

Interaction atmosphere: blending design style

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ABSTRACT

Interfaces, created by HCI with functional and ergonomic objectives, due to the proliferation of communication landscape need today new design methodologies to develop standardized solutions. Interaction Design is the discipline that deals with these new design aspects in order to foster interactions simpler and designed for specific contexts. This paper explores the role of creativity and emotions, related to atmosphere interaction in visual interfaces. The research intends to investigate the potential of a *blending approach* between functionality and creativity that introduces in the user oriented design process some techniques coming from different disciplines. The main goals are: stimulate the creative process, arise inferential aspects about previous positive experience, develop aesthetic awareness of the atmosphere concept as balance of points highlighted in the studies of Cooper, Verplank and Veen. The first aim of this paper is to propose a new blending approach called 'interaction atmosphere' for further application in digital ambient.

Categories and Subject Descriptors

H.5.2 User interface design.

General Terms

Design, Theory.

Keywords

Interaction Design, emotion, blending design, interaction atmosphere, semiotic, inference, creativity, body experience.

1. INTRODUCTION

Starting from the question "how to improve interaction design using creativity and emotion?", this research propose a blending design style emerging from three main concepts: balance in design, creative process and semiotic inference in the development of interaction atmosphere devoted to trigger positive emotions by visual interfaces.

This paper is divided in five main parts: Introduction, Theoretical Framework, Blending Atmosphere Design, Blending Design Model and Conclusion.

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Three fundamental approaches are investigated during this work: design, creativity and semiotic and how each of them are able to trigger human emotions and positive feelings. The paper explores the role of the creativity and emotions for Interaction Design, related to the context and atmosphere in dedicated scenarios.

The section on lessons intends to investigate the potential of a *'blending design style'* that introduces creative techniques dedicated to stimulating the creative process, the inferential aspects but mainly the concept of interface balancing the interaction atmosphere as the points highlighted by Veen [11] (*behavior-presentation-structure*) and Cooper [2] (*behavior-form-content*) in the following interaction design principles.

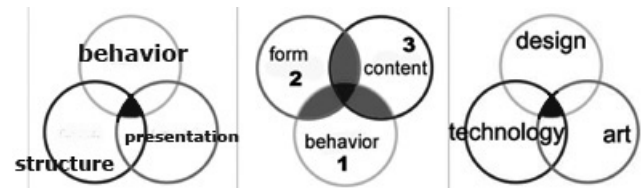


Fig. 1, interface is the core of Interaction Design principles

In this research I propose to improved set of techniques of interface design engineering for the semiotic and also the development of the definition of "general atmosphere of interaction" as a result of aspects highlighted by interaction designers and from elements emerging by studies about creative and inferential process. These studies are based on different theories in an attempt to build bridges between the various disciplines involved in interaction design. They thus create a boundary zone fed by different points of views. Starting with hard science (HCI, computer science, software engineering, ergonomics, cybernetics and neuroscience) and then proceeding to the humanities (semiotics, philosophy, cognitive science, art and psycho-analysis), the paper aims to raise awareness of the different expertise that can be found in different working groups to develop a better communication atmosphere at all levels: between the designers themselves and between designers and users at every stage of human machine interaction.

The goal is to propose a blending design style derived from an understanding of the importance of atmosphere in interaction flow, emphasizing the need for empathy and general comfort in common processes in virtual space. Interface design and communication theory are closely related to metaphor and contexts, while communication itself is a generative process.

Being creative can be defined, following Munari [8], Arieti [1] and Peirce [10], as the breaking of existing rules and the generation of new ones. Even in the hard sciences, rejected until quite recently as an attitude, ability or process, creativity has, by the very virtue of its unpredictability, made its contribution by

introducing new ways of seeing the world and by countering set biases.

2. THEORETICAL FRAMEWORK

The today ID framework is cross-disciplinary and involved indeed a number of different viewpoints, among which only a few could be treated in depth. This work is addressed to analyzed some of them: design, creativity and semiotic in order to find out a “lateral” thinking in interaction design.

The classical paradigm in HCI, coming from the rationalist tradition, divides the user from the designer and formed the starting point in software engineering. Along the history of HCI three interaction paradigms were described. The 1st see the interaction as man-machine coupling, the 2nd as information communication and in 3th as phenomenological situated, Harrison and Tatar [5].

The third paradigm was further developed by interaction designers in order to explore the dialogue between products, people and contexts (physical, cultural, historical), but also to create a balance between function and form by looking at cultural, visceral and visual aesthetics. Verplank [12] says that a system able to conform to user expectations has to comply with a model of interaction design that is essentially based on three concepts: do, feel and know and that together represent the fundamentals of each interaction style. In the Verplank’s vision of interaction, designers answer three main questions: how do you DO? how do you FEEL? And how do you KNOW?



Figure 2, Interaction Design by Verplank [12]

According to his thought, the feature “feel” allows to understand “how much of itself” explains the system, how it does it, and then how much is the benefit the user has from an emotional point of view. The feature “do” allows to understand which modality of use the system communicates to the user, and if so, if it does it in an efficient and understandable way. The feature “know” allows to understand if the system is able to communicate its “knowability” in a clear way, that is if it is able to transfer the proper logic of use to both novice users and to advanced users.

These design features are addressed to emphasize what Norman [8] claims: “emotion plays a significant role in attracting the user and an attractive thing makes a person more relaxed and a relaxed person is better at problem solving than a tense one..”. In this perspective the design process has to be addressed to define an interactive environment embedding an atmosphere able to triggered positive and confident emotions in the user during the interaction with the elements of the system and interpreted according to her/his culture, interests, and context of use.

Moreover the process of finding new interaction strategies by inferring, from a semiotic point of view, allows to recovered emotions by previous interaction experiences.

New devices develop great complexity of behavior and some simple theory on what people know may be useful. A conscious consideration of what we are expecting from the people for whom

we are designing is essential. To help the designers in doing this, they drew upon philosophy, ontology and epistemology, with special reference to the studies of Flores and Winograd [14] who argued forcibly that the time for an alternative orientation to be introduced was coming, and that the rationalist tradition has to be over passed. In general these ideas put together mind and body, action and experience. As Winograd [14] said “every representation is an interpretation”, interaction design needs a language, language is an action and we create our world through language. Winograd further shows how it is possible to move from a rationalistic point of view to a heideggerian perspective in the new conception of computer design interface.

Heidegger declared that cognition is not based on a systematic manipulation of representation. The interpreter and the interpreted do not exist independently: existence is interpretation and interpretation is existence. Interface interaction tools enable human beings to act inside a virtual space. “In order to act we need the body knowledge”. Dourish [4]. In the body, in the experiences of the body, which is not to be separated from the mind or feelings, we will find the memory and the inference related to our experience... Peirce [10]. Moreover the contribution of Arieti [1] and the underlie psychoanalysis studies made clear that “every concept has an emotional equivalent” so in creating the general atmosphere of interaction emotional aspects can be used to improve the interaction.

3. BLENDING ATMOSPHERE DESIGN

This new model of interaction design propose the blending of different creative design techniques, in which some elements like: awareness, group cooperation, semiotic inferences and mainly balance in design contributes to define a creative product that embeds a pleasant atmosphere supporting successful interactions. The blend theory, or “conceptual integration” is an operation that is applied to two input spaces, which results in a new, blended space. The blend receives a partial structure from both input spaces but has an emergent structure of its own, not provided by the inputs.

The blend is a theory of knowledge and allows inferences and creative process. Along this research I used the term blend or blending referred to blending theories developed by Fauconnier and Turner in 2002 stemming from the studies of Koster in 1964 and recently used in HCI by Imaz and Benyon [6].

During the experiment I used the blend as the result of input 1 (classical/functional design) and input 2 (blending/creative design).

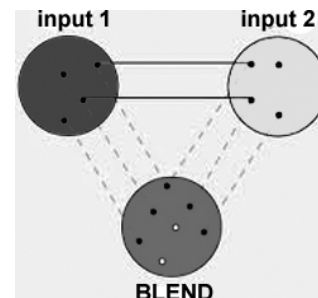


Figure 3, the blend by Imaz and Benyon [6]

3.1 Experiment: atmosphere design lessons

As a general method the Wallas’s model [13] of creative process described by Arieti [1] was used and the experimental lessons were divided in four phases: 1. preparation, 2. imagination/incubation 3. illumination, 4. develop-testing.

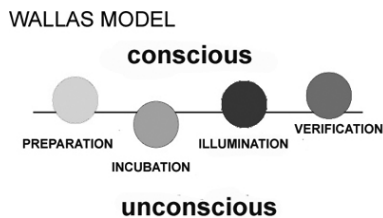


Figure 4, Wallas model [13]

3.1.1 Preparation. The aim of this phase is to make the students familiar with atmospheres already adopted in others design projects. Each competing product has to be analyzed in order to highlight its strong points, its weak points and should be described both from a user and from an expert point of view. This means that each student should first test the product identifying her/himself in a targeted user profile and then test it again using her/his knowledge in her/his domain of expertise. Finally, each student is asked to balance her/his personal results and to explain them to the others. The preparation was also an awareness building exercise. On this first meeting the students had to make a working group, by role playing three experts (software developer, graphic designer, content architect) and designing a comfortable virtual atmosphere for the users. In order to develop the awareness of each area of expertise and make the students see how different their own points of view, and those of user and designer, can be, Verplank's division (do-feel-know) was used. The design balance of these 3 aspects results in a good atmosphere of interaction, but they also highlight that the FEEL aspect was used less than the others.

3.1.2. Imagination/incubation. In order to understand the meaning of atmosphere and the "awareness of atmosphere concept" better, some simple exercises were used. The students listened to music, with which they had to associate an adjective and then express those adjectives in images. Each of them came up with different ideas as to the meaning of the music and thus the feelings, emotions, atmosphere associated with it. Some of these ideas were very different while others were very finely *nuanced*. It became clear that atmosphere is a cultural, personal and mostly experiential phenomenon. How can this problem be solved? Starting from basic human emotions, sensibility and feelings, three creative techniques were chosen to stimulate ideas about a sensible communication atmosphere.

These were the creative techniques chosen:

- a. Munari [8] theory 'Costants of Munari';
- b. Dix [3] technique about 'Bad ideas' breaking rules means understanding the rules;
- c. Osborn classical 'Brainstorming' session.

For the whole lesson new ideas were generated and refined which were then left to incubate for two weeks. The main goal was to develop the imagination regarding bad or good feelings.

a. Munari [8] identified some creativity constants that characterized the creative design processes, these constants are the basic operations made by the human brain using memory.

These constants are:

- Reverse of a situation using opposites and complements.
- Multiplication of the elements in a set.
- Creation of new relations between elements in a set.
- Change of colors, context, materials, function, dimension, etc.

- Merge of more things in a unique one.

At this stage in the creative ideas definition phase, the students are invited to apply the Munari [8] constants to the bad ideas formulated at the previous stage.

b. Dix's bad ideas [3]: this technique starts from the basic assumption that in order to learn how to apply new rules they should be first broken. In fact, to apply bad ideas helps at immediately understand which functional needs are strongly required. Following Alan Dix's bad ideas technique, students proposed some ideas that are considered bad in that they produce negative effects if adopted in an interaction design process. These ideas are devised starting from experiences gained during the previous phase. Combining comparative analysis of competing products and the basic features of the atmosphere characterizing the domain context in which the project is grounded, the students identify bad design solutions.

c. Osborn classical brainstorming, this is the core of this phase, at this stage, each student is involved in defining creative ideas according to her/his skills, background, and culture. Moreover defining creative ideas, the students find new solutions for embedding in the environment a positive atmosphere able to support the user in her/his interaction activities. Therefore, the proposed design model has not the aim to design a full usable system but a satisfactory and pleasant environment according to the user's expectation and wishes. During the brainstorming the students transform the creative ideas in creative possible solutions according to the specs of the system to be developed. In this phase, the collaboration of technical and non-technical experts is very important in order to design a working solution according to the atmosphere features detected in the previous phases.

Incubation phase: between the design and the development of the system, a period of two weeks is granted to the students. In this period of time they are invited to reflect on the work done so far and to think on its further development.

3.1.3 Illumination-development: each student presented the final ideas with the aim of negotiating meaning in the group. After the presentation each of them refines the prototype and uses insight for the next development.

3.1.4 Develop-testing: during this development phase the more technical experts (designers, software engineering, HCI experts) are involved in the development of a set of prototypes, each one evolving the previous one, in a cycle that leads to the release of a candidate final system.

4. BLENDING DESIGN MODEL

During all this research clearly has emerged the centrality of some themes: i) the general concept of interaction design as a balance of elements that were identified by Verplank [12], Veen [11] and Cooper, [2] ii) the concept of creativity and how creative process are related to ideas and awareness iii) the concept of *endocetto* as no-verbal activity emphasized by Arieti [1] iv) the Peirce [10] concept of inference tied in with previous experience and finally all the possible relationships between these concepts and user's emotions. The ontological aesthetic of the atmosphere could be seen from different point of views; a mix of perception, knowledge and embodiment (Aristotle: quality and attribute); a collection of cultural and personal experiences which build an encyclopedia of signs Eco, [5] a process of acknowledgement; a familiar way of communicating; a personal state of 'being in the world' in the *heideggerian* vision or a phenomenological situation closely related to memories, experience, inferences, emotions and sensibilities.

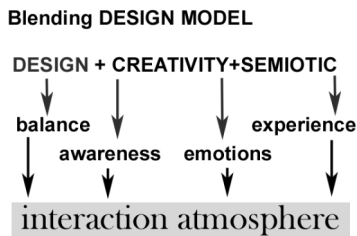


Figure 5, Blending Design Model

As in architectural design, the concept of atmosphere is related to a space. A virtual space gives us special feelings, most of which are related to functionality because they involve the achievement of our goals. The users reach the goal in different ways through personal knowledge, remembering previous experiences (inferences) or through intuition and insight. Blending design model is only a starting point to analyze how to develop new design styles “*digital artifacts and people are evolving rapidly, the blending theory in place of methods provide debate and critical analysis*”. Imaz & Benyon [6].

This model should be used for digital ambient in the field of mobile application and m-learning in order to design visual interfaces embedding positive previous positive experiences.

5. CONCLUSIONS

This research set out with one simple hypothesis that design should be improved by emotional aspects and to do that we used some creative techniques.

We found that using a blending style, focused on building a better interaction atmosphere, emerging from the balance of the aspects (do-feel-know), the interaction seems to clearly improve.

I have done the experimental lessons in Udine University with the goal to propose and evaluate two different design style (1.classical/ functional and 2.blendig/creative) applied to the same interface web application. Of course these results are limited to the web interface and cannot be generalized but I feel very important for the future to investigate the concept of interaction atmosphere in depth.

This research opens up new insights on several fronts:

a. New design styles that offer the possibility of including experimental setup dedicated to the integration of the three project areas by promoting team with multi disciplinary consequences also in teaching. The use of blending design style as a mixture of different techniques, it is really very large, therefore, this research represents only a starting point, or rather the beginning of a viable.

b. Definition of a general atmosphere of interaction as a set of different elements. In his more theoretical aspects, the intention is to contribute to the evolution of the concept of effective communication (now composed of usability, accessibility, ergonomics) in order to integrate it with the concept of a general atmosphere of interaction, where the former is always bound to functional aspects (related to the achievement of objectives) and the second lets you interact with situations more complex, involving both emotional and unexpected use.

c. New perspectives in the evolution of types of evaluation to be dedicated to different aspects of the interaction. Future development of semiotic analysis in evaluations by introducing

aspects dedicated to the concept of ‘ interaction atmosphere’ in order to achieve a more articulated the concept of atmosphere.

The technological landscape offers us new possibilities, the boundaries between hardware, software and services are blurred, the products in the network have already deployed their generative potential radically changing our lives and other new ideas will continue this transformation.

Over time the body experience Dourish [4] will be incorporated in the use of increasingly mobile and smart. This research in designing for mobile technologies: smart phone, pod, pad, tablet, etc., defining new criteria for emotional design activities at multiple interface levels.

The atmosphere quality is linked to the quality of inferences, activated by interfaces, to past experiences and emotions that they are capable of arousing and making choices.

During the interaction the decisions processes triggered by visual interfaces should be improved by a positive ‘interaction atmosphere’ but of course more accurate experimental lessons are required in order to obtained a successful blending design style.

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