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USABILITY PRINCIPLES AND MEASURES FOR THE DESIGN OF A PRODUCT APPLIED TO THE DESIGN MANAGEMENT

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1. Context

Design products suitable for its users since your conception, taking into account not only its features and performance but also the users comfort and its satisfaction, it is a essential requirement and a challenge as well. The usability can bring principles and measures that can help us with this process.

According to ISO 9241-111 "to plan for usability, as part of a design and development of products, involves a systematic identification of requirements for usability, including usability measures and verifiable descriptions within the use context. These in turn provide project targets that support the verification of the resulting design." For the development of the design management tool, it will be considered the steps of product design process for usability proposed by Jordan2 . Further, we follow the ISO 9241-111 usability guidelines and the usability principles of Jordan2 that guide how each item can affect the usability of an interface.

The goal of the research was to establish usability measures and principles for the design of a design management tool that reach the users needs of this context. Through a mapping of the design management Silva3 raised the first users needs in relation to a tool which aims to improve the environment and facilitate the control and the access to information concerning the plans, objectives and strategies of the com-

pany. From this, this research seeks for establishing the usability measures and principles to develop a tool that helps us with the solution of specific problems.

2. Method

The research here considered is characterized as applied, with a qualitative approach and exploratory aim4 . With relation to technical procedures, its a case study in a small-sized design studio placed in Florianópolis with ten employees. This study is a continuation of a survey conducted by Silva3.

Data gathering was from September 2013 to November 2013. The participant observation procedure listed information about the tool usage context. The procedure of focus groups, defined the purpose of the tool, the usability requirements and the usability specifications2.

3. Results

The results include the objectives and the use context specification users and their tasks, equipment and the environment of the design management tool for further specification of usability measures and principles. The tool usage context has not include in the results of this short paper.

The objective was to design a support tool to design management that manages all process stages. This was considered from the conception of strategies for development of design projects to their final stages delivery and return on customer satisfaction with the product or service performed. Furthermore, this tools aims to facilitate the work of the components of design management, especially the design manager and the designer, who perform most of the practical tasks concerning the design management. Finally, the tool will try to make the design management more effective expedite the process, efficient bring higher quality to the process, lower incidence of errors etc. and bring greater satisfaction in performing the tasks.

Usability measures were defined from the tool's objectives, according to the guidelines of the ISO 9241-111 . For each item of the tool's goals, requirements have been generated for effectiveness, efficiency and satisfaction measures (table 1).

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Usability objetives	**Ef cacy measures**	**Ef ciency measures**	**Satisfaction measures**
- Facilitate control of all design steps	- Percentage of completed tasks on the rst try - Percentage of tasks completed and documented	- Time entering information on the rst try	- Voluntary adherence rate
- Facilitate the work of the components involved in design management	- Percentage of users completing tasks successfully - Percentage of tasks	- Relative ef ciency compared to management without the use of a system	- Frequency reuse - Frequency of access to the system
- Expedite the process	- Percentage of time performing the tasks reduced by the use of the system - Number of tasks reduced by the use of the system	- Time spent in lling out information using only a management tool	- Satisfaction rate in relation to the runtime of the tasks in the system
- Facilitate and improve the design process	- Reduced number of errors	- The steps runtime	- Scale of satisfaction in relation to facilitating the work
- Reduce the incidence of errors	- Percentage of errors corrected by the system	- Time spent by errors	- Stress rate by forgetfulness
- Bring greater satisfaction in implementing design management tasks	- Number of tasks in comparison to no management system.	- Time of tool use - Time devoted to lling in forms compared to previous methodologies	- Usage fee - Scale of satisfaction with the tasks are performed using the system

Table 1: Effectiveness, efficiency and satisfaction measures for usability
Source: Adapted from ISO 9241-111

The usability principles of Jordan2, that guide how each item can affect the usability of an interface. The usability specifications contained in table 2 were identified according each usability principle.

Principle	**Speci cation requirements for interface**
1. Consistency	- Similar navigation in different modules and screens; - Iconography and graphic elements with a visual pattern; - Similar sound, visual and textual effects for each activity. Returns of the same category.

Principle Speci cation	**requirements for interface**
2. Compatibility - Use creation / deletion / editing reference of softwares existing	documents in the projects operation; - Use red, green and yellow reference colors to de ne project status; - Usar uma agenda com os dias da semana para mostrar a programação dos projetos pessoais; - Use a calendar with the days of the week to display the personal projects schedule.
3. Consideration of user resources	- Ability to use by people with reduced mobility and deafness; - Use visual stimulus to attract attention to important events on screens with lots of information; - Consider users with intermediate to advanced experience in the use of digital systems; - Remind the user about actions or activities that need attention in the term, the lack of integration of information, the excessive hours spent etc.
4. Feedback - Provide a return after executing actions (audible, visual and / or	textual);
5. Error prevention and recovery	- Possibility to reverse actions inadvertently taken; - Message con rming actions with decisive results (exclusion, Close Program etc.); - Provide explanatory about buttons actions for user education; - Use relevant terms and icons for the actions taken.
6. User control - Possibility	of user interface customizing.
7. Visual clarity - Synthesize	of information and menus through iconography; - Use of relevant icons to the actions and to the context of the users; - Use of graphics as shapes, colors, hierarchy, rhythm etc. as a synthesis information.
8. Prioritization of functionality and information	- Use reduced amount "clicks" to reach a certain information (at most 3 levels); - Sectorial and rank information through visual resources.
9. Appropriate transfer of technology	- Use of free programming language; - Develop an open source system; - Using models of existing free apps.
10. Explicitness - Use the same terms of the activities performed	without a system, for the same tasks in the system; - Use of analogies with other systems, like softwares to intermediate users (email, text editor, web sites etc.); - Self explanatory commands through dialog boxes.

Table 2: Usability requirements specifications for the interface
Source: Elaborated by authors

4. Conclusions

From the collection of the information of the use context, the requirements provided by the usability measures and the requirements specifications derived from usability principles is intended to devise a tool that brings comfort and usability of the users in the design management context. In addition, it is expected to provide higher quality in the development of activities and reduction in run time, through the organization and monitoring of projects, strategies and tasks.

This research aims to study other design management cases for the tool to be applicable in other situations and environments, such as non-profit design small groups, design departments in companies, design junior company, among others. Thus, the research can extend their reach and cover different contexts of use.

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