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On the Relationships between Norms, Values and Culture: Preliminary Thoughts in HCI

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Abstract. Different studies and initiatives have indicated a new moment in the Human-Computer Interaction field that requires it to consider aspects that are difficult to be identified, such as values and culture. However, these aspects have been traditionally left on the margin of approaches for technology development, and still demand investigations on how to effectively deal with them in design activities. In this paper, we consider the concept of Norms as a promising concept to advance the understanding and knowledge on this topic, and draw on a socially aware perspective to the design of information systems, presenting preliminary discussions on the concepts of norms, values and culture, and their possible relationships, as a first step into a norm-oriented perspective for values and culture in HCI.

Keywords: Norms · Organizational Semiotics · Values in Design · Culture in Design · Information Systems.

1 Introduction

Every technology triggers (positive and/or negative) impacts on the environment in which it is inserted and on the people who live in this environment — even if they do not use it directly. Ubiquitous Computing, Wearable Computing and Social Software are some examples of how Information and Communication Technologies (ICTs) have permeated all aspects of personal and collective life. In this sense, the task of designing interactive systems has assumed new dimensions in terms of complexity and has required a wider and deeper understanding of the ethical and social responsibilities of those who create them [12].

Different studies and initiatives intended to identify, discuss and inspire the research in Human-Computer Interaction (HCI) have indicated a new paradigm, or wave, in the area [1][5][8]. This new moment requires HCI theories, methods and practices to be rethought in order to consider aspects that are difficult to be identified, such as values and culture.

Values are culturally built [13], varying in meaning, importance and priority according to the culture being analyzed and across time and space. Therefore, although there

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are some universal values, it is possible to say that values cannot be properly understood outside their cultural context: while a value indicates what is important for people, culture explains why [12].

The (lack of) consideration and implication of values in technology are usually too subtle and only noticed when a social rule is violated, a behavioral pattern is broken, or a conflict of interest arises. The lack of attention to values and the complex cultural context of people have led to the creation of products that are not suitable to their needs and expectations, that do not make sense to them, and that often generates undesirable side-effects.

In the literature, there are relevant works on values and culture that discuss the design, adoption, use, and impact of technologies, the relationship between culture and usability, and that address the involvement/concern with values during design activities [6]. However, there is still a lack of studies that support the explicit and articulated involvement of both values and culture throughout the design process, helping designers to deal with them, reflecting them in their design decisions and products. From the perspective of the Semiotic Onion [16], there is a need for investigation on how to deal with values and cultural aspects not only in the informal layer, but also in the formal and technical ones.

In this paper, we start discussions about the potential of norms for supporting the understanding, involvement and formalization of aspects related to values and culture in the design of information systems from a HCI perspective. These discussions are grounded on different theories on norms, values and culture, as well as on practical examples. The paper is organized as follows: in Section 2, we present the background and a brief discussion on the concepts of values and culture, and in Section 3, we present different types of norms related to these concepts. In Section 4, we draw on the Value Pie artifact to exemplify different perspectives for the relationship between norms, values and culture, and in section 5, we present our conclusion and suggestions for future work.

2 Background

The ACM (Association for Computing Machinery) defines HCI as "*a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them*". This definition represents the complexity and comprehensiveness of the area, and attributes to HCI the responsibility to consider beyond technical issues, the formal and informal ones that coexist in society.

Aligned with ACM's definition for HCI, Winograd [21] asserts that the role of an interactive system designer goes beyond the construction of an interface to encompass all the interspace in which people live, and argues that it is necessary a shift from understanding the machinery to understand the lives of the people using it. This shift is key to the new moment in HCI that have been indicated by authors, such as [1][5][8][15], and results in a quite different perspective for the design of interactive systems, where technical issues play only part of the role, and not necessarily the most important one.

Such perspective have been proposed and explored by Baranauskas [3][4] for more than a decade through her social perspective to the design of interactive systems, often named as "Socially Aware Design". Baranauskas recognizes the existence of three levels in which humans operate and understand the world: the informal, formal and technical. These levels were introduced by Hall [7] and structured by Stamper [16], through the Semiotic Onion (Fig. 1.), in order to explain how these levels exist in the context of organizations and information systems. The informal represents the culture, values, habits, beliefs, behavioral patterns of people and other aspects that are usually difficult to describe and even identify. The formal represents aspects that are well established and accepted, becoming social conventions, norms, or laws. Finally, the technical represents aspects that are so formalized that can be automated or approached in a technical way.

Grounded on Organizational Semiotics [9] and inspired by Participatory Design [14], Baranauskas [2][3][4] brings to HCI the understanding that any technical system exists in the context of a formal system that, in turn, exists in the context of an informal one. In this sense, a design process that is centered in technical aspects ends up giving little (or no) attention to the formal and informal aspects of organizations and the society, preventing designers from a wider sense-making of the problem being handled, the solution being designed, the stakeholders involved and the complex social world in which they live. Therefore, positive and negative effects on the formal and informal layers are completely undefined and unanticipated, leading to solutions that frequently do not make sense to users and trigger negative side effects on them and on the environment in which they are introduced.

Friedman [6] argues that, although the neglect of values (and here we include culture) in any organization is disturbing, it is particularly damaging in the design of computer technology where we can hardly disagree and negotiate about values and their meanings. In fact, as Hall [7] indicates, the technical system is where one can introduce changes with the greatest ease. However, as Baranauskas [2] indicates, the degree to which the system will respect or violate the *norms of the informal and formal systems* depends on how much these levels were understood.

In her socially aware design, Baranauskas [2][3][4] recognizes design processes as a movement that begins from outside to inside the Semiotic Onion (see the dashed arrows in Fig. 1.), crossing the informal and formal layers of signs towards the construction of the technical system. This movement favors the identification, articulation and formalization of relevant aspects of the social world, such as the ones related to stakeholders' values and culture. Therefore, when the movement returns, the technical system will impact on the formal and informal layers and on the society in an informed way, reflecting an understanding of the social world, potentially making sense to users, promoting its acceptance and adoption.

Adopting Baranauskas perspective, Pereira [10][12] proposed and experienced a set of artifacts to support the consideration and involvement of aspects related to culture and values in different design activities: from the identification of stakeholders, to the clarification of requirements and the evaluation of the resulting interactive system. Results obtained from different case studies recognized the need for further studies to support designers in the representation and formalization of such aspects, suggesting norms as a promising concept to be considered.

The three main words in this paper, "Values", "Culture" and "Norms" have been used in many senses, often with an unclear meaning. Each one has been the main concern of researchers from different disciplines, being approached and investigated for and from quite different perspectives. Therefore, we are not looking for an ultimate definition, and do not intend to unify the different interests and understandings around these words. Instead, we are presenting one possible view for them, which may support their consideration in the design of information systems from a HCI perspective. In the next sections, we introduce the definitions we are adopting for each one, and develop a discussion about the relationships between them.

2.1 Values and Culture

In HCI, Friedman [6] have adopted a broad understanding for value, defining it as something that a person or a group of people consider important in life. This understanding goes beyond the notion of moral and ethical values, allowing additional notions (e.g., personal values, technical values). The key point we highlight in this understanding is that it opens space for considering (and inquiring) not only what theories and formal definitions determine as values, but mainly what people think about when they are thinking about values.

However, a more elaborated definition may be useful to support our discussions. According to Williams [20], the word "values" has been used to refer to interests, pleasures, preferences, moral obligations, desires, goals, needs, etc., reflecting a kind of selective orientation where the core phenomenon is the presence of criteria or standard of preference. The author defines values as core conceptions of the desirable within individuals and society that serve as standards or criteria to guide not only action, but also judgment, argument, evaluation, choice. This definition encompasses Friedman's aforementioned understanding and is the one we consider in this paper.

Stamper et al. [17] assert that people's systems of values are largely determined by their culture or subculture. Different authors, such as Hall [7] and Rokeach [13], recognize the cultural nature of values, arguing that their importance and roles vary strongly according to the culture being analyzed. In this paper, we adopt Hall's [7] understanding of culture, which refers to people's attitudes, material things, and learned behavioral patterns, representing the very different ways of organizing life, thinking, and understanding basic assumptions about the family, the economic system, and even the mankind. For Hall, culture controls the behavior of people in deep and persisting ways, many of which are out of their awareness, being the link between people and the means they have of interacting with others.

When talking about culture, Hall [7] believes it is more important to look at the way things are put together than at specific theories, suggesting that, although it is useful to question about specific situations, understanding the cultural context in which people live, the way they interact, and their behavioral patterns can offer more information than looking at pre-defined hypothesis. In this sense, the author proposed 10 Primary Messages Systems (PMS), or areas, he named the basic building blocks of culture (Interaction, Association, Learning, Play, Protection, Exploitation, Temporality, Territoriality, Classification, and Subsistence), arguing that any culture could be characterized, analyzed and compared through a combination between these areas

(e.g., in a 10x10 matrix). Hall also suggests that values are developed according to these areas and their combination.
According to the exposed above, one may consider that: 1. if values are core conceptions of the desirable, and these conceptions are culturally determined, then, the desirable is not only influenced by what is taught, verbally communicated and explicitly identified in a society, but also by time and space (and their role in people's lives), socioeconomic conditions, and the environment characteristics (e.g., climate, natural resources). 2. If values serve as standards to guide action, judgment, argument, evaluation, and choice, then, they may act as a specific kind of force that make "*the members of a community tend to behave or think in a certain way* [17]", i.e., a norm.

3 Types of Norms

The OS theory considers an organization and its information system as a social system in which human behaviors are organized by a system of norms [9]. Norms are a key concept in OS, being understood as collective constructions of agents at the social level, providing guidance for their actions. Among the methods offered by the OS there is the Norm Analysis Method, which supports the study of an organization from the perspective of the behavior of agents that are governed by norms, and that makes it possible to specify the studied organization by specifying norms.
Stamper et al. [17] argue that the shared norms are what define a culture, or a subculture, presenting and explaining different taxonomies for norms: 1. formality (informal, formal, technical); 2. Social psychological (perceptual, evaluative, cognitive, behavioral); 3. Kinds of tasks (substantive, communication, control). From these different kind of norms, the Evaluative Norms are considered the most basic ones, being directly related to people's system of values and influencing people's behavior (e.g., action, judgment, argument, choice). However, understanding evaluative norms, the way they interact with other kinds of norms, and representing them are still issues that demand further investigations.
In his book "Norm and Action", von Wright [19] developed a deep discussion on norms in general, exposing the complexity of giving a definition for the word norms, focusing on norms related to actions, and distinguishing between three major groups of norms: 1. rules, 2. prescriptions, and 3. directives. Briefly, 1) Rules are regulations or principles governing conduct within a particular activity, such as the rules of game, grammar, and even logic. 2) Prescriptions are commands, permissions and prohibitions, such as the laws of the state. 3) Directives are also understood as technical norms and are concerned with the means for reaching an ending, such as the instructions that will take the person who follows them to a specific result.
Additionally to the three major groups, three minor groups were introduced by von Wright [19]: i) customs, ii) moral principles, and iii) ideal rules. These groups may be related to one or more of the major groups, and can help us to discuss more about evaluative norms.
Customs determine certain patterns of conduct, exerting a normative pressure on the members of a community to follow them. They can be understood as social habits that are imposed on the members of a community rather than acquired by them individually. For instance, if a person is late for a meeting, it may be a custom he or she to apol-

ogize to the other participants for being late. Whether the apology happens, its intention (inform, explain, justify), in what moment (when the person arrives, at the end of the meeting) and in what way (gestures, voice tone, vocabulary) it happens, etc., reveal additional cultural norms.

Moral principles enter in the realm of ethics and, therefore, require a deeper and critical discussion that is out of the scope of this paper. The key point suggested by von Wright [19] is that moral norms are "conceptually autonomous", standing by themselves, and having complicated relationships to the other kind of norms and to the (value) notions of good and evil. For instance, introduced in 2010, full body scanners at airports produced livid naked pictures of people. In several countries, the concern with the possible ethical problems triggered by these scanners resulted in different movements and actions: in United Kingdom, these scanners conflicted with child protection laws that ban the creation of indecent images of children [18]. While no one could argue against the possible evil consequences of producing and storing images of naked people, prioritizing people's security and well-being for the common good (e.g., against terrorism) was often used as a justification.

Ideal rules, in turn, are not directly related to actions, i.e. something to be done, but to the nature of being (or not being). Ideal norms are usually related to the idea of goodness, and unlike moral rules that are related to moral action, they set a pattern of what is good (the characteristic of being good). Ideal rules apply to people, organizations, as well as classes and objects, allowing us to say they apply to both agents and affordances. In the example of full body scanners, ideal norms would not define the properties or behavior of every scanner, but the ones that would characterize an ideal body scanner.

One may develop extensive discussion about these three minor groups of norms, bringing innumerous examples and exceptions. However, we can highlight two common points shared by these minor groups: 1) the existence of relationships with the major groups and between them; and 2) the idea of the desirable and, therefore, the link to the notion of values – what allow us to talk in terms of evaluative norms.

In von Wright's theory [19], the author argues that to understand the nature of moral norms is not to discover some unique features in them, but to survey their complex relationships to a number of other things. This may suggest that understanding evaluative norms is not to specify and represent their unique characteristics, but to recognize and understand their possible relationships to the other kind of norms. In the next section, we draw on the Value Pie artifact to expose practical discussions on values, culture and norms.

4 The Links between Values, Culture and Norms

The Value Pie (VP) is a culturally informed conceptual scheme for guiding discussions on values and culture in design [11] [12]. The VP was built on the grounds of Organizational Semiotics [9] and the Building Blocks of Culture [7], presenting three layers and ten slices that organize and support the discussion about values according to their dominant level of formality (informal, formal and technical) and cultural nature (Hall's 10 areas of culture) — see Fig. 2. Formality means that values are mani-

fested on one of the three levels, but have aspects to be considered in all the three simultaneously. Cultural nature means that values are developed according to an area of culture, and with possible intersections between different areas. In [12, 10], the interested reader can find additional discussions and examples of values according to the VP and its dimensions.

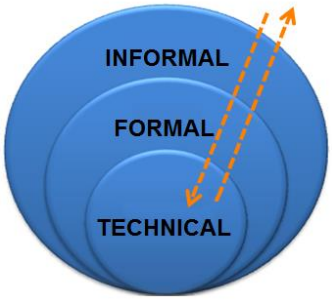

Fig. 1. The Semiotic Onion.

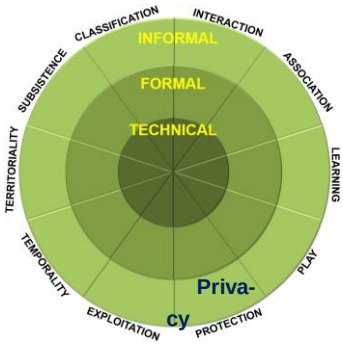

Fig. 2. The Value Pie. .

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According to the notion of "privacy" given by Encyclopedia Britannica: "*the quality or state of being apart from company or observation; freedom from unauthorized intrusion (one's right to); a private matter*", one may see it was a value developed in the VP's "Protection" area, reflecting the importance of protecting personal information, things, ideas etc. — see Fig. 2. Because the areas of culture interact with each other, it is natural their values to present aspects developed from the intersection among them. For instance, when privacy refers to the protection of space (personal, social, physical), then it has a clear relationship to the "Territoriality" area.

Furthermore, what is necessary or expected to protect and why, what are the means to protect it, the extension and limits of privacy, and the importance given to it are examples of aspects that differ strongly according to the culture being analyzed. People from different cultures have their own informal understanding of what privacy is, as well as its meaning and importance. There are social protocols, conventions, rules and laws that are formally established to define the limits and guarantees of an individual's privacy. There are also some facets of privacy that are so formally accepted that can be technically supported, such as a curtain to cover a window, the wall for restricting the visibility of a house, and the privacy of medical examinations, just to name a few.

Considering Baranauskas' perspective to the design of information systems [2][3], the VP's structure suggests at least two core ideas on norms and values. The first idea is that each value has formal issues to be understood and considered, and that may be represented by norms. Therefore, norms may act as the bridge between the informal and the technical levels, specifying the way technical features should work. The second idea is that cultural areas, their values and, consequently, the norms related to them, are not isolated, but interact with each other in a complex interplay. Thus, if values are not understood in their cultural context, the norms related to them tend not to reflect their role and importance, being supported by technical features that do not make sense to users, do not afford the behaviors they are used to in their social world,

and may trigger undesired side-effects on them and on their environment. Following, we present brief examples that illustrate the different norms we discussed in the previous section, and the way they are related to values and cultures of stakeholders.

4.1 Designing the TNR (Portuguese acronym for "All of Us Networked") system:

In Brazil, public policies for inclusive education created the Specialized Educational Services (SES), in which teachers conduct activities with students in rooms equipped with specialized resources at traditional schools. In order to qualify professionals, teachers from all over the country started specialization courses within e-learning environments, but with a limited period (18 months). After that, teachers must be able to work with students regardless their disability, and have no additional support for a continuing learning. In this context, researchers from Education and Computer Science have been working in a research project, which one of the main goals is to design a social network system for these teachers. This system is intended to support teachers in their day-by-day work in a continuing education process.

The TNR system is being designed with representatives from the target audience in an iterative and incremental style according to Baranauskas' design model [2][3][4]. During all the design activities, artifacts created on the grounds of the VP were used to support the explicit consideration of stakeholders' values and culture. Therefore, the TNR system is a viable context to investigate and analyze the different norms related to values and culture. Following we present some examples.

Customs: participatory activities with representatives from the teachers revealed the concept of "authorship" (property, ownership) as a value for them. Using a teacher's words: "*I understand that a contribution must be edited only by its authors. I think it is interesting a space for discussion, but respecting and keeping the contribution of each member. The interventions/editions in texts created by other people may not be well-accepted*".

In fact, teachers are used to work in groups, exchanging ideas and sharing materials; they believe it is possible to develop better solutions when they work together. However, the identification and the recognition of the individual contribution and participation must always be explicit and preserved. In an information system, they would not conceive the idea of someone but the author modifying an existing contribution (content). Therefore, a collaborative editor would trigger conflicts between the participants: e.g., a user could modify the text typed by other user when adding his or her own contribution. In this sense, a cooperative feature that allows users to contribute to each other but that identifies and keeps the individual contribution would be more adequate.

Norms may be derived from the explanation about this custom and may be represented according to the format proposed by the OS theory [9]. For instance: i) "WHENEVER new data is created in the system, IF it was created by a user, THEN the user must be defined as the data author". ii) "WHENEVER an existing data is selected, IF the user is the data author, THEN the user may update the data."

Moral Principles: because teachers are used to discuss their problems and ideas at their schools, they first did not express concern with privacy: they think it is good to share their opinions and information, and do not see risks in making them available to others. However, they are very concerned about security issues, and start to worry

about privacy when they became aware of the possible impact on their life, or on the file of students and their families. This indicates that teachers believe privacy is important and must be considered, but they usually become aware of that only when a problem or conflict arises. Therefore, the system should be designed not only to protect the stakeholders' privacy, but also to instruct users to be aware of it.
Example of norms: i) "WHENEVER new data is created in the system, IF it contains personal information of others, THEN its author must have the authorization to use the information". ii) "WHENEVER a new content is shared to other users, IF it is publicly available, THEN the user must indicate that the content does not offer risks to his/her privacy and the privacy of others".
Ideal rules: the system's terms of usage were also defined in a participatory way. As a by-product, teachers and researchers identified values that were not being considered in the terms, but that were important to guide the users' ethical behavior in the system (the ideal behavior). Thus, it was created a "Letter of Principles" to make these values explicit at the system home page. Examples of values are: i) Accessibility: the network must be able to attend to the different needs of a heterogeneous group of participants. ii) Autonomy: people may be capable of making decisions, planning, and acting in order to achieve their goals; of controlling the technology and using it. iii) Collaboration: possibility to cooperate, working together for a common goal. iv) Groups (team spirit): participants may work together, with common interests, needs and goals, supporting each other.
Mapping the values listed in the Letter into the VP supports a deep discussion about each one, and provides useful information for their effective consideration and promotion in the TNR system (due to the limited space we will not develop such discussion here). Example of norms: (accessibility) "WHENEVER a new content is shared, IF it is a picture or a video, THEN the author may inform a textual description for it."
The examples presented in this section demonstrate the existence of values related to different types of norms. For each type (customs, moral principles, ideal rules), behavioral norms where identified, indicating a relationship between them. These examples support our previous discussions about the importance of considering the different types of norms and their possible relationships. However, understanding how evaluative norms influence behavioral norms, and how they can be represented is still an issue that requires further research.

5 Conclusion

Considering values and culture in the design of information systems is still a challenge for the Human-Computer Interaction field. Although literature presents relevant works on these issues, how to support designers to deal with them and to reflect them in their design decisions and products are still open issues that require further investigations.
In this paper, we presented preliminary discussions about the relationships between norms, culture and values, offering a perspective to understand these concepts and articulate them. We consider norms as a concept able to support designers to move from informal understandings about values and culture of different stakeholders to their effective involvement and consideration in the resulting technical artifact. We

also suggest that different types of norms interact with each other, and are required to represent different facets of values and culture.

For further investigations, it is necessary both deepen theoretical discussions and to analyze more practical examples. A conceptual scheme to represent norms and their interplay may contribute to clarify the relationship between norms and values, as well as to support the creation of artifacts and methods to carry design activities.

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