data from project management tools and a variety of produced artifacts, allows us to reconstruct the design process from its beginning. Moreover, the immersion allows us to capture collaborative processes that occur in an opportunistic manner. These data are completed with personal notes.

#### Structural analysis of the design

We will carry on a structural analysis of the design from its beginning to its end. This analysis will lead us to understand how the whole design and the team are structured and ordered. It will be achieved through different levels: types of prototypes, themes and iterative cycles with the participants and artifacts uses. This global description of the design organization allows us to situate our collected data, in particular video recordings, in the whole design process (see Annex 1).

#### Content and interactional analyses

Content and interactional analyses will be performed on a pool of excerpts. Excerpts are taken for covering (1) different steps in an iterative cycle of a theme, (2) different iterative cycles within a theme and (3) iterative cycle of different themes. The particular criteria of selection of

particular excerpts are (1) the emergence of original ideas and alternatives, (2) the presence of different affiliated designers in the meeting.

The content analysis highlights the progression of design ideas in the team as well as the different positions taken by participants in design (generate, argue...). The interactional analysis highlights how suggestions are generated, received and treated/elaborated in collaborative process. These analyses will give us insights on how collaborative design actions are structured and accomplished: how proposals are suggested, how they are received and how they are treated by all the designers in terms of collaborative aspects as well as in terms of interactional dynamisms. This will be completed by the analysis of uses of artifacts.

## Two examples of analyses

#### Example of macroscopic analysis of design organization

The design organization is characterized by three types of prototype so far (see fig. 1). Team design evolved to manage the progression of the design needs and prototype needs. Nevertheless, two designers went through all the processes conveyed by these different prototypes. This 'core team' includes a creative director also CEO and a coder. Depending on the needs of the design, different participants join this 'core team':

- Designers (in graphics or music) as freelance
- Designers (e.g. others game designers CEO) or other domains' researchers (e.g. historian) for punctual collaboration
- Users (hard/casual players) for playtests.
- Open source communities for remote ephemeral collaborations (via IRC channels) around coding issues



Figure 1 Types of prototypes and team design

The design processes relied mainly on iterative design. Iterative design is a design methodology based on a cyclic process of defining a new function, prototyping, testing, analyzing, and refining a work in progress (Zimmerman, 2003). In this way, the project develops through interactions between the designers, the design prototypes and the users (playtesters).

It is worth noting that the project is conducted in a high velocity and the designed prototypes need to be "pretty and simple" at first. There are reasons for that; first, it enables to work with simple things that will get complicated over time. Second, it facilitates the understanding of what is working well. Last, it forces designers to reflect only in terms of simple things and to find interesting new ideas. Iterative design encompass number of iterative cycle, these cycles were seen to be achieved by the use of several artifacts (Fig. 2).



Figure 2 Artifacts used in iterative design cycles

We observed that a multitude of artifacts are used for specific tasks or moments of the design:

- Few artifacts are in personal spaces i.e. papers with a to-do list, mathematical functions and graphics, magazines/books.
- Shared surfaces can be either visible by all persons coming or working in the studio or only by the core team. On the one hand, white board, sketches, graphics, IRC channels for programming languages, dictionaries of functions, and so on, are visible by all externs. On the other hand, *Bitbucket* (group coordination) and an IRC channel were used among team members.
- Live surfaces are the short-lived, temporary surfaces used for brainstorming, playtesting, evaluating and so on. These surfaces include prototypes of the video game, other video games, musical compositions but also non verbal communications (e.g. corporal simulations).

#### Example of fine grain analyses of interactions

We show an example of excerpt that is taken from the audio-interaction-visual prototype (fig. 3). This prototype encompasses three broad themes: visual representations, scene and character: context of the game and music architecture. The excerpt illustrated (fig. 4) is situated in the theme 'Scene and character: context of the game' (see fig. 3). It represents the first iterative cycle of this theme.



Figure 3 Themes in Audio-interaction-visual prototype and situation of the excerpt presented



Figure 4 Excerpt (§= designer B)

The excerpt is taken from a meeting between the creative director (B) and an extern (A), a friend of B who is also a game designer. In this meeting, B presents to A a new prototype of the game encompassing a character. In the excerpt, the designers discuss and develop various design alternatives concerning the replay mode of the game (when the player progresses from one play time to another). They develop alternative proposals concerning the type of gain given to the players at each replay.

To analyze collaboration in creative design, we have used different descriptors which are (1) the pooling and exchange of information for a common representation of the problem and solution, (2) the generation of proposals and by whom, (3) the argumentation dynamism, (4) the

deepening or reformulation of proposal/s, (5) the movement of divergent and then converging thinking and (6) the symmetry and shifts in proposals' generation, argumentation and consensus.

We can underline several collaborative aspects in this excerpt (as shown in Figure 4). First, each designer proposes at least one proposal, thus expanding the solution space by the generation of multiple alternatives (P1 to P4). Second, it shows an argumentative dynamics with both positive and negative arguments in regards to the proposals generated. The alternative proposal of A (P2) is indirectly argued negatively by B in regards to the reified solution P3 (6B and 8B). This same alternative (P2) is also argued positively in regards to a previous solution (P4) made by another designer (6B and 8B). Then, B argues positively for P2 and P4 (9B). A follows with another positive argument for P2 (12A to 14A). Third, deepening of proposals by designers is seen in the fact that A's alternative (P2) is reformulated by both designers (10A and 11B). Fourth, A and B diverge by proposing four proposals and then converge toward P2. This expresses the movement of divergent and then converge making the design dynamics and the shifts of interactive role between them symmetrical.

No. utterance and		Issue		Issue	
Designer		type of (players') gain		initiation of sound tracks	
		P1 proposal	P2 proposal	P3 proposal	P4 proposal
		adding a	adding sound	(reified)	(discarded
		player	tracks	starting with	Florent's
		character's		all sound	proposal)
		attribute		tracks	starting with
					few sound
					tracks
1,2	В	Generates (P1)			
3,5	Α		Generates (P2)		
6,8	В		Contradiction		Compatibility
			(P2-P3)	Argues – (P3)	(P2-P4)
9	В		Argues + (P2)		Argues + (P4)
10	Α		Reformulates (P2)		
11	В		Reformulates (P2)		
12,13,14	А		Argues + (P2)		

Figure 5 Content analysis of the first excerpt

Our excerpt also shows some collaborative phenomena used by designers. These relate to vagueness and delay. Designers may use vagueness as a strategy to encourage other proposals and that can serve an encouragement-to-contribute function (McDonnell, 2010). Delaying of decisions is considered as a deliberate strategy to cope with uncertainty or an information deficit (McDonnell, 2010) and may be marked by 'hedge word' (Glock, 2009; Ball and Christensen, 2009).

Designers work with a prototype that was designed to be 'pretty and simple'. The simplicity of the prototype might introduce a first element of vagueness as designers interact with it during the meeting. At the conversational level, in the first turn, B uses vagueness in his proposal by stating "choisir un objet" (2.B) which he does not describe in detail, thus leaving open the nature of the 'object' for other alternatives or possible refinement. Then, B follows with a proposal on the function of the object but specifies that it is "par exemple" leaving again the notion of object open for other suggestions. In this same turn, B also uses delay with his 'hedge word' 'je sais pas' in (1B, 2B: tu vas avoir je sais pas le droit). The use of vagueness and delay by B, in this

turn, was followed by an alternative generated by A (3A and 5A). It is worth noting that the use of vagueness and delay, in this turn, opens up for further ideas to be generated by the other designer.

About changes in footings, the excerpt is divided in two parts. In the first part of the excerpt, an idea is generated by designer A (3A and 5A) which makes A the 'principal', 'author' and 'animator' of this proposal. This proposal is received by a neutral reception (4B). Designer B subsequently attributes the proposals to another participant, Florent (6B) which becomes 'principal' of this proposal. Reaction to this dispossession is seen in 7A. In the second part, designer B (the creative director) also reformulates the ideas he attributes to an absent designer (8B, 9B and 11B), this way becoming himself the author. Thus, designer B removes designer A from being the author of this proposal (P2).

Conclusions on these analyses are that the argumentative analysis highlights collaborative aspects of the design with a co-elaboration of the solution space. In this perspective, this excerpt shows creativity processes by the diverging and then converging thinking. These collaborative aspects are also seen in strategies undertaken by Designer B such as delaying decision and vagueness. The interactional analysis highlights also less collaborative aspects of interaction through changes in production format, in particular re-attribution and re-appropriation of ideas.

## Planning

What has been done?

- Theoretical framework: in progression
- Most of the field observation (since January 2009)
- Argumentative and interactional analyses on three excerpts,
- Structural analysis of the design (Prototypes, themes and artifacts)
- Credits: 6 in the domain and 4 in complementary formations (in process of validation)

What needs to be done?

- Argumentative and interactional analyses on more excerpts that need to be selected
- Structural analysis of the design (iterative cycles and social aspects)
- The redaction of the these

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#### Annex 1Video recording in the Audio-interaction-visual prototype

