Sharing Wishes on Public Displays: Using Technology to Create Social Places

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Abstract. We present a public-display-and-mobile-based digital art installation named WishBoard that translates the essence of a chalk-and-wall based art installation called 'Before I Die' into a technological communal expression. Our studies show that public sharing of personal wishes leverage the connection inside a community, creating a feeling of neutral ground for gathering, giving a sense of third place independent of physical constrains, named thirdplaceness. The installation allows people to freely express their wishes, with certain personalization, and provides a public visualization of all shared wishes promoting face-to-face conversations. We conducted two deployments using our installation in a 'socially abandoned' space. Analyzing the shared wishes content and people's behavior when observing the wishes popping up on the public displays, we were able to notice the essential role that public displays combined to mobile devices interaction can play in creating a community meeting place when providing a way for self-expression.

Keywords. Self-expression, socialization, ICT interactive installation, art installation, public display in social spaces, WishBoard, thirdplaceness

1 Introduction

Expression of thoughts, preferences, and feelings is a common and habitual practice among human beings. This expression reveals people's internal attributes, such as preferences, beliefs, and values. In Western culture, self-expression is valued as a powerful sign of individual freedom in which involves projecting one's own thoughts and ideas into the world [22]. With the rise of social media, new possibilities of expression and communication are emerging. People can keep in touch with friends and family on-the-go through their mobile devices creating new social practices. However, supporting traditional social interaction (face-to-face) is still an important issue in order to support local communities and to avoid its fragmentation [7]. Community fragmentation is a problem that has been increasing due to urbanization and decline of places outside work or family-based communication contexts. Such places, described as third places, provide the feeling of inclusiveness and belonging to a community. Coffee shops, pubs, and squares are typical examples of third places. These places have an important role in promoting quality of life for individuals reinforcing in their

regulars the sense of community [35]. According to Sarason [41], sense of community is "the perception of similarity to others, an acknowledged interdependence with others, a willingness to maintain this interdependence by giving to or doing for others what one expects from them, and the feeling that one is part of a larger dependable and stable structure". This sense has two dimensions: territorial and relation [30]. The territorial dimension has relation with the territory, shared space, and proximity. However, not all cases constitute a community, the relational dimension is also essential. The relational dimension includes factors of nature and quality of relationships.

In order to support such sense of community, we translated the essence of a chalk-and-wall based art installation called Before I Die [10] that promotes self-expression through public sharing into a mobile-device-and-public-display based art installation named WishBoard. This public sharing can leverage the feeling of a neutral ground for gathering and, consequently, a sense of third place independent of place constrains, defined as thirdplaceness and discussed in section 3.

Several studies have used public displays and/or interactive art installations to design a space for self-expression and socialization. In these studies, they found that public displays and interactive art installations can foster civic engagement, place attachment and community awareness [10][13][18][28][29][40]. Moreover, such spaces give people a place and a chance to expose their inner thoughts and feelings in order to express their individuality [7].

In this context, our goal was to understand if a digital art installation, called WishBoard, which allows self-expression, combining interaction between mobile devices and public displays, can support community awareness and thirdplaceness experience. This paper focus on the impact the system had on the sense of community by promoting thirdplaceness in a place that is not a third place, which it differs from others [13][18][29]. To address this, we conducted an empirical study at a workplace to investigate the experience in-the-wild and observe cultural trails in anonymous posts shared. As a result, we believe that public sharing represents a promising model for mobile social collaboration in promoting and reinforcing the sense of community.

2   Self-expression supporting the sense of community

According to Kiesler & Sakumura [21] when people express their thoughts, using words, they may feel more committed to their thoughts and bound by them. They explain that expressing involves aspects of selfhood. Furthermore, the self-perception theory [5] suggests that observing their actions and behaviors is a key way for people to be aware of their own internal states.

Designing tools for self-expression in public spaces has an important role for people in a community, remembering and celebrating their own culture [7]. This public authoring enriches the space by sharing local information, knowledge and experiences [24]. In order to improve people's engagement with their community, interactive public displays and public art installations are mechanisms widely used. Several studies show that public displays can promote place attachment, community awareness, co-located interactions and technology-supported relationships. In addition, public dis-

plays can foster face-to-face human interaction and encourage collaboration among community members [1][10][13][18][28][29][32][40]. Furthermore, public art installations can give people the opportunity to express their individuality and aspirations with their community, improving or creating relationships between them [7]. Regarding to design tools for self-expression, several studies have focused on elements for self-representation in online environments [8][28]. Although, more means to express this dynamic and innate nature of self-expressions in public spaces are essential.

In this context, we have used an interactive art installation that promotes self-expression in a community exploring the interaction between mobile devices and public displays. In addition, this installation creates a space for people to freely socialize supporting the sense of community belonging and thirdplaceness experience, beyond architectural and temporal restrictions.

3   Beyond third places

Third places are places where people gather and enjoy each other's company. Oldenburg [35] describes third places as a means of 'keeping in touch with reality' promoting intimate personal ties outside the home (first place) and workplace (second place). In order to be a third place, the place has to be a neutral ground where everyone is free to come and go, and also, welcome without caring about the individual's status in the society. There is lively conversation inside and it is easy to access. Moreover, there are regulars who shape and bring the place to life, attracting newcomers. The place has no extravagances and the mood inside is playful. Summarizing, it is a home away from home for their regulars [35]. Within these descriptions, ethnographic studies of virtual environments such as chat rooms, multi-user environments and bulletin board systems suggest those settings can often function as a third place [19][43]. However, these virtual environments differ from third places in respect of the 'realness' of the interaction or dependence upon simulation [45]. According to Doheny-Farina [12], a third place cannot exist separate from a locality. For him, this occurs for the reason that a 'third place exists only in comparison to its neighborhoods, to local work, play and family life, to the institutions and formal rituals that encompass daily life'.

Perhaps as a reaction to the disappearance of third places in the physical world, people found in virtual environments their third place [1]. These virtual environments have provided opportunities for people with similar interest to meet both in cyberspace and in face-to-face fostering elements of third places [36]. Nevertheless, both public places (such as third places) and more private or exclusive places have importance in the personal and collective value of social capital [37]. Taking the absence of such informal public spaces, companies spread the idea that their stores are third places, e.g., Starbucks and Applebee's. Despite that, these companies fail to meet many aspects of third places and rarely do patrons engage others in lively, extended and informal interaction [20]. For Oldenburg [35], third places are about civic responsibility and localized community maintenance and revitalization. On the other hand, Starbucks prefers an interpretation of 'third-place-ness' restricted to customer satis-

faction, not civics [46]. This interpretation of 'third-place-ness' involves a set of characteristics of a third place that are often at odds with the social needs of a third place. Considering the need for promoting the sense of being in a third place not limited to architectural constrains of a third place, we prefer the definition of thirdplaceness as the 'event' of achieving the third place's characteristics in a certain place and time.

Thirdplaceness is constructed and sustained through experiences and interactions with and in the place. The thirdplaceness experience can transform a place in a third place-like permanently or just for that period. For example, in a 'happy hour' can occur thirdplaceness giving people the temporary sense of being in a third place. In third places, thirdplaceness occurs very often maintaining and reinforcing in the community this sense of third place. Such places are democratic and accessible, allowing people to discuss politics, the last football game, or the next music festivals, strengthening the notion of community in those people. However, a room full of individuals talking is not a third place [35]. Thirdplaceness has been observed in ethnographic studies, describing that third places can have an emergent nature happening in spontaneous, sporadic and nomadic way, and even in unexpected places, e.g., in a sidewalk [9][31].

Aiming at observing thirdplaceness supported by technology, we designed a technological art installation, called WishBoard [14], in a 'socially abandoned' space. WishBoard creates a favorable space for occurrence of the sense of being in a third place, independent of where and when, a thirdplaceness.

4   ICT for self-expression and contemplation - WishBoard

WishBoard [15] is an interactive art project that invites people to share their individual aspirations with the community. The installation gives people a reason and an opportunity to express openly their thoughts and feelings in a public and common space. WishBoard offers a space for self-reflection, which differs it from similar works, for example, The Facebook Wall [4] as seen in figure 1a, and others, such as, CitySpeak [26], TexTales [1], and Discussions In Space (DIS) [42], that encourage civic engagement through the reflection about the community problems. WishBoard also differs from other installations, such as, "A Wall of Wishes" [44] and Wishing Wall [16] (see figure 1(b) and 1(c)) in the way of engaging people by asking them to complete a fixed prefix about their expectations for the future and presenting the wishes.

Fig. 1. Installations that promote self-expression: (a) The Facebook Wall [4], (b) "A Wall of Wishes" [44], and (c) Wishing Wall [16].

WishBoard translates the essence of Chang's installation [10], consisting of five screens presenting the sent wishes dynamically and the inspiration considered imaginary and dreams, as present in figure 2, leveraging discussions and socialization. Every time a wish is sent, WishBoard creates a typographic art animation displaying the wish on the screens. After that, the sentence 'flies through the clouds' and joins the other sent wishes giving a certain sense of community belonging.
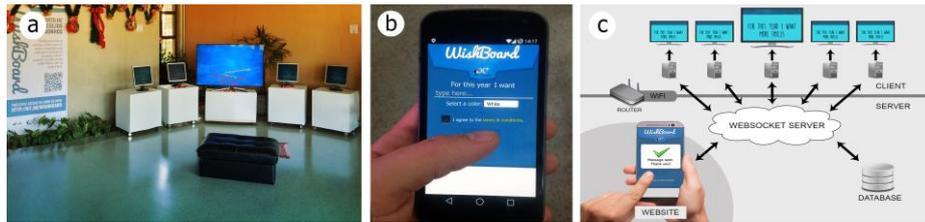
Fig. 2. (a) WishBoard installation, (b) mobile user interface, and (c) the system architecture. Users send an anonymous wish accessing the WishBoard website through their mobile devices. Once this wish is sent, the WishBoard system presents it with an animation on the screen using a WebSocket server to synchronize all screens and exploring the potential of HTML5 and CSS3.

Chang [10] built a public art installation in which people could reflect their aspirations for a life that has an end. The installation consists of a wall painted in black stenciled with a grid of the sentence "Before I die I want to...". Chang observed that the space, once abandoned, became a meeting point in the neighborhood, as shown in figure 3. Moreover, Before I Die affords people to socialize, collaborate, appropriate the space and use, share democratically the space, and express their feelings considering the finitude of life [10].

Fig. 3. A Before I Die installation and people writing on the wall their wishes related to what they want to do before they die [10].

Translating the essence of an art installation needs to consider cultural issues and adaptations for the new context [14]. WishBoard has some adaptations maintaining the proposal of sharing in a public space, promoting individual reflection, supporting self-expression (without identification), and allowing variations (remixes) adapting to other contexts, as presented in figure 4.

Fig. 4. Comparing Before I Die and WishBoard in order to: a) write a message (chalk vs. phone); b) personalize the message (color chalk vs. color font); c) read messages (blackboard vs. public screen).

Before I Die [10] aims at contemplating death to make lives meaningful. On the other hand, WishBoard celebrates life reflecting about expectations for the future. WishBoard also has a keyword-based filter to unsuitable sentences due to the experience reported by Chang [10] about people writing bad things. Such corpus demands future analysis.

5 Study design

Aiming at investigating the audience behavior, we carried out an in-the-wild study using the WishBoard installation in order to analyze collected messages comparing with the Before I Die installation. According to Rogers [38], this kind of study involves deploying new technologies in real-world conditions to observe the real-use of these technologies by people in their real context of use. We conducted this investigation dividing into two deployments using the WishBoard allowing us collect data from messages, spontaneous comments and video recordings filming both the users and the installation. Besides that, one observer was present, in a strategic place, taking field notes without disturbing the normal characteristics of the space. The advantage of using observations, taking notes and recording video, is that users behave most natural making the findings ecologically highly valid. On the other hand, a concern about the privacy of users is required.

In both deployments, we used the lobby of the Department of Computing at [*university's name*], attracting passersby to interact with the installation. In addition, the installation was set following the model of central and peripheral attention [33] and observations done in our previous work. Furthermore, that space is a transitional and socially non-used space, as well as, the space in the first Before I Die installation. Taking the advantage of the festive spirit around the New Year, in the first deployment, we used the prefix 'For next year I want …'. And, in the second deployment, conducted in April, we adapted the prefix to 'For this year I want …'. In both deployments, the installation was available for five days.

In order to create an inviting place and to allow people to interact with the WishBoard, we provided a beanbag (giving a space to sit, talk, and send wishes) and information about how to interact with the installation, as presented in figure 5. Wireless signal was available for people to submit wishes accessing a website with a QR code or a tiny URL.

Fig. 5. People hanging out observing displayed wishes (a, b, c) and (d) using cellphone to interact with the WishBoard public display.

We have used the department' mailing list for informing people of the installation, collecting of data, presence of cameras, and the privacy policies. In addition, before posting a phrase, the system presented to user the ethical agreement on keeping the anonymity of senders and use the content for research only. Moreover, we did not request register information from the participants, e.g., name and email.

6   Behavior Discussion & Wishes Analysis & Cultural Findings

Aiming at observing the impact of the WishBoard deployments in supporting community awareness and thirdplaceness experience, we gather all collected data and we started an investigation of the audience behavior and also the content shared on the displays discussing our findings.

6.1   Understanding the audience behavior

In public space, the efforts in evaluation have been on identifying humans and clustering behaviors aiming at finding unusual behaviors that may help to model human interactions. Automated methods from computer vision as systems to track people sometimes can help in identifying people and audience behavior. However, uncontrolled environment and complicated scenes can decrease the accuracy of these systems [46]. In this work, we manually analyzed fifty hours of recording from both deployments, captured by two cameras, making annotations, coding, and then summarizing the results. Inter-rater reliability was substantial (Cohen's Kappa = 0.75) [25]. We observed the aspects described by Alt et al. [2] basing on a literature survey and their expertise on evaluating public displays installations. The aspects were audience behavior around the installation, effectiveness of the installation, social interaction among users, users' acceptance by engaging and inviting others, and people's concerns about their privacy. For each aspect, we observed some variables comparing the results with the reported in the Before I Die [10] discussing the findings.

Audience behavior
In order to understand how people behave around the installation, we examined our annotations and then we reviewed the recording for a better comprehension. In WishBoard, we observed that users felt engaged in posting a message when they were in a group, about 68% of the messages. Groups formed around the screens started a competition for the most creative message. We noticed many situations in which the audience around the installation progressively increased forming a sociable 'buzz' in the area, creating the Honey-pot effect [8]. Sometimes people stopped late and had to walk back trying to explore/understand more. This effect, known as Landing effect [34], occurred more often when there was no one in the installation or people were in a hurry noticing something different on site.

During the experiment and the analysis, we found in few moments people appropriating the installation. According to Salovaara et al. [39] appropriation refers to the creative ways in which people adapt and repurpose technologies to serve their own goals. In WishBoard installation, people subverted, in a few situations, the installation proposal by sending messages for the immediate present instead of future. For example, '*Para o próximo ano eu quero um café*' (In English: 'For next year I want a coffee'). People began to exchange messages to each other and to joke with each other, e.g. '*Para este ano eu quero que o Lucas realmente trabalhe*' (In English: 'For this year I want that Lucas works really hard'). People sent emoticons and internet slang expressions, e.g., '*hauhauhau*' to express laughs, commonly used by Brazilians.

In the Before I Die, it was common people see drawings on the wall, such as, hearts, stars and rainbows. In addition, people wrote wishes for the present, e.g., in Berlin, a man wrote on the wall that he wanted to eat a strawberry cake and then immediately he entered in the nearest café [10].

These findings suggest that, in public spaces, installations must be prepared for the Honey-pot effect and the Landing effect. In addition, tools for self-expression need to allow appropriation of use, which may be a sign of new uses for the installation, reflecting the necessities of some users. Furthermore, allowing appropriation of use plays an essential role in designing tools for self-expression.

Display effectiveness

Attracting attention with interactive installations is not easy. In public spaces, this is more challenging due many other objects strive for the user's attention [34]. Analyzing the footage, we observed if people looked at the installation, how many stopped and how long they stayed on site, and how many started interacting with the installation sending a message in front of the screens.

In the WishBoard installation, it was evident the passersby turning their head to the installation area attracted by the screens. Some people kept on walking looking at the displays and some people mentioned curiosity in testing the system. In the first deployment, about thirty percent of the passersby stayed in the installation and more than half of these people remained there for more than one minute [14]. In the second one, about one quarter of the passersby stayed in the installation and about sixty percent of these people remained there for more than one minute. We counted approximately 325 users sending messages in front of the screens.

According to Chang [10], with the first Before I Die wall, people paid closer attention to the abandoned house. People started to know more about the place, once forgotten, asking others what happened there and where the house's owners were living.

For achieving effectiveness, attractiveness plays an important role drawing audience attention and engaging them to use the installation, having correlation with to the chosen location for the deployment and the ease of access to the place. However, display effectiveness raises the question of whether the system is sustainable for gaining feedback from the public beyond the novelty factor of the technology.

Social impact

Aiming at observing how an interactive installation could foster social interaction, we analyzed the video recordings and the annotations aiming at finding social experiences as interactions promoted by the installation.

In both deployments, people used the WishBoard space, never used before except to cross the hall, to gather, to introduce themselves, and to talk about their common interests. People democratically shared devices, the pouf and even the floor. The wishes leveraged discussions and sometimes laughs. For example, a group of professors began discussing the wishes shown on the displays and guessing who sent those wishes showing interest in knowing more about the community. We observed people experiencing unexpected encounters with their acquaintances as shown in figure 6. The place became a space for students, professors, employees and visitors to share playful conversations. For example, a group of students was asking the results of the exams for a professor and this professor answered sending a message for them saying to stop annoying him with the following sentence '*Para o próximo ano eu quero que os alunos me deixem em paz!!!*'(In English: 'For next year I want that the students leave me alone!!!').

Fig. 6. User greeting an acquaintance while he was using the installation.

Similarly, in Before I Die people began to use that space to introduce themselves. People started to talk about what they read on the wall and to laugh together.

Regarding to public displays, they can give people a chance to socialize taking the advantage of the Honey-pot effect [8]. Our findings support the notion of community, constructed and sustained through experiences and interactions with and in the place. Besides that, self-expression and information provided by these public displays leveraged discussions.

User acceptance

Designing engaging systems, which make the users feel invited, interested and encouraged to interact, is very challenging. Engaging people to use continually the installation is still more difficult to achieve. These regulars are important shaping the "tone" of the place [35]. Reviewing the videos, we observed these regulars considering, in this work, as people who used the installation more than twice and also invited others to use it.

In the first deployment, we already had identified about seven regulars [14]. In the second deployment, we found four regulars. Figure 7 shows some of these regulars.

In several Before I Die installations, it was evident the presence of regulars [10]. Regulars bring the place to social life maintaining the playful mood [35].
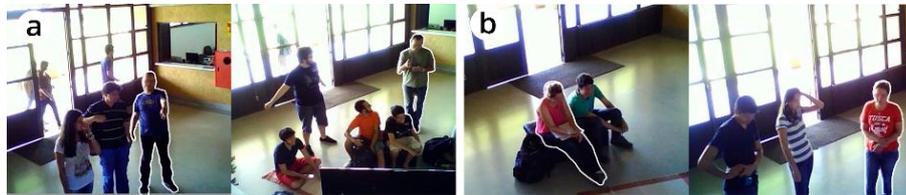
Fig. 7. Regulars using the WishBoard in different moments engaging other users in using it and starting a conversation about something shared on the screens in a process of socialization.

Privacy concerns

Regarding to privacy concerns, the wishers were anonymous, and we observed how people perceive privacy issues reviewing videos, annotations, audience comments.

In WishBoard, we noticed many situations in that people wanted to show their message to others, pointing to their message or even calling someone to see their message. For example, a user called a girl friend who was passing by and sent the following phrase for her: 'For the next year I want <girl's name> finishing her PhD!!!'. She smiled and raised her hands celebrating, as shown in figure 8a. Some people took photo of the message, as present in figure 8b. In the comments from the audience, people said that they perceived that it was not possible to identify their anonymous wishes, making the use of the system comfortable for them. Nobody expressed any privacy concerns.
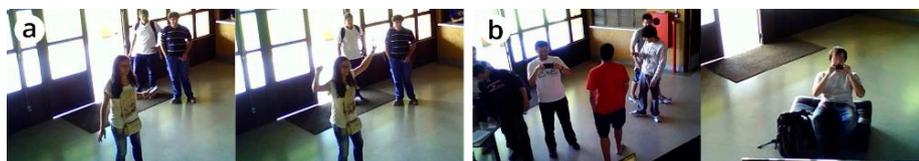
Fig. 8. (a) User celebrating a message sent for her and (b) users taking pictures of the messages.

Similarly, in the Before I Die some people took photos in front of the installation and showed their message to others. Furthermore, some people reported that the anonymous nature of the contribution could allow shy people to express themselves [10]. This anonymous nature of wishes creates a neutral and leveler ground for all users without caring about the individual's status in community [35].

6.2 Observing thirdplaceness supported by ICT

Several studies have been focusing on observing how ICT can support communities or socialization in third places [13][18][29]. According to Oldenburg [35], a real third place is a community-meeting place where the owner plays a key part in creating social connections by welcoming strangers and introducing them to the regulars. Such places are conversational zones where people can talk freely, openly, and entertain

without care about their social status. In our study, we aimed at observe the occurrence of thirdplaceness in a place augmented by ICT that is not a third place. For this, we reviewed the videos, the annotations, and the comments listing our findings related to thirdplaceness for each characteristic of third places. In order to achieve thirdplaceness these characteristics are essentials:

- Neutral ground: People need to feel free to express their thoughts and opinions. Promoting tools for self-expression can support to achieve this feeling. Moreover, we observed in comments that the anonymity can comfort audience giving them a chance to express themselves.
- Leveler: People might have the same privileges and opportunities to express themselves or to participate of the activities in such place. Similarly as for neutral ground, anonymity can give the leveler awareness. This leveler awareness was present on the messages sent. Students, professors, employees and visitors used the installation sharing democratically their thoughts.
- Conversation: The experiences and interactions with and in the place can empower relationships and promote place attachment. We observed that ICTs can promote activities among its users such as competitions, and provide information that can leverage discussions and conversations. Besides that, people had a chance to socialize taking the advantage of the Honey-pot effect [8].
- Accessibility and accommodation: The place needs to be easy to access and comfortable. In order to promote the feeling of fulfilled needs in the occupants, allowing appropriation of use plays an essential role. In the comments, people said the WishBoard was ease to use and accessible providing information and Wi-Fi signal allowing users to interact with it. Regarding to the few non-users of smartphones, we observed people sharing their devices and a tablet was available in the second deployment. After the installation, the department perceived the lack of accommodation and installed chairs around the department providing more comfort for all.
- Having regulars: Regulars bring the place to social life making newcomers welcomed and shaping the "tone" of a place. We noticed that themes or activities can also support to shape the "tone" [31], but people will appropriate the space according to their needs or possibilities.
- Low profile: The place needs to provide some comfort for their occupants, but this cannot be the main reference of the place. People are the main reference of a place that promotes thirdplaceness. We observed people sharing the space, the pouf and even the floor enjoying each other's company and having playful conversations.
- The mood is playful: The mood is not hostile and people always try to find ways to maintain their spirit high, even when few people want to bring this feeling down. In the WishBoard, people maintained a lively mood avoiding sharing unsuitable things. We also observed people very excited in seeing their messages on the screens, sharing smiles and laughs.
- A home away from home: People often have the relative feelings of warmth, possession, and belonging of being in their own homes. People can feel a piece of themselves is rooted in the space through their collaboration sharing a message shown on the screens.

Thirdplaceness is the 'event' of achieving these third place's characteristics in a certain place and time. Furthermore, this emergent nature transforms the concept of third place, making it independent of architectural constrains. This thirdplaceness experience can transform a place in a third place-like permanently or just for that period. However, in a third place will always occur thirdplaceness.

## 6.3   Finding cultural trails in anonymous posts

Hofstede et al. [17] defines culture as "the collective programming of the mind that distinguishes the member of one group or category of people from others". Several studies have been analyzed culture from data on the Web [15]. According to Garcia [15], making analysis of culture can benefit cultural social studies and the understanding on how culture affects user behavior giving insights to the designers. In addition, this analysis can model differences and similarities between cultures leading to serendipity by the discovery of unexpected data [15]. However, our work differs from those cultural researches due to restricted data.

We plan to analyze a set of phrases without related personal information (e.g., gender and age) or systematized correlations (e.g., replies). For that reason, we propose to conduct a language dependent analysis using: the classification used in the Before I Die, the Affective Norms for English Words, the Hofstede's cultural dimensions, and morphologic analysis. Our goal is to find cultural trails considering the 391 messages collected by WishBoard.

Classifying the messages
Aiming at understanding the topics shared in the WishBoard, we performed a classification. In our previous work [14], we classified the 244 messages collected in the first deployment into the themes presented in 'Before I Die, the book' [10]: helping others, love, well-being, celebrities, fame, family, religion, wealth, work, travel, outer space and sex. Moreover, we introduced three new themes: study, humor and politics. For each sentence, we classified in at least one of these themes. For sentences classified by the coders in different categories, we made decisions about the category chosen. In this work, we did the same for the second deployment comparing with Before I Die. In this analysis, we had a good inter-coder reliability (Cohen's Kappa = 0.61).

Our findings show that the both deployments had a similar pattern, suggesting their preferred topics. People discussed about ongoing Brazilian soccer championship, upcoming episodes of their favorite TV series and movies, their wishes for love, peace and success. Comparing the results of Before I Die with the WishBoard results there is also a similar pattern, as presented in figure 9.
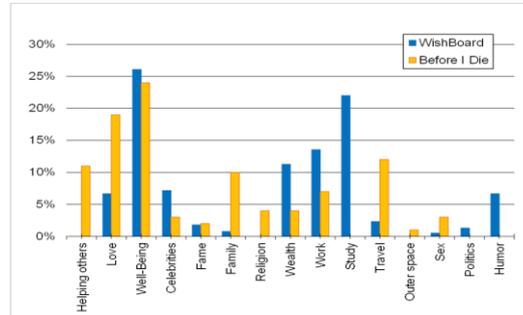
Fig. 9. Comparing the concentration of messages in WishBoard and Before I Die. Observing the graph, there is a higher expression about study, work and wealth in the WishBoard, what not happen with Before I Die. We believe that is because aspects related to the place context may lead people to think and talk more about related themes, in this case a workplace for some and study place for others. On the other side, there is a bigger concentration of phrases about love, travel, helping others, family and religion in the Before I Die, once it promotes a reflection about the end of life leading people to express religious values and feelings for family.

Regarding to the sentences, there was a match between WishBoard and Before I Die. For example, people want to live intensely, lose weight, find a love, be rich and visit other countries. The mains topics discussed for each theme in the WishBoard were: (1) Love: find a love and declarations of love; (2) Well-being: things that make them happy (e.g., parties); (3) Celebrities: soccer, sayings, music lyrics, movies, and games; (4) Fame: be heard and have their wishes coming true; (5) Family: Friendship; (6) Wealth: be rich, win the lottery, and bought things; (7) Work: fewer meetings, bureaucracy, and scholarship; (8) Study: disciplines course, improving their grades, and getting a scholarship to study abroad; (9) Travel: travel more, visit other countries; (10) Sex: metaphors to reference women private parts; (11) Politics: be president and belong to some political party; (12) Humor: nonsense things and jokes. Analyzing the WishBoard messages inside the themes, the posts were casual, interesting, funny, poetic and sometimes heartbreaking. For example, in the well-being theme, people want more smiles, to live in a world without wars, to be a Jedi, to achieve nirvana and to fix everything wrong in his/her life.

Affective analysis

In order to analyze the aspects of affectiveness, we adopt the correspondent Affective Norms for English Words (ANEW) for our language – Brazilian Portuguese. The Affective Norms for English Words (ANEW) consists of a set of 1034 words, including verbs, nouns, and adjectives, based on a tri-dimensional perspective of emotions (valence, arousal, and dominance) [23]. The Brazilian version of these norms, called ANEW-Br, provides affective norms only for valence (which ranges from pleasant to unpleasant) and arousal (which ranges from calm to excited) scales to judge the emotionality [23]. Aiming at analyzing the audience mood through their sent wishes, we used ANEW-BR to calculate the valence and the alert. For each variable, we have used the average value. For the valence, this analysis consists in for each phrase we

sum up all values of valence of words dividing it by the total number of occurrence of words. For example, in the phrase: '*Para este ano eu quero um bom emprego*' (in English: 'For this year I want a good job'). Excluding the prefix 'For this year I want' we found two valence instances: good (*bom*) and job (*emprego*). Their valence values are respectively 8.19 and 7.31. Summing the values of the valences of the words and dividing by the amount of occurrence of words in the text, which in this example was 2: $(8.19 + 7.31) \div 2 = 7.75$ that means use of positive words. In order to calculate the alert, we proceed in the same way, but using the values for alert. Furthermore, we normalized all sent messages correcting typos manually. This process of normalizing phrases, transforming text into a single canonical form, can be (semi-) automatic using a parser.

Considering the collected phrases, we found a higher occurrence of valence between 7.20 and 8.75, and a concentration of alert between 3.36 and 5.45, suggesting that people used positive words, as shown in figure 10. According to Kristensen et al. [23] positive words have the valence values higher than six and the alert values lower than five ($V \geq 6$; $A \leq 5$); negative words have the valence values lower than four and the alert values higher than five ($4 > V < 6$); neutral words have valence value between four and six ($V \leq 4$; $A > 5$). Regarding to unsuitable sentences, people took care of the WishBoard installation maintaining its high spirits. In addition, we had only five blocked messages by being potentially offensive. In Before I Die installations, people also tried to maintain the mood of the installation by erasing bad things and filling with good things. These findings suggest that perhaps we need to explore ways to allow and to engage the community in managing their own messages in future work.
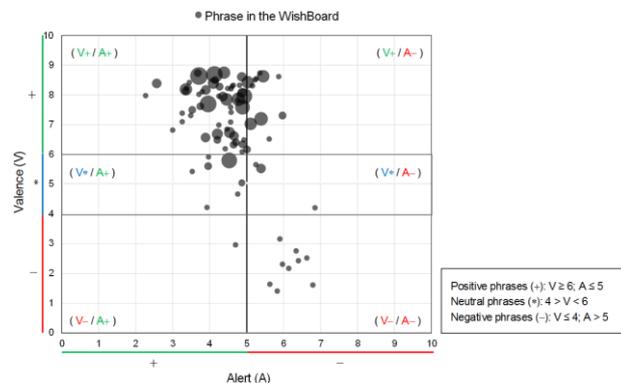
Fig. 10. Concentration of phrases in the WishBoard regarding to their valence and alert. The higher concentration of phrases on the top-left area indicates bigger number of positive phrases.

Individualism cultural dimension

In order to observe the Hofstede's cultural dimensions in the collected messages. We chose to measure the dimension of individualism of our audience due the restriction of our data. However, we still need to understand how to measure others dimensions with this set of data. For Hofstede et al. [17], individualism (IDV: high vs. low) can

measure the level of integration into a group. Individualist societies (high IDV) represent loose ties between individuals basing on meritocracy and competition with other individuals. Collective (low IDV) societies represent individuals strongly integrated, extending sometimes the notion of family. However, the individualism dimension is not a dichotomous variable. This dimension ranges between 0 (lowest) and 100 (highest). For this work, we divided the dimension of individualism into four categories: collective, for a group of people, for other person, and individual. These categories ranges from low individualism to high individualism. For example, we classified 'For the next year I want more compassion among people' as collective and 'For the next year I want to be rich' as individual. For each sentence, we classified in at least one of those categories.

Analyzing the individualism in the collected phrases, we had an acceptable intercoder reliability (Cohen's Kappa = 0.67). We found in the average that 60% of the messages were for individual interests, followed by 12% for other person, 18% for a group of people, and 9% for collective. These results indicate a prevalence of individualism in the messages. We believe this occurred due the proposal of the installations, which it was a self-reflection about their future filling the prefix 'For next year, I want …' or 'For this year, I want …'.

Morphologic analysis

In this section, we discuss a form of morphologic analysis that can be performed (semi-) automatically using a Part Of Speech Tagger (POS-Tagger). This analysis has an objective of creating clusters for further interpretation. Aiming at analyzing tendencies in the messages, we used the PALAVRAS parser [6] for Portuguese on the collected messages with the typos already corrected. After that, we created clusters with the adjectives found in the results. Observing the clusters formed, we found that, in both deployments, about 20% of the messages had superlative and comparative adjectives, predominating 'more' and 'better' words. Interestingly, in a manual analysis, we found that 24% of the messages had metaphors. Optimistic words such as more and better can be related with the proximity and the start of a new year which it makes people thinking positively and optimistically. In addition, Brazilians are known by their playful nature and easygoing personality, what can justify the large number of statements related to metaphors, jokes, music and poetry.

7   Conclusion

In this paper, we demonstrate the relevance of supporting self-expression in public spaces through an interactive art installation, entitled WishBoard, at a workplace. This installation creates an environment to people express their thoughts, feelings, and aspirations. During the deployments, people shared the environment, once socially forgotten, using to discuss various topics and enjoying each other's company. The installation gave people a chance to socialize taking the advantage of the Honey-pot effect and provided information that leveraged conversations reinforcing their notion of community. Our study found that, by allowing this expression, offers the neutral

ground to people express freely their individuality. In addition, we showed the importance of allowing appropriation of use in self-expression. In order to verify cultural trails in anonymous messages, we described a model to categorize, to analyze emotion related information, to verify the level of individualism in Hofstede's cultural dimensions, and to realize a morphologic analysis. Overall, it validates our previous work [14] reinforcing the essential role that public displays and mobile devices can play in providing an accessible mean for people express their individuality.

As part of our future work, we hope to extend our evaluation methods exploring the potential of quantitative methods developed from the field of psychology, such as the "Sense of Community Index" [27]. Furthermore, we also hope to explore this technology intervention to support a sense of community in further different settings.

Acknowledgments

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