TOOL FOR DESCRIPTIVE ANALYSIS OF VISUAL ELEMENTS IN PORTABLE DEVICES

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1 Context

The popularization of digital artifacts, especially handhled and portable, brought about new fields in Design theretofore almost unexplored. These devices have a particular form of interaction through gestures and communicate information to users in different ways, using mechanisms not so common in computers. It was chosen the domain of digital games given the amount of visual elements employed and the aspects of interaction and communication that are crucial to the quality of user experience.

This study aims to foster a critical body in this field encompassing issues of information design and interaction design in handhled devices. The objective of the research is to develop an analytical tool that can observe the occurrence and identify which visual elements are most prevalent in certain functions such as browsing, instruction and interactive communication. It is also intended to understand which characteristics of various types of visual records are better suited and in which situations they are more efficient.

This study employs descriptive qualitative research to analyze not the aesthetic aspect, but rather the informational process of visual elements. It is used the inductive method with systematic observation of visual components. This study is part of a dissertation research developed in the Post-Graduate Program (Master's level) in Design at *Universidade Federal do Maranhão* (UFMA) and it is in a validation stage of the tool. What is presented herein is the pilot test with analysis of seven different games.

This paper is organized as follows: classification of visual elements, definitions of digital devices and portable games, structuring information, definitions of the basic functions of the visual language and finally the analysis of digital games on handheld devices.

2 Method

The study has been conducted in three distinct stages, each of which employs specific methods. Firstly, a literature search was performed in order to define which visual elements and interactive functions would be observed.

The visual elements were defined based on Twyman and Santaella (2005) classification, as follows:

- Pictorial Representation - These images are intended to mimic the objects of reality. According to the degree of realism and social conventions was subdivided into:
    - Figurative
    - Non-figurative
    - Representative
- Schematic Representation - It employs images related to graphs, charts and diagrams.
- Verbal Representation – It employs text and words.

Interactive functions have been defined by adapting work of authors such as Pressman (1995), Xavier (2010) and Cybis (2010) and establishing the following functions:

- Navigation - displacement in the virtual space in the game. The user's interests drive this shift, which in the case of digital games is to reach the next stage of the game.

- Instruction - activity to teach the player about the elements of the system, allowing him/her to learn how to control the components present.

- Interactive Communication - input and output devices, and it may happen through graphics or gestural elements.

Each function has different interaction tools in order to improve the efficiency of the relationship with the user. This study relates the visual representations with three interactive functions to develop the analytical tool.

Once defined the elements and functions, the second phase of the research aimed to structure and systematize the analysis tool. It was decided that such a tool would have a quantitative approach, measuring the presence or absence of visual elements in interactive features.

The quantitative approach could be compared with literature in order to verify which visual elements are most employed in each function, which strategies are most used and possible impacts that these cognitive elements and strategies would have on user interaction.

Finally, in the third stage, a pilot test of the tool was conducted in order to verify possible flaws and to validate the steps of observation and measurement data.

3 Results

Seven digital games were selected, according to the success in their respective categories, all of them available at the Apple's *App Store*. This test allowed us to make some initial considerations such as:

- Structures that show the visual displacement may allow better visualization of the position of the elements, since the mobile user divides his/her attention with other devices, tasks and environments.
- Strategy instructions that are close to the interactive environment are more efficient in the learning process.
- Gestural controls that do not employ visual elements in the interaction can have positive impact on the cognitive overload of the user.
- Verbal language is the main type of means employed. This fact can be explained by the concise nature of the language.

4 Conclusions

The pilot test was considered satisfactory in proving the effectiveness of the tool in analyzing visual elements as well as raising some questions about the efficiency of records concerning navigation, communication and education.

Despite having analyzed a small sample of the universe of digital games, some observations deserve further investigation, such as:

- The assessment of virtual displacement by carousel, which may indicate some advantages of this strategy over other ones.
- The navigation maps can generate a lower cognitive load compared to other navigation strategies.
- The instruction that occurs in the context of the game can be more effective.
- Gestural controls may become a trend in handheld gaming since they require fewer visual elements, thus reducing cognitive effort.
- Verbal language is prominent in digital games and the pictorial elements that stand out among the others are those that abstract visual qualities such as color, texture and volume.

Preliminary conclusions indicate that, in the context of digital handheld gaming devices, visual elements tend to employ graphic qualities in order to reduce the cognitive effort of users.

As further work, the aim is to increase the sample of games analyzed in order to confirm the hypotheses detailed here and following conduct an experimental study to assess the effectiveness of each element in the context of digital games, comparing data from different research.

5 References

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