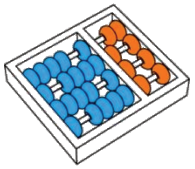


Guilherme Colucci Pereira

Mediation of processes of systems codesign and the empowerment of lesbian, gay, bisexual, and transgender (LGBT) people

Mediação de processos de codesign de sistemas e o empoderamento de pessoas lésbicas, gays, bissexuais e transgêneras (LGBT)

CAMPINAS
2018

GUILHERME COLUCCI PEREIRA

MEDIATION OF PROCESSES OF SYSTEM CODESIGN AND THE EMPOWERMENT OF LESBIAN, GAY, BISEXUAL, AND TRANSGENDER (LGBT) PEOPLE

MEDIAÇÃO DE PROCESSOS DE CODESIGN DE SISTEMAS E O EMPODERAMENTO DE PESSOAS LÉSBICAS, GAYS, BISSEXUAIS E TRANSGÊNERAS (LGBT)

Thesis/Dissertation presented to the Faculty/Institute of the University of Campinas in partial fulfillment of the requirements for the degree of Master in Computer Science

Tese/Dissertação apresentada à Faculdade/Instituto da Universidade de Campinas como parte dos requisitos para a obtenção do título de Mestre em Ciência da Computação

Orientador(a): PROF(A). MARIA CECILIA CALANI BARANAUSKAS

ESTE EXEMPLAR CORRESPONDE À VERSÃO FINAL DA DISSERTAÇÃO DEFENDIDA PELO ALUNO GUILHERME COLUCCI PEREIRA E ORIENTADA PELA PROF(A). DR(A). MARIA CECILIA CALANI BARANAUSKAS

CAMPINAS

2018

Agência(s) de fomento e nº(s) de processo(s): CNPq, 132272/2016-4

Ficha catalográfica
Universidade Estadual de Campinas
Biblioteca do Instituto de Matemática, Estatística e Computação Científica
Ana Regina Machado - CRB 8/5467

P414m

Pereira, Guilherme Colucci, 1992-
Mediation of processes of systems codesign and the empowerment of lesbian, gay, bisexual, and transgender (LGBT) people / Guilherme Colucci Pereira. – Campinas, SP : [s.n.], 2018.

Orientador: Maria Cecilia Calani Baranauskas.
Dissertação (mestrado) – Universidade Estadual de Campinas, Instituto de Computação.

1. Sexualidade. 2. Gênero. 3. Interação humano-máquina. 4. Codesign. 5. Empoderamento. I. Baranauskas, Maria Cecilia Calani, 1954-. II. Universidade Estadual de Campinas. Instituto de Computação. III. Título.

Informações para Biblioteca Digital

Título em outro idioma: Mediação de processos de codesign de sistemas e o empoderamento de pessoas lésbicas, gays, bissexuais e transgêneras (LGBT)
Palavras-chave em inglês:
Sexuality
Gender
Human-machine interaction
Codesign
Empowerment
Área de concentração: Ciência da Computação
Titulação: Mestre em Ciência da Computação
Banca examinadora:
Maria Cecilia Calani Baranauskas [Orientador]
Julio Cesar dos Reis
Luiz Ernesto Merkle
Data de defesa: 28-02-2018
Programa de Pós-Graduação: Ciência da Computação

Instituto de Computação – Universidade Estadual de Campinas (UNICAMP)

Guilherme Colucci Pereira

Mediation of processes of systems codesign and the empowerment of lesbian, gay, bisexual, and transgender (LGBT) people

Mediação de processos de codesign de sistemas e o empoderamento de pessoas lésbicas, gays, bissexuais e transgêneras (LGBT)

Banca examinadora

Presidente: Profª. Drª. Maria Cecilia Calani Baranauskas (Instituto de Computação – UNICAMP).

Titular interno: Prof. Dr. Julio Cesar dos Reis (Instituto de Computação – UNICAMP).

Titular externo: Prof. Dr. Luiz Ernesto Merkle (Departamento Acadêmico de Informática – UTFPR).

A ata da defesa com as respectivas assinaturas encontra-se no processo de vida escolar do aluno.

Data da defesa: 28/02/2018.

Acknowledgments

During the past years (and before), I have interacted and bonded with several people because, for, and through this project. I start thanking the UNICAMP Nucleus of Informatics Applied to Education (NIED) and Institute of Computing (IC) for providing the physical infrastructure where the activities hereby described took place, as well as the National Council for Scientific and Technical Development (CNPq) for funding the research. In particular, I thank Sandra and the IC secretaries and concierges, who granted that all communication flowed smoothly and efficiently. I also thank InterHAD, the IC group of research in HCI, for teaching me, through example, how exemplary science and researchers should look like. Speaking about role models, I am thankful to the amazing HCI scientists and practitioners I met in the conferences I had the opportunity to attend and that inspired me so much to be part of the community. To my friends, my appreciation for helping me to organize and deal with all these overwhelming signs. In special my gratitude to Rodrigo, for inspiring and supporting me in taking the challenge of this work subject even before it had begun, and to Bia, for always giving me thoughtful second opinions and backing me up through the daily challenges. I do not know from where to start thanking my family, specially Maria, Gi, Kátia, Isadora, and Marcos. In a world where “family” is so often used as a syntactic scapegoat for hatred and prejudice, it is an immense privilege to be part of one where love, care, and union are daily verbs. I am also warmheartedly grateful for my supervisor, Cecilia. There were hurdles during this graduation that occasionally made me feel unmotivated, for example, not having a conference paper published years after it had been accepted or dealing with rumors of having the scholarship cancelled due to the freeze of the national science budget. Cecilia always gave me faith when I was bewildered, incentive when I was apathetic, insights when I was off-track, and support every single time I needed. With our honest talks, she boosted my passion for this project and encouraged me towards the best I could do. What another great privilege, to enroll in an opportunity with a top-notch scientist and end up in a fun cooperation with a creative, patient, dedicated, humane, and kind friend. Last – but definitely not least – a huge “thank you” to the volunteers who participated, entrusting their personal experiences,

sharing the faith on a better world and believing in this research as an honest step towards this dream.

I am honored to say that thanks to all and each one of these people, I learned the values of respect, empathy, honesty, patience, professionalism, collaboration, and so forth. And I truly thank you all from the bottom of my heart.

Resumo

O uso de tecnologia para melhorar a qualidade de vida de pessoas tem sido crescentemente explorado na área de IHC (Interação Humano-Computador). Abordagens subjetivistas são preferidas nesses contextos pelas suas considerações de cultura, valores e singularidades dos aspectos humanos da interação. O paradigma crítico-ideológico é um referencial teórico da Filosofia da Ciência que pode guiar esses esforços – ele considera nosso mundo como o resultado de processos históricos definidos por relações de poder. A realidade, de uma perspectiva crítica, é uma experiência pessoal, mas influenciada por desigualdades sociais e opressões.

Historicamente, pessoas lésbicas, gays, bissexuais e transgêneras (LGBT) têm sofrido com numerosos desafios. Preconceito, perseguição, criminalização, tortura, estereotipagem são alguns exemplos de uma extensa lista de barreiras que pessoas LGBT tiveram – e em muitas regiões ainda têm – que enfrentar simplesmente por serem (ou aparentarem ser) LGBT.

Esse trabalho pretende abordar criticamente tais questões para entender as relações entre tecnologia e o suporte e proteção de pessoas LGBT. Ele parte do princípio de que pessoas deveriam ter acesso aos mesmos direitos e qualidade de vida independentemente de suas características sociais, como gênero e sexualidade. O projeto começa com um estudo exploratório virtual sobre como a tecnologia por meio de suas interfaces de usuário - em particular, as redes sociais – pode reproduzir o preconceito existente no contexto social onde está inserida. Em seguida, nós utilizamos o codesign, baseado na Semiótica Organizacional (OS) e no Design Participativo (PD) para desenvolver uma aplicação móvel para mediar o empoderamento de pessoas LGBT.

As atividades de codesign foram realizadas com um grupo de voluntários e ocorreram pessoalmente e virtualmente. O ciclo de codesign abarca a maioria dos passos do desenvolvimento de produtos, incluindo a elucidação do problema, engenharia de requisitos, prototipagem e avaliação. Como resultado, apresentamos LGBTrust, uma aplicação que visa articular funcionalidades educacionais, protetivas

e sociais para dar suporte à luta contra LGBTfobia e fortalecer os laços entre múltiplas partes interessadas. Ademais, nós refletimos nos modos que a LGBTfobia está presente em interações virtuais, aspectos de questões LGBT abordadas por tecnologias atuais e suas limitações, o uso crítico da OS e PD, o design rationale dos elementos de interação da aplicação e uma avaliação de valores baseados em teoria da cultura.

Abstract

The use of technology to improve people's lives has been increasingly explored by the HCI (Human-computer Interaction) field. Subjectivist approaches are preferred in such contexts for the consideration of culture, values, and singularities of the human aspects of interaction. The critical-ideological paradigm is a framework from the Philosophy of Science that might guide these efforts – it regards our world as the result of historic processes shaped by power relations. The reality, from a critical perspective, is a personal experience but influenced by social inequalities and oppressions.

Historically, lesbian, gay, bisexual and transgender (LGBT) people have suffered with many challenges. Prejudice, persecution, criminalization, torture, stereotyping are some examples of an extensive list of hurdles LGBT people had – and in many areas still have – to deal with just for being (or resembling being) LGBT. This work intends to critically approach such issues in order to understand the relations between technology and the support and protection of LGBT people. It departs from the principle that people should have access to the same rights and quality of life regardless of their social characteristics, such as gender and sexuality. The project started with an online exploratory study of how technology, through its user interfaces, – in special, social media – might reproduce the prejudice existent in the social context where it is inscribed. Then, we adopted a codesign approach, rooted on Organizational Semiotics (OS) and Participatory Design (PD), to develop a mobile application to empower LGBT people.

The codesign activities were realized with a group of volunteers and took place both in-person and virtually. The codesign cycle encompassed most steps of a product development, including the problem elucidation, requirements engineering, prototyping, and evaluation. As a result, we present LGBTrust, an application which aims to articulate educational, protective, and social features in order to support the fight against LGBTphobia and strengthen ties of multiple interested parties. Moreover, we provide reflections on the ways that LGBTphobia is present in virtual interactions, aspects of LGBT issues addressed by currently technology and their limitation, the usage of OS and PD in a critical setting, the design rationale for the

interaction elements of the application, and an evaluation in terms of values in theory of culture.

LIST OF ABBREVIATIONS

EF	Evaluation Framing
FL	Federal Law
FLP	Federal Law Project
HCI	Human-Computer Interaction
ICT	Information and Communication Technologies
ICT4D	Information and Communication Technologies for Development
ID	Identification Document
IS	Information System
LGBT	Lesbian, Gay, Bisexual, and Transgender
LOS	Laws of Simplicity
LP	Law Project (or Law Proposal)
MASP	São Paulo Art Museum
MEASUR	Methods for Eliciting, Analyzing and Specifying User Requirements
NIED	Center of Informatics Applied to Education
NGO	Non-Governmental Organization
OS	Organisational Semiotics
PAM	Problem Articulation Methods
SAC	Socially-Aware Computing
SD	Stakeholders Diagram (or Stakeholder Identification Diagram)

SL	Semiotic Ladder
SO	Semiotic Onion
UN	United Nations
VF	Valuation Framing
VF4SS	Valuation Framing For Social Software

CONTENTS

Chapter 1

Introduction

The pervasiveness of technology has created new opportunities to HCI practitioners, ranging from business innovations allowed by Internet of Things to the political impact of social media. In particular, researchers and practitioners have increasingly considered how technology can be used to improve people's lives, to help them face struggles and disenfranchisement, to provide them with agency to talk and direct their own lives. Bardzell and Bardzell (2015) label such approaches as "emancipatory HCI" – a non-exhaustive list includes techniques such as Participatory Design (PD), Critical Design, Information and Communication Technologies for Development (ICT4D), and Action Research.

The construction of a new technology or the development of a scientific research needs to follow a consistent set of assumptions about the functioning of their basic components. The specific areas of Philosophy of Science reflects on how each component might be regarded during a scientific quest – the ontology reflects on the nature of reality; the epistemology, in the nature of knowledge; the axiology, in the nature of values. Thomas Kuhn (1998) coined the term "paradigm", by proposing that science experiences "paradigm shifts," when key theories, tools, and philosophical assumptions change to deal with questions that the previous disciplinary matrix did not allow. Currently, the term "paradigm" is also used as a synonym to describe a set of metaphysical assumptions and methodologies that guide scientists' choices. Ponterotto (2005) describes four common paradigms – the positivist, post-positivist, constructivist-interpretativist, and the critical-ideological. This work explicitly assumes the critical-ideological paradigm, sometimes referred simply as "critical paradigm" or yet, "critical theory." This paradigm considers the reality as a subjective construct, shaped by historical power relations. It highlights the values of freedom and equality, which sum up the goal of critical researches – to help people realizing, understanding, and changing the oppressive social structures that deprive them from freedom.

The LGBT population has also gained visibility in the past years. LGBT population has been more prominent in political agenda as civil rights are conquered and mainstream representation increases across the globe. However, the historical exclusion of LGBT people has resulted in consequences still felt nowadays. Bullying and offensive jokes are still common in schools and workplaces; children and teenagers are often beaten or expelled from home for being LGBT; some rights – such as the presence of transgender people in the U.S. army – are revoked; conservative groups organize to influence politics to a less progressist stance; hate crimes are widespread; and even media portrayal still not suffice to represent a large part of LGBT people and issues.

This work intends to investigate the subject by proposing and trying a software codesign process, bringing stakeholders to all stages of the development of a new product, under the critical paradigm posture. The object to think with in this research refers to the construction of a new mobile application to help LGBT people facing forms of LGBTphobia. It uses the codesign methodology (Baranauskas, 2013), applying concepts, techniques, and artifacts from Organizational Semiotics (OS) and PD in virtual and in-person activities. At the core of the research is the understanding of the relations of LGBT concerns and interests with possible technological outcomes.

1.1 Problem

LGBT is an acronym related to three dimensions of human experience – sex, gender, and desire. Traditionally, every newborn is classified as a man or as a woman according to their reproductive organ. This attributed label is called “sex”. The distinction between sex and gender is rooted in feminist approaches which seek to dissociate the social expected role of women from the female genitalia. According to these approaches, women are expected to universally behave in specific manners and perform specific activities. Judith Butler argues that gender is constructed and reinforced through these social performative acts (Butler, 1999). In her theory, this notion is called gender. This distinction between sex and gender were first made by Robert Stoller (1968) in an attempt to describe people who were classified as a specific sex, but that does not feel fully accommodated by this classification, i.e.,

whose gender does not match the attributed sex. These people are called “transgender,” and correspond to the T in the acronym.

Gender and desire are related by the other letters in the acronym – people who feel sexually or affectively attracted by other people with the same gender are called “homosexual,” whereas a “heterosexual” relation is that which happens between people from different genders. Homosexual women are referred to as “lesbians” and men as “gays”, corresponding to the L and G letters in the acronym. Finally, people who feel attracted by more than one gender are referred to as “bisexuals,” corresponding to the B. Butler argues there is a social expectation that privileges the cisgender[1] and heterosexual configuration of the aforementioned dimensions (Butler, 1999), hereby referred to as “cisheteronormativity”. Finally, the LGBT acronym has become an umbrella term to describe people who do not fit in socially expected gendered behaviors, encompassing asexual people – those who do not feel sexually attracted by any gender, genderqueer people – those who do not feel entirely part of any gender, intersex people – those who were born with some level of reproductive or sexual anatomical ambiguity; one of which is often removed in early life, forcing them to be raised according to the sex chosen by the doctor as the “prevailing,” and others. Other acronyms, such as LGBTQ, LGBTQIA, among others, have been created but not consensually adopted by related movements. Due to this, we preferred to adopt the original LGBT acronym.

Brazil is a country of contrasts in respect to LGBT issues. It was one of the first countries to decriminalize homosexuality (ILGA, 2016) and to introduce United Nations (UN) resolutions on gender identity and sexual orientation rights (Rosenberg, 2009). Free medical treatment to HIV is universally offered since 1996, transexualizing surgeries are offered by the public health system since 2008 and homoaffective marriage is legal since 2013. Openly LGBT artists have reached massive success in music, acting, fashion, among others, being Pabllo Vittar the most recent LGBT national superstar – the singer has become the most followed drag queen in the world (Folha, 2017).

[1] Cisgender is a neologism used to designate people who are not transgender. It is not part of Butler’s original text, but a more recent term coined by transfeminist activists.

However, Brazil is also home of the highest rate of LGBT killings in the world – one LGBT person each 27 hours (GGB, 2015); half of all homicides in the world if we consider just transgender women (TGEU, 2015). 18% of companies in Brazil said to have at least some resistance to hire openly homosexual candidates (Sobrinho, 2015) and statistics point that around 90% of transgender women in Brazil are forced to prostitution (Rossi and Novaes, 2015). The Brazilian Ministry of Human Rights does not consolidate any report on violence against LGBT people since 2013[2], leaving most of statistics to non-governmental organizations and observers. Around 70% of Brazilian LGBT students have suffered with verbal discrimination and 36% with physical aggression in school. Nevertheless, in 2017, the Ministry of Education has excluded all texts mentioning the respect and accommodation of all students regardless their sexual orientation and gender identity from the national guidelines for education (Cancian, 2017). Conservative politicians have been making several attempts to redefine the definition of family as a heterosexual union, such as the Federal Law project 6586/2013, and the blocking of LGBT rights has been frequently part of the political landscape. During a television debate in the presidential campaign of 2014, a candidate said that "We are the majority, let's battle this minority (…) the most important is that people who have these problems be treated psychologically and affectively, but really far away from us."[3] (Affonso and Macedo, 2017) A favorite candidate for 2018 election has already publicly said that people are gay "due to the lack of beating [in childhood]." (O Globo, 2016) While both have already been convicted by justice (Affonso and Macedo, 2017; Guerra, 2017) a debate sparkled nationwide in 2017 after a federal judge allowed psychologists to offer treatment to "revert" homosexuality (Vassallo, 2017).

Kincheloe and McLaren (2000) say that, according to the critical thinking, oppressions are multifaceted facts (Kincheloe and McLaren, 2000). As highlighted, LGBTphobia can be perceived in different levels across a wide range of events, from jokes to physical aggression. It is also related to other forms of discrimination and affects even non-LGBT people - in 2011, a man had his ear bitten off after him and his son be mistakenly taken as a gay couple in São Paulo countryside (EPTV, 2011).

[2] http://www.mdh.gov.br/assuntos/lgbt/dados-estatisticos
[3] Translation by the author.

Moreover, the LGBT group cannot be seen as a uniform entity, since, for instance, cisgender gay men are still prone to discriminate lesbians or transgender people.

1.2 Objective

The goal of this research is to propose and experiment a software codesign process, adopting the critical paradigm. The object of the process is the construction of a mobile application aiming at the empowerment of LGBT people. It does not depart from a "salvationist" perspective or an ambition of solving all problems that LGBT people face in Brazil, but rather to build something helpful and supportive in a local context. In order to achieve this, other intermediary objectives were drawn, being the application itself just one of the intended outcomes. The intermediary objectives are summarized by the following questions:

1. How oppressions related to sexual orientation and gender identity prejudice can be perceived in digital systems?

2. How has LGBT issues appeared in HCI literature?

3. How current systems address LGBT issues?

4. Which features and characteristics could a novel meaningful system have and how would they be associated with LGBT experience?

5. How complexity emerges in the system in this context?

6. How to evaluate both the outcome and the construction process from a critical perspective?

1.3 Methodology

The work is divided in two phases – the context investigation and the semioparticipatory workshops. The context investigation is related to objectives 1-3 and encompasses an exploratory study and literature and technical reviews. The other objectives were addressed by semioparticipatory workshops, a core practice of the Socially Aware Computing (SAC) framework, called "semioparticipatory" since it is an articulation of OS and PD theories.

According to OS, an organization can be view as made of three levels: informal, formal, and technical (Liu, 2000), as depicted in Figure 1.1. The first layer is made of values, commitments, beliefs; the second, corresponds to the formalization of the previous in rules, norms, and bureaucracy; finally, the last one is a technical artifact which will mediate processes in the external layers. Codesign, in SAC, intends to understand and carry knowledge from informal and formal levels to the technical system. Each layer is not a rigid frontier of components - during workshops, aspects of all three layers are worked together. The representation as the "semiotic onion" is used to highlight that, in SAC, the design process can be seen as a "slicing" of layers, until reach the final technical outcome.

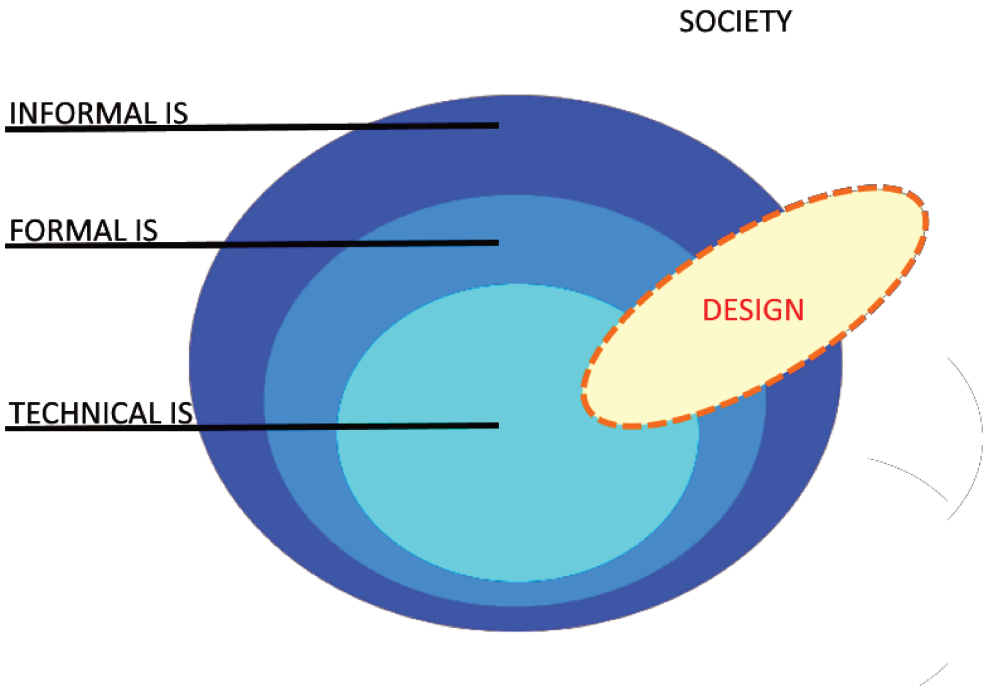


Figure 1.1 Semiotic onion and the design activities in SAC

The project was submitted to a Committee of Ethics[4] prior to any contact with participants. Before the workshops, volunteers were recruited using posts on Facebook calling to participate on an MSc project intended to build a mobile application targeting the empowerment of LGBT people. 40 people

[4] All presented information about volunteers was self-disclosed on a questionnaire given prior to the first participation in an activity.

volunteered, all from Campinas, São Paulo; from this group, a random stratified sample was taken by randomly selecting people representing different genders and sexualities. This pre-selection was made in order to difficult the prevalence of one group across the LGBT spectrum in the activities. The final group was comprised of 3 queers (1 bisexual, 1 pansexual and 1 homosexual), 1 homosexual transgender man, 2 transgender women or travesti (1 heterosexual and 1 bisexual), 5 cisgender heterosexual women, 2 cisgender heterosexual men, 4 cisgender bisexual women, 2 cisgender bisexual men, 1 cisgender lesbian, and 4 cisgender gay men.

In the semioparticipatory workshops, volunteer stakeholders[5] engaged in activities together to conceive, to plan, and to prototype a system. Between each workshop, warmup activities also took place, in order to bridge the subjects from one workshop to the next, continue open discussions, and give to absent participants a glimpse on what was discussed and made in the last meeting. An overall look of methods and artifacts used in each phase is presented in Figures 1.2 and 1.3.

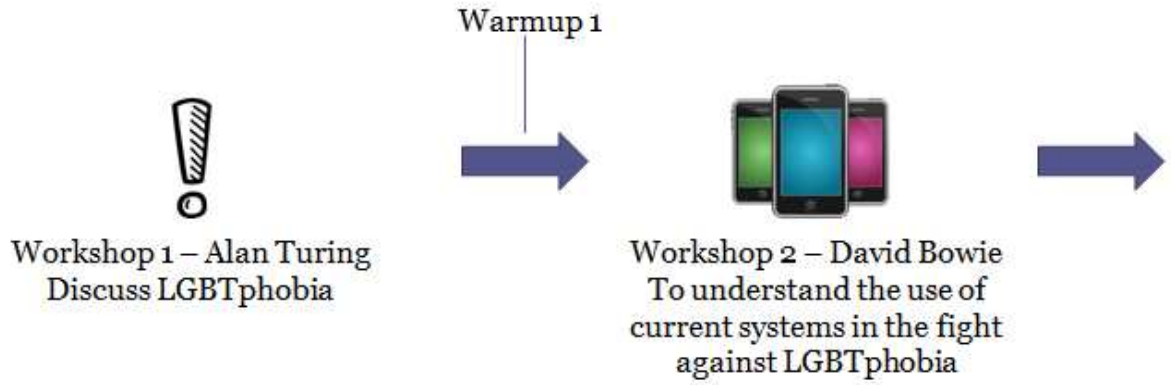


Figure 1.2. Context and organization phase

[5] Certificate of Presentation for a Committee of Ethics: 58185916.3.0000.5404.

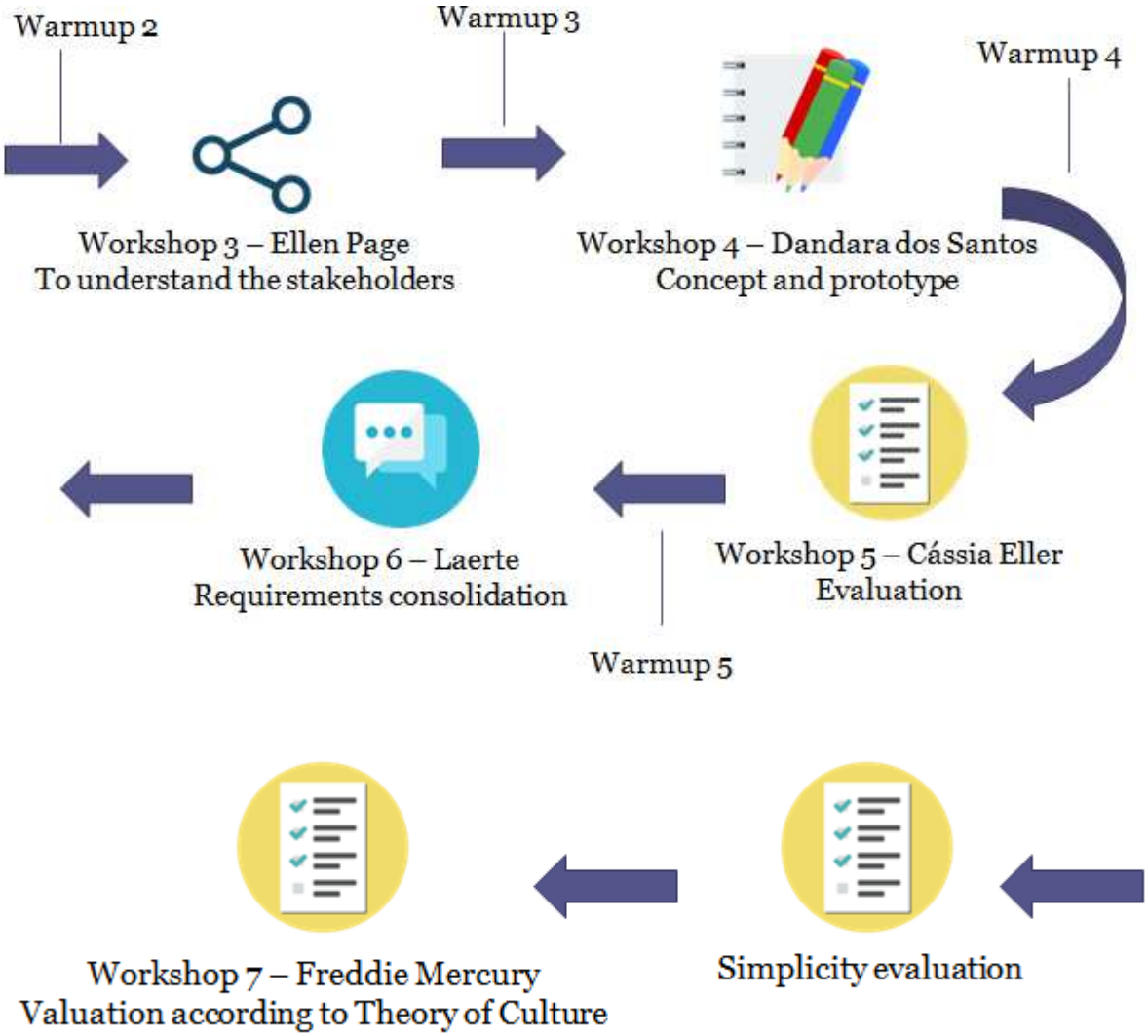


Figure 1.3. Codesign phase

1.4 Outline and contributions

This text is composed by a collection of five papers published or submitted for publication. All chapters corresponding to papers repeat, at some extent, the introduction from this dissertation. They are ordered periodically considering the time when they were produced and the study phase they discuss and follow the order presented in the objectives.

Chapter 2 aims at understanding how LGBTphobia might be reproduced in digital systems available interactions. It discusses the result of an online survey conducted in May, 2015 with 114 respondents. The survey intended to gather whether the participants had already perceived a form of oppression in digital systems, where this oppression was embedded, and how it

could be lessened. Our results suggest that the LGBT community perceives such prejudice in the social network interfaces and content there posted. Respondents also pointed that current features implemented on social media fail to prevent and fight it, which impacts the decision of using a network and users' comfort. The paper (Pereira and Baranauskas, 2015) received an honorary mention during IHC '15 and was invited to publication in a national journal.

Chapter 3 presents the results of the state of art and technique reviews, as well as an in-depth discussion of Alan Turing and David Bowie workshops. The state of art and technique reviews present an overall look of mobile applications directed to LGBT people and how it has been treated by HCI. During Alan Turing workshop, we talked about positive and negative experiences by LGBT people and how technology could have affected them. In David Bowie workshop, volunteers explored the Espaço Livre app and the Federal Chamber of Deputies website in order to understand how such systems could support the fight against LGBTphobia. This paper (Pereira and Baranauskas, 2017a) was invited to publication in a national journal.

Chapter 4 is dedicated to the requirements engineering that took place to conceptualize the novel application. It provides an in-depth look of workshops 3-6. During these meetings, OS artifacts were used to collectively understand the network of people interested by the novel application; PD activities were performed to generate a concept and a paper prototype for the application; a digital prototype was constructed and evaluated; a final discussion took place to clarify open questions about the application features. This paper (Pereira and Baranauskas, 2017b) was submitted to an international conference.

Chapter 5 presents a discussion of the use of laws of simplicity by John Maeda to guide the application conception and to evaluate a functional digital prototype, providing insights for redesign. The evaluation was attended by HCI experts and its results show an approval of the constructed prototype. This paper (Pereira and Baranauskas, 2018a) was submitted to an international conference.

Chapter 6 visits Edward Hall's theory of culture and describes an evaluation made by volunteers in the final workshop. This evaluation intended to understand how suited was the adopted methodology by discussing values embedded in the final system. It also reflects on the critical mindset involved in the choice of methodology. This paper (Pereira and Baranauskas, 2018b) was submitted to an international conference.

Appendix A presents the online questionnaire on the perception of LGBTphobia in digital systems. Appendix B presents the picture cards we constructed to activities in the first workshop. In Appendix C, we placed a copy of questions we used to explain Hall's theory to volunteers. The terms of consent for participation for both the online questionnaire and the workshop activities are presented in Appendix D and E, respectively. In Appendix F, the digital prototype is described. Finally, Appendix G contains the permission from publishers for papers approved in conferences.

Chapter 2

An exploratory inquiry towards prejudice based on gender identity or sexual orientation in digital systems user interfaces[6]

2.1 Introduction

The importance of considering user context when building digital systems interfaces has been pointed out since early Human-Computer Interaction studies; however, there are still few considerations regarding the role that gender identity and sexual orientation play at systems design and usage. Neglecting such aspects may affect the user experience and bring social and political implications.

Despite the lack of official statistics, Non-Governmental Organizations (NGO) point that Brazil is known for being the country with the highest rate of killing of LGBT people [45]. One of the latest reports states that 50% of trans people assassinates in 2014 occurred in Brazil [49], where it is also estimated that one LGBT individual is killed or commits suicide each 27 hours [27]. Other non-official statistics estimates that 90% of Brazilian trans population is coerced into prostitution [45]. The lack of official or academic data is another example of the exclusion of LGBT people. Prejudice can also be felt by professional barrier, bullying, mockery, misrepresentation, gender disrespect, rights denial, among others.

This work approaches the subject by formulating the following question: to which extent the interfaces and interactions of social networks are reproducing

[6] Original article presented at IHC'15 as "Pereira, G. C.; Baranauskas, M. C. C. Opressões de identidade de gênero e orientação sexual percebidas em interfaces de usuário de sistemas digitais: um estudo exploratório. *Proceedings of the 14th Brazilian Symposium on Human Factors in Computer Systems* (IHC '15)".

normative views of gender identity and sexual orientation, causing discomfort and reinforcing oppressions and exclusions? To better understand this matter, we formulated a survey with university groups, concerning their usage experiences with social networks. The goal was to gather practical information about elements of interaction that could reproduce oppressions and to measure their effect in the decision of using it, and comfort issues of those who use such systems.

In this paper, we describe some theoretical foundation on gender and sexual orientation, the process of conducting the survey and the possible implications of its results. The terms “LGBT-phobia” and “oppression” will be used to refer to any kind of exclusion, hurdle, disrespect, discomfort or offense based on sexual orientation or gender identity. Also, “trans” will be used as synonym of “transgender,” and “cis” as synonym of “cisgender.”

The paper is organized as follows: the first section presents a brief explanation about gender identity, sexual orientation, our philosophical background, HCI related studies and efforts taken by virtual systems targeted to LGBT people. The second one presents our research design. Finally, we discuss practical aspects about how interaction elements of digital systems interfaces might reproduce LGBT-phobia and how this could be dealt with.

2.2 Work context

2.2.1 Gender identity

Typically, newborns are classified in men or women, based on their genitals. “Trans” is used as an umbrella term to describe people who do not identify themselves with their sex assigned at birth. Some trans people identify as men or women – the so called binary trans. Others are not contemplated by such binarism and may identify with no gender, partially or totally with more than one gender, with distinct genders in distinct instants of time, among others. These people are named non-binary trans. On the other hand, people who identify themselves with the sex they were assigned to at birth are called cisgender[7].

[7] The prefix “cis” means “at the same side,” in Latin.

Back in the eighteenth century, Mary Wollstonecraft was one of the first thinkers to radically question sex-based roles, by stating that men and women may have the same virtuous character and rational approach to life if they are raised the same way [54]. This idea resonated in the mid twentieth century through the work of Simone de Beauvoir. For existentialist thinkers as she, human life is not determined by essential inherent characteristics, but rather defined through exploring and developing latent possibilities. From this premise, she argues that oppressions towards women were historically developed by a men-centered ideology that engenders differences between sexes in different social experiences. She states that there is no essential way of being a woman and that links between “feminine” roles, expectations, and attributes to women are social constructs. This led to her most famous quote “one is not born, but rather becomes, a woman.” [18]

Butler has interpreted the ideas of de Beauvoir as a radical understanding of gender that includes an initial differentiation between sex and gender [14]. On her conception, sex and gender are socially expected to follow a pre-determined ordering: female bodies are associated with women, and male bodies with men. More than that, women are raised to develop distinct abilities than men. Other feminist approaches followed the track opened by de Beauvoir in the 60s. One of the first formal definitions was Gayle Rubin’s sex/gender system, where she defines gender as the socially imposed division of the sexes [46].

More recent works disagree with the notion that sex is immutable, and gender gives shape to it, as if nature and culture were disjoint. Butler questions if sex exists outside culture and even if sex and gender are distinct after all [13], that is, without gender, how could we even think about distinct sexes? Even though this sex/gender separation discussion about has been there for a while, the biologically determinist rationale is still widespread.

Butler advocates that gender is not a universal notion regarding who one is, but one built by acts and roles (e.g. hair shape, manners of walking, preferred toy, color of clothing, hobbies, etc.) that people (re)produce to express their gender [13], as if such acts held a truth about gender. Moreover, people who do not fit the performative expectations are prone to bullying and disfranchisement.

She borrows Adrienne Rich's concept of compulsory heterosexuality [44] to state that there is a social expectation that imposes that sex, gender and desire be related in a heterosexual fashion [13]. This expectation produces a social coercion in which heterosexuality and cisgender identity are compulsory. More specifically, it is a structure in which lesbians, gays, bisexual and trans do not typically have the same social privileges (and rights) than people matching this order. Instead of using Rich's terminology, we are going to refer to this structure as cis-heteronormativity, since the term makes explicit that the cisgender identity is part of the expected consonance.

2.2.2 Sexual orientation

Sexual orientation is related to one's object of sexual or affective attraction. At the poles, we have the homosexuality, attraction solely to the same gender, and heterosexuality, attraction solely to other gender. "Bisexuality" term more commonly refers to attraction to two genders. However, some define bisexuality as an umbrella term, which encompasses all sexual orientations between those poles. Since the prefix "bi" may presuppose a binarism of attractions, some advocate for the use of "pansexuality" as opposed to the attractions to only one gender. There is also the asexuality, that is, the absence of sexual attraction, the attraction only affective, among others.

Western social views on homosexuality have changed throughout history – according to Greenberg [29] in Ancient societies, human sexuality as a positive good in general enabled the acceptance of same-sex practices. It changed in the Roman Empire under the influence of Augustinean views where only procreative sexual practices were allowed, culminating in Justinian's Code's prohibition on same-sex relations. In most barbarian kingdoms, a general tolerance towards same-sex relations raised but declined after twelfth and thirteenth centuries.

In the eighteenth century, the theological foundation of sexuality knowledge was replaced by secular and, in particular, medical theories [25]. In this new framework, homosexuality is seen as an unchosen characteristic which might express a pathological mental state and demands, therefore, a medical cure. Although the twentieth century had witnessed a sexual liberation and the expansion of LGBT movements, the medical view remains influent having the homosexuality

been removed from World Health Organization's International Classification of Diseases only in 1990 (transsexuality still remains).

Foucault advocated for a historicist view on sexuality, one where sexuality is not seen as a universal practice observable, but rather one shaped by discursive practices [25]. For instance, during Middle Age, same-sex relationship was just one of forbidden practice from a set of sodomite acts, which also included punishments for certain heterosexual relations [29]. However, the raise of psychiatry and the term "homosexuality" in the nineteenth century gave birth to a new "species," the "homosexual." At the same pace it allowed homosexual practices to be pathologized, it also opened an opportunity for people to gather and have a voice.

Although LGBT acronym is used to generally classify people outside the cis-heterosexual spectrum, we stress that one should not use it to label people's sexual experience. To name different practices is important to remind practitioners of the complexity of identities and understand them as important elements of human individuality, but not to consider them as shaped boxes to put individuals in. We also highlight the interaction with characteristics such as race, social class, and nationality, and the unbalanced representativeness of each letter, with gay men being perhaps the most prominent group. Also, updated acronyms might be used to highlight other groups, such as queers and intersex people.

2.2.3 LGBT as system users

Kannabiran et al. [34] point out that some aspects of sexuality are neglected by HCI studies, due to the great complexity and interdisciplinarity of involved subjects and to the existence of taboos, producing a gap of researches related to LGBT population. The approach in this area has been influenced by feminist [3] and critical theories, such as Queer Theory [e.g. 39]. For instance, Kannabiran [33] argues that we may regard user profiles as something in constant (de)construction, reflecting their own identities organically changing.

Following this denaturalization of gender, the quest for differences in the use of technology between men and women has been discouraged [11, 12] and subjectivist approaches have been preferred such as Kvasny [37], who points out the combined effects of race, gender and social class in women in technology fields. Few

works have considered LGBT people as users of systems and studied their experience. Haimson et al. [30] assessed the use of social media during gender transition while Blodgett et al. [8] advocates for studies on sexual orientation-related disfranchisement on virtual worlds. Freeman et al. [26] included LGBT users in their study about marriage simulation in online games.

Kannabiran and Petersen [35] present a Foucaultian study about Facebook and power relations that take place by interacting with the system. They bring the example of someone who wishes to express their gender identity in their personal profile, but the system does not provide options for that. Hence, the user needs to search for alternative ways of expressing it, such as writing it in their Biography section. It is noted then that the system had an active role in the prohibition (or permission) of an action, and the user used the available interactions as ways of resistance. Thus, such mechanisms of interaction may disfavor groups or promote specific behaviors.

2.2.4 LGBTphobia in digital systems

Social networks have made some efforts to better accommodate LGBT people, especially by allowing the inclusion of other genders beside male and female in personal profiles. Google+, for example, allowed since 2011 the choice of “Other” as a gender. At the time, there was a bit of controversy due to the obligation of letting the chosen option be public, but that was changed after a month [31]. Las Casas et al. [38] suggest that providing the option “Other” might not be appropriated, since it clusters trans people with people who just do not want to expose their gender or accounts such as bands, couples’ profiles, fictional characters, institutions, etc. In 2014, Google announced two new options: “Decline to state” and “Custom” [6], which displays an open text field and allows choosing the preferred pronoun.

Facebook initially limited the choice between male and female. In 2014, 56 new options of gender were included [19] and, in 2015, an open text field was added to gender, with the possibility of choosing the preferred pronoun [20]. However, as Bivens [7] states, in a database and coding level, the system still stores information in an oversimplified way, built over a binarist bias.

It is well known that Internet has a big influence in self-identification and the exteriorization of the “true self” [5, 9, 30] and, therefore, it is essential that systems care to provide enough options for their users to express their gender and sexuality. Since other authors [22, 32, 53] have shown that developers’ stereotypes might be root causes of systems stereotypes themselves and that personal values are always incorporated to the design, one may question the presence of LGBT stereotypes embedded in interaction mechanisms and think about the role that the user interfaces play at reproducing or combating social oppressions.

2.3 An exploratory study

2.3.1 Objectives

For Michel Foucault, an influent author for queer and feminist theories, power is also exercised in local forms – micropowers – within the network composed by relations between people and institutions [24]. As Kannabiran and Petersen [35] show in their case study about Facebook, digital system and user become political agents through interaction, which can be seen as power relations. This study aims to expand the knowledge about how such relations are perceived by people interacting with digital systems, how they affect the use experience, and how they are enabled by the available interaction mechanisms.

The consideration of oppressions in interfaces meets at some points the concept of Universal Design or Design for All. Connel et al. [15] already stressed the inclusion of gender as an important factor in planning interfaces, and Stephanidis [48] highlighted the importance of individuality in the design process. Kannabiran et al. [34] states that other related ramifications may impact the progress of HCI field, as well as innovation, commerce, well-being and public health.

2.3.2 Method

The approach was based in the work of Kannabiran et al. [34], which uses analysis of discourse to describe how works regarding sexuality have been developed in the HCI field. Following the paper’s recommendations, sexual orientation and gender identity are seen in this study as variables to analyze design choices, focused on Internet systems interfaces.

The research comprised an online survey, created via Google Form tool. Its online address was published in one of the authors' profile and in Facebook university groups. Participants were encouraged to share the survey. Only voluntaries at 18 years or older could access the questions. The answers considered were given between 2015, May 29th and June 20th.

The survey is made of 35 questions[8]. First page (Q1-3) gathers information about age and whether any social network is used. We focused on social networks to bring the discussion on how to treat LGBT-phobic user content.

Next, we asked which social networks are used and their weekly frequency of use. We also asked about experienced LGBT-phobic situations (Q6-22) by presenting three types of episodes – LGBT-phobic user content, automatic content or interface elements. We aimed to know if they had already experienced this kind of event, which mechanisms they used to react to this event, and how efficient they were. We presented a list of common tools provided by social media such as reporting, hiding, commenting, and graded their efficiency via a Likert scale. The sections were complemented by open questions to suggest new tools for fighting or preventing LGBT-phobic experience. The list also allowed the insertion of other known mechanisms.

Third page asked questions regarding mechanisms provided to treat privacy concerns (Q23-28). Again, we provided volunteers with a list of options, and asked those which they had already used, how efficient it was and suggestions.

In the last step, participants were asked generally about other LGBT-phobia situations in other systems and how to fight it in open answers (Q27-31). We asked them to grade to the importance that LGBT-phobia combat and prevention mechanisms have on the decision of using (or not) a system and the discomfort caused when they are absent. We asked also a general grade to current systems, with regard to such issues. Finally, we collected demographic data about gender identity and sexual orientation (Q32-34) and extra comments (Q35).

[8] See questionnaire in Appendix A.

2.4 Results

2.4.1 Demography

A total of 114 answers were analyzed. All volunteers were users of some social network, represented by the following percentages: Facebook (100%), Youtube (82.6%), Instagram (69.6%), Twitter (46.5%), Linkedin (30.7%), Google+ (22.8%), Tumblr (6.1%), Quora, Hornet (1.8% each), Research Gate, Academia.edu, Slack, Grindr, Last.fm and Badoo (0.9% each). Some instant message apps, like Whatsapp (2.6%) and Snapchat (4.4%), were also mentioned.

106 respondents declared themselves cis persons and 8, trans. In the trans group, there were 3 men (37.5%), 2 bigender trans (25%), 2 gender-fluid (25%) and 1 woman (12.5%). As to the sexual orientation, 3 were homosexual (37.5%), 2 heterosexual (25%), 2 bisexual (25%) e 1 pansexual (12.5%). In the cis group, 60 are men (56.6%) and 46, women (43.4%). Besides, 52 consider themselves homosexuals (49.1%), 29 heterosexuals (27.4%), 22 bisexuals (20.8%), 2 pansexuals (1.9%), and 1 asexual (0.9%).

We acknowledge the common sense stereotype that trans people are “overly homosexual,” and that by considering sexual orientation only of cisgender people, one might reproduce this misconception. However, due to the small amount of trans respondents, we were not able to detect differences in perception across different sexual orientations, therefore trans population was analyzed as a single group. Results for cis pansexual and asexual cis groups are not presented due to the small participation and the lack of open answers, which might have pointed to specific demands. We again advise researchers to consider such groups separately in studies with greater samples. Proportion of each group in the final population is presented at Figure 2.1.

46 of the respondents were between 18 and 22 years old (40.4%), 52 between 23 and 30 years old (45.6%) and 16 over 30 (14%). Finally, 16 said they use social networks between 1 and 3 weekly hours (14%), 28 between 3 and 7 hours (24.6%), 27 between 7 and 15 hours (23.7%) and 43 more than 15 hours (37.7%).

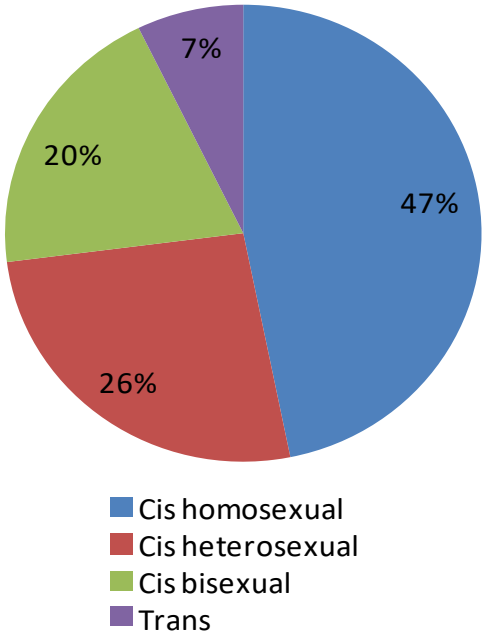


Figure 2.1 – Proportion of each group taken into account

2.4.2 Oppressions at the interface

42 respondents (36.8%) said they had already noticed some type of oppression in systems interface elements - 4 trans (50%), 5 cis heterosexuals (17.2%), 18 cis homosexuals (34.6%) and 13 cis bisexuals (59.1%). Which percentage of each one of these answers chose each vehicle of oppression is presented at Figure 2.2: 2 cis heterosexual (40%), 2 cis homosexual (11.1%), and 4 cis bisexual (30.8%) chose improper text. Form fields were mentioned by 4 trans (100%), 3 cis heterosexual (60%), 18 cis homosexual (100%) and 4 cis bisexual (95.2%), and graphic elements for 2 cis heterosexual (20%), 3 cis homosexual (16.7%), and 4 cis bisexual (21.4%).

40 answers (95.2%) mentioned absent or improper form fields; 9 (21.4%), graphical elements such as text, colors, profile images, buttons, and 8, offensive or improper labels (19%). All answers from trans population included absent or improper form fields.

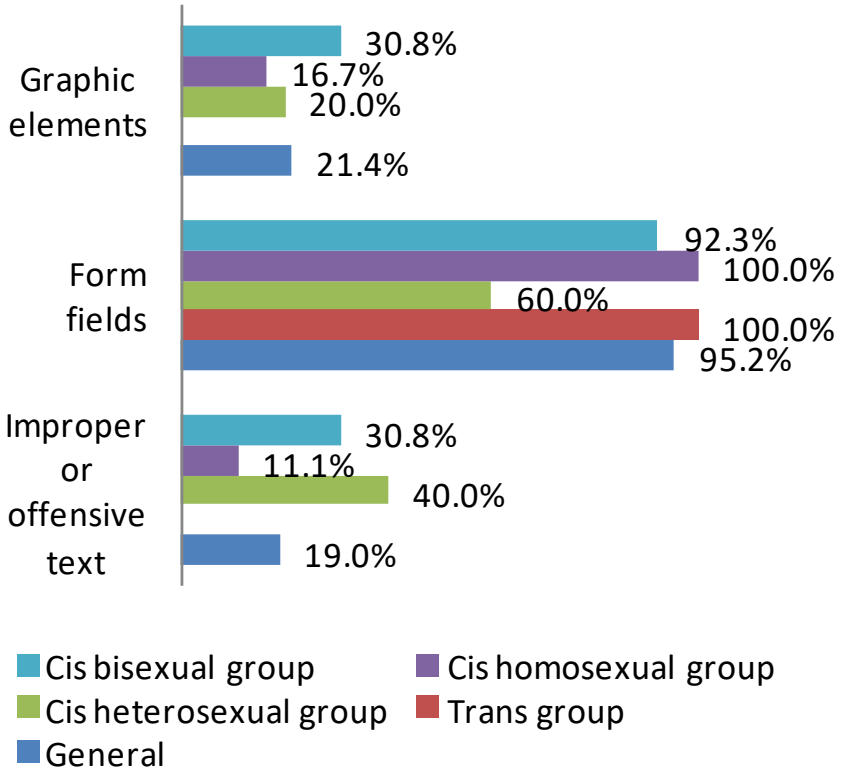


Figure 2.2 – Proportion of each group that perceived oppressions in each element

In the extra details, other issues were absence of enough options of gender identity or sexual orientation, and the use of "sex" instead of "gender" as label[9]:

"Most social networks use the word "sex" and there are only the options "male" and "female." It should be "gender" and the field should be open so the person could fill it in with the gender she identifies with" (P60); *"Many involve only two genders, or yet three sexual orientations."* (P85)

Apart the aforementioned nature/culture ontological debate, "sex" refers to the assignment made at birth, and "gender" to the individual identification. As Kannabiran [33] describes, the networks request for the "sex" input is a request of a physical attribute description, while other fields in profile relate to socio-cultural stances. Besides this incoherence in the interface, asking for the sex of a trans person may trigger bad memories or feelings.

[9] All presented statements are translations made by the authors from Portuguese original comments.

Foucault saw discourse as a tool for inquiring power relations, since regimes of meaning-making are built in and as discourse, (re)producing knowledge and, thus, power [23]. Based on Foucault's theory, Kannabiran [33] presents an analysis of further consequences of preventing users from properly expressing gender. Kannabiran notes that the lack of such functionalities is also a denial of discourse power for users to express non-binary gendered subjectivities, which might prevent non-binary trans users from having meaningful interactions within the system. It is a systematical structure that denies agency for some users, while allowing it to others.

Some networks, as Flickr, still let only binary gender identity options available. Facebook sign up also contains only two options, although others are made available in the profile editing page. Some people also pointed out the presence of stereotypes in graphical elements:

"It's not actually LGBT-phobic, but gender binarism is always perpetuated: from always using masculine adjectives (an issue of our idiom) to the imposition of patterns in the generic profile pictures, for instance." (P113)

Indeed, when user does not upload a profile picture, many social networks opts to include a generic image. For instance, Twitter exhibits the image of an egg, while Google+ and Facebook display the silhouette of a person. By doing this, some stereotypes might be used, such as associating women to long hair and men to short hair. Consequently, improvement suggestions mentioned the expansion of options for gender identity and sexual orientation. Some also mentioned the creation of a communication channel with LGBT population in order to get information directly from this group:

"Social networks should create mechanisms and work groups who'd aim to talk with the LGBT community in order to incorporate its countless suggestions." (P42)

To include real users in the design process is a concern of some methodologies in HCI, such as the Participatory Design, and, in this case, a demand of some users themselves. In fact, researchers and developers should pay a special attention to this, and be able to properly choose groups to work with and consider

them in across the phases of development and support. Some answers also questioned the need of informing gender. Some networks, as Twitter, Vine, Linkedin, and Tumblr do not require so.

In the end, we asked a grade, from 1 to 5, for current interfaces with respect to the presence of LGBT-phobic elements. 88 respondents gave a grade. When considering just who noticed oppressions, the average was 2.74 (sd = 0.96) and, for those who had not noticed, 3.37 (sd = 0.97). Among the trans group, values are 1.75 (sd = 0.96) for those who perceived oppressions and 4 (sd = 1) for who did not. Amid the cis heterosexual population, 3.2 (sd = 0.45) for those who perceived oppressions and 3.38 (sd = 1.09) for who did not. Cis homosexual population who has perceived gave 3.28 (sd = 0.57), and who has not, 3.29 (sd = 0.9). Finally, the bisexual population who perceived gave 2.08 (sd = 1.08) and, who did not, 3.33 (sd = 1.03). General grades were 2.74 (sd = 0.96) for those who perceived and 3.37 (sd = 0.97) for those who did not. All grades are presented at Figure 2.3.

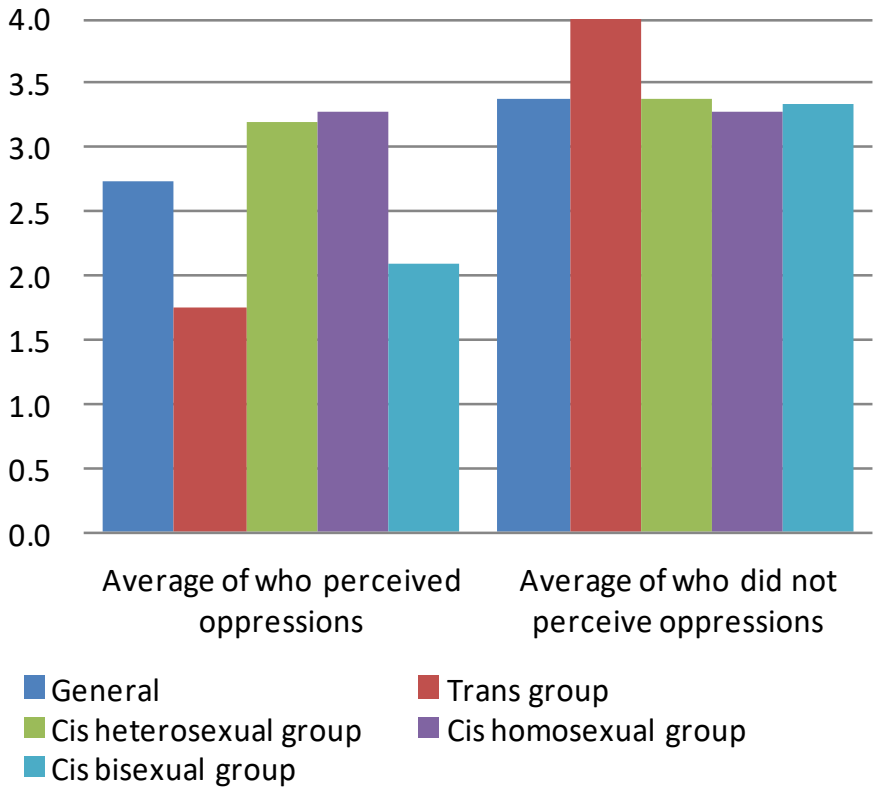


Figure 2.3 – Average of grades given by each group

Those who did not perceive a situation of discrimination gave a greater grade. There was bigger difference between grades of those who have and have not perceived among the trans and cis bisexual groups. Besides, grades from cis homosexual and heterosexual populations were not very different from each other. The most frequent complaint was the absence of gender identity or sexual orientation options.

2.4.3 Oppressions in user content

All respondents affirmed they had already seen some oppression in user content:

"It's hard to talk about one situation, because LGBT-phobic content is so vastly broadcasted that it's hard to get one single day without coming across plenty of prejudiced posts and comments." (P85)

The action taken in response by each population is represented in Figure 2.4. To report the publication was the preferred action for cis homosexual (80.8%) and bisexual (77.3%) groups. Cis homosexual and trans populations opted more to exclude than to block authors; the other populations chose such options equally. The preference for excluding was alike the portion of those who prefer to write answers, except for the trans group. Trans population preferred writing answers, reporting, excluding the author and writing posts (50% each).

When asked to give a grade to the efficiency of these mechanisms, cis heterosexual group gave an average of 2.14 (sd = 1.03), cis homosexual group, 2.31 (sd = 1.02), cis bisexual, 2.09 (sd = 0.97), and trans, 1.25 (sd = 0.46). The low grade of this last group explains the preference for more drastic actions. General grade was 2.16 (sd = 1.00). All grades are presented at Figure. 2.5.

58 respondents (50.87%) wrote an improvement suggestion. Among them, 45 improvement suggestions (77.6%) mention faster and more efficient assessment of reports or harsher punitions. The answers suggest that many reports are ignored. Some suggest forwarding the reports to responsible government institutions:

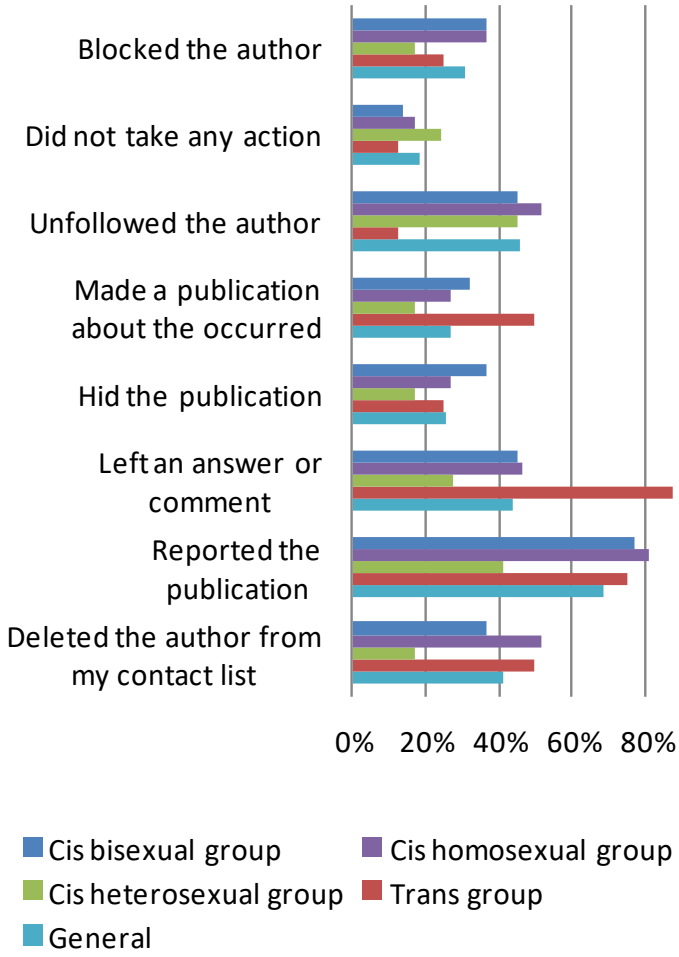


Figure 2.4 – Percentage of response actions taken by each group

"To read carefully the reports. Much explicit LGBT-phobic content is reported, but the answer usually is that there is nothing wrong." (P53); *"Facebook rarely removes publications that I report as prejudiced. I've never reported in other networks. There should be a bigger/better prepared team to deal with publications report, also providing assets for police to investigate such situations."* (P3)

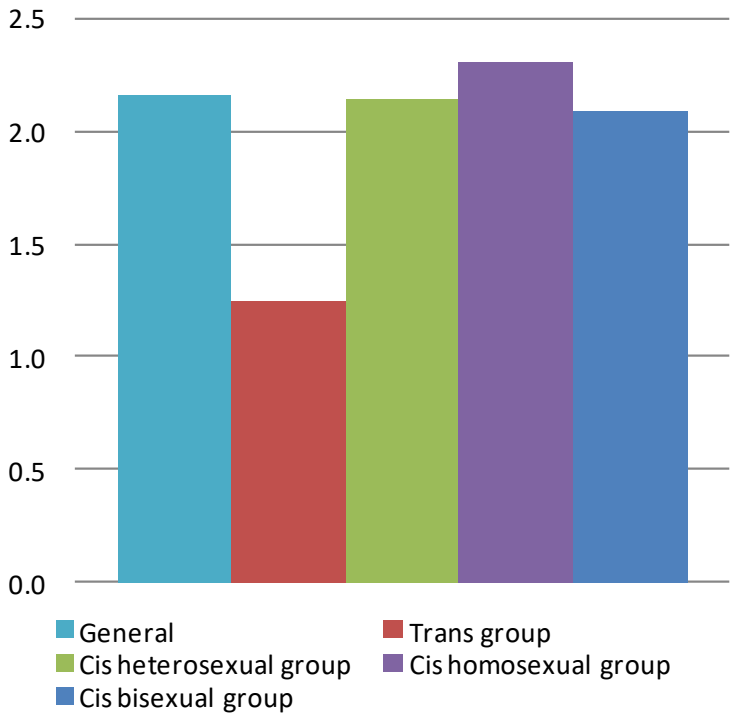


Figure 2.5 – Average of grades by each group

Content removal depends on subjective evaluation of moderation teams and reflects a modern debate about freedom of expression limits. As systems reflect the developers' personal expectations, content review is subject to teams' own expectations. Some respondents, aware of that, stated this concern in the answers. However, it is important to remember that equalitarian treatment, independent of private questions such as gender and sexual orientation is also a right provided by Brazilian law [16].

The controversial approach taken by Facebook to deal with hate speech has implications in other social areas as well. A recent example is the dialogues between Germany's chancellor and Facebook's CEO to eliminate racist and xenophobic content in the media [10]. In times of social media intense use, we should not see the virtual social life as a separate, distant reality; bigoted content is not only a consequence of prejudice outside Internet, but also an intensifier of it. Content moderators should be aware that the omission in excluding hateful speech does not only affect individuals, but also reinforce social oppressions outside the media. Consequently, it is needed to use some reflection and think about policies

and values involved when classifying content as non-offensive, based upon a misleading claim of freedom of expression.

Other answers include broadcasting of educational content or suggest that current report mechanisms are not clear, or need to be more specific. The broadcast of educational content may be a complementary but important strategy to fight LGBT-phobic activity, since social media plays a big role in citizenship formation:

"Relevant and clarifying content that fight the LGBT-phobic thinking." (P69); *"To allow reports."* (P59); *"Specific report mechanisms to such situations."* (P22).

Open answers highlighted concerns with the reporting process of user content. All suggestions mentioned some step of the revision process – the availability of report mechanisms, the efficiency and partiality of the analysis, or the severity of punishment. It is also remarkable that all volunteers stated to have seen hateful user content in social media.

2.4.4 Oppressions in automatic content

49 respondents (43%) have already noticed discrimination in automatic content, 5 trans (62.5%), 10 cis heterosexuals (34.5%), 22 cis homosexuals (42.3%), and 12 cis bisexuals (54.5%). Cis heterosexual population showed less perception of this kind of situation.

The type of content flagged by each population is presented in Figure 2.6. Suggestions of pages are the most frequent type for all populations, except the cis heterosexual. For this, the most frequent is the "hot topics," that is, popular posts or hashtags. Cis homosexual and bisexual populations perceived more situations of this kind, when compared to the others. Some were described:

"It was an event created to support a heterosexual pride parade and it contained quite offensive posts." (P61); *"I saw an extremely transphobic person among suggestions of people I might know in Facebook. Before excluding it, I reported their profile."* (P65); *"The most frequent are pages of people whom I have common friends with that advocate for hate speech toward minorities [...] and*

advertising that propagate LGBT-phobic speech, typical of publicity, such as the sale of xxx for 'true men'… Or, in the Youtube case, at the suggested videos aside." (P86)

Answers suggest that developers should reflect upon even the chosen algorithms, in order to assure that it does not only work as expected, but that no subjective harm is caused. Also, even a simple and seemingly naïve functionality of suggesting friends may cause harmful experiences.

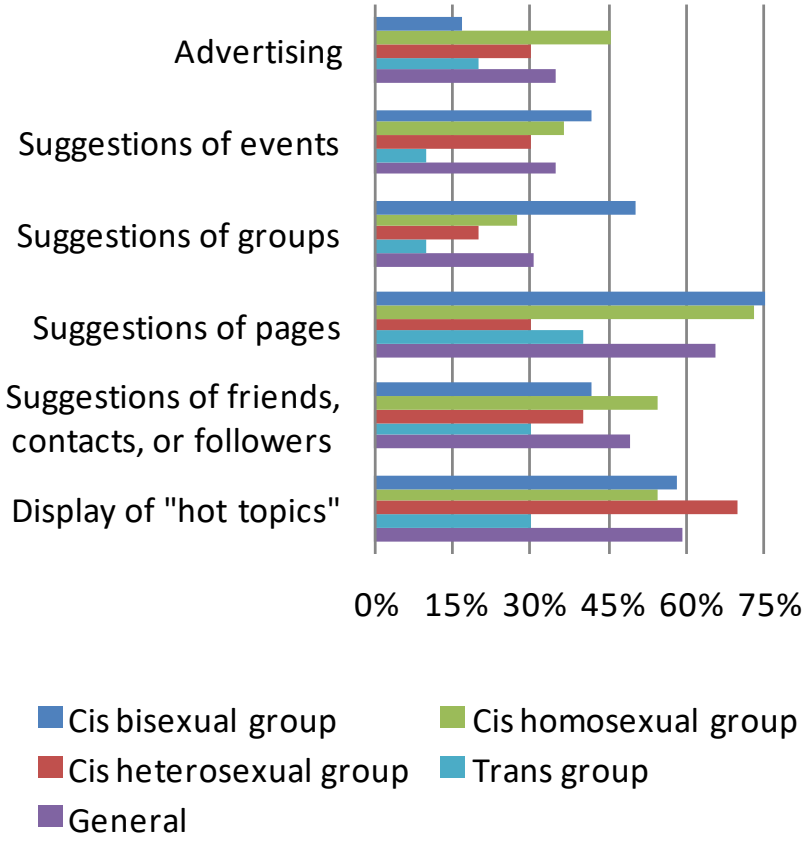


Figure 2.6 – Percentage of content type signalized by each group

Cis heterosexual population presented lesser preference for direct actions than the others, and more inclination to not taking actions. The exception was to write a post, chosen more times by the cis heterosexual group than by the homosexual. To report and to exclude the suggestion were the main actions of all populations, followed by hiding the post. These are the sole mechanisms that provide the user with an active role in the content treatment, which may explain the predilection. The percentage of actions taken by each group in response is presented at Figure 2.7.

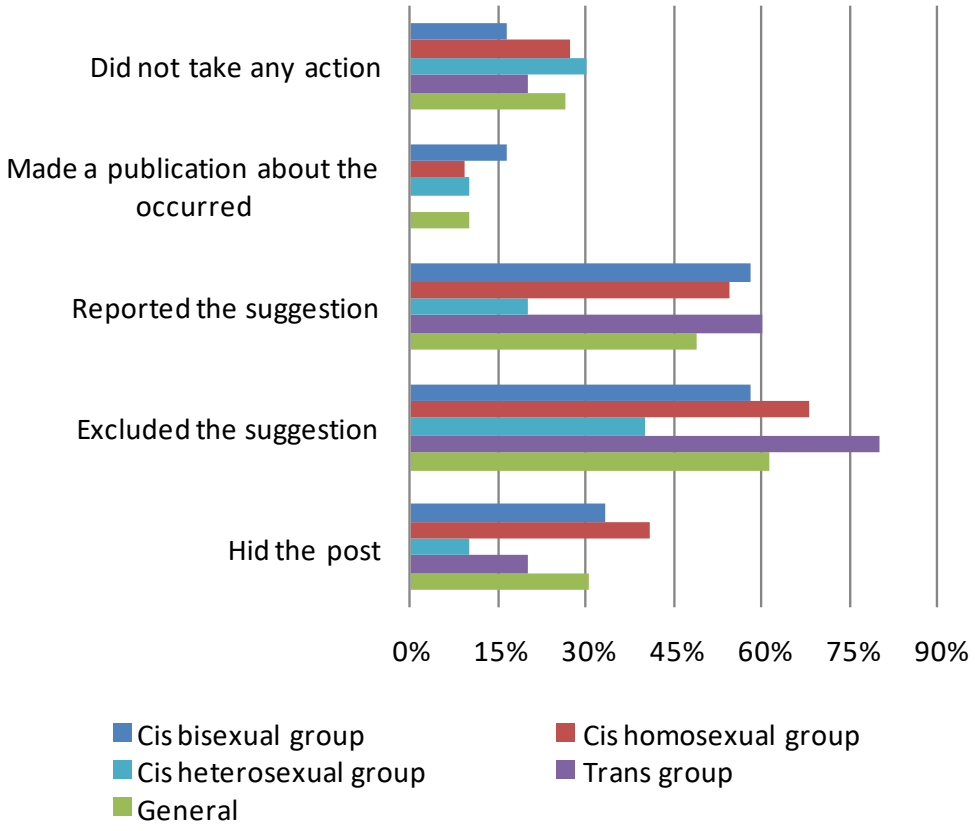


Figure 2.7 – Percentage of response actions taken by each group

To increase the accuracy of algorithms that produce automatic suggestions with better heuristics or human supervision was also suggested:

"User should have greater control and clarity about the way social network produces page suggestions and be provided with an option for ranking, consciously (thus, with user on control), pages s/he would like to see the most or the least, and which pages or users should be taken as models for suggesting new pages, friends, and advertising." (P86); *"More rigid algorithms with automatic suggestions in a way that intolerance does not get broadcasted (it should not even be present in the media channels)."* (P60)

The possibility of configuring pages user would like to see was mentioned in 9 (32.1%) of the 28 given suggestions. Facebook, the most used social media, in fact has a page where user can see subjects the system believes that could interest them. The page is located at the account preferences under the label "Ads," and allows user to remove categories of advertisement that appears in the profile. However, it is not possible to choose which advertisements the user would like to see

or remove completely. The suggestions are very alike those given in previous section, such as ranking users and implementing detection algorithms.

Plenty volunteers mentioned actions related to broadcasting of user or sponsored content. Changes in the terms of use, in the partner policy and harsher policies were mentioned:

"To better evaluate partners (in the case of sponsored content). To have a harsher policy regarding LGBT-phobia. To put under automatic evaluation groups or pages with certain names (for instance, those containing the word "pride," etc.)." (P5)

8 respondents (28.57%) made similar suggestions. We highlight again the fact that the prevention to LGBT-phobia cannot be restricted to any particular phase of a project. Legal and financial decisions should also be made having the prevention to prejudiced content in mind.

Grades from 1 to 5 were given to the mechanisms efficiency. Among the cis heterosexual population, the average of who already perceived oppressions was 2.40 (sd = 1.17), and of who did not, 2.67 (sd = 1.50). Among the cis homosexual group, average of who already perceived oppressions was 1.95 (sd = 0.95), and of who did not, 2.70 (sd = 1.25). The cis bisexual group that already perceived gave an average of 1.67 (sd = 1.15), and that did not, 2 (sd = 1). Only one trans volunteer who have not perceived oppressions gave a grade and, therefore, this subgroup average was not considered. For those who have, grade average was 1.80 (sd = 0.84). In general, average was 1.96 (sd = 1.04) and 2.63 (sd = 1.28) for those who perceived and who did not, respectively. Grades are presented in Figure 2.8.

The cis bisexual population gave lower grades in both cases, with a difference of 0.33 between each subgroup. The greatest variation was among the cis homosexual population, where those who perceived oppressions gave an average 0.75 lesser that the opposite subgroup. As in the user content case, averages did not reach 2.75, suggesting respondents' dissatisfaction with the currently provided mechanisms.

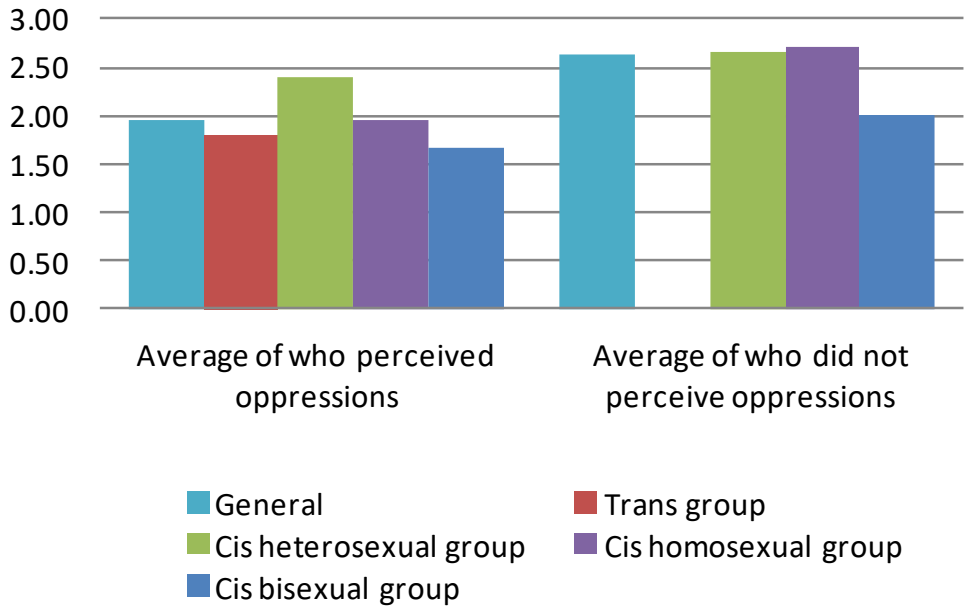


Figure 2.8 – Average of grades given by each group

2.4.5 Privacy

72 respondents (63.2%) said to have already used some mechanism to preserve information about sexual orientation or gender identity. Theoretically, cis heterosexual people are less subject to have issues with exposing sexual orientation or gender identity. Nevertheless, many of cis heterosexual volunteers gave some opinion about this subject. Figure 2.9 depicts the use rate of privacy mechanisms that each population uses.

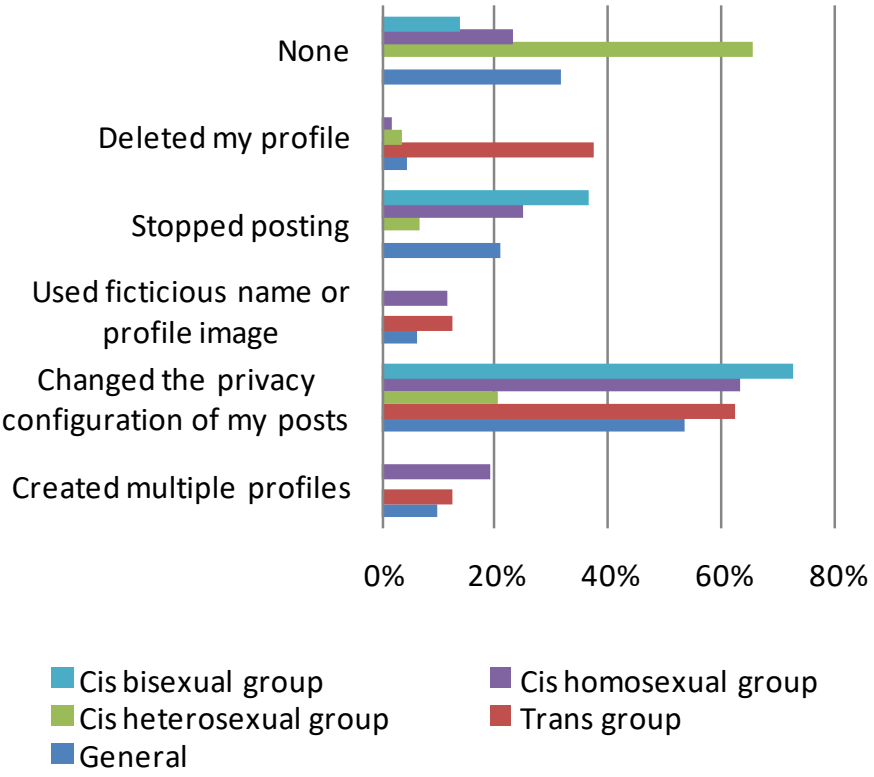


Figure 2.9 – Mechanisms used by each group

In general, to change the privacy configuration was the preferred mechanism of volunteers. 37.5% of the trans group has already opted to delete the profile, showing a bigger proclivity for this option when compared to other groups (1.9% of cis homosexuals and 0% of cis bisexuals chose it). On the other hand, no trans has given up posting, while 36.4% of the cis bisexual and 25% of cis homosexual population have.

A possible explanation for the profile deletions is the fact that the process of gender transitioning[10] in social networks possibly requires actions that expose them more, such as updating the profile image, the gender, and the name [30]:

"I'm a male trans, so when I came out, I excluded my old profiles and made new ones." (P65)

[10] "Transitioning" refers to the time when some trans people afford legal, social, or physical changes in order to better suit their gender expression. One should not see transitioning process as a gender change - gender identity remains the same, but gender expression is altered.

Other mentioned reasons for using any mechanism were fear of suffering professional disadvantage, lack of personal acceptance, and intention of avoiding fights and disrespectful comments from social contacts:

"Many companies evaluate, before hiring, people's social network profiles. Unfortunately, I've heard Human Resources people telling they've given up hiring some people based on LGBT-related content posted." (P9); "In order to avoid the conservatives of my family and occasional unknown people." (P50); "Just while I still didn't accept and was not entirely comfortable with myself, I created a fake profile." (P10)

A research from 2015 showed that 11% of Brazilian companies would consider hiring a LGBT candidate only for jobs with low degree of visibility, and 7% would not hire a LGBT at all [47]. A similar study showed that UK applicants who openly disclose their sexual orientation are approximately 40% less likely to be offered a job interview [2]. The lack of specific law protection towards LGBT people is not a concern specific of Brazilian population. Even after legalizing same sex marriage, in 2016, almost 30 US states still allow companies to fire their employees for being LGBT [42].

A type of privacy mechanisms improvement suggested was related to being forced to give personal data to the network:

"Facebook and Google+ should not obligate users to give them the same name as in my legal documents." (P93); "To stop accepting reports of "wrong" names, because it's harmful for people updating their legal names" (P57); Some networks, as Facebook, demand the use of your "real" name, that is, the name that is in your ID. But it's difficult for trans people (binary or not) to change their legal documents." (P54)

Many users do not feel comfortable in using their legal names in the network, especially if they are trans people who have not updated legal documents, or concerned with privacy or artistic work advertisement. Legal names usually reflect the sex assigned at birth and which children are registered with. Since the childhood of many trans people is marked by psychological, physical, behavioral, and social repression of gender identity prevailing cisgenerity as the right and natural one, many

occasions may trigger bad feelings, like the use of wrong pronouns or the use of legal name. Besides not matching trans people identity, these may be used by bullies to expose and mock individuals. Since the update of documents demands legal actions, this kind of policy may force several trans people to use and be referred to by undesired names. P57's suggestion also reveals another flaw: in some networks, users can report profiles for using so called fake names, allowing deceitful users to report trans people profiles.

Other controversial aspects of this exigency relate to personal advertisement, such as polemics involving drag queens in 2014. Many artists claimed to have had their Facebook accounts deleted for using allegedly fake names, and therefore violating the clauses of being real persons. Although Facebook and Google+ allow the creation of pages, many users would like to be able to use personal profiles to interact with their public. To obligate users to use a media mechanism instead of another may be seen as other example of uneven exercise of power by networks.

Many other examples can be given to justify the choice of not using the legal name, such as abuse victims or persons who would just like to be anonymous in the network. Some Native Americans also had their Facebook account deleted in this period [40]. The network later posted an apology request for the crisis, promising to tone down the names policy [17]. An updated followed in December, 2015 [21], requiring users to go through more steps to report someone, and giving reported users the possibility of justifying the use of the name and access the account for more 7 days, while name is being verified (previously, the accounts were deleted without prior notice). The website still reinforced the use of pages for professional personas. Google+ abandoned the demand of legal name in 2014 [28].

Another kind of suggestions is related to the lack of control of exposition of some data. For instance, name and profile picture, are typically public:

"I wouldn't like my profile picture to be available to every Facebook user, for example, because a hurtful user can simply take a screenshot and use it freely." (P35)

Finally, it was mentioned the difficulty of using privacy mechanisms, such as friend lists. Other studies also bring difficulties in configuring privacy [1, 41, 50, 51].

"A system to index users who should (not) see some content in a more straightforward fashion, like Facebook's friends list, but easier to add members (e.g., a button to add a friend to a list in the moment you accept a friendship request, as in G+ circles)." (P50)

99 respondents gave a 1 to 5 grade to the efficiency of available privacy mechanisms. By considering just those who already used some, general average was 3.41 (sd = 1.10), and, for who did not, 2.79 (sd = 1.17). The whole trans population had already used some mechanism, totaling an average of 3 (sd = 0.82). Among the cis heterosexual population, we got 3.80 (sd = 0.84) for who used a mechanism, and 3.19 (sd = 1.03) for who did not. The homosexual cis population who used gave an average of 3.28 (sd = 0.57), and who did not, 3.29 (sd = 0.9). Finally, the cis bisexual population who used gave 3.11 (sd = 1.37), and who did not, 1.67 (sd = 0.58). General averages were 3.41 (sd = 1.10) and 2.79 (sd = 1.17) for those who used and did not use such mechanisms, respectively. All grades are presented in Figure 2.10.

Respondents who never used some mechanism gave a lower grade than those who already did, within the same population, except for the cis homosexuals:

"I never used anything to protect my sexual orientation, but I have friends who have trouble with filtering friends and posts so that work colleagues do not know their orientation."(P43)

Arguably, respondents who never used any mechanisms graded based on the feeling that people who use them may have difficulties with the current functionalities. Although some mentioned needs of improvements in the current mechanisms, the volunteers in general appeared to be able to correctly configure privacy. Since the volunteers were mostly university students, we may presuppose a greater easiness of use of mechanisms and, therefore, a high grade.

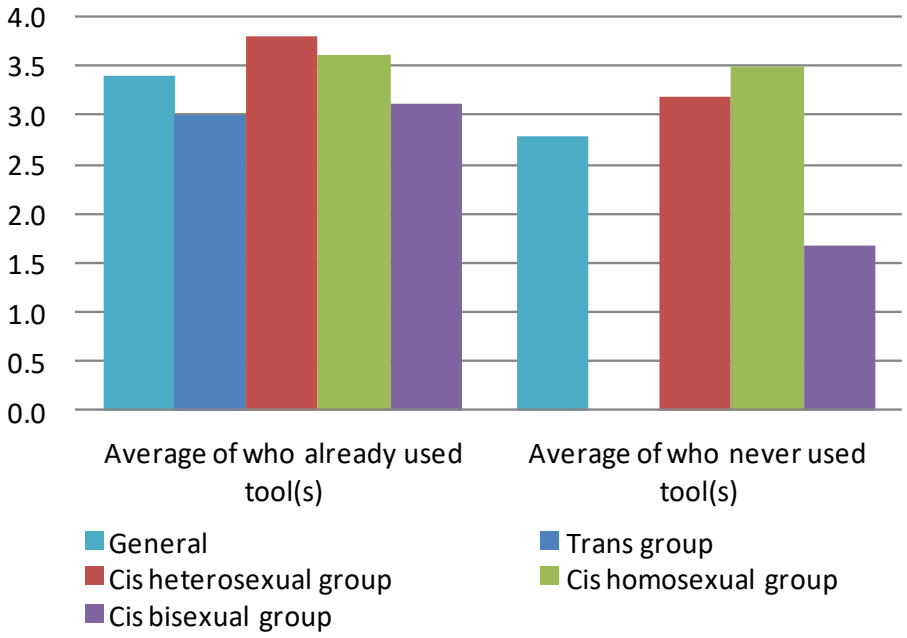


Figure 2.10 – Average of grades given by each group

2.4.6 General grades

The respondents were asked to give grades from 1 to 5 to current Internet systems, considering the LGBT-phobia threat. Average was 1.50 (sd = 0.76) within trans population, 2.52 (sd = 1.33) within cis heterosexual population, 2.21 (sd = 0.95) within cis homosexual population, and 2.07 (sd = 1) within the cis bisexual. General average was 2.28 (sd = 1.21).

Next, they were asked about the importance that proper mechanisms for fighting and preventing LGBT-phobia have in the decision of using or not a system. This was made via a 1 to 5 Likert scale, where 1 is “regardless” and 5 is “essential.” Average was 3.38 (sd = 1.19) for trans population, 3.21 (sd = 1.54) for the cis heterosexual population, 3.83 (sd = 1.32) for the cis homosexual population, and 3.27 (sd = 1.28) for the cis bisexual population. In the following discussions, the importance of such mechanisms in the decision of using a system will be referred to as “importance of mechanisms.” General average was 3.51 (sd = 1.37).

Finally, it was asked about the comfort users feel when using systems with no proper LGBT-phobia prevention or fight mechanisms, via a Likert scale from 1 (very uncomfortable) to 5 (very comfortable). Average was 2.38 (sd = 1.41) for the trans population, 2.24 (sd = 1.12) for the cis heterosexual population, 2.88 (sd =

1.36) for the cis homosexual population, and 2.38 (sd = 1.40) for the cis bisexual population. Grades are presented in Figure 2.11. In the following discussions, comfort felt when using systems without such mechanisms will be referred to as “comfort of use.” General grade was 2.55 (sd = 1.32).

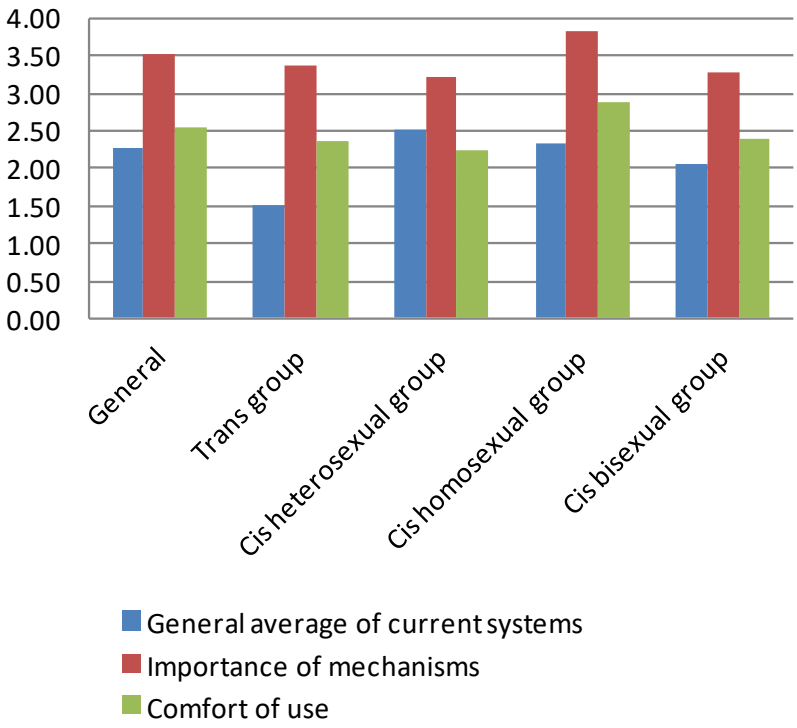


Figure 2.11 – Average of grades given by each group

Cis homosexual group gave the greater importance to the mechanisms, followed, in order, by the trans, cis bisexual, and cis heterosexual groups. This is the same ordering of the comfort of use grades. This ordering might not sound compatible with the previous result, since it was expected for groups that place more importance on such mechanisms to feel more uncomfortable with their absence. However, when checking the absolute values, it is noticeable that no grade is greater than 3, the neutral grade. We conclude that it is consensual that some discomfort is caused by the absence of proper mechanisms.

Even though not required, 51 volunteers justified the general grades. Among them, 44 (86.27%) explicitly mentioned the report mechanism as main justification, which reinforces the urgency of better conceiving and providing it:

“Many reports are ignored.” (P75); *“Most analysis are superficial and posts are rarely excluded, even when many people report them.”* (P57); *“Facebook has a troublesome pattern of posts removal, being misogynist many times.”* (P38).

Trans population gave a lower general grade, albeit it was not the group who gave greater importance to the mechanisms. It might indicate these participants were more critical with current systems, which may lower the importance of mechanisms. Yet, the grades of importance were greater than 3 within all groups. It might point that more proper mechanisms could improve the experience of users.

2.5 Discussion

Results presented in this study allow us to better understand how social networks reproduce oppressions based on sexual orientation or gender identity. This role may be active, such as oppressions in interfaces, perceived mainly in sign up forms and in personal information disclosures, or passive, not debating discriminatory content or yet broadcasting undesired content via imprecise algorithms. Open answers suggest that the process of report analysis should include demands from the LGBT community. Our results also suggest that cis heterosexual people perceive less oppression in systems, and, therefore, more diverse groups should be considered.

Answers also depict, as in other studies, the seriousness of social networks in the self-identification process, which is directly linked to concerns with security and privacy. Many respondents also question the need of requiring and publicly displaying sensible personal information.

We also observed dissatisfaction in the studied population concerning the current status of Internet systems. Moreover, the presence of proper fight and prevention of LGBT-phobia mechanisms impacts the decision of using a system, and their absence provokes discomfort. Consequently, such functionalities must be taken into account during the building of interfaces, so that we can create genuinely Web spaces for all.

Our research reinforced that mechanisms of exclusion based on cis-heteronormativity are present in digital systems user interfaces. More than that, the

ways that the user can be affected by this bias are diverse – it ranges from functional requirements to legal matters. Whether by denying discourse power for expressing gender subjectivity, broadcasting bigoted advertisement, not deleting hateful speech, or reproducing physical, behavioral or linguistic stereotypes, system interfaces can reproduce and reinforce social oppressions.

Finally, the survey got 114 answers in 21 days, with little announcement. Among the volunteers, some less known identities and orientations were declared. This suggests there is a population up to discuss improvements to current Internet systems and have their needs heard.

2.5.1 Suggestions for future works

Subjects related to gender and sexuality are gaining more space within research in HCI, but there is still no systematic practical study with concerns to design of interfaces, that consider aspects of gender identity and sexual orientation, as well as their social and political implications. Indeed, there are accessibility and usability guidelines [36, 52], but gender identity and sexual orientation have not been considered. Results from this study shed light on LGBT-phobia situations assisted by the digital system interface, and identified elements of interaction that reproduced them, with possible solutions. To identify such elements may provide a ground for broader discussion about gender identity and sexual orientation in design.

Reflexivity, that is, the questioning of their own values, must be in developers' agenda [12, 34], and also is a responsibility of researchers [33]. One of the greatest contributions of post-war philosophy is the call for reflection in all values that appear natural or normal. To apply the reflexivity properly requires breaking any social determinism that may fit people in fixed roles. When talking about gender and sexuality, we must detach from the common idea that puts cisgender heterosexual men as the norm, and any different configuration as the other, the exception.

It is also necessary to have a good comprehension of our society nowadays. Though sexuality still remains a strong taboo, previously invisible identities begin to gain space in discourse. Universal claims about identity, behavior, and expectations are rarely going to express correctly individual traces. To proper

balance the value given to divergent attributes is essential to not propagate uneven privileges, rights, and opportunities.

Participatory theories seem to be well-suited for considering the experience of excluded people as core of inquiry and changing processes. There is no other way of adding such concerns to interface building, if not through the attention to what people affected by them have to say. Processes of design and social formation are deeply related and co-constructed [4], which stress the urgency of including LGBT people when considering users and their needs.

2.5.2 Work limitation

The biggest limitation of this research is related to the volunteers' cut – survey was published in university discussion groups, which suggests a homogeneous scholar degree. Besides, the survey reflected the fact that a very small amount of the Brazilian trans population is currently enrolled in Universities, although there are no official statistics.

Since it was not on-site, the questionnaire attendance may have caused some questions to not be understood and some details to not be provided, as in the mentions to graphical elements as vehicles of oppression in interfaces. An extension of the work, including on-site interviews or focal groups would allow the research to bring up other relevant elements to the field. Nevertheless, the option of making an online form allowed a big amount of answers in a short timeframe, proving itself suitable to the exploratory nature of this study.

2.6 Conclusion

To disregard the influence of gender identity and sexual orientation in the processes of design and use of digital systems can impact the user experience, and cause social and political implications. This work approached the subject aiming to identify the perception that users have of reproduction of oppressions based on gender identity or sexual orientation via their interfaces. Results presented some situations where these oppressions occur and gave some suggestions to prevent and eliminate them. Moreover, we concluded that the studied group has a consensual

discontentment towards current social networks, and that this can impact the decision of using a network and in the feeling of comfort.

This study aimed at a specific cut regarding social networks. Future works may involve other functionalities and specific populations. Besides, other components of human individuality may be used as object of study, from an oppression inquiry point of view; for instance, studies regarding racism or sexism would be valuable to the construction of more inclusive systems and, thus, contribute to a more open-minded and fair society.

2.7 Acknowledgments

We thank all volunteers who have spent some time in reporting their experiences and to the colleagues who contribute to conduct the study and consolidating the text. We also thank the research funding agencies (CNPq, #308618/2014-9 and CNPq, #132272/2016-4).

This work has the approval of the Committee of Ethics in Research, with number of CAAE 43706615.000.5404[11].

2.8 References

[1] A. Acquisti, R. Gross, “Imagined communities: awareness, information sharing, and privacy on the Facebook,” Privacy Enhancing Technologies. Springer (2006), 36–58.

[2] Anglia Ruskin University, “Gays and lesbians face CV bias – study,” 2014, retrieved May, 2015 from https://goo.gl/tafSGs.

[3] S. Bardzell, J. Bardzell. “Towards a feminist HCI methodology: social science, feminism, and HCI,” CHI 2011, ACM Press, 2011, 675–684.

[4] S. Bardzell. “Utopias of participation: design, criticality, and emancipation,” CHI 2011, ACM Press, 2014, 189-190.

[11] See term of consent for participation in Appendix D.

[5] J. A. Bargh, K. Y. A. McKenna, G. M. Fitzsimons, “Can you see the real me? Activation and expression of the ‘true self’ on the Internet,” Journal of Social Issues, Volume 58, Issue 1. Springer, 2002, 33–48.

[6] R. Bennett, Plus.google.com, 2014, retrieved May, 2015 from https://goo.gl/Ln9xZ8

[7] R. Bivens, “The gender binary will not be deprogrammed: ten years of coding gender on Facebook,” Social Science Research Network, 2014.

[8] B. M. Blodgett, H. Xu, E. M. Trauth, “Lesbian, gay, bisexual and transgender (LGBT) issues in virtual worlds,” ACM SIGMIS Database 38, 4, ACM Press, 2007, 97-99.

[9] B. J. Bond, V. Hefner, K. L. Drogos, “Information-seeking practices during the sexual development of lesbian, gay, and bisexual individuals: the influence and effects of coming out in a mediated environment,” Sexuality & Culture, Volume 13, Issue 1. Springer US, 2009, 32-50.

[10] C. Brennan, “Angela Merkel overheard confronting Mark Zuckerberg over the need to 'do some work' about racist posts on Facebook,” 2015, retrieved May, 2015 from https://goo.gl/PNn6uv.

[11] S. Breslin, B. Wadhwa, “EnGendering interaction design,” iUSEr 2014, IEEE, 2014, 292-295.

[12] S. Breslin, B. Wadhwa, “Exploring nuanced gender perspectives within the HCI community,” IndiaHCI 2014, ACM Press, 2014, 45.

[13] J. Butler, “Gender trouble: feminism and the subversion of identity,” 1999, Routledge.

[14] J. Butler, “Sex and gender in Simone de Beauvoir’s Second Sex,” Yale French Studies, 72, “Simone de Beauvoir: witness to a century”, Helen V. Wengel (ed.), 1986, 35-49.

[15] B. R. Connell, M. Jones, R. Mace, J. Mueller, A. Mullick, E. Ostroff, J. Sanford, E. Steinfeld, M. Story, and G. Vanderheiden, “The principles of universal design,” Version 2.0, 1997, retrieved May, 2015 from https://goo.gl/uW6mqn.

[16] Brazilian Constitution, articles 3 (item IV) and 5 (caput and item I). 1988.

[17] C. Cox, Facebook.com, 2014, retrieved May, 2015 from https://goo.gl/2Bq9Vz.

[18] S. de Beauvoir, “Le Deuxième Sex,” 1986, Gallimard Education.

[19] Facebook Diversity, Facebook.com, 2014, retrieved May, 2015 from https://goo.gl/ctdwQo.

[20] Facebook Diversity, Facebook.com, 2015, retrieved May, 2015 from https://goo.gl/TSf5hv.

[21] Facebook help, “What names are allowed on Facebook?,” 2016, retrieved May, 2015 from https://goo.gl/ZxSwHv.

[22] M. Flanagan, D. C. Howe, and H. Nissenbaum, “Embodying values in technology: theory and practice,” Information Technology and Moral Philosophy, J. van den Hoven, J. Weckert (eds.), Cambridge University Press, 2008, 322-353.

[23] M. Foucault, “L’archéologie du savoir,” 1969, Gallimard.

[24] M. Foucault, “Surveiller et punir: naissance de la prison,” 1993, Gallimard.

[25] M. Foucault, “L’histoire de la sexualité I – La volonté de savoir, ” 1994, Gallimard.

[26] G. Freeman, J. Bardzell, S. Bardzell, S. C. Herring, “Simulating marriage: gender roles and emerging intimacy in an online game,” CSCW 2015, ACM Press, 2015, 1191-1200.

[27] Gay Group from Bahia (GGB). “Assassinato de homossexuais (LGBT) no Brasil: Relatório 2014,” 2014, retrieved May, 2015 from https://goo.gl/ETfFpP.

[28] Google+ post, Plus.google.com, 2014, retrieved May, 2015 from https://goo.gl/bzeS6r.

[29] D. F. Greenberg, “The construction of homosexuality,” 1988, University of Chicago Press.

[30] O. L. Haimson, J. R. Brubaker, L. Dombrowski, G. R. Hayes, “Disclosure, stress, and support during gender transition on Facebook,” CSCW 2015, ACM Press, 2015, 1176-1190.

[31] F. Haugen. July 12, 2011 - Google+ Update. Youtube.com, 2011, retrieved May, 2015 from https://goo.gl/Bqd6Ai

[32] C. Huff, J. Cooper, “Sex bias in educational software: the effect of designers’ stereotypes on the software they design,” Journal of Applied Social Psychology, 17, 1987, 519-532.

[33] G. Kannabiran, “Themself: critical analysis of gender in Facebook,” CHI workshop paper, 2011.

[34] G. Kannabiran, J. Bardzell, S. Bardzell, “How HCI talks about sexuality: discursive strategies, blind spots, and opportunities for future research,” CHI 2011, ACM Press, 2011, 695-704.

[35] G. Kannabiran, M. G. Petersen, “Politics at the interface: a Foucauldian power analysis,” NordiCHI 2010, ACM Press, 2010, 695-698.

[36] S. J. Koyani, R. W. Bailey, J. R. Nall, “Research-based web design & usability guidelines,” retrieved May, 2015 from http://guidelines.usability.gov/.

[37] L. Kvasny, “Triple jeopardy: race, gender and class politics of women in technology,” SIGMIS CPR 2003, ACM Press, 2003, 112-116.

[38] D. Las Casas, G. Magno, E. Cunha, M. A. Gonçalves, C. Cambraia, V. Almeida, V, “Noticing the other gender on Google+,” WebSci 2014, ACM Press, 2014, 156-160.

[39] A. Light, “HCI as heterodoxy: technologies of identity and the queering of interaction with computers,” Interacting with Computers 23, 5, 2011, 430–438.

[40] O. McAteer, “Native Americans booted off Facebook for having ‘fake’ names like Creepingbear,” 2015, retrieved May, 2015 from https://goo.gl/KrdqRQ.

[41] M. Madejski, M. Johnson, S. M. Bellovin. “The failure of online social network privacy settings,” CUCS-010-11, 2011, retrieved May, 2015 from https://goo.gl/QUZtJc.

[42] T. McKay, “One map shows where you can still be fired for being gay in 2015,” 2015, retrieved May, 2015 from https://goo.gl/4iWGjf.

[43] J. Osofsky, T. Gage, “Community support FYI: improving the names process on Facebook,” 2015, retrieved May, 2015 from http://newsroom.fb.com/news/2015/12/community-support-fyi-improving-the-names-process-on-facebook/.

[44] A. Rich, “Compulsory Heterosexuality and Lesbian Existence,” 1981, Onlywomen Press Ltd.

[45] M. Rossi, M. Novaes, “Os direitos básicos aos quais transexuais e travestis não têm acesso,” 2015, retrieved May, 2015 from https://goo.gl/Yv7Bs4.

[46] G. Rubin, “The traffic in women: notes on the ‘political economy’ of sex,” In: “Toward an anthropology of women,” Monthly Review Press, 1975, 157-210.

[47] W. P. Sobrinho, “Duas em cada dez empresas se recusam a contratar homossexuais no Brasil,” Carta Capital, 2015, retrieved May, 2015 from https://goo.gl/A4SA4f.

[48] C. Stephanidis, “User interfaces for all: concepts, methods, and tools,” 2001, Lawrence Erlbaum.

[49] Transgender Europe. “Trans murder monitoring 2015,” 2015, retrieved May, 2015 from https://goo.gl/oxtAZo.

[50] Y. Wang, S. Komanduri, P. G. Leon, G. Norcie, A. Acquisti, L. F. Cranor, “‘I regretted the minute I pressed share’: a qualitative study of regrets on Facebook,” SOUPS, 2011, article no. 10.

[51] Y. Wang, P. G. Leon, A. Acquisti, L. F. Cranor, A. Forget, and N. Sadeh, “A field trial of privacy nudges for Facebook,” CHI 2014, ACM Press, 2014, 2367 - 2376.

[52] Web Content Accessibility Guidelines (WCAG) 2.0. W3.org, 2008. http://www.w3.org/TR/WCAG20/

[53] L. Winner, “Do artifacts have politics?” In: L. Winner, “The whale and the reactor: a search for limits in an age of high technology,” University of Chicago Press, 1988, 121-136.

[54] M. Wollstonecraft, “A vindication of the rights of woman,” 1792, Courier Corporation.

Chapter 3

Codesigning emancipatory systems: a study on mobile applications and lesbian, gay, bisexual, and transgender (LGBT) issues[12]

3.1 Introduction

Visibility of LGBT issues is increasing, as reflected by their taking into account by electoral agendas, the use of social media as an arena for sexuality and gender debates, or the recent achievement of rights in American countries. However, it does not follow that quality of life of LGBT people or social equality are universal, especially in Brazil.

It is natural that software development and, in particular, Human-Computer Interaction (HCI) research also increasingly treat related subjects. One particular approach is to seek ways of supporting LGBT people across the daily struggles. This is the goal of the project where this work is inscribed, whose intended result is a mobile application to help prevent and fight prejudice in Brazil.

Brazil is notorious for being the country with the highest amount of LGBT killing – one LGBT person each 27 hours [17], 117 people only until 2017, May 17th [12]. Such statistics are based on Non-Governmental Organizations (NGO) reports, since Brazil does not have a specific law against LGBTphobia[13], so police lacks proper ways to classify them.

[12] Original article presented at IHC '17 as "Pereira, G. C.; Baranauskas, M. C. C. Supporting people on fighting lesbian, gay, bisexual, and transgender (LGBT) prejudice: a critical codesign process. *Proceedings of the 16th Brazilian Symposium on Human Factors in Computer Systems* (IHC '17)."

[13] Here used as a generic term to prejudice towards LGBT people.

This paper discusses how mobile applications might impact the fight against LGBT prejudice. In section 3.2, we briefly describe LGBT issues and disclose our philosophical stance, which we believe is helpful to proper frame our values and assumptions. Section 3.3 presents a literature review on HCI works and LGBT issues. We visit how current mobile applications relate to the subject in Section 3.4, where a review of Google's Play Store is presented. Section 3.5 describes a codesign methodology adopted to develop a new application targeted at supporting LGBT people. Section 3.6 discusses the first realized activities, where the relation between mobile apps and LGBT issues is discussed by a group of volunteers, in participatory tasks. The remaining activities are summarized in Section 3.7, where LGBTrust, the resulting application, is described. Finally, we discuss our contributions, limitations, and suggestions of future works in Section 3.8.

3.2 Social context

3.2.1 Sexual orientation and gender identity

At the core of LGBT framework, are the terms sex, gender, and desire. The former is related to the gender assignment made based on newborns' genitalia – the sex of babies born with a penis, for instance, is said to be male. In most societies, including Brazil, people may be assigned to only two sexes, male or female. Feminist approaches state that different social roles and expectancies are placed upon individuals, according to their sex. Perhaps the most influent piece from last century is de Beauvoir's "The Second Sex", where she describes how regards to women's body changed throughout history, in order to investigate if there is an essential explanation to so-called female "body disadvantages" or if they are the product of patriarchal social phenomena [4].

This leads to the second term: "the socially imposed division of sexes" [31]. The exact nature of gender is subject of debate in social sciences and we will not further explore it. More important to this work is the sex/gender distinction, firstly proposed by a psychologist, Robert Stoller [34]. Although there is also debate about misleading characteristics of this distinction, it is convenient to describe transgender people – those who self-identify with a gender which does not entirely match the sex

assigned at birth. For the opposite case, the neologism cisgender is used. The T in LGBT accounts for transgender people.

Finally, sexual orientation is related to one's gender and the gender of people to whom one feels emotionally or sexually attracted – the object of desire. The LGB segment encompasses non-heterosexual people, i.e., people who do not feel attracted (only) to people with a gender different from their own. In general, LGBT stands as an umbrella term for non-cisgender and non-heterosexual people. Other acronyms are used to highlight other groups such as the intersex or asexual, but LGBT is still the most consensual form across organizations in Brazil.

3.2.2 LGBT issues

Transgender people are arguably the most vulnerable group, being Brazil the country where half of transgender women homicides in the world takes place [36]. Two famous brutal episodes involving travestis[14] were the broadcast in Facebook of a video where Dandara was beaten to death by a group of guys in Fortaleza [16] and the shocking images of Veronica thrashed by policemen in São Paulo [35]. Such violence results in a life expectancy of around 35 years for transgender women in Brazil [3].

Discrimination in form of bullying or moral harassment is also very common. A recent report shows that around only 19.3% feel safe in school [1]. Intolerance is not restricted to school, but also familiar environment such as in cases of home expelling or in employment market - 18% of companies in Brazil say they would put some resistance to hire gay people [33]. These facts help to explain the estimative that around 90% of transgender women are coerced into prostitution [30].

Institutionally, congressmen work (or attempts) has increasingly not matched the interests of LGBT population. Examples include the proposal of definition of family as the "union of a man and a woman" by the Federal law project (FLP) 6583/2013, the polemic religious lobby in the rejection of LGBTphobia criminalization by FLP 122/2001, the removal of the words "sexual orientation" and

[14] Travesti is sometimes used as synonym of transgender woman, but the word historical use in latin American countries associated the former with lower income classes and marginalized areas. It is also sometimes used as a "third" gender, apart from male/female. The adoption of each term by women might highlight an embodied political stance.

“gender identity” in the Ministry of Education guidance for schools curriculum in 2017, or the nationwide proliferation of projects aiming to fight “gender ideology,” such as the FLP 2731/2015 which tried to establish a prison sentence to teachers debating gender and sexuality in schools.

3.2.3 Philosophical disclosure

Scientific works are enclosed within a set of ontological and epistemological stances that describe the scientist regards about how the world functions. The set of assumptions is commonly regarded as a paradigm. The conscious disclosure of a paradigm choice is what guides the practitioner throughout the decisions during the research process. Duarte and Baranauskas [13] point that the outline of the chosen paradigm may be useful to the academic community as a whole.

Our project stands upon the critical theory (or critical-ideological) paradigm, as summarized by Ponterotto [29]. It regards reality as product of historical processes emerging from power relations. It also assumes that knowledge and perception of reality are subjective and mediated by values. The paradigm is summed up by the explicit directions of freedom, equality, and support for disenfranchised voices. Finally, it is intrinsic to the paradigm the will of changing the reality of socially oppressed groups. Therefore, values are taken into account as formative pieces of the scientific quest itself, not as qualitative biases.

3.3 Literature review on systems and LGBT issues

In order to understand how Information and Communication Technologies (ICT) for LGBT people are created or evaluated by works in HCI, we conducted a systematic literature review by the following steps:

1. Search for a string of keywords[15] in main digital libraries. The chosen ones were the ACM, Springer, and IEEE. We set the filters to consider only HCI publications from 2006 on.

2. We then removed: those which did not contain any of the search string terms string in the title, abstract, or keywords; duplicated papers; works-in-progress, conference, panel, or workshop calls, and posters.

3. Finally, we read the abstracts of the remaining publications and removed those which did not discuss the usage or design of ICTs by or for LGBT people.

3.3.1 Results

The review was first conducted in 2016, but we updated the results in May, 2017 in order to complete the overview in this paper. All presented results refer to the last one. Our first step resulted in 514 publications, cut down to 32 in the second one. Our final set consisted in 13 publications. The considered results are presented in Table 3.1.

3.3.2 Analysis

The first call for researches about LGBT people we found was in 2007, by Blodgett et al. [8]. In that work, the authors present a research agenda addressing avatar-based systems and their relation with identity construction and representation. Their assumption is that virtual worlds reproduce social structures that might narrow the experience of LGBT users, such as gender binary attribution and non-heterosexual marriages. One result was found in 2010 [25], but they began to appear in a constant pace after 2014. The subject has appeared in the last 4 years of the CHI conference. It also follows a surge of Queer Theory as a broad framework for HCI in multiple contexts not restricted to LGBT people [e.g., 9, 15, 24, 26].

[15] The keywords were intended to cover the LGBT umbrella in Portuguese and English, with terms like “gay,” “transsexuality,” “gender identity,” as well as words related to the community work, such as “HCI” or “design”.

Table 3.1. Papers considered in the literature review

Authors	Title	Publication venue
Blodgett et al. [8]	Lesbian, gay, bisexual and transgender (LGBT) issues in virtual worlds	SIGMIS Database 38, 4 (2007)
Kannabiran and Petersen [25]	Politics at the interface: a Foucauldian power analysis	NordiCHI (2010)
Haimson et al. [21]	DDFSeeks same: sexual health-related language in online personal ads for men who have sex with men	CHI (2014)
Homan et al. [23]	Social structure and depression in TrevorSpace	CSCW (2014)
de Wiele and Tong [37]	Breaking boundaries: the uses & gratifications of Grindr	UbiComp (2014)
Champagne et al. [10]	Fuzziness in LGBT non-profit ICT use	ICTD (2015)
Deen et al. [11]	Diversity through specificity: design lessons learned from the Games [4Diversity] Jams	ACE (2015)
Haimson et al. [19]	Online Inspiration and Exploration for Identity Reinvention	CHI (2015)
Haimson et al. [20]	Disclosure, Stress, and Support During Gender Transition on Facebook	CSCW (2015)
Blackwell et al. [7]	LGBT Parents and Social Media: Advocacy, Privacy, and Disclosure during Shifting Social Movements	CHI (2016)

Yeo and Fung [38]	Relationships form so quickly that you won't cherish them: mobile dating apps and the culture of instantaneous relationships	#SMSociety (2016)
Beirl et al. [6]	GotYourBack: An Internet of Toilets for the Trans* Community	CHI (2017)
Gonzales and Fritz [18]	Prioritizing Flexibility and Intangibles: Medical Crowdfunding for Stigmatized Individuals	CHI (2017)
Hardy and Lindtner [22]	Constructing a Desiring User: Discourse, Rurality, and Design in Location-Based Social Networks	CSCW (2017)

Most of the analyzed papers focus on LGBT people as system users, with only two exceptions, as showed in Table 3.2. Deen et al. [11] assess the impact of in-group sexual orientation diversity in design outcomes. Although it does not critically develop the context of LGBT people, they noticed that social critiques underlined the games designed by the participant groups. Beirl et al. [6] also describe the design of a new system, namely a mobile application to help transgender people to find a safe toilette, as part of a student design competition. The use of toilettes has been a hot topic on transgender issues, since it impacts a very basic, intimate, and natural need; transgender people are often not welcome in the toilette for people of the gender they identify with and do not feel comfortable in toilettes for people of the same sex attributed after birth. The system was conceived after ethnographies, interviews, and questionnaires with specialists and transgender people.

Table 3.2 How LGBT people was approached by the works found during literature review

Work	LGBT as users	LGBT as designers

Blodgett et al. [8]	x	
Kannabiran and Petersen [25]	x	
Haimson et al. [21]	x	
Homan et al. [23]	x	
de Wiele and Tong [37]	x	
Champagne et al. [10]	x	
Deen et al. [11]		x
Haimson et al. [19]	x	
Haimson et al. [20]	x	
Blackwell et al. [7]	x	
Yeo and Fung [38]	x	
Beirl et al. [6]		x
Gonzales and Fritz [18]	x	
Hardy and Lindtner [22]	x	

All other exemplars in the set present works on evaluation of systems, as showed in Table 3.3. The analyzed system was chosen a priori for some authors, or resulted from the feedback given by research participants. Among a priori choices, Kannabiran and Petersen [25] were the only ones to explicitly present critical remarks in terms of social power relations, by analyzing how they take place in the interaction between transgender people and Facebook available mechanisms. Facebook was also chosen by Haimson et al. [20] to assess transgender people use experience during gender transitioning. Gender transitioning is another important subject on transgender issues and corresponds to the period where transgender people adapt their identity expression to accommodate the gender they identify with. It might involve body, style, and name, among other changes. The paper investigates how the use of Facebook might be associated with stress and support during gender disclosure.

Table 3.3 Objective of works found during literature review

Work	Evaluation of an existing system	Construction of a new system	User data analysis
Blodgett et al. [8]	x		
Kannabiran and Petersen [25]	x		
Haimson et al. [21]			x
Homan et al. [23]			x
de Wiele and Tong [37]	x		
Champagne et al. [10]	x		
Deen et al. [11]		X	

Haimson et al. [19]	x		
Haimson et al. [20]	x		
Blackwell et al. [7]	x		
Yeo and Fung [38]	x		
Beirl et al. [6]		X	
Gonzales and Fritz [18]	x		
Hardy and Lindtner [22]	x		

Most popular systems for evaluation were location-based applications for gay and bisexual men [22, 37, 38], which offer means for users to chat with other users nearby. They adopt different approaches for users to reach others and means of interaction provided. For instance, Hornet displays a list of profile pictures ordered by distance and offers instantaneous chat, while Tinder only allows users to chat after they show mutual interest on each other by “liking” or “disliking” profiles. While Grindr just allow one free picture to be displayed, other networks such as Scruff allows users to upload multiple. Pokes, likes, and other forms of interaction are also differently available across the apps.

Hardy and Lindtner [22] analyze the relations between discourses and design choices of location-based applications and rural users. They discuss the construction of the universal gay user based on urban experience and how rural users appropriate and negotiate the means of interaction during their experience of use. De Wiele and Tonga [37] study the “uses and gratifications” for Grindr users and also analyze the use in urban and rural areas, as well as the use of Grindr for self-

disclosure of information. They point out that the motivations for use of Grindr is not exclusively related to sex and the conversations and disclosures made in the app reflect such gratifications. Finally, Yeo and Fung [38] present an inquiry on how the interface design and affordances of location-based applications affect the construction of long-term relationships. They argue that the foreground of profile pictures in respect to textual descriptions privilege physical appearance and casual hook-ups.

A crowdfunding website, YouCaring.com, for transgender men was analyzed by Gonzales and Fritz [18]. They discuss the flexibility of privacy mechanisms to control the exposition of shared information and the presence of intangibles, such as emotional support and political values, and how they affect the use of systems by vulnerable populations. Homan et al. [23] investigated the structure of TrevorSpace social graph a social media for LGBT youth, and the presence of depression, finding a correlation between the depth of involvement of users in the network and the illness. Haimson et al. [21] analyze sexual health-related language in Craigslist, a U.S.-American advertisements tool, and its relation with HIV rates in a certain location.

Haimson et al. [19] investigated the online aspect of style change by transgender people. They argue for the consideration of finding inspiration and getting advice from strangers, as well as experimenting with close friends when designing a social media that accommodates identity presentation. The use of ICT in non-profit LGBT organizations is visited by Champagne et al. [10], who discuss issues raised by the blurring of boundaries between professional and personal interactions on Health House, a non-profit organization for gay men and black transgender women. Finally, Blackwell et al. [7] consider the use of social media by LGBT parents. The paper points out that LGBT parents use social media to detect unfriendly and friendly people in the network and discusses the importance of privacy mechanisms and how such users become “incidental advocates,” by having their posts regarded as advocacies even if it was not their intention.

As a subject that has recently begun to occupy HCI agenda, there are naturally several opportunities for works about LGBT people. This literature review can also be further updated including works yet to be indexed by digital libraries,

such as Pereira and Baranauskas [28], which make a critical survey about how LGBTphobia might be reproduced in social media interaction mechanisms, or works published in correlated areas or which place LGBT issues in a more peripheral place in the investigation. In particular, this review was sufficient to point a gap in the HCI exploration of designing apps: despite several design recommendations, we found just two works who actually tried to materialize them into a new product. The presence of LGBT people in the design process is also hardly explored, as well as an explicitly critical approach on works to help build a more equalitarian society.

3.4 Mobile applications and the LGBT issues

We also conducted a review with the goal of finding how support for LGBT people is currently provided by mobile applications. The first survey was conducted in May, 2016, but we repeated the process in May, 2017 to update our findings. Initially, we executed a search on Google's App Store for the terms LGBT, lesbian, gay, bisexual, and transgender. We then analyzed those in English or Portuguese and fit them into broad categories related to how they might fight against LGBTphobia.

We also made an exploratory search for terms describing forms of violence such as harassment or transphobia to seek forms of combatting prejudice in other contexts that did not appear in the first approach. In this case, we only considered apps that explicitly stated they aimed for support of LGBT people.

3.4.1 Results

We categorized the results from the surveys in 9 groups: social, sexual, games, streaming, press, geographic guides, static content portals, mobile themes, and health support. All results are from the searches made in 2017.

The first category is comprised of social networks apps. The most prominent example is location-based dating apps, which we previously discussed. Only one dating app directed to women, called Spicy, reached the mark of 1 million (or more) downloads, while Grindr, the most popular application for men, surpassed 10 million downloads. Other apps for men, such as Hornet, Scruff, and Blued, have reached at least 1 million downloads. The top applications in terms of downloads, however, do not restrict the gender allowed to join the network, such as Tinder, which

surpassed 100 million downloads. The results for men also include more apps directed towards more specific niches, such as bears and daddies. Some apps include other features from social media, such as posting and creation of groups, but the chat with other people is arguably the predominant feature across this set. Exceptions are also made by online forums, such as Grasshopper Mob, with 500-1,000 downloads, which intends to provide a place for LGBT people to discuss important subjects.

The “sexual” category encompasses Kamasutra guides and sexual toys, such as an app that allows user to control vibrations from the smartphone. The “games” category is self-explained. The next one, streaming, includes apps that offer digital audiovisual content, such as radio or TV stations – for instance, the LGBT Gay Music Radio Stations app broadcasts over 30 “LGBT & gay” radio stations around the world. The press category is similar to the previous, and includes digital magazines or newspapers, such as Frock, a digital magazine focused on transgender people and drag queens.

In geographic guides, we included applications directed to travelers, such as the Bump! series, as well as recommendation/alerting applications such as Espaço Livre, which will be further discussed. Under static content portals, there are information portals and blogs, such as Stigmabase, as well as apps related to conferences on LGBT issues. The “mobile themes” category contains applications to customize the cellphone visual interface or pictures with images related to LGBT pride, such as the rainbow flag or transgender icons. Finally, the health support apps offer varied services to physical health, such as calendars to control hormonal injections and voice exercisers.

We considered 193 mobile apps for the search for “LGBT,” 222 for “lesbian,” 223 for “gay,” 208 for “bisexual,” and 198 for “transgender.” In all of them, the social category was the biggest, accounting for more than 50% of apps for “lesbian” (111), “gay” (147), and “bisexual” (114). For “transgender,” 75 results were found. The other most popular categories for “LGBT” were static portals, mobile theme, streaming, and geographic guides - respectively, 20% (39), 16% (31), 14% (27), and 10% (19); for “lesbian,” geographic guides and static portals - respectively, 20% (44) and 15% (34); for “gay”, geographic guides, which contemplated 14% (31)

of the results; for “bisexual,” games and static portals -17% (36) and 13% (28); and for transgender, static portals and games - 21% (41) and 15% (29), respectively. The other categories did not reach 10% of results in each term. Remarkably, health support apps were only identified in searches for bisexual and transgender and sexual apps only for gay and lesbian (just one, in the latter). Figure 3.1 depicts the number of apps for each category according to the searched term.

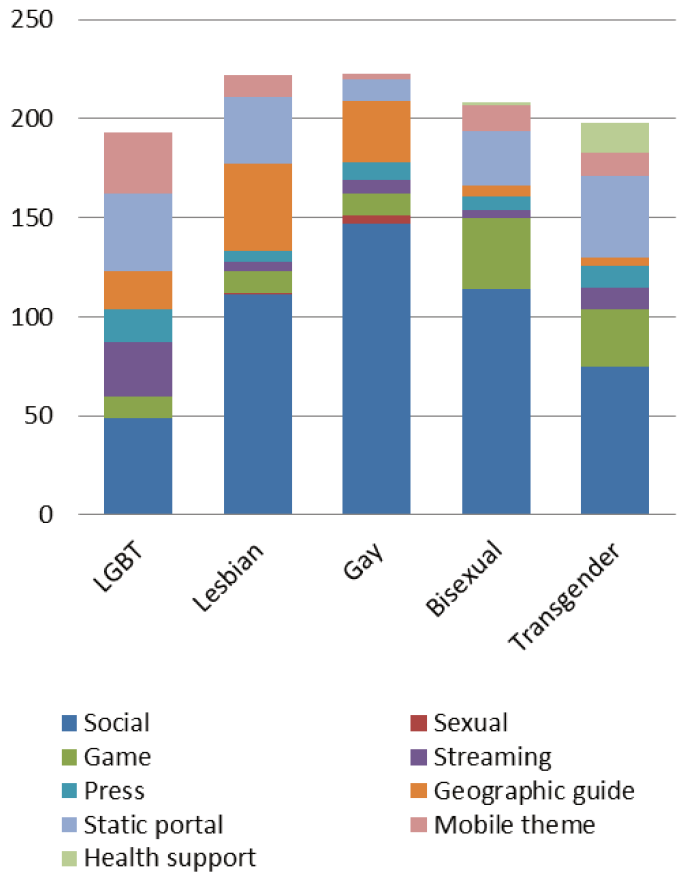


Figure 3.1. Presence of each category of apps in results for searched terms.

From the violence-related terms search, we considered 5 more apps. They fit on the previously defined category: 2 social, 1 static portal, 1 game, and 2 geographic guides. We also searched for the terms queer, asexual and intersex, but no new app was presented.

3.4.2 Analysis

It is not trivial to design applications with a critical goal, since the meanings produced by interaction might lead to other directions. This was more evident when analyzing the games category. For instance, one might wonder if it is

possible to design a quiz to detect one's sexual orientation, such as the multiple Gay or Straight tests, or to detected prejudiced opinions, such as the Homophobia Test, without reinforcing prejudiced judgements or oversimplifying complex facts. Other apps such as My Virtual Gay Boyfriend, where user customizes an avatar of a gay boy, or Qutie Life, where user runs a city that grows according to the success of its pride parades, might also arguably recur to stereotypes about LGBT people. The same sort of generalization can be found in streaming apps, since a rigid definition of "LGBT content" is inconceivable. The "bubble effect", i.e., the isolation of people inside clusters of like-minded acquaintances is also a possible consequence of networks targeting a very specific audience.

Furthermore, most of the apps do not explicitly consider a critical goal. Their interaction design also may not match this possibility [eg. 38]. Table 3.2 presents some apps self-stated as fighting prejudice and their approach to the subject.

Table 3.2. Examples of self-disclosed LGBT support apps.

App name	Description
Binder Reminder	Helps people in process of body masculinization to monitor the use of chest binders.
Bullied Buddies	Network for victims of bullying.
Espaço Livre	Places markers in a map to show where episodes of homophobia happened in Brazil.
Hate Crime	Portal with laws and regulations about hate crimes in the U.S.
Homophobia Test	Trivia game to detect homophobe people by their answers.
Refuge Restrooms	Geographically display the location of safe bathrooms for transgender people.

Xomnet Buzz	Security	A button that makes noise to alert surrounding people about an ongoing harassment.

From the results of the review, we list below some identified means through which mobile applications currently (or could potentially) address the fight against LGBTphobia:

1) Engagement in communities or creation of social ties

Social change can only take place through group mobilization. Leaders praised for revolutionary contributions have only achieved them after inspiring and engaging communities around a strategy or a cause. Collective reasoning is a pillar of modern democracy. Outside the political realm, sociability is also a desired feature for individuals. Philosophers and social scientists have extensively explored the notion of alterity and the construction of the "self" after the "other". Being part of social relations affects our self-esteem, emotions, and our personal growth. This can be easily seen in the applications from "social" category.

Association with people is also important for LGBT people to build their identity. It provides inspirational figures, relieves loneliness by showing that other people face the same situations as one does, and creates a protection feeling that allows one's own voice to be uttered. However, we have already discussed some findings by studies suggesting a negative impact of dating apps on these aspects. Although sex is an important element of human experience, there is a lack of exploitation of other social elements in the currently available applications, contributing to (or, at some extension, because of) Facebook dominance on social binding.

2) Rise of awareness and alterity creation through story sharing, news, and informational content

To be able to read stories from other people is also an associative feature. It allows people to comprehend a certain time and a certain space, to know what people had been through, to know places to avoid or to go to, to create a political consciousness around the state of rights and what it ideally should be. Similarly, informative content also supports the awareness of current challenges, fights, and

progresses; it gives one confidence to demanding their rights and knowledge about legal boundaries and protections. “Social,” “streaming,” “static portals,” and “press” categories are examples of this possible effect.

3) De-stigmatization of sexual activities

LGBT people were persecuted during centuries and are deprived from fully living their gendered and sexual experience in many parts of the world. In this sense, the exposition to LGBT-related content, such as the Kamasutra apps, might lessen the feeling of being a “deviant” or “incorrect” behavior. Apps from the “sexual” category might support LGBT people through education around practices which related material is, traditionally, predominantly on cisgender and heterosexual experiences.

4) Self-disclosure and strengthening of self-pride

Most mobile themes applications build on the idea of “pride.” The use of filters in photos to be later shared might create an associative impact, such as the use of badges and profile decorations on Facebook pictures. Individually, assuming one’s own sexuality and gender identity might improve confidence, feeling of belonging, and self-acceptance.

5) Health monitoring

There are some health concerns that might affect LGBT people in a larger or specific proportion. When searching for “bisexual,” only one application, related to tracking of periods, was found. All other results were found under “transgender,” and are related to specific experiences of this population. The apps included calendar to control the use of chest binders by transgender men undergone through mastectomy surgeries and voice exercisers for people to adapt their voice tones to what is socially expected for the gender they identify with.

6) Call for help

In face of emergencies or life-threatening situations, applications in this category help people to ask for help using panic buttons or sending pre-configured messages.

3.5 A semioparticipatory approach to critical codesign

Codesign grounds its philosophical stance in Organizational Semiotics (OS). In OS theory, an organization is said to consist of 3 different layers or information systems (IS) [27]: a broad informal one, made of beliefs, inte ntions, commitments, and habits; a formal one, defined by bureaucracy and rules; and a technical one, comprising the technological artifacts themselves. They are best represented by the image of the “semiotic onion,” presented in Figure 2.

Codesign is based on the realization of workshops, meetings where the most interested parties in the problem domain engage in activities with artifacts and techniques from PD and OS. The intent of the workshops is to carry knowledge from each external layer and embed it into a meaningful product, which will then produce a new effect back to society. This rationale, known as Socially Aware Computing (SAC) [5], is represented at Figure 2.2.

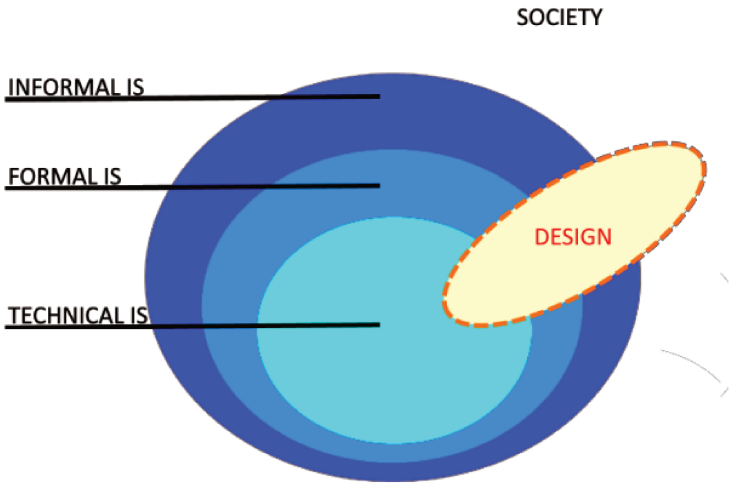


Figure 2.2. Representation of the semiotic onion and the inscription of design activities in SAC

3.5.1 Participants

The contact of volunteers began after the study approval by the Committee of Ethics in Research[16]. We reached candidates by posting in Facebook LGBT groups and our personal timelines and stimulating the broadcast to people interested in activism or social work. We intended to have a balanced representation of different gender identities and sexual orientations while keeping a number of volunteers suitable for the participatory activities. We also restricted the participation to people older than 18 years and living in Campinas, São Paulo. Our final group, including the researchers, had 24 people: 3 queers[17] (1 bisexual, 1 pansexual and 1 homosexual[18]), 1 homosexual transgender man, 2 transgender women or travesti (1 heterosexual and 1 bisexual), 5 cisgender heterosexual women, 2 cisgender heterosexual men, 4 cisgender bisexual women, 2 cisgender bisexual men, 1 cisgender lesbian, and 4 cisgender gay men.

3.5.2 Methodology

We divided our codesign activities into two major groups: organization and context and codesign workshops. The former intended to clear up the problem domain, i.e., to know more about issues related to the group and use of existent applications. We will discuss it in details in the next section. The latter corresponds to the (co)design cycle and was subdivided in 3 steps: pre-design or requirements elicitation; design or product conceptualization and prototyping; and post-design or evaluation. Volunteers were asked to give a name to each one, in order to homage LGBT representative people. The activities and artifacts used are listed in Table 3.3. Workshops were realized between November, 2016 and November, 2017.

[16] Certificate of Presentation for Ethical Consideration: 58185916.3.0000.5404. See the term of consent for participation in Appendix E .

[17] Queer is an umbrella term for people whose gender lived experience does not fit in the male/female binary, but also does not necessarily feel part of the transgender label. All presented characteristics from volunteers were self-disclosed.

[18] Personal identification and social interpretation of a gendered body are two interweaving aspects of someone self-disclosure. In this particular context, the volunteer claims the unsuitability of gender labels, but is socially seen as a man, which reflects his description as an homosexual, here referring to an exclusive attraction for men.

Table 3.3. Methods and tools used in each workshop.

Phase	Workshop name	Methods and tools
Organization and context	Alan Turing	Storytelling; picture cards
	David Bowie	Exploration test
Codesign	Ellen Page	Stakeholders diagram; evaluation frame
	Dandara dos Santos	Brainwriting; braindrawing
	Cássia Eller	Prototype evaluation
	Laerte	Discussion
	Freddie Mercury	Evaluation of building blocks of culture

In order to foster participation and ease the start of activities, each workshop besides the first was preceded by an online “warm-up” task. The tasks consisted in short questions, to be answered either in Google Forms or in the discussion platform Consider.It, intended to link the discussion from a previous workshop to the practices put in place in the next one.

3.6 Organization and context workshops

For the first workshop, we would like to begin the creation a comfortable and trusty relationship with the volunteers. 7 selected volunteers went to the meeting. We began it by lecturing an overview of the research and exposing our intended outcomes. They were asked to sign an Informed Consent and we encouraged them to correct us if we say something offensive. This process was repeated every workshop someone new attended.

3.6.1 Workshop 1: Alan Turing

The first workshop was baptized after Alan Turing, the highly influential British scientist who inaugurated studies in a vast range of Computer Science fields

and committed suicide in 1954 after convicted to chemical castration for homosexuality.

For the main activity, we spread 50 cards on a table. Each card belonged to one of the following categories: politics, quotidian, places, occasions, society, emotions, or news[19]. There were 20 news cards and 30 cards equally distributed among the other categories. The former contained only a headline related to LGBT or politics and the others an icon representative of some aspect of the category, as depicted in Figure 3.3[20]. We chose to include politics in order to foreground formal aspects of the context.

Each volunteer was then asked to randomly pick a news card and any other one. Then, we invited them to link the cards to two stories – a positive and a negative one – permeated by one of the following themes: activism, politics, or LGBT. Even though the stories could be fictional, all participants told a real story. They are summarized in Table 3.4.

Finally, we proposed a discussion about how technology could be used to give an alternative path for the negative stories, if possible, linking it with public policies creation. 4 ideas were proposed: (a) Facebook as a popular and addictive source of information, where it is possible to create mutual support groups; (b) a game where children can engage in activities from all forms of gender stereotypes in order to show that there is no inherent link between the tasks and the gender; (c) a reporter of LGBTphobia episodes and mediation of solidarity; (d) a system that finds favorable legislators and judges to provide assistance and orientation in specific cases.

Participants reported they did not know about any application with similar features to those suggested. Support, education, complaint, and guidance can be seen as the underlying themes of the proposals. Participants pointed out that Facebook is also a channel to broadcast of hateful content and lacks proper interaction tools to fruitful debates. Also, an educational tool must take into account the barriers imposed by society to genderless life and the negotiation everyone must engage with in order to belong to a group. Moreover, a way of preventing unprepared

[19] See Appendix B
[20] See all picture cards created in Appendix B.

or malicious people of getting involved in cases of discrimination or aggression is fundamental. Finally, the generation of statistics might be helpful to fill in the lack of official reports.

Figure 3.3. (a) A headline from Zero Hora (November, 2015), stating that 62 Globo[21] soap-operas have portrayed LGBT characters, and (b) a mirror. Respectively, they represent news and quotidian categories.

3.6.2 Workshop 2: David Bowie

Based on the previous activity, we wanted to further discuss the use of geolocation, suggested in proposals (c) and (d). We made the following affirmation on ConsiderIt and asked the volunteers to give an opinion as a warm-up for the workshop: “The use of geolocation can be an important resource for applications fighting intolerance against LGBT people.” 14 people participated, 12 favorably and 2 opposing the affirmation. We present next the top arguments:

- In favor: it might be useful to call engaged people for help in emergency cases, as a panic button, or to find help from solidary people. It facilitates the choice of safe places to go, as well as the avoidance of dangerous ones; it is an embedded feature in most smartphones; it allows the creation of a map of violence and the further use to report statistics; it helps the creation of a network among LGBT people.

[21] Globo is the major Brazilian soap-opera creator for TV.

• Against: it might create a target in places marked as friendly and create a segregationist bubble effect; geolocation is sensitive information and prone to fraud.

In the workshop, we invited the volunteers to split into 2 groups and navigate in two systems: the Brazilian Chamber of Deputies[22] website and the app Espaço Livre. We chose both to assess, respectively, the search for legislative information and the use of geolocation. For the former, we invited volunteers to search 2 proposals favorable to LGBT people and for Espaço Livre, to navigate in the map the app displays, making notes about the decisions and impressions they had. 7 participants were present and the workshop was named David Bowie, in homage to the British gender-bender musician, performer, and pop icon, deceased in the beginning of 2016.

Table 3.4. Summary of stories shared on Alan Turing workshop.

	Positive	**Negative**
P1	Researches that present an informed consent, since transgender people are a particularly vulnerable group, often exploited for the sake of the practitioner's career.	The headline from Figure 2 might be a misleading clickbait, because it does not say anything qualitative about the characters representation.
P2	A love story about two men who faced adversities to be with each other after falling in love in a Catholic seminary.	Schools as places of many moral, social, and physical aggressions to LGBT people, even by teachers.
P3	Small groups have organized to help women facing harassment or abuse.	A radio headline saying that rape of women in the city has increased. Laws are often targeted to treat the problem after it happened, instead of preventing it.
P4	Presence of inclusive churches that	A guy was expelled from home by

[22] http://www2.camara.leg.br/

	accommodate LGBT people.	his priest father for being gay.
P5	Facebook groups that help people to bond with others with similar struggles, although it is a hostile place.	A girl developed panic crisis after receiving death threats and having her bedroom wrecked by her mother, for being lesbian. Today they talk to each other without mentioning personal relationships.
P6	LGBT people have been increasingly elected, showing that representativeness has not ceased to grow.	An 11 years old boy said he had “lost his reference of masculinity” after his father said he was dating another man.
P7	Barack Obama awarded Ellen DeGeneres with the Medal of Freedom.	Dialogue has been giving place worldwide to rivalry between poles, as in Mr. Trump’s election.

In the Chamber of Deputies website, each group adopted a different approach: one chose to search directly for parties and law projects they knew were favorable, while the other searched for keywords related to LGBT and then explored the news in the result page. None of them had previously used the website, being habituated to get informed via Facebook posts. They mentioned that it is hard to quickly identify favorable projects, because examples are presented mixed, the language is too technical, and news are too short. Also, they feel a disconnection between the laws being voted and the violence episodes. Such results have already been pointed out [e.g., see 14 or 32]. However, participants suggested that would be important to follow the laws proposals, if an aid to interpret the results was given.

As for Espaço Livre, participants complimented the ease of use, but pointed out the lack of details and reuse of information. They mentioned the fact that the buttons collect two different kinds of violence, but the map exhibits only one color of marker (see Figure 3.4). It also does not collect further information about the episode to inform users neither allows them to assess the reports. Participants also suggested features of warning users nearby risky areas, offering help, and messages communication. Such remarks resemble the use of technology as builder of a

support network proposed in the first workshop. They also mentioned the navigation app Waze as an example of tool to collectively assess reports and moderate content.

The importance of accessing public regulation and the suitability of Waze's collaborative audit tool were subjects of the second warm-up. Considering apps directed to collect stories or reports, participants stressed the importance of having a way of auditing information to not drive people to fake safe places – it would be necessary to have a clear policy of use, a tutorial that contextualizes the functionalities, details about the occurrence and possibility of anonymity and edition. Another raised concern is the prevention of "trolls," which might perform fake validations or report fake incidents with malicious purposes. The access to legal information was said to be helpful to bring confidence in dealing with discrimination, and it would be good to have a place where it can be easily found. A new app, TODXS, launched in May, 2017, tries to fill in this gap.

However, volunteers mentioned it would be palliative, since it does not replace educational campaigns. Additionally, it demands a dedicated team to translate the technical language and keep it updated, especially because Brazilian portals often do not provide machine-readable information, as demanded by law [2].

3.7 Codesign workshops[23]

The third workshop marked a transition from the organization and context to codesign phase. We used two artifacts, the stakeholders diagram and the evaluation frame, to, respectively, list interested parties and their respective issues in the context of LGBT discrimination and ways to prevent and fight it. It provided us with a list of requirements to a possible application, though it was still not defined what this application would be. It was named after Ellen Page, a young Canadian lesbian actress and activist.

[23] The remaining prototyping workshops are presented in Chapter 3.

Figure 3.4. Screenshot from Espaço Livre – users are provided with 2 buttons, to report physical or verbal aggression. The complaint is then added as a green spot in the map.

The application gained some form in the following workshop, named after Dandara dos Santos, the Brazilian travesti beaten to death in Fortaleza. In this workshop, we firstly conducted a brainwriting activity, where participants sat in a circle and wrote on a paper features or requirements about an app based on the previous discussions. After 1 minute, the sheet should be given to the person beside, who had 1 minute to read the first idea proposed and comment it. The activity stopped when each paper reached back its first owner. Later, a similar activity was made, but this time participants should complete the draw of an application begun by others, in a braindrawing activity. The workshop was preceded by a warm-up on the offer of help by users to other users inside the application. It inaugurated a discussion around the ability and intentionality of possible helpers, which was carried through the following activities.

The fifth workshop featured a warm-up intended to pre-evaluate the application prototype. It contained a form where the application main features and characteristics were listed and volunteers assessed whether they were appropriate

by using a Likert scale. Cássia Eller, a popular bisexual Brazilian singer, was honored by the workshop name. In this workshop, we debated the functionalities raised by the previous activities and evaluated a functional digital prototype based on the consolidation of braindrawing results.

Next workshop, called Laerte, after a popular Brazilian transgender woman cartoonist, hosted a discussion about some sensitive open issues about malicious people exploiting the application. In this workshop, the registration, content moderation, and ask for help processes were defined. The application name, LGBTrust, was also suggested in this activity. It was not preceded by a warm-up activity.

Prior to last workshop, an evaluation of simplicity according to John Maeda's laws was conducted with HCI experts. The final workshop, named Freddie Mercury, was dedicated to an evaluation of the adoption of SAC in the research, in order to assess whether participants' voices were indeed heard and embedded in the product. It was based on Edward Hall's theory of building blocks of culture.

The main goal of the app is the protection of users through the articulation of educational, protective, and social aspects on a network of supportive and engaged users. In order to sign up in the application, one must be either a verified partner or be invited by a registered user, as per the decision in Laerte workshop. It contains five main features, described below. A screenshot of some screens can be seen in Figure 3.5.

- **Panic button:** a button which, when pressed, sends a pre-defined call for help to people nearby or selected contacts, depending on user configuration. Initially, the button was conceived to send alerts to police, as well. However, since it depends on the availability of corresponding systems in the police side, it was replaced by just opening the dial screen with the police number typed (if user chooses to call the police). The position of the caller is displayed on the map and updated as long as the call is on.

- **Support:** a place where people can state possible ways of helping other, as well as ask for help. After Laerte workshop, it was decided that people would be able to reach only trusted partners directly, in order to avoid unprepared or

malicious helpers. However, the final evaluations pointed out that a form of help for not so sensitive issues should also be available. Volunteers also suggested the use of artificial intelligence techniques to provide guidance in simpler issues.

• **Share of experiences:** creation of three types of content – stories, mobilizations, and reports. The former is related to personal experiences, the second, to collective events (such as crowdfunding, protests, or parties), and the latter, to the indication of places where episodes of prejudice or violence happened. All of them feature a textual description. They are displayed on a map (the landing page) and in a timeline. The group was not consensual over the term “mobilization,” since it might be associated to explicitly political actions. All content can be reported in case they are offensive or hateful. The number of reports and the reason are displayed with each post.

• **Information:** educational material about gender and sexuality, laws, news, among others.

• **Advertisement:** registered partners can advertise services related to LGBT issues.

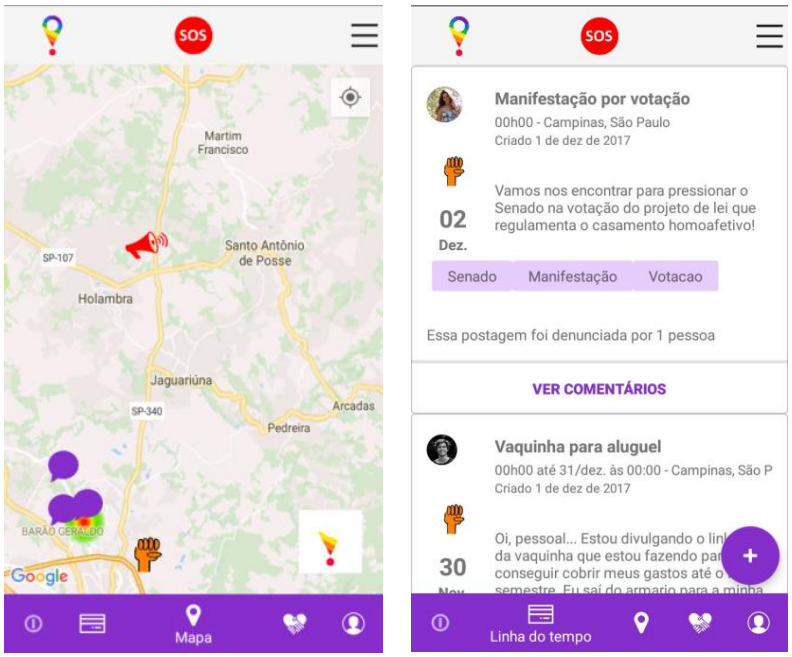


Figure 3.5. Screenshots of LGBTrust map and timeline pages

Some of the means of fighting against LGBTphobia we previously discussed are evident on the application. Firstly, the explicit protective features

include the panic button and the “ask for help” feature. The information portal corresponds to the most educational part. Finally, the share of experiences establishes the social aspect of the application. Some screens of the final digital prototype are presented on Figure 3.5.

3.8 Discussion

The codesign cycle we described has no intention of revealing a universal truth about LGBT demands or how to supply them. It must be noted that the methodology is an attempt to build an application upon participatory knowledge (co)construction – its expected outcome is a better contextualized app, not an undeniable solution to social problems. However, through it we were able to identify problems and silver linings of LGBT reality from sociological personal backgrounds to technical experience with applications. Moreover, the proposed activities resulted in a functional prototype with features both distinctive from the current corpus and meaningful to concerns raised by interested parties. Hence, we believe this experience helped to validate codesign not as the definitive method, but as a well-suited approach to critical socially aware design.

We were also able to identify concerns and requirements when dealing with applications directed to LGBT people. Content moderation and concerns with privacy are a central issue, as already pointed out by previous works. We contextualize these concerns in LGBTrust, departing from interested people’s personal experience and their own perspective on how a system could accommodate it. Prejudice faced day-by-day is also transported to online interaction, what makes necessary for information systems to stand for a moral ground, namely the respect and tolerance for diversity. Although some apps offer functionalities to listen to the voice of people, it is important for users to know if this voice is indeed being heard and how, including in the research process. There is a form of political participation demand that requires a skilled and engaged group to mediate the access to information, as some previous works have pointed – the specific use of public data for awareness of disenfranchised people, however, seems a potential subject to be explored.

There are two main differences of LGBTrust in relation to the existing set. One is the explicit consideration of privacy and safety issues. Volunteers opted for an invitation-based registration process, in order to create a safe and comfortable environment. The geolocated posts contain a description, in order to offer more details around the stories, according to what was discussed about the Espaço Livre app. Posts can also be created anonymously, in an attempt of stimulating users to share personal experiences. The moderation process was also privileged throughout discussions in all workshops. Although the contact with supporting institutions is provided by other applications, it is usually based on the availability of phone numbers and e-mails, but not direct requests. Moreover, the limitation of some requests to trusted partners is intended to prevent malicious individuals from exploiting people in sensible situations.

The other difference is related to the articulation of all these aspects. Through the descriptions on shared content, we target the social benefits of alterity and empathy. It also generates an educational aspect, through the information not only by traditional media outlets, but also with regular people. It is also linked to protection and creation of groups, but in a way that does not privilege only the sexual aspect of interactions. It also has an impact on the awareness of the surrounding environment through the description of reports. The content of publications might also spontaneously trigger de-stigmatization of sexual practices and self-pride if these subjects appear on-the-fly. The contact with registered partners is also inherently a social feature and also a source of information.

PD is traditionally associated with specific contexts, such as shared workplaces. In our case, the only shared background was the city where participants live and the goal of fighting against LGBTphobia, which might partially explain the small quantity of people participating in the workshops. It might seem a lack of engagement, but the online participation in warm-ups, the formation of a small group, which attended most workshops, the contact between researcher and participants about the work in between workshops, and the almost constant presence of at least one person going for the first time suggest the opposite. The willingness to talk about the subject is also reflected in the sharing of only real stories during the presented activities. This process also reflected the effect of variety in features in the app that seem applicable to other vulnerable groups, since volunteers' experience also

interlaced with other groups besides the LGBT. Being reality apprehensible only through personal interpretations according to Semiotics tradition, it is likely that activities with other people result in new knowledge to be added.

The states of technique and art reviews illustrate some opportunities to research. Firstly, the apps stores enclose a vast corpus of knowledge interpretable by a critical read on how the results for a term and the social views about it relate to each other, perhaps throughout a timeline. Such contextualization might provide scientists with rich sociological data to better understand the technical productions around LGBT people. It must be stressed, however, that mobile applications are not the only technological artifact that can be used and this review does not account for a general state of technique around LGBT issues.

Also, each result or category might be seen as a source of investigation. As we described, HCI works are dominated by mobile location-based apps, but there is a wide range of other categories that might be evaluated – especially those targeted at improving people's lives – as well as other LGBT particular contexts of use. In particular, lesbian and bisexual women and non-U.S. citizens are extremely underrepresented in studies about the LGBT spectrum, but there is also room for new takes on support of disenfranchised people by focusing on different goals (e.g., other unexplored ways of support), groups (e.g., other categories, places, economic conditions), technologies (e.g., the Internet of Things), or design and evaluation methods.

3.9 Conclusion

LGBT people face a range of daily struggles. Few mobile applications have been developed with the explicit goal of supporting them and HCI still lacks both evaluation and design works on the issue. In this paper, we presented a systematic review on the state of art and technique around LGBT issues in HCI and mobile application production. It the experience of a critical codesign methodology to this end, focusing in the lessons learned in the workshops. Some problems with existent applications were suggested, as well as potential paths to be refined or explored. Finally, we briefly describe a new application (co)conceptualized with a

sexually and gender diverse group and link it to experiences raised during the workshops.

3.10 Acknowledgments

This work is funded by CNPq, #308618/2014-9 and CNPq, #132272/2016-4. We thank UNICAMP Center of Informatics Applied to Education (NIED) for providing material and place for the workshops, the colleagues from InterHAD group, and the study volunteers. Freepik is the author of the icons used in the presented cards, taken from FlatIcon.com.

3.11 References

[1] ABGLT (Associação Brasileira de Lésbicas, Gays, Bissexuais, Travestis e Transexuais). 2016. Pesquisa nacional sobre o ambiente educacional no Brasil 2016: As experiências de adolescentes e jovens lésbicas, gays, bissexuais, travestis e transexuais em nossos ambientes educacionais. Retrieved May, 2017 from https://goo.gl/8AU3eB.

[2] Pierre Andrews; Flávio S. C. da Silva. 2013. Using Parliamentary Open Data to Improve Participation. In *Proceedings of the 7th International Conference on Theory and Practice of Electronic Governance*, 242-249.

[3] Pedro P. S. Antunes. 2010. Travestis envelhecem?. *MSc Dissertation*. Pontifícia Universidade Católica de São Paulo, São Paulo, SP.

[4] Simone de Beauvoir. 1986. Le deuxième sex. Gallimard Education.

[5] M. Cecilia C. Baranauskas; M. Cecilia Martins; José A. Valente. 2013. Codesign de redes digitais. Penso.

[6] Diana Beirl; Anya Zeitlin; Jerald Chan; Kai I. A. Loh; Xiaodi Zhong. 2017. GotYourBack: An Internet of Toilets for the Trans* Community. In *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems*, 39-45.

[7] Lindsay Blackwell; Jean Hardy; Tawfiq Ammari; Tiffany Veinot; Cliff Lampe; Sarita Schoenebeck. 2016. LGBT Parents and Social Media: Advocacy,

Privacy, and Disclosure during Shifting Social Movements. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*, 610-622.

[8] Bridget M. Blodgett; Heng Xu; Eileen M. Trauth. 2007. Lesbian, gay, bisexual and transgender (LGBT) issues in virtual worlds. *SIGMIS Database* 38, 4: 97-99.

[9] Samantha Breslin; Bimlesh Wadhwa. 2014. Exploring Nuanced Gender Perspectives within the HCI Community. In *Proceedings of the India HCI 2014 Conference on Human Computer Interaction*, 45-54.

[10] Ryan Champagne; Julio Guerra; Chun-Hua Tsai; Jocelyn Monahan; Rosta Farzan. 2015. Fuzziness in LGBT non-profit ICT use. In *Proceedings of the Seventh International Conference on Information and Communication Technologies and Development*. Article no. 30.

[11] Menno Deen; Frank Nack; Mata Haggis. 2015. Diversity through specificity: design lessons learned from the Games [4Diversity] Jams. In *Proceedings of the 12th International Conference on Advances in Computer Entertainment Technology*. Article no. 5.

[12] Pedro Diniz. 2017. Brasil patina no combate à homofobia e vira líder em assassinatos de LGBTs. *Folha de São Paulo*. Retrieved May, 2017 from https://goo.gl/JIcavi.

[13] Emanuel F. Duarte; M. Cecilia C. Baranauskas. 2016. Revisiting the Three HCI Waves: A Preliminary Discussion on Philosophy of Science and Research Paradigms. In *Proceedings of the 15th Brazilian Symposium on Human Factors in Computing Systems*. Article no. 38.

[14] Cristiano F. Faria. 2010. Can people help legislators to make better laws?: the Brazilian parliament's e-democracia. In *Proceedings of 4th International Conference on Theory and Practice of Electronic Governance*, 301-306.

[15] Cally Gatehouse. 2016. Feral Screens: Queering Urban Networked Publics. In *Proceedings of the 2016 ACM Conference Companion Publication on Designing Interactive Systems*, 99-104.

[16] G1 CE. Travesti Dandara foi apedrejada e morta a tiros no Ceará, diz secretário. *G1*. Retrieved May, 2017 from https://goo.gl/p2KUr5.

[17] GGB (Grupo Gay da Bahia). 2015. Assassinato de LGBT no Brasil: Relatório 2015. Retrieved April, 2017 from https://goo.gl/Hq5qZO.

[18] Amy Gonzales; Nicole Fritz. 2017. Prioritizing Flexibility and Intangibles: Medical Crowdfunding for Stigmatized Individuals. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*, 2371-2375.

[19] Oliver L. Haimson; Anne E. Bowser; Edward F. Melcer; Elizabeth F. Churchill. 2015. Online Inspiration and Exploration for Identity Reinvention. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, 3809-3818.

[20] Oliver L. Haimson; Jed R. Brubaker; Lynn Dombrowski; Gillian R. Hayes. 2015. Disclosure, Stress, and Support During Gender Transition on Facebook. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing*, 1176-1190.

[21] Oliver L. Haimson; Jed R. Brubaker; Gillian R. Hayes. 2014. DDFSeeks same: sexual health-related language in online personal ads for men who have sex with men. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems,* 1615-1624.

[22] Jean Hardy; Silvia Lindtner. 2017. Constructing a Desiring User: Discourse, Rurality, and Design in Location-Based Social Networks. In *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work and Social Computing*, 13-25.

[23] Christopher. M. Homan; Naiji Lu; Xin Tu; Megan C. Lytle; Vincent M. B. Silenzio. 2014. Social structure and depression in TrevorSpace. In *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work & Social Computing*, 615-625.

[24] Gopinaath Kannabiran; Shaowen Bardzell; Jeffrey Bardzell. 2012. Designing (for) desire: a critical study of technosexuality in HCI. In *Proceedings of*

the 7th Nordic Conference on Human-Computer Interaction: Making Sense Through Design, 655-664.

[25] Gopinaath Kannabiran; Marianne G. Petersen. 2010. Politics at the interface: a Foucauldian power analysis. In *Proceedings of the 6th Nordic Conference on Human-Computer Interaction: Extending Boundaries*, 695-698.

[26] Ann Light. 2011. HCI as heterodoxy: technologies of identity and the queering of interaction with computers. *Interacting with computers* 23, 5: 430-438.

[27] Kecheng Liu. 2004. Semiotics in information systems engineering. Cambridge University.

[28] Guilherme C. Pereira; M. Cecilia C. Baranauskas. 2015. Opressões de identidade de gênero e orientação sexual percebidas em interfaces de usuário de sistemas digitais: um estudo exploratório. In *Proceedings of the 14th Brazilian Symposium on Human Factors in Computing Systems*.

[29] Joseph G. Ponterotto. 2005. Qualitative Research in Counseling Psychology: A Primer on Research Paradigms and Philosophy of Science. *Journal of Counseling Psychology* 52, 2: 126-136.

[30] Marina Rossi; Marina Novaes. 2015. Os direitos básicos aos quais transexuais e travestis não têm acesso. El País Brasil. Retrieved April, 2017 from https://goo.gl/58BqJQ.

[31] Gayle Rubin. 1975. The traffic in women: notes on the “political economy” of sex. In *Toward an anthropology of women*, Rayna R. Reiter. Monthly Review Press.

[32] Rodrigo Sandoval-Almazan; Fabro Steibel. 2013. Benchmarking Mexico & Brazil open government websites: model and metrics. In *Proceedings of the 7th International Conference on Theory and Practice of Electronic Governance*, 372-373.

[33] Wanderley P. Sobrinho. 2015. Duas em cada dez empresas se recusam a contratar homossexuais no Brasil. *Carta Capital*. Retrieved April, 2016 from https://goo.gl/wFKHhC.

[34] Robert Stoller. 1968. Sex and gender: On the development of masculinity and femininity. Science House.

[35] Kleber Tomaz; Cíntia Acayaba. 2015. Travesti fica desfigurada após prisão; Defensoria diz haver indício de tortura. *G1*. Retrieved May, 2017 from https://goo.gl/8CISN3.

[36] TransgenderEurope. 2015. Trans murder monitoring 15. Retrieved April, 2016 from https://goo.gl/0oYrdY.

[37] Chad Van de Wiele; Stephanie T. Tong. 2014. Breaking boundaries: the uses & gratifications of Grindr. In *Proceedings of the 2014 ACM International Joint Conference on Pervasive and Ubiquitous Computing*, 619-630.

[38] Tien E. E. Yeo; T. H. Fung. 2016. Relationships form so quickly that you won't cherish them: mobile dating apps and the culture of instantaneous relationships. In *Proceedings of the 7th International Conference on Social Media & Society*. Article no. 2.

Chapter 4

Developing user requirements for emancipatory applications directed to lesbian, gay, bisexual, and transgender (LGBT) issues: a case study

4.1 Introduction

Unprecedented LGBT rights have been achieved in Western societies. Brazil was once globally recognized for the promotion of LGBT rights – just to name some, in 2011, it co-introduced the first-ever UN resolution on gender identity and sexual orientation human rights [31] and legalized same-sex marriage [20]; since 2008, it provides universal free access to transgenitalization surgeries under Decree 457, and, since 1996, to HIV treatment under Federal Law 9,313.

Nevertheless, the country is home to staggering statistics and episodes of discrimination. The most notorious are related to violence – one LGBT person is killed or commits suicide each 27 hours [12] and half of the homicides of transgender women in the world happen in Brazil [37]. The public sphere is increasingly discussing laws propositions (LP) by conservative politicians towards important subjects to LGBT people, such as the restriction of discussions about gender and sexuality in schools (e.g. LP 2731/2015) and the redefinition of “family” as a heterosexual union (e.g. LP 6583/2013).

Activists have manifested concerns with LGBT protection in next years, considering the exclusion of terms “gender identity” and “sexual orientation” from the national school guidelines [10], the controversial decision by a Federal judge to allow psychologists to offer volunteer treatment for sexual orientation redefinition [38], and the presidential candidature of a deputy who has already openly associated homosexuality to lack of beating and drug abuse [13].

Some systems have been developed aiming to support LGBT people, trying, for instance, to map dangerous places, provide access to information or to meet people. We call such systems “emancipatory” in the sense that they aspire to liberate people from sociopolitical oppressions. Being oppressions a multifaceted fact, involving complex networks of people and institutions, their comprehension is challenging and without paying attention to this context, computer technologies might reinforce their effects, instead of interfering for social good.

This work presents the development of requirements for a novel mobile application aiming at supporting LGBT people. It was based on Socially Aware Computing (SAC), a framework built upon Participatory Design (PD) and Organizational Semiotics (OS). We used OS artifacts and techniques to explore the context, elicit requirements, and validate them in participatory activities, in-person and online, realized with a diverse group of interested parties.

The paper is organized as follows: section 4.2 discusses works focusing on LGBT issues or LGBT people. Section 4.3 introduces SAC and the OS artifacts and techniques used during the case study. Section 4.4 describes the case study in detail, presenting the instantiation of OS artifacts with the knowledge coconstructed with participants. Section 4.5 discusses our lessons learned, limitations, and possible future works. Finally, section 4.6 summarizes our contribution.

4.2 Background

One of the earliest published works focusing on LGBT issues in virtual systems in Computer Science literature was [8], which outlines a research agenda to explore the relations between users’ identities and avatars in virtual worlds. The work highlighted that people who did not fit in certain social categories could often be forced in misrepresentative narrow interactions – for example, some virtual worlds do not allow same-gender avatars to marry.

How users make sense of systems’ affordances has been the focus of subsequent works. Studies on location-based dating applications have explored their use in rural areas [17], the use of available mechanisms for personal gratifications [39], the impact of system design in the formation of long-term relationships [40], and their linking to loneliness [36]. Privacy mechanisms are discussed in the contexts of

social media use by LGBT parents [6], gender transitioning [14], and identity reinvention [15]. Other exemplars bring critical analysis [21, 29], focusing on reproduction of oppressive interactions in social media. Finally, user content has also been studied as a source of indicatives about depression [19] and HIV [16] occurrences.

Some concerns are prominent throughout the corpus of related work – privacy mechanisms, so users have agency to control who can see their disclosed information; resistance, self-disclosure, violence, and social indexes in user content; the design accommodation of non-cisgender[24] and non-heterosexual groups and transformations in self-presentation. While these are certainly valuable insights for systems directed to LGBT people, their contribution to develop requirements for emancipatory systems is underexplored.

Few LGBT-related topics have been addressed by applications. For instance, Binder Reminder helps people during body masculinization to monitor the usage of chest binders, Bullied Buddies provides a social network for victims of bullying, and Security Buzz provides a button that sounds a loud noise to warn people nearby of ongoing harassments. For Brazilian users, other tools include the TransEmpregos website, which assists transgender people to find jobs, the Espaço Livre app, which aims to create a map of homophobia by keeping track of violence episodes and MonaMigs, intended to help LGBT people expelled from home. Existing applications are specialized, but the list of related topics to be possibly addressed is enormous. Also, there are few systematic approaches for their ideation, since literature also lacks proposals of new systems for LGBT people (e.g. [7]). Analysis on how existing systems reach (or do not) emancipatory ends is also underinvestigated.

[24] "Cisgender" is a neologism created to identify people who are not transgender.

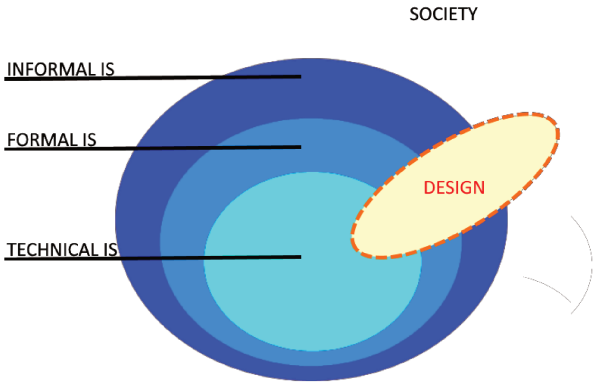


Figure 4.1. The SO and the (co)design activities

4.3 A socially aware approach

Supporting social change with technology includes the challenge of understanding complex social contexts through and for the construction of meaningful technical artifacts. Requirements Engineering (RE) activities typically involve stakeholders to build social knowledge and to minimize the introduction of biases and stereotypes from the researcher. The disregard of practitioners' personal values might lead to user representations incompatible with local realities [17] and the embedding oppressions in interaction mechanisms [29]. PD, Action Research, critical design, Information and Communication Technologies for Development (ICT4D), among others, ground different approaches [4] and frameworks [e.g. 1, 11, 27].

We adopted the SAC framework proposed by Baranauskas [1]. It is rooted in contributions from OS and PD and targets to collectively articulate social meanings in a meaningful and responsible product. Its core methodology is codesign or "the action of jointly working with people, using diverse artifacts (…) to clear up meanings they build to what a product may become, engender a shared vision about the product and involve the parties, especially the most interested (…) in the design process." [2]

In SAC, participatory workshops are realized with interested parties to engage in activities to create computer technologies, from clarifying the context to design and evaluation. Its methodology is a participatory instantiation of OS MEASUR, a set of Methods for Eliciting, Analyzing and Specifying User

Requirements [34]. It explicitly takes a radical subjectivist philosophical stance [35], where reality is seen as a social construct through behavior of the agents. Epistemologically, it is summarized by the following axioms: there is no knowledge without a knower and there is no knowing without action [35].

OS' understanding of information and knowledge is grounded on Peircean Semiotics. In Peirce's theory, a sign is "anything which is so determined by something else, called its object, and so determines an effect upon a person, which effect I call its interpretant, that the latter is thereby mediately determined by the former." [28] The sign is the fundamental part of any representation; semiosis, the process of mediately knowing something is the means through which we communicate, perceive, and think. We will next explore two key concepts – the Semiotic Onion (SO) and the Problem Articulation Methods (PAM).

4.3.1 SO

In OS, an organization is a social system in which people's behavior is defined by a set of norms and signs are employed to perform actions [26]. It is composed by an informal layer, related to meaning-making practices, such as beliefs, culture, habits, values; a formal layer, related to the bureaucratization of the previous in norms, rules, and laws; and a technical layer, related to artifacts and tools used to mediate processes in the others. Each layer is embedded in the previous one, so this configuration is called the "Semiotic Onion" (SO). In SAC, (co)design activities intend to carry social knowledge to a technical system which will then mediate interactions within the organization. Figure 4.1 depicts the SAC rationale.

4.3.2 PAM

PAM is one of OS five sets of methods composing MEASUR. It is used to help stakeholders to identify issues worth of attention in initial phases of a project, when problem lacks precise and simple definitions [26]. In this work, we adopted the following methods:

4.3.2.1 Stakeholder analysis

It aims to identify interested parties who are, direct or indirectly, concerned with or affected by the system. The analysis is facilitated by the Stakeholders

Identification Diagram (SD) [25], which groups parties in the following layers, according to their degree of impact on/by the system: operation (who use it), contribution (who are directly affected by it), source (who provide/consume information to/from it), market (partners and competitors), and community (who is socially impacted by it).

4.3.2.2 Evaluation Framing

Guided by Evaluation Framing (EF) artifacts [e.g. 3], it targets to identify and anticipate, for each stakeholder, their respective interests, questions, problems, and possible solutions for anticipated problems.

4.3.2.3 Semiotic Diagnosis

It aims to analyze an information system in terms of sign properties. It is guided by the Semiotic Ladder (SL) [33], an extension of Semiotics traditional branches. Bottom-up, its lower steps are Physics (physical properties of signs, such as size or format), Empirics (transmission statistical properties, such as pattern, entropy or channel capacity), and Syntactics (structural properties, such as norms to combine signs); the upper steps are Semantics (modes of signification, creation of meanings), Pragmatics (behavior, intentions or purposes), and Social (consequences of use of signs in human affairs).

4.4 A case study

4.4.1 Overview

Firstly, it is necessary to make explicit our philosophical position, since all decisions throughout the research should be compatible with our ontological, epistemological, and axiological assumptions. We adopt the critical-ideological paradigm [30], a stance that regards reality as the product (and producer) of interactions in a sociohistorical context, mediated by power relations. Critical theory was created with the goal of democracy, liberation from oppression [22] and gave bases to modern theories of gender, race, colonialism, sexuality, urbanism, among others.

This view is compatible with OS radical subjectivism, since both advocate a reality constructed by human interaction and perceived subjectively. Moreover, Semiotics considers the signs apparatus that influence the semiosis process on different interpreters – there is no “face to face” relation between subject and object relation, but a triadic relation mediated by signs [32].

The concern with practitioners’ own values and biases are central to critical approaches since they might reinforce oppressions. By assuming that the interested parties are the experts on issues concerning their lives, we believe participatory approaches might minimize biases by democratically contrasting differences and seeking consensus. Finally, our initial context definition is vague and complex, therefore a candidate for PAM.

4.4.2 Workshops practices

Workshops were realized during Saturdays’ afternoons[25] at installations in the university. Each workshop was named after a relevant person (iconic) for LGBT community, chosen by the participants. They were grouped in two phases, according to their goals – Organization and Context phase explored related LGBT issues and how technology might interfere on them, while Codesign phase iteratively designed and evaluated a system. Nevertheless, outputs from each phase were dynamically incremented to create a collective understanding about the software. Methods and artifacts used in each workshop are presented in Table 4.1.

Based on each workshop, researchers summarized findings in OS artifacts. Controversial or open-ended discussions were taken online before the following workshops, presenting volunteers with warmup tasks in Consider.It website[26], a public deliberation tool that allows users to state how much they agree or do not, with a statement and provide arguments to their opinions [23]. Intermediary results were organized by the researchers in EF instances, presented in the next sections. The SD and EF for the application as a whole, presented in Tables 4.8 and 4.10, were the only constructed during a workshop activity.

[25] Only workshop Ellen Page took place on a Thursday night.
[26] https://consider.it

To compose the working group, researchers posted a call for participation[27] in Facebook groups dedicated to LGBT issues. Readers were asked to broadcast the invitation to colleagues interested in the subject or engaged in any form of social activism. 45 people manifested interest in collaborating with the research. In order to achieve a size suited for workshop activities and a balanced stratified sample, we created groups according to gender identity and sexual orientation and randomly picked people from them. All recruited volunteers were at least 18 years old.

The final group of participants was comprised of 24 people: 3 genderqueers (1 bisexual, 1 pansexual and 1 homosexual), 1 homosexual transgender man, 2 transgender women (1 heterosexual and 1 bisexual), 5 cisgender heterosexual women, 2 cisgender heterosexual men, 4 cisgender bisexual women, 2 cisgender bisexual men, 1 cisgender lesbian, and 4 cisgender gay men. Among them, there were 9 activists or former activists and 5 IT experts. All participants had completed at least high school, and 17 were taking or completed a University degree. As of the age distribution, 1 was under 20, 11 between 20 and 25, 4 between 25 and 30, and 4 were over 35.

Table 4.1. Methods and tools used in each workshop

Phase	Workshop name	Methods and tools
Organization and Context	Alan Turing	Storytelling, picture cards
	David Bowie	Exploratory navigation
Codesign	Ellen Page	SD, EF
	Dandara dos Santos	Brainwrite, braindraw
	Cássia Eller	Prototype evaluation

[27] Approval by an Ethical Committee: 58185916.3.0000.5404. See provided form of consent for participation in Appendix E.

4.4.3 Exploring the context

Volunteers were provided with the statement of a broad goal: to join a collaborative approach to conceive and develop a novel mobile application to support LGBT people. None was said regarding which issue(s) would be addressed, since all definitions should be made in group. The first two workshops intended to clarify the context of LGBT people through the perception by the recruited group and possible technological opportunities.

For the Alan Turing workshop, researchers prepared a set of 20 cards containing recent news headlines about LGBT concerns and 30 containing images related to politics, quotidian, places, occasions, society or emotions. Each participant was instructed to take one card from each set and tell two stories, one positive and one negative, about LGBT issues, technology or activism, inspired by the chosen cards. In the end, we discussed how technology might have given a different end to the stories. Participants' feedbacks[28] originated four proposals:

a) Facebook groups: *"When my mother found out I was lesbian, she constantly threatened me, locked me, and even wrecked my bedroom. (…) I believe it was important to share experiences with people who had faced the same problems than I did (…) although, of course, Facebook can also be harmful when we consider the amount of prejudiced content we see there."* (P1)

b) Educational games: *"I know a kid, son of a colleague, whose father happened to start dating another man (…) so the kid said he had lost his reference of masculinity. (…) A game that uses audiovisual resources to teach kids that, unlike what we learn in school about women and men roles, we are human beings above all."* (P2) *"The neutral faces a problem, namely, the society is not neutral.""* (P1) *"If a girl would play, she'd experiment with a phase where she has to do 'girl things' and then another with 'boy things,' so children learn to see as natural to want to fix something or to cook something, that this has nothing to do with their gender."* (P3)

[28] All quotes were translated from Portuguese by the researchers after careful review of audio and video records from the workshops.

c) A tool to report LGBTphobia episodes and get help from people: *"Nowadays, crimes against LGBT people are often not accounted as hate crimes and it is impossible to create public policies without this data. An application that could quantify events and display them geographically could help to advance in this direction."* (P3*) "It is important to create groups and promote solidarity – maybe a tool that tells me 'there is someone nearby needing help.'"* (P4) *"To be able to aid someone who has not a home, for instance, could allow this person to keep their job, routine (…) which is especially important when we consider school dropout rate or transgender women life expectancy, (…) half of national average."* (P3)

d) A system to find legislators to provide guidance and assistance: *"Since institutions have been so difficult, it would be nice to have something as a 'Legislator Go', (…) because it is often so hard for us to find favorable people to help with cases people bring."* (P5)

Upper levels of SL were used to frame the goals and effects of the suggested new technologies, as presented in Table 4.2. Volunteers also mentioned drawbacks and concerns with such technologies, which were added to the EF in Table 4.3. No solutions or stakeholders were discussed at this point.

Table 4.2. Semiotic analysis of novel technologies

Step	Technology analysis
Social	a. Share hard times with people with similar stories b. Educate children about gender equality c. Track safe and dangerous places; create a solidarity network from engaged people; generate statistics for public policies d. Facilitate taking burdensome legal processes
Pragmatics	a. Mediate the creation of social ties b. Disrupt stereotypes that tie genders to pre-defined roles c. Know the safety of visited places; find help from people nearby d. Mediate the contact between activists and people with power of

	decision
Semantics	a. Join online groups b. Realize different virtual tasks with (non)gendered characters c. Provide geographically located information about LGBT threats; trigger a call for help d. Find legislators according to their history.

In order to continue the discussion on geolocation, related issues were elicited in the warmup preceding the David Bowie workshop. Volunteers were presented with the following sentence in Consider.It: "The use of geolocation can be an important resource in apps to fight intolerance towards LGBT people." While useful to map the violence and ask for help, issues related to privacy and trust were raised, as summarized in Table 4.4*: "By specifying safe places to frequent, it might stimulate aggressors to attack people."* (P6) *"It makes it easier to locate LGBT concentrations in the city."* (P7) "*Many aggressors are intimate with the victim, with access to the cellphone and they could use the information to stalk the person."* (P5)

Table 4.3. EF of novel technologies

Issues
a. Groups might be used to spread hateful content
b. A genderless application might not prepare children to life in a society based on gendered rules
c. Unprepared or bad intentioned people might take advantage of geolocated information; it could isolate people; legal knowledge is necessary before engaging in certain actions

The workshop was dedicated to explore two existing applications – researches chose Brazilian Federal Chamber of Deputies website to represent a formal layer of information, and Espaço Livre, for being a mobile app that enables users to report homophobia in a map. None of the volunteers previously knew the tools. For the first, participants were asked to use the system to find two LPs favorable to LGBT people: *"It is hard to know which are pro or against LGBT issues."*

(P6) *"I usually use Facebook to follow politics."* (P6) *"Propositions take so long to be voted and their enforcement is so slow, that I see it as secondary in the fight against violence."* (P7)

Table 4.4. EF of geolocation feature

Enabled interests	
a. Call for help from people nearby using panic buttons b. Tracking of potentially safe and dangerous places c. Creation of a map of violence to be used by authorities	
Issues	**Possible solutions**
a. Creation of targets b. Isolating "bubble" effect c. Sensitive information d. Prone to fraud	a. Use of aggregated information, rather than individual

Using the Espaço Livre, they were asked to freely navigate the map. It was welcome to see where episodes happen more frequently, but the reports lack details*: "I can't figure if this mark is because someone was beaten, cursed or if someone drove by and whistled at the person."* (P8) *"Violence has also nuances according to the profile of who was beaten."* (P8) *"I see a big spot in MASP [the São Paulo Art Museum], so I think I'll start to avoid there."* A summary is presented in Table 4.5.

Table 4.5. EF of systems discussed in workshop David Bowie

System	**Issues**	**Possible solutions**
Chamber of Deputies website	a. Favorable and unfavorable laws are mixed b. Hard to know proposition status	a. Pre-process propositions to include more information and a more accessible language

	c. Technical language d. Lack of context e. Proposition of laws feels disconnected to daily violence f. Social media is preferred to get this kind of information	b. Link legislative procedures to media news
Espaço Livre app	a. Presentation of reports lack details b. Impossible to differentiate types of episodes c. Lacks a way to call for help d. Lacks audit of reports	a. Description of the episodes b. Visually label different episodes c. Panic button d. Collaborative audit of reports

The collaborative audit and the importance of accessing legislative information were the subject of the second warmup. The feature is used by traffic and navigation app Waze to validate user content, allowing users to confirm or deny information given by others. The following affirmation was proposed: "Waze's mechanism of collaborative audit is a good solution to validate user information." Trust was again a frequent concern, as shown in Table 4.6*: "Prejudiced people might belie reports."* (P9) *"People might also flood a region with reports to prevent others from going there."* (P10) *"It is necessary to prevent fake reports to lead people to dangerous places."* (P11)

Table 4.6. EF of collaborative audit feature

Issues	**Possible solutions**
a. Fake content might lead people to dangerous places b. Prejudiced people or trolls might belie true reports	a. Clear privacy policy b. Disclose what information is shared and with whom c. Anonymous posting, edition, and

	deletion

The other proposition was*: "To access legislation impacting LGBT issues is important to prevent and fight LGBTphobia." Some contributions were: "The lack of information often prevents us from acting and protecting ourselves, to access them might give the feeling of safety and confidence."* (P12) *"I think it would be just informative. It would not directly promote protection."* (P3) Table 4.7 summarizes raised subjects.

Table 4.7. EF of legislative information related feature

Enabled interests
a. Track judicial processes that directly impact LGBT people
b. Sensation of confidence and surety
c. Quick access to legal information
d. Psychological and social well-being
e. Central point of access to information
f. Facilitate for the population to know their rights and duties
Issues
a. It does not replace educational campaigns
b. Users would be people already interested in the subject
c. Demands an engaged team to pre-process information
d. Indirect effects on LGBTphobia

4.4.4 Formalizing requirements

The Ellen Page Workshop meant to bridge Organization and Context and Codesign phases. At this point, the system was not well-defined, but an exploratory corpus of related interests and issues had been constructed. The workshop extended discussions by collaboratively constructing the SD (presented in Table 4.8) and EF for the novel mobile application. Both artifacts were introduced in the format of posters and participants filled them in gluing post-its. Part of the input came from the

contributions from previous workshops. New aspects included: other potential users – *"We must also consider people that would install the application just for curiosity or to know more about the subject,*" (P10*) "it could be also a mean of psychologists offer their services;"* (P13) the preparation of authorities – *"I am afraid of calling the police, because my friends and I were already insulted and mocked by policemen for being transgender;"* (P8) the offer of fake assistance – *"Churches can be inclusive but they also might try to promote the 'gay cure;'"* (P14) and the transparency of panic calls – *"User should not have a false sensation of safety when triggering the button. (…) Maybe disclose how many users are near in the moment."* (P10)

Table 4.8. Novel application SD

Level	Stakeholders
Operation	LGBT people
	Public security institutions and agents
	Incidents witnesses
	Activists and Non-Governmental Organizations (NGOs)
	Interested or curious non-LGBT users
Contribution	Activists and NGOs
	LGBT people and their relatives or friends
Source	Google Maps
	Specialized police stations
	Business' owners
	Politicians
Market	Social media
	Businesses ranking observers
	Medical clinics and lawyers
	Reporter apps
	Information portal apps

Community	LGBT people friends and family
	Aggressors and prejudiced people
	Specialized police stations
	Government deputies
	Investigators
	Social assistants

The Dandara dos Santos' Workshop warmup feature the following affirmation: *"The application should contain a feature that allows people to offer help to each other."* Concerns and countermeasures related to safety were elicited: *"People willing to help would receive a notification of panic. (…) Then a messenger box (…) would be opened to clarify what is happening and from there on [they] agree on what can be done to help."* (P3) *"Yes, but with a geographic limitation to not turn people willing to help in targets."* (P3) *"Some 'helps' could worsen the situation."* (P10). Table 4.9 presents the feature EF.

Table 4.9. EF of help offer feature

Enabled interests

a. Easy localization of people able to help, specially offering shelter to LGBT individuals at risk

Issues	**Possible solutions**
a. Helpers may be targets	a. Communication prior to accepting help; do not display user location
b. Unprepared people might cause more harm	b. Peer evaluation
c. Prevention is important	c. Provide orientation

Next, a brainwriting was conducted with the following script: initially, each participant was given a blank sheet and had 30 seconds to write "something you think the application should do or be;" then, the paper should be given to the participant sitting to the left, who had 1 minute to write comments, favorable or not, to

the first suggestion – this was repeated until when everyone had analyzed each paper once. Then, a braindraw activity was made to generate a paper prototype of the main screen. In this dynamics, each participant was given a blank sheet and had 30 seconds to draw what they considered the main feature; after the time elapsed, the paper should be given to the participant sitting to the left, who would have 1 minute to continue the draw – this was repeated until everyone updated each draw once. The draws were discussed and summarized in a low-fidelity prototype.

This was the set of elicited features resulting from brainstorming activities:

- A panic button, to call for help in case of emergencies
- An “ask for help” item where users state an on-going problem and other users might help
- A “stories” item to report prejudice or share personal experiences
- A “mobilization” item representing collective meetings such as manifestations, parties, or events in town
- An “advertising” item where service providers might advertise their work
- A map and a calendar where aforementioned items are displayed
- A portal of information about LGBT issues

Some solutions to previously raised concerns were also discussed, completing the application EF, presented in Table 4.10. The prospected system was framed by the researchers in a SL, presented in Table 4.11. The Social layer contains requirements related to protection of users, privacy, and responsibilities. The Pragmatics layer encompasses goals and intentions behind the available interaction mechanisms. The Semantics layer is concerned with how meanings are expressed and constructed by application data. Syntactics refers to UI elements. Empirics describes how data is transferred between components. Finally, Physics accounts artifacts and technological constraints.

Table 4.10. EF of novel application

Level	Enabled interests	Issues	Possible solutions
Operation	a. Find help during dangerous or troublesome situations b. Consolidate trustful reports of LGBTphobia episodes c. Know more about LGBT issues	a. People might not be prepared to help others b. Users might want to be anonymous c. Promotion of hate campaigns	a. Clear privacy and use policies; communication channel between users before accepting help b. Custom visibility of user data c. Moderate content and users
Contribution	a. Offer help and assistance b. Share stories and information	a. Assistance in form of “gay cure” might be offered b. Unprepared authorities	a. Disclose policies and values; report of users b. User chooses who to be called
Source	a. Track reports of incidents b. Track business’ reputation	a. False reports b. Difficulty to consolidate statistics	a. Collaborative audit b. Machine-readable open data
Market	a. Divulgate pro-LGBT services	a. Facebook is preferred to share personal stories b. Prejudiced service providers might produce hateful content	a. Integrate social media share features b. Enable feedback of partners
Community	a. Prepare public policies b. Raise awareness of LGBT issues c. Prevent LGBTphobia	a. Lack of specific legislation	a. Listen the voice of marginalized social groups

Table 4.11. SL of novel application's requirements

Step	Requirements
Social	a. User must be able to pre-define who to be warned by panic button triggering among: security agents (if a receiving system on their end is available), known friends or people nearby b. Application must warn users about legal consequences of actions c. Three types of users must be supported: regular users, helpers, and advertisers d. Application must request information to allow to hold users accountable e. Precise user location should never be displayed, except for chosen users in panic calls f. Stories can be shared anonymously g. Transgender people should not be obliged to use their civil name h. Application should not give a false sensation of security i. Community of users will be responsible for moderating content through collaborative audit j. NGOs and partners will be responsible for inserting content related to legal information or LGBT issues
Pragmatics	a. The application aims to: b. Create a network of mobilization and support c. Facilitate access to services for LGBT people d. Raise awareness and knowledge about LGBT issues e. Enable the reuse of data about LGBT issues f. Facilitate ask for help when facing or witnessing emergencies or risky events

	g. Inspire and educate people h. Users should be provided with clear information about its values, rules, goals, and risks i. Application should prevent libeling, exposition or incentive to violence or exclusion
Semantics	a. Content can be collectively reported b. User content must be located geographically and temporarily c. Panic situations can become stories d. Shared stories might be positive or negative e. Mobilizations must contain identification details f. User should be notified when actions he subscribed were taken
Syntactics	a. Application's description in app stores must target all possible profiles b. Panic button must be easy to access c. Different types of information must be displayed differently in the map/calendar and be filterable d. A tutorial must be presented on first uses e. Users must prove they are real through sharing identifier information f. "Clean" and simple interface g. Language must respect users' gender and be accessible h. The amount of users nearby must be informed so user gets a better feeling of obtainable help
Empirics	a. Alerts could be sent via SMS, if Internet is not accessible

	b. Fast loading of information and triggering of panic button c. Safe transmission and storage of user data d. Panic button includes a timer before triggering to avoid mistakes
Physics	a. Multiple operating systems must be covered b. Panic button can be triggered by gestures c. User location must be obtained via GPS information d. CSV files must be provided for download with data related to LGBTphobia episodes e. A distance limit must be defined for panic button notifications

4.4.5 Validation and refinement

Prior to the Cássia Eller workshop, an online form was created in order to obtain feedback for the defined features. It contained 8 affirmations to be evaluated using a 1 to 5 Likert scale, where 1 was “totally disagree” and 5 was “totally agree”. Q1-3 asked about the importance of the panic button, the help call, and the stories sharing features in the fight against LGBTphobia; Q4 asked if the listed profiles (LGBT people, supporters, NGOs, activists, service providers) are indeed the application’s target users; Q5-6 asked if the map and the calendar would be adequate representations of user content; Q7 asked about integration with Facebook for login and sharing; Q8 asked about requiring the national identification document (ID) for register.

Complementarily to these, we developed a digital prototype to validate the set of requirements. It must be noted that the validation underlies previous activities, even though a formal model of requirements had not been presented to volunteers. Due to this, we opted to a prototype-based validation, which took more time to be made, but could enable a more spontaneous and contextualized discussion of the requirements (and their embedding). Participants wrote comments while exploring the prototype and debriefed both activities in the end of the workshop.

Three requirements were not consensually approved. The discussion about them was consolidated in the last workshop, Laerte*. “I think we could make the application simpler and safer from risks by putting people in contact with responsible organizations.”* (P3) *“It is impossible to automatically detect all forms of hate speech, so the community should be provided with means to regulate the use.”* (P14). *“I would not install an unknown application that already requests my ID. It would be even worse for a transgender person who had not changed the legal name.”* (P8) *“Invitation is a way to make users responsible for who they include in the community.”* (P14) Suggestions and commentaries are summarized in Table 4.12. The following changes took place:

1. When asking for help, the user picks a category and the request is sent only to NGOs and activists registered as helpers.

2. Stories and mobilizations will display how many times they were reported and for which reason. Beyond a threshold, the content is removed. A small team of moderators can be set to handle reports.

3. Users will be required to provide a real phone number and will only be able to access the application after invitation.

Table 4.12. EF of digital prototype

Feature	Issues	Possible solutions
Call for help	a. Reports might not suffice to avoid malicious helpers	a. Establish a channel with partner institutions and organizations
Content moderation	b. Social media still fail to handle hateful content	b. Human moderation c. Progressive access to features, according to users' reputation d. Display of reports history
Profile moderation	c. Request ID on registration is intrusive	e. Request valid phone number f. Require invitation from registered users

The digital prototype built afterward was evaluated by a group of HCI experts and the participants of the last workshop, called Freddie Mercury. The former was based on John Maeda's laws of simplicity and the latter on a valuation based on Edward Hall's theory of culture.

4.5 Discussion

The phases of the codesign cycle have contributed with two different perspectives. The Organization and Context phase departed from a very broad scope, where the would-be application was formless and lacked any defined goal. This proved to be an initial challenge to be addressed when talking to potential

volunteers, funding institutions, and academic evaluators who approached the researchers with the question “but what will this application be like?” The phase served as an exploratory step to understand possible uses of the application from people’s knowledge. This scope was iteratively shaped during Codesign phase, where each workshop narrowed down the possibilities and provided input for a set of requirements to be constructed.

The diversity of the group was essential to allow different perspectives and experiences to emerge and form a broad vision of the context where LGBT issues are inscribed in all layers of the SO. It must be noted, however, that some identities were not represented in our group. Also, among the transgender volunteers, some sexual orientations were not represented, such as heterosexual transgender men. It might reflect the exclusion of transgender people from public spaces, such as universities, as well as a bad reputation of researchers and practitioners – *“I think it is good to be provided with an Informed Consent Agreement because transgender people are very vulnerable and often exploited for the sake of researchers’ own careers.”* (P5) Other differences might arise if non-urban participants were included. Also, this work focused on the interests of stakeholders from the Operation and Contribution layers of the SD, since we explicitly aimed to understand how technology could support LGBT matters. Although some concerns from more external layers have appeared, they were brought under the semiotic apparatus from the participants. Future developments might focus on their specific interests enablable by the application.

The diversity of volunteers in respect to other personal aspects demanded some flexibility from the process. While contextual techniques, such as PD and ethnomethodology, are more traditionally used in well-defined scopes, like working places or local communities, we gathered volunteers from different parts of the city, professions, and social income, not sharing places frequently attended, free schedules or interests in joining the research. Average attendance on workshops was of 5 volunteers and participation on warmups averaged 7 volunteers. However, most volunteers[29] engaged in at least 4 proposed activities, some joining only online activities, some joining only workshops, and a more active group attending both, as

[29] 4 volunteers participated just in one activity.

well as occasionally bringing friends to participate in the meetings. While this setting certainly imposes a limitation since more knowledge could possibly have been generated by an interaction among more people, the engagement demonstrated by participants was enough to provide valuable and distinct contributions to the study. In particular, the use of Consider.It has enabled a participation mode more suited for some volunteers and contributed to overcome obstacles to collaboration.

The artifacts used in the semiotic approach also proved flexible enough for this context. EF idea was extended to not only account for stakeholders' related values, questions, and issues, but also to evaluate features or systems' concepts, guiding the development of requirements from Consider.It discussions. The SL also allowed a modelling of both requirements and goals, and provided a direction to extend them along each step. It could be used also for evaluation of the system social consequences [18] or direct validation of requirements [2], although we have not hereby explored these possibilities.

The semiotic rationale also favored the emergence of social aspects related to ongoing subjects. Each characteristic of the application evolved directly from concerns or interests of the involved interested parties - the ubiquitous presence of hateful content in social media led to the concern with content moderation; issues with police violence led to the exchange from always involving authorities in a panic call to a configurable set of receivers; exclusion and expelling of LGBT people from home led to the ask for help feature; etc. It distinguishes itself from the existing set of applications especially for articulating multiple aspects, such as education, protection, denounce or support, and explicitly accommodating multiple stakeholders' interests, rather than specialize in one aspect of a problem or be tied with specific organizations.

Some issues were already known from existing set. Brito et al. [9], for instance, had already identified the preference for social media or newspapers and the difficulty of understanding legal data in Brazilian websites and Barkhuus et al. [5] had already discussed concerns around applications sharing users' location. However, their relation to emancipatory systems for LGBT people had not been explored. Similarly, activities did not intend to explore IT problems in depth, such as group moderation or fight against hate speech and fake news. However, they

enabled the link between such concerns and the reality as lived and constructed by participants, as well as the conception of solutions for this local context and surely contribute to the corpus of studies around such subjects. Also, the approach focus on requirements related to the emancipatory goals of the application. Therefore, it does not replace techniques for engineering requirements somewhat independent of this aspect, such as performance, security, or maintainability.

Finally, this work does not intend to provide an extensive list of requirements to fight against LGBTphobia, being social oppressions multifaceted and deeply interleaved. Being a contextual method, every output must be regarded as locally validated. However, to know to which extend it is generalizable seems an intriguing question to be answered by a richer corpus on the development of application to help disenfranchised or vulnerable groups, such as women, people of color or even LGBT people in other social surroundings. Also, this paper intended to present the results of a case study of a semioparticipatory methodology in a critical context for developing social requirements. OS provides formal methods for modelling requirements, such as the Semantic Analysis Methods and Norms Analysis Methods, which could be subject for future works. Such works might evaluate the appropriateness of OS artifacts in the evolution of a system involving different developers in a long run. For any of these, to be able to look at your own values and learn from others' experience, respecting diversity and equality, are essential characteristics to any engaged practitioner.

4.6 Conclusion

Computer Science practitioners take a central role in the shaping of future. This future is not merely technological, since the shift of computer environments from workplace to nearly ubiquitous entities demands responsiveness to ongoing social events [24]. Oppressions towards LGBT people are a social issue, since they lead to social disenfranchisement and death. In such a critical landscape, it is important for researchers and developers to have proper tools to comprehend the context and embed social knowledge in meaningful technologies. This case study elicited major issues in a Brazilian community and presented technical proposals to tackle some of them, while contextualizing each decision in the present sociohistorical reality. We contribute with the community by providing socially informed requirements developed

aiming to produce a novel application and to inspire colleagues to keep exploring the matters that characterize our current political landscape.

4.7 Acknowledgments

This work is funded by CNPq, #308618/2014-9 and CNPq, #132272/2016-4. We also thank the study volunteers, the colleagues from NIED for allowing us to use their locations and materials for the workshops and from InterHAD for discussing and helping improving the presented work.

4.8 References

[1] M. C. C. Baranauskas. Social awareness in HCI. In *Interactions*, 21 (4). 2014.

[2] M. C. C. Baranauskas; M. C. Martins; E. C. S. Hayashi. 2013. E-cidadania na linha do tempo. In *Codesign de Redes Digitais: Tecnologia e Educação a Serviço da Inclusão Social*, M. C. C. Baranauskas, M. C. Martins, J. A. Valente (orgs.). Penso, Porto Alegre, Brazil. 65-84.

[3] M. C. C. Baranauskas; J. Schimiguel; C. A. C. Simoni; C. M. B. Medeiros. 2005. Guiding the Process of Requirements Elicitation with a Semiotic Approach. In *Proceedings of 11th International Conference on Human-Computer Interaction*. 100-111.

[4] J. Bardzell; S. Bardzell. 2015. Humanistic HCI. Morgan and Claypool.

[5] L. Barkhuus; B. Brown; M. Bell; M. Hall; S. Sherwood; M. Chalmers. 2008. From Awareness to Repartee: Sharing Location within Social Groups. In *Proceedings of the 2008 SIGCHI Conference on Human Factors in Computing Systems* (CHI ’08). ACM, New York, United States. 497-506.

[6] L. Blackwell; J. Hardy; T. Ammari; T. Veinot; C. Lampe; S. Schoenebeck. 2016. LGBT Parents and Social Media: Advocacy Privacy, and Disclosure during Shifting Social Movements. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (CHI ’16). ACM Press, New York, United States. 610-622.

[7] D. Beirl; A. Zeitlin; J. Chan; K. I. A. Loh; X. Zhong. 2017. GotYourBack: An Internet of Toilets for the Trans* Community. In *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems* (CHI EA '17). ACM Press, New York, United States. 39-45

[8] B. M. Blodgett; H. Xu; E. M. Trauth. 2007. Lesbian, gay, bisexual and transgender (LGBT) issues in virtual worlds. In *SIGMIS Database* 38, 4: 97-99.

[9] K.dos S. Brito; M. A. da S. Costa; V. C. Garcia; S. R. L. Meira. 2015. Assessing the Benefits of Open Government Data: The Case of Meu Congresso Nacional in Brazilian Elections 2014. In *Proceedings of the 16th Annual International Conference on Digital Government Research* (dg.o '15). ACM, New York, United States. 89-96.

[10] N. Cancian. 2017. Ministério tira 'identidade de gênero' e 'orientação sexual' da base curricular. In *Folha de São Paulo*. https://goo.gl/UdMxS5. Accessed in October, 2017.

[11] M. A. Ferrario; W. Simm; P. Newman; S. Forshaw; J. Whittle. 2014. Software Engineering for 'Social Good': Integrating Action Research, Participatory Design, and Agile Development. In *Companion Proceedings of the 36th International Conference on Software Engineering* (ICSE Companion '14). ACM Press, New York, United States. 520-523.

[12] GGB (Grupo Gay da Bahia). 2016. Assassinato de LGBT no Brasil: Relatório 2015. https://goo.gl/Hq5qZO. Accessed in April, 2017.

[13] O Globo. 2016. Ellen Page confronta Jair Bolsonaro em cena de documentário. https://goo.gl/ue5y7m. Accessed in October, 2017.

[14] O. L. Haimson; A. E. Bowser; E. F. Melcer; E. F. Churchill. 2015. Online Inspiration and Exploration for Identity Reinvention. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems* (CHI '15). ACM Press, New York, United States. 3809-3818.

[15] O. L. Haimson; J. R. Brubaker; L. Dombrowski; G. R. Hayes. 2015. Disclosure, Stress, and Support During Gender Transition on Facebook. In

Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing (CSCW ’15). ACM Press, New York, United States. 1176-1190.

[16] O. L. Haimson; J. R. Brubaker; G. R. Hayes. 2014. DDFSeeks same: sexual health-related language in online personal ads for men who have sex with men. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI ’14). ACM Press, New York, United States. 1615-1624.

[17] J. Hardy; S. Lindtner. 2017. Constructing a Desiring User: Discourse, Rurality, and Design in Location-Based Social Networks. In *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work and Social Computing*. ACM Press, New York, United States. 13-25.

[18] M. S. H. Heng. 2002. Using Semiotic Framework to study social consequences of IT. In *Coordination and communication using signs: Studies in Organizational Semiotics 2*, K. Liu; R. J. Clarke; P. B. Andersen; R. K. Stamper (eds.) Kluwer Academic Publishers. 167-178.

[19] C. M. Homan; N. Lu; X. Tu; M. C. Lytle; V. M. B. Silenzio. 2014. Social structure and depression in TrevorSpace. In Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work & Social Computing (CSCW ’14). ACM Press, New York, United States. 615-625.

[20] ILGA (International Lesbian, Gay, Bisexual, Trans and Intersex Association). 2016. State Sponsored Homophobia 2016: A world survey of sexual orientation laws: criminalisation, protection and recognition. https://goo.gl/weJBTk. Accessed in April, 2017.

[21] G. Kannabiran; M. G. Petersen. 2010. Politics at the interface: a Foucauldian power analysis. In *Proceedings of the 6th Nordic Conference on Human-Computer Interaction: Extending Boundaries* (NordiCHI ’10). ACM Press, New York, United States. 695-698.

[22] J. L. Kincheloe; P. L. McLaren. 2000. Rethinking critical theory and qualitative research. In *Handbook of qualitative research*, N. K. Denzin; Y. S. Lincoln (eds.), 2nd ed. Sage, Thousand Oaks, United States. 279–313.

[23] T. Kriplean; J. Morgan; D. Freelon; A. Borning; L. Bennett. 2012. Supporting Reflective Public Thought with ConsiderIt. In *Proceedings of the ACM 2012 conference on Computer Supported Cooperative Work* (CSCW ‘12). ACM Press, New York, United States. 265-274.

[24] A. Light; I. Shklovski; A. Powell. 2017. Design for Existential Crisis. In *Proceedings. of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems* (CHI EA ’17). ACM Press, New York, United States. 722-734.

[25] K. Liu. 2001. Employing MEASUR Methods for Business Process Reengineering in China. Ph.D. Thesis University of Twente, Enschede, Netherlands.

[26] K. Liu. 2004. Semiotics in information systems engineering. Cambridge University Press.

[27] K. Lyons; C. Oh. 2015. SOA4DM: Applying an SOA Paradigm to Coordination in Humanitarian Disaster Response. In *Proceedings of the 37th International Conference on Software Engineering - Volume 2* (ICSE ’15). IEEE Press, Piscataway, United States. 519-522.

[28] C. S. Peirce. 1998. Excerpts from letters to Lady Welby In *The essential Peirce: selected philosophical writings*, 2, Peirce Edition Project (eds.). Indiana University Press, Bloomington, United States. 477-492.

[29] G. C. Pereira; M. C. C. Baranauskas. 2015. Opressões de identidade de gênero e orientação sexual percebidas em interfaces de usuário de sistemas digitais: um estudo exploratório. In *Proceedings of the 14th Brazilian Symposium on Human Factors in Computing Systems* (IHC ’15). ACM Press, New York, United States. 93-102

[30] J. Ponterotto. 2005. Qualitative research in counseling psychology: a primer on research paradigms and philosophy of science. In *Journal of Counseling Psychology*, 52 (2). American Psychological Association. 126-136.

[31] A. Rosenberg. 2009. The Brazilian paradox: the lesbian, gay, bisexual, and transgender battle for human rights. In *Revisiting human rights in Latin America*, A. Nowakowski (ed.). University of Denver. 16-30.

[32] L. Santaella. 1983. O que é semiótica. Brasiliense.

[33] R. K. Stamper. 1973. Information in Business and Administrative Systems. John Wiley and Sons, New York, United States.

[34] R. K. Stamper. 1993. Social norms in requirements analysis – an outline of MEASUR. In *Requirements Engineering, Technical and Social Aspects*, M. Jirotka; J. Goguen; M.Bickerton (eds.) Academic Press, New York, United States.

[35] R. K. Stamper; K. Althaus; J. Backhouse. 1988. MEASUR: Method for Eliciting, Analyzing and Specifying User Requirements. In *Computerized Assistance During the Information Systems Life Cycle*, T. W. Olle; A. Verrijn-Stuart; L. Bhabuts (eds.) Elsevier Science, Amsterdam, Netherlands. 67–116.

[36] S. H. Taylor; J. Hutson; T. R. Alicea. 2017. Social Consequences of Grindr Use: Extending the Internet-Enhanced Self-Disclosure Hypothesis. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (CHI ’17). ACM Press, New York, United States. 6645-6657.

[37] TransgenderEurope. 2015. Trans murder monitoring 15. TGEU Transgender Europe. https://goo.gl/0oYrdY. Accessed in April, 2016.

[38] L. Vassallo. 2017. Juiz libera cura gay por psicólogos. In *Estadão*. https://goo.gl/cgVczM. Accessed in October, 2017.

[39] C. V. de Wiele; S. T. Tong. 2014. Breaking boundaries: the uses & gratifications of Grindr. In *Proceedings of the 2014 ACM International Joint Conference on Pervasive and Ubiquitous Computing* (UBICOMP ’14). ACM Press, New York, United States. 619-630.

[40] T. E. E. Yeo; T. H. Fung. 2016. Relationships form so quickly that you won't cherish them: mobile dating apps and the culture of instantaneous relationships. In *Proceedings of the 7th International Conference on Social Media & Society* (#SMSociety ’16). ACM Press, New York, United States. Arcticle no. 2.

Chapter 5

Empowering lesbian, gay, bisexual, and transgender (LGBT) people with codesign: a critical evaluation through the lens of simplicity

5.1 Introduction

HCI subdomains are increasingly taking into account approaches towards emancipation. Bardzell and Bardzell [3] define emancipatory HCI as “research or practice oriented toward exposing and eradicating one or more forms of bondage and oppression.” Participatory Design (PD) is a traditional emancipatory branch, with roots in the political concerns of Scandinavian workers facing the insertion of computers in the workplace. It focuses on the knowledge about an issue from people whose lives are affected by it.

LGBT people are historically an oppressed group in most of Western societies, facing violence in physical, verbal, legal, and affective forms, among others. Such struggles are faced by LGBT people in current Brazilian society, as well. The country is home to half of the killings of transgender women in the world [10] and to 1 death of a LGBT person each 27 hours [4]. Not only the numbers themselves are alarming, but also the cruelty present in such crimes, which often include sexual abuse, torture, and mutilation. One emblematic case was the killing of Dandara dos Santos in Fortaleza, a travesti beaten to death by men in a street of the city of Fortaleza, who later posted the video online in Facebook in February, 2017. Although such characteristics seem remarkable signs of hate crimes based on gender identity or sexual orientation, Brazilian law lacks specific definitions of LGBT-phobia causing such incidents to blend with the country’s high homicide rates. Congressmen also

make harder for such law to be made, since the country is also facing a rise of political conservativeness and religious influence in politics.

The project where this work is inscribed aims to develop a novel system to support LGBT people and provide them with means to survive and empower themselves. In order to do this, we adopted a socially-aware approach, based on PD and Organizational Semiotics (OS). The result of the activities is a new Android mobile application called LGBTrust, which articulates formal and informal aspects of the fight against LGBTphobia strengthening a group of users constituted of people and partner institutions.

The fight against LGBTphobia is inherently complex – it involves immediate defense against life-threatening events, education to raise (self-)awareness, and support to collective action. When developing a system to tackle it, one risks embedding such relations in bewildering interactions or neglecting some component in a simplistic product. John Maeda [8] developed a framework to study simplicity in "design, technology, business, [and] life." The framework is based on 10 laws ranging from straightforward design principles to "deep" conceptual aspects, from information presentation to the simplicity-complexity relationship.

This work discusses the design rationale of LGBTrust through the lens of simplicity laws[30]. Section 5.2 provides the theoretical foundations needed to comprehend the work. Section 5.3 details our codesign instance, from recruitment to evaluation. Section 5.4 discusses how simplicity underlined the application design, drawn upon an evaluation by HCI experts. Finally, we discuss our findings and possible future directions in Section 5.5.

5.2 Theoretical foundations

5.2.1 Philosophical stance

Scientific works are based on a set of assumptions that shape how the scientist sees the world. In his seminal work, Thomas Kuhn [6] names such sets "science paradigms." One can think about paradigms in terms of ontology (how one

[30] The choice of a mobile application was the main reason for the adoption of the subject of simplicity, being Maeda's theory arguably the most proeminent on the area.

regards reality), epistemology (how one regards knowledge), and axiology (how one regards values). For each of these, a subjectivist or an objectivist stance might be taken. While the former might assume that reality is universal, fully apprehensible, and not influenced by personal values, the latter regards reality as a personal construct, shaped by our subjective experiences and values as well.

Ponterotto [9] summarizes four major paradigms according to such aspects: positivist, post-positivist, constructivist-interpretativist, and critical-ideological. It must be stressed that these classifications intend to guide decisions and to explain core characteristics of each approach, but in practice the paradigms contributions are often blended. More important than to automatically adopt a fixed set of such contributions is to be able to coherently adopt the stances more suited to the specific quest.

In this project, our assumptions fit better in the critical-ideological paradigm. In our view, reality is framed and constructed by socio-historical processes and collective interaction. Therefore, what we can learn from it is dependent of our own feelings, culture, and values. Furthermore, the dynamics of power in society creates oppressed or disenfranchised groups, whose emancipation or empowerment is the purpose of science development.

5.2.2 Socially-Aware Computing (SAC)

In order to achieve our critical goals, we adopted a codesign methodology, defined as “the action of jointly working with people, using diverse artifacts (…) to clear up meanings they build to what a product may become, engender a shared vision about the product and involve the parties, especially the most interested (…) in the design process.” [1] Codesign is the core of the SAC framework [2], which aims to articulate knowledge and experience from diverse interested parties into a socially meaningful artifact.

SAC is rooted in the theory of OS [7]. In OS, an organization is seen as an information system (IS) composed by three nested layers (each one is an information system by itself). The most external layer is the informal IS, comprised by the organizational culture, values, beliefs, expectations, commitments, and others. The middle layer is the formal IS where bureaucracy instantiates the previous layer into

norms, rules, laws, and regulations. The inner layer is the technical IS where materials and artifacts mediate processes in the previous ones. This scheme is depicted at Figure 5.1 in the form of the “semiotic onion” (SO). In SAC, (co)design activities are intended to “peel” the onion carrying social knowledge to a novel technology which will, in turn, affect and influence the outer layers.

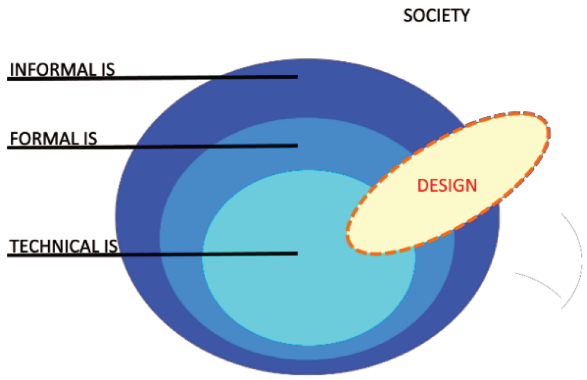


Figure 5.1. (Co)design activities and their inscription in the SO.

In SAC, different interested parties meet in workshops where they engage in PD activities to collectively construct artifacts which will guide the system development. Due to this, it can be named a “semioparticipatory” approach. From the point of view of the critical-ideological paradigm, OS theory is compatible with the assumed ontological and epistemological stances, since it advocates for a reality constructed by responsible agents’ actions and experienced with the mediation of signs [7]. The participatory approach is also suited to lessen our own biases’ influence and to carry meaningful knowledge from people affected by LGBT-phobia.

5.2.3 Maeda’s laws of simplicity

The laws of simplicity (LOS) were first published in a homonymous book by John Maeda [8], where he presents a framework of simplicity ranging from design to life. The laws might be grouped in three sets of recommendations: laws 1-3, laws 4-6, and laws 7-9, spanning from “basic” simplicity immediately applicable in design to “deep” simplicity, which approaches more subjective or complex conceptual aspects. Law 10, “the one,” is a summary of the others. Next, we present a brief explanation of the 10 laws.

Law 1 (Reduce) says that “the simplest way to achieve simplicity is through thoughtful reduction.” This reduction is guided by the SHE acronym: shrink, hide, and embody. Law 2 (Organize) states that systems components must be organized to make it seem fewer by implementing another acronym, SLIP: sort, label, integrate, and prioritize. It is related to information visualization and also mental categorization processes as described by Gestalt theory. Law 3 (Time) also uses the SHE acronym to balance the tradeoff between reducing the time spent in a task as well as the feeling of spending time in a task.

Law 4 (Learn) says that “knowledge makes everything simpler.” It also has an acronym, BRAIN: “Basics are the beginning; Repeat yourself often; Avoid creating desperation; Inspire with examples; Never forget to repeat yourself.” It also advocates for the culturally-aware use of the relate-translate-surprise functions of design, which should first create a sense of familiarity in the person interacting through a translation of this familiarity in a service or component, and, ideally, insert a little surprise. Law 5 (Differences) stresses the dependence between simplicity and complexity – one needs the presence of the other, ideally in a rhythmical way where one is enhanced instead of cancelled out. Law 6 (Context) closes the medium simplicity set stating that “what lies in the periphery of simplicity is definitely not peripheral.” It highlights the tradeoff between the boringness and meaningfulness of familiarity and the thrill and danger of being lost.

Law 7 (Emotion) stresses the need of provoking emotion, even though it might require a move towards complexity. Law 8 (Trust) deals with the balance between the ease obtained by what the system knows about you and the control resulting from what you know about the system. Law 9 (Failure) highlights there might be “flaws” in the framework – some things could (or should) never be made simple.

Finally, Law 10 (The One) summarizes everything: “simplicity is about subtracting the obvious and adding the meaningful.” The 10 laws are also directly related to each other – emotions might aid learning, which reduces time to perform other activities; context provide situatedness in the differences dynamics; and so on.

5.3 Codesign activities

5.3.1 Recruitment

The recruitment for SAC activities was made online, via calls for participation in Facebook groups dedicated to LGBT issues. The posts called participants interested in the subject or engaged in social activism to join a research aiming to develop a novel mobile application to fight and prevent LGBTphobia. In order to achieve a balanced stratified sample, volunteers were randomly picked from the interested groups. The final group of participants was comprised of 24 people[31]: 3 genderqueers (1 bisexual, 1 pansexual and 1 homosexual), 1 homosexual transgender man, 2 transgender women (1 heterosexual and 1 bisexual), 5 cisgender heterosexual women, 2 cisgender heterosexual men, 4 cisgender bisexual women, 2 cisgender bisexual men, 1 cisgender lesbian, and 4 cisgender gay men.

5.3.2 Overview

The activities were split into two phases – Organization and Context Analysis, which aimed to understand the LGBTphobia context experimented by participants and its relations with technology, and Codesign, which involved techniques to create and evaluate the application. Each workshop was named after a relevant character for the LGBT community, chosen by participants at the end of the meeting. Besides in-person meetings, volunteers could also engage in online warm-ups available through the Consider.It website, a public online debate tool. In these warm-ups, one or two ideas emerged in a workshop were explored prior to the next one. Not all volunteers engaged in both forms of contribution, but every one joined at least one activity, virtual or not.

In the first workshop, Alan Turing, volunteers and researches met for the first time and participated in a storytelling activity, where experiences related to LGBT issues and activism were shared. In the next workshop, David Bowie, two systems were explored (the Espaço Livre app, which intends to create a map of homophobia in Brazil, and the website of the Federal Chamber of Deputies) and discussed in

[31] All participants signed a consenting term approved by an ethics committee (see Appendix E). Certificate of Presentation for Ethical Consideration: 58185916.3.0000.5404.

terms of how they (could) aid the fight against LGBTphobia. The third workshop, Ellen Page, bridged both phases by analyzing the network behind a prospective system and listing interested parties using a stakeholder diagram and their respective issues on the application.

In the fourth workshop, Dandara dos Santos, the concept of the system was constructed after brainwriting and braindrawing activities. The paper prototype was transformed into a digital prototype for evaluation in workshop Cássia Eller. Finally, open issues on the features conceived for the application were discussed in workshop Laerte. Two evaluations were performed – an evaluation of simplicity with HCI experts and an evaluation based on cultural values in the last workshop, Freddie Mercury.

5.3.3 LGBTrust

The resulting application was named LGBTrust as decided in Laerte workshop. It aims to build a safe environment for people to collectively articulate pillars of the fight against LGBTphobia, such as education, protection, empathy, and sociability. Its main features are:

• An information portal, with news, external links, and other content related to LGBT issues

• The share of experiences, which could be 3 types: mobilizations (collective engagements such as manifestations, meetings, events, etc.), stories (personal narratives intended to relief emotional pain, motivate people going through similar issues, etc.), and reports of violence or prejudice episodes.

• A panic button, which sends a pre-configured message to pre-defined contacts and nearby users via SMS or notifications push.

• A ask for help section where people can directly reach registered partners such as NGOs and activists to ask for assistance in ongoing issues.

5.4 An analysis of simplicity

The evaluation of simplicity took place in between Laerte and Freddie Mercury workshops. The group of HCI experts was composed by UNICAMP students

and teachers. 9 participants joined the activity. An application installer was made available in a cloud storage and participants were instructed to download and install it. Then, participants were distributed in 3 groups and instructed to navigate the application according to a scenario assigned to each one. Scenario 1 was a person in need of orientation after witnessing or experiencing a discrimination episode; scenario 2 was a person willing to share an experience or goal related to LGBT issues with other people; and scenario 3 was a passerby who had identified an imminent danger nearby. For each scenario, a task was defined to introduce users to the application; after finishing the task, participants were free to explore other interactions. The tasks were, respectively, to register and ask for aid to partners, to register and share an experience, and to login and ask for help. A debriefing was realized in the end.

5.4.1 Navigation and structure

In the braindrawing activity, a map screen was defined as the landing page, containing the panic button in an easy to access area and buttons to the main features. In the final version, general navigation is performed in two bars: a top one containing the application logo, the panic button, a help button, and an icon for a general menu, and a bottom bar with icons to the information portal, timeline, map, ask for help, and profile pages. The evolution of the landing page is shown in Figure 5.2.

Experts' feedback pointed out that although it is easy to master the use of the application, in accordance to Law 4 (Learn), this multimenu navigation was onerous. In order to improve it, some suggested removing items of the bottom bar, following Law 1 (Reduce), and grouping the panic button with the others, according to Law 2 (Organize). However, these recommendations were not consensually agreed. For instance, the repositioning of the panic button might violate Law 8 (Trust), by making it easier to be triggered by accident. Also, the bottom navigation bar as-is allows one-click access to all core functionalities of the application. By hiding these features, one might misbalance the embodiment of qualities stated by Law 1 (Reduce) and the background awareness required by Law 6 (Context).

Nevertheless, one suggestion was consensual – the removal of the help button in the top bar. When clicked, the help button displayed an overlay window with information about the currently displayed page. Experts pointed out that the button could be hidden in the main menu pursuing Law 1 (Reduce), also preventing a violation of Law 2 (Organize), due to the presence of multiple components with the label “help.” Instead of this navigation-aware help, the first-access tutorial could be reformulated to provide a global vision of the application, still contributing to Law 4 (Learn) and avoiding user to feel directionless, according to Law 6 (Context).

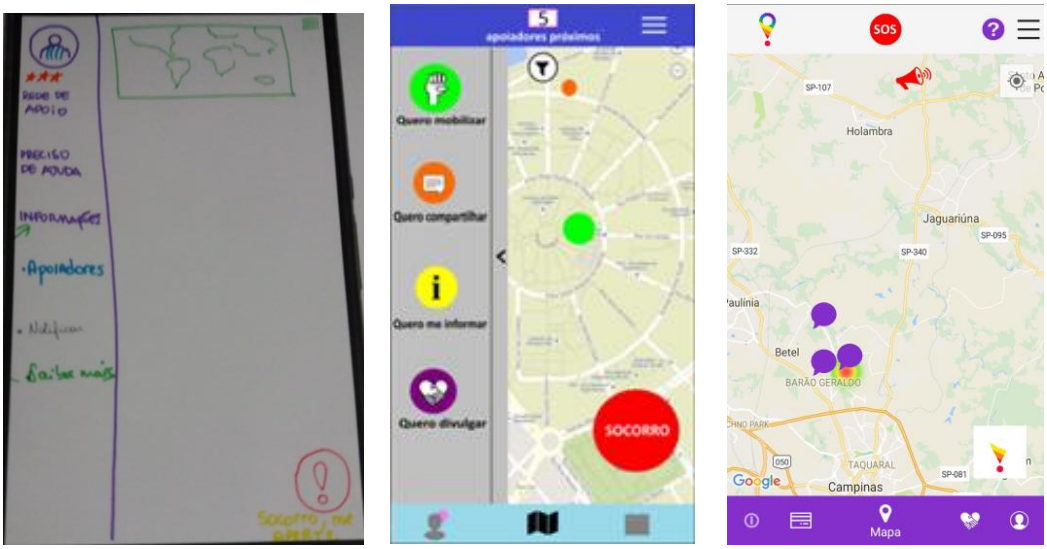


Figure 5.2. From left to right, screenshots of the landing page in the paper and digital prototypes and evaluated application.

5.4.2 Share of experiences

In the Laerte workshop, two alternative exploration tools were planned for user content: a map and a timeline. The presence of hate content in social media boosted debates on security concerns such as malicious people tracking targets, exposition of personal data, and prejudice broadcast. Such debates resonate with Law 8 (Trust) and resulted in mechanisms such as the possibility of reporting and anonymously creating content.

The timeline similarity with Facebook news feed was said to contribute to Law 4 (Learn) and its layout was highlighted by comments in Law 2 (Organize). In the map screen, each type of content was represented by an icon figure, proposed in the first digital prototype (a raised fist for mobilizations, a speech balloon for stories,

and a loudspeaker for reports). In the version presented for evaluators, no identification was presented in the timeline, which was also criticized according to Law 2 (Organize). The different kinds of content were also mentioned as a contribution to Law 6 (Context).

New content could be created in the timeline screen, by fulfilling a form requiring the type of content, a place, a date and time, a summary, a description, identifier tags, and whether it should be anonymous. The form was also mentioned to violate Law 1 (Reduce), while some Android chosen components such as date/time and location pickers were praised for contrasting a complex data with a simple interaction in terms of Law 5 (Differences). In order to simplify the form, it was suggested to transform the radio buttons containing the type of content in different floating buttons which could be shown when the main one is clicked and to display it also in the map screen.

Other concerns around Law 8 (Trust) were discussed during the workshops – since the panic button might alert nearby users, it is necessary to prevent a false sensation of security when triggering it. Thus, a button was added in the map screen to display how many users were nearby. This button would also be hidden in the floating button in this screen.

5.4.3 Registration

Hate content also motivated concerns about registration. After Laerte workshop, it was defined that the registration would be available in two ways – after an invitation and as a partner. The latter was still not implemented for the evaluation. For the former, one must receive an invitation code from an already registered user via e-mail or SMS. Then, the registration is a 4 step process split in 4 different screens: first, the user insert the invitation code; if valid, the user is invited to provide the phone number to be associated with the account; then, the system sends a second phone code via SMS and asks the user to insert it in the third step; finally, the user is requested to provide full name, e-mail, password, and to agree to terms of use.

Experts mentioned the registration was too lengthy to complete due to its many steps, violating Law 3 (Time). Registering in the application is a sensible issue

in the perspective of Law 8 (Trust), since it must assure as much as possible that the user is real, identifiable, and well-intentioned. It is an example of application of Law 9 (Failure), since the verification is inherently complex and impossible to be fully simplified without losing the security expectations. However, it is possible to simplify its current form according to some given suggestions. Firstly, the system could retrieve phone number or e-mail information automatically from the code generation, not needing to ask the user to insert it. The system could also detect SMS receiving and instantly validate the phone code. The perception of time could also be softened by providing a "big picture" of the process via a progress bar or the unlocking of options in a one-screen multistep form.

5.4.4 Help calls

The application provides two ways of asking for help – through a panic button and a contact form with partners. For the panic button, the main concern during the workshops was to provide a fast mean to access it – resembling Law 3 (Time) – and to avoid mistakenly triggers – resembling Law 8 (Trust). Besides placing it in the top bar, a chronometer was added to the panic screen – until the chronometer finishes, the user would be able to hit the "cancel" button and stop the panic call. The first debated version of the other kind of help placed it as another type of user content and allowed users to ask and offer help among them. Again, Law 8 (Trust) was somewhat approached since some raised the concern about malicious or unprepared people attending the calls. It was decided to put users in contact only with registered partners, resembling Law 9 (Failure) by considering such activity too complex to be simplified by a direct contact between users.

The overall simplicity of both screens was mentioned while discussing Law 5 (Differences) due to its contrast with the complexity of user generated data. Also, the chronometer used along the panic button was complimented according to Law 3 (Time) and the exhibition of a list of registered partners in a separate tab also according to Law 8 (Trust).

The headline "Preciso de ajuda" (Portuguese for "I need help") in the call for aid screen was criticized for being confusing with the intention of asking help via the panic button. While some experts suggested merging both, others pointed the

need of the panic button to be easier to trigger and a separate icon and suggested it was more an issue of labeling, approaching Law 2 (Organize). Others mentioned the absence of a third way of asking for help, which was not urgent as a panic call, but also not so sensitive to depend on a trusted partner, as an oversimplification violating Law 9 (Failure).

Observations were also made regarding what happens after the panic call is triggered. In its current version, the application displays a pop-up window informing the call was sent to user's contacts. Some experts argued that it violates Laws 6 (Context) and 9 (Failure) for not showing the user whom the request was sent to, neither providing ways to tell when the call was accidentally triggered. Suggestions included to display the list of contacts in the panic screen (it is currently displayed only in the profile page), to manually select who should receive the call, and to display notifications as people receive the message. While the two first suggestions might increase context awareness, they could also violate Law 1 (Reduce) by adding extra information arguably meaningless in a moment of desperation. Furthermore, Law 3 (Time) would also be affected. A possible middle ground would be to have a single notification opened in a sort of "panic state," allowing more complex interactions such as to cancel the call or to share current location but not adding complexity to the trigger itself.

5.4.5 General

When evaluating Law 7 (Emotion), the application was considered comfortable and suitable for the sentimental background when sharing experiences or asking for help. However, the design was criticized for not directly evoking emotions, for instance, using emojis. The application aesthetics was praised, including icon and color choices. When summarizing the findings in Law 10 (The one), experts mentioned the distribution of features along the screens, the sensation of security, and the ease of use.

The overall averages of grades given by HCI experts for laws 1-10 were, respectively, 3.4, 3.5, 3.9, 4.1, 4.0, 4.5, 4.0, 4.1, 3.5, and 4.4. The grades are depicted in Figure 5.3.

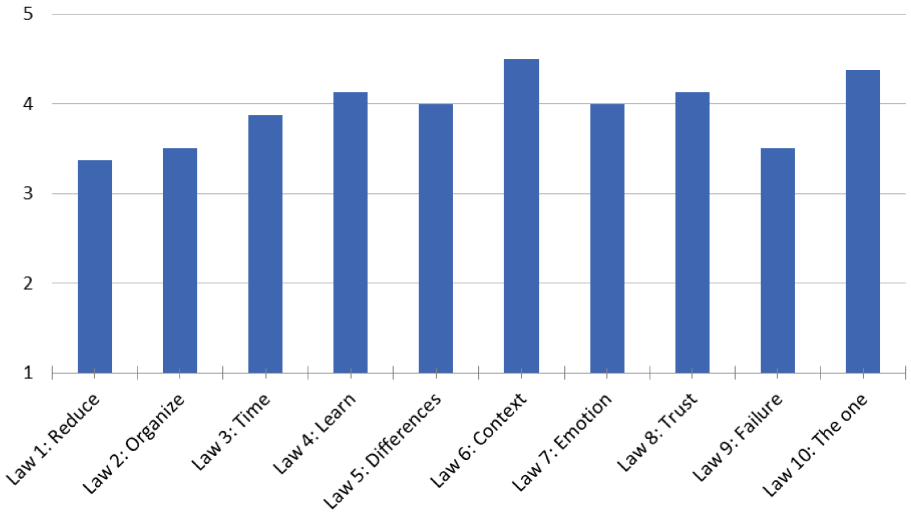


Figure 5.3. Average of grades for each LOS.

5.5 Discussion

All LOS received grades above 3, with Law 10 (The one) exceeding 4, which suggests the application has successfully achieved the goal of simplicity. The most frequent compliments regarded the application layout, the safe environment it provides, its ease of use, and the articulation of multiple parts of a complex context. As of the most recurring drawbacks, we highlight the (over)complexity of forms, the confusing contextual help, and the misleading labeling of help calls.

No detailed presentation of the application was given prior to the evaluation and just one HCI expert in the group also joined the workshops process. While the lack of familiarity arguably privileged an impartial view of the application, it also opened room to conflicting suggestions – for instance, one participant mentioned it should be possible to share more types of content, besides the available. Thus, the analysis and debriefing of observations also required filtering the comments so that concerns, values, and interests developed in workshops were not overwritten by “outsiders’” contributions. Consequently, the results of the evaluation are somewhat constrained in technical comments. The contribution of HCI experts who also are part of the codesign cycle could be further explored in other works.

Even though the LOS could be applied in other domains, as reflected in Maeda’s book subtitle - “design, technology, business, life,” they are more common in design contexts. Due to the long timespan of workshops, we preferred to make just

one meeting for final evaluation and focus it on cultural values rather than adapting the framework for a general audience. Therefore, subjective reflections on the critical role of simplicity were assigned to the leading researchers rather than the subjects themselves. We believe the involvement of subjects would require some training, since the association of laws titles and statements is not always immediate and might be confusing even for experts (e.g. Law 9 (Failure) which was incorrectly regarded as bugs-related by one evaluator). It must be noted that Maeda brings plenty examples not related to design in his book. Future works might further explore the contribution of non-technical participants of the codesign cycle in evaluating simplicity as well.

Since oppressions are multifaceted and often intertwined [5], the fight against them is inherently complex. The LOS were a proper framework for evaluating and reflecting on the application in such context, specially due to its stress of the relation between complexity and simplicity. The “deep simplicity” set shaped features in terms not only of what could be done, especially using Law 9 (Failure) but also what should be done, raising concerns around privacy, comfort, and autonomy. Finally, it must be noted that a future redesign does not imply in an end point to the process. The production of new signs via interaction with and through the application favors the concept of perpetual beta rather than final versions.

5.6 Conclusion

Such as other social concerns, the fight against prejudice is complex because it involves multiple parties, with different interests often intertwined with other kinds of oppression. In this work, we analyzed the development of a novel application using the lens provided by Maeda’s LOS. An evaluation with experts was also performed, not only raising successful instances or violations of Maeda’s laws, but also suggesting possibilities for the redesign cycle. Moreover, we verified the LOS potential influence in the conception and ideation of social applications, adding to its most direct use in design. Ongoing work in this project involves analyzing cultural aspects in the LGBTrust, as perceived by the involved people using it.

5.7 Acknowledgements

This work is funded by CNPq, #308618/2014-9 and CNPq, #132272/2016-4. We also thank the study volunteers and the colleagues from InterHAD for their valuable participation in the evaluation of simplicity and knowledge contribution throughout the project.

5.8 References

1. Baranauskas, M. C. C.; Martins, M. C.; Valente, J. A. Codesign de redes digitais. Penso (2013).

2. Baranauskas, M. C. C. Social awareness in HCI. *Interactions* 21 (4), 66 (2014).

3. Bardzell, J.; Bardzell, S. Humanistic HCI. 1st edition. Morgan and Claypool Publishers, San Rafael (2015).

4. GGB (Grupo Gay da Bahia). Assassinato de LGBT no Brasil: Relatório 2015. https://goo.gl/Hq5qZO (2016). Accessed in April, 2017.

5. Kincheloe, J. L.; McLaren, P. L. Rethinking critical theory and qualitative research. In: Denzin, N.K.; Lincoln, Y. S. (eds.) *Handbook of qualitative research*. SAGE, Thousand Oaks. 138–157 (1994).

6. Kuhn, T. A estrutura das revoluções científicas. Perspectiva (1998).

7. Liu, K. Semiotics in information systems engineering. Cambridge University Press (2004).

8. Maeda, J. The laws of simplicity. Design, technology, business, life. 1st edition. The MIT Press, Cambridge (2006).

9. Ponterotto, J. Qualitative research in counseling psychology: a primer on research paradigms and philosophy of science. *Journal of Counseling Psychology* 52 (2). 126-136 (2005).

10. TransgenderEurope. Trans murder monitoring 15. TGEU Transgender Europe. https://goo.gl/0oYrdY (2015). Accessed in April, 2016.

Chapter 6

From critical theory to practice: culturally-aware reflections on mediated empowerment of lesbian, gay, bisexual, and transgender (LGBT) people in codesign

6.1 Introduction

Human-Computer Interaction (HCI) works have explicitly aimed at social development and emancipation. This is pursued with the aid of contributions from the human sciences schools, such as critical theory.

However, while critical theory may inform HCI about social structures and conflicts, to effectively design a technological artifact to tackle them is not trivial. The interdisciplinarity of HCI places the discipline in a well-suited position to be informed by critical theory about issues; nevertheless, the process of designing a solution to mitigate them is challenging.

This work evaluates a mixed approach of Participatory Design (PD) techniques and Organizational Semiotics (OS) rationale to this end. It describes the foundations of a research that explicitly aims at building a socially-informed application to mediate empowerment of an oppressed group, the Brazilian lesbian, gay, bisexual, and transgender (LGBT) community. Then, we present an evaluation of the process through the lens of Edward Hall's building blocks of culture [22]. Hall's theory is one of the foundation blocks of OS. Moreover, the range of aspects approached by his theory of culture building blocks provides a solid framework for mapping values.

The paper is organized as follows: first, we provide an overview of the critical paradigm and of LGBT issues, situated in Brazil. Following, we describe the research design and the mobile application resulting from the process. Then, we present the results of a cultural-aware evaluation conducted in the end of the study. Finally, we discuss lessons learned, challenges, and possible future works.

6.2 Critical theory paradigm

According to Thomas Kuhn, scientific work is framed by an ensemble of assumptions and tools conceived to deal with historically contextualized questions [29]. This set of assumptions and tools is named a paradigm. Lincoln et al. [32] review inquiry paradigms commonly found in qualitative research, describing them according to a matrix of core issues. We will focus on four philosophical anchors: ontology, epistemology, axiology, and methodology.

Ontology reflects on the nature of reality and existence, and its influence by mental perception and subjectivity. Epistemology deals with the nature of knowledge, truth, what can be known and how. Axiology is the branch that determines the role of values, and their effect on research. They determine the methodology of a scientific quest, i.e., the procedure to be executed. Different stances span from objectivism to subjectivism in each anchor. While positivists prefer quantitative-wise methods to understand a mind-independent reality, constructionists, instead, believe comprehension is subjective and are more concerned with local conclusions. However, one should see this categorization as a description of related assumptions rather than a rigid basket of concepts.

We adopt the critical theory paradigm. The birth of the critical theory is attributed to the work developed at the Frankfurt Institute for Social Research. Its self-defining goal is “(…) the interest of a rationally organized future society, to shed critical light on present-day society (…) to interpret it in the light of traditional theories elaborated in the special sciences, (…) hope of radically improving human existence.” [25] In this context, inquiry is a value-mediated, subjectivist process. Thus, methodology prioritizes dialogue with subjects to dialectically change their reality. Critical theory also highlights the existence of oppressive structures that

privilege some groups in society, in an interconnected, multi-faced set of power relations where thought, inquiry, and subjectivity formation are inscribed [28].

6.3 LGBT Population

The acronym LGBT refers to a spectrum of sexual orientation and gender identity. The former is related to the gender one feels sexually or emotionally attracted to, while the latter is related to the match between the gender one self-identifies with and the sex attributed at one's birth. This distinction between sex and gender is tied to feminist approaches to disprove the innateness of the link between feminine roles and the female reproductive organ. Judith Butler, in particular, stated that there is a social expectation that people's sex, gender, and desire follow a heterosexual[32] matrix [8], e.g., if one is born with a penis (thus assigned to male sex), one is expected to self-identify as a man and be attracted to women. LGBT acts as an umbrella term to describe people who do not fit in this expectation.

LGBTphobia can assume various forms. The most evident perhaps is physical aggression or subsequent killing. Moral harassment as jokes and pre-judgements can play major roles in self-esteem and self-acceptance. Historical taboos and stereotypes reinforced through linguistic manners or mainstream representations are a collective barrier to be broken. Prejudice can also be reproduced within the community, since violence towards each category has specific characteristics and to be part of one does not provide automatic awareness on every other. Other forms of disfranchisement can intertwine – Rodovalho [44] gives the example of discrimination against cisgender heterosexual masculine-looking women. A complete list is impossible to be given, but the complexity of the subject must be highlighted.

6.3.1 A brief history of LGBT issues in Brazil

LGBTphobia roots in Brazil can be traced back to 1530, when Portuguese penal code[33] prohibiting sodomite acts[34] was applied. Following the discursive power

[32] Although "heterosexual" refers only to sexual orientation, Butler was also implying conformity between sex and gender identity. Some transfeminist movements have advocated using the term "cisgender" to refer to people who self-identify with the sex declared at birth, in contrast with "transgender" [11]. In this context, the term "cis-heterosexual" might be more accurate to Butler's matrix.

[33] Title XII, book V (https://goo.gl/9C7Oof).

displacement from theological to medical knowledge, sodomy regulations disappeared after independence [26]. Now, LGBT people began to be approached by police for offending "moral and good manners." [43] It was continued by the dictatorship that started in 1964, whose Catholic elite discursively associated homosexuality to communism and immorality [17].

According to Facchini [12], Brazilian LGBT movement can be split in 3 phases: one concerned with advocacy of social changes in the late 70s; one hit by HIV/AIDS epidemics, more pragmatically engaged in civil rights and actions against discrimination; and the third, begun in the 90s, with defined distinction of political representation. It is in this moment that travestis[35] groups consolidate. Since then, Brazil has distinguishably promoted LGBT rights, having, for instance, legalized same-sex marriage 5 years before the U.S. [26], co-introduced unprecedented international resolutions on sexual orientation and gender identity rights [45], and provided universal free access to HIV treatment, under Federal Law (FL) 9.313/1996, and transexualizing surgeries[36], under Decree 457/2008.

However, reports show that, in Brazil, one LGBT person is killed or commits suicide approximately each 27h [15], around 70% of LGBT students have suffered with verbal discrimination and 36% with physical aggression at school [1], and 50% of worldwide killing of transgender women takes place [48]. The absence of federal laws, educational campaigns and statistics on hate crimes are also an issue. There have also been clashes with political leaders, such as in the proposition of FL project 6586/2013 which legally defines family as the union between a man and a woman. More recently, a Federal judge allowed psychologists to offer volunteer treatment for sexual orientation redefinition [50]. The rise of a far-right candidate which has associated homosexuality to lack of beating in childhood[37] and the role of openly anti-LGBT evangelical leaders in former president Ms. Rousseff ousting also pushes LGBT people into current political turmoil.

[34] It designed a set of considered immoral sex practices in Middle Ages, including same-sex relation - the term "homosexual" was coined in the 19th century [18].

[35] The terms "travesti" and "transgender woman" are often used as synonyms. Historically, however, "travestis" most commonly refer to women from lower income classes [34] or to people who set themselves apart from men/women binarity [44]. Thus, the adoption of "travesti" as self-identification might also denote a political stance.

[36] However, only 5 hospitals across the country actually offer it [36].

[37] https://www.youtube.com/watch?v=QJNy08VoLZs

6.3.2 LGBT and HCI

Recent years have witnessed a rise of interest of HCI in queer and feminist theories, which also boosted works about LGBT people. There is a predominance of analysis of LGBT people as users, including social networks [6, 20], critical analysis [27, 39], dating apps [23, 51, 52], virtual worlds [7], crowdfunding websites [16], and information and communication technologies [9]. Data has also been analyzed to seek diseases or epidemics affecting LGBT population [24, 21]. Scarce exemplars designed new products for or by LGBT people [e.g. 5, 10].

We argue that HCI literature still lacks the exploration of techniques to assess these efforts or to design an alternative solution. It must be noted, nonetheless, that being oppression multi-faced, this gap does not imply that HCI has not yet engaged in the fight against LGBTphobia, but instead that there are blind spots to be exploited.

6.4 Research design

We intended to design a mobile application that might help LGBT people to face struggles and provide them with some agency and empowerment in daily life. We call it mediated according to Bruno Latour's holistic account of human and technical artifact as a hybrid constantly changing through interaction [30]. Technical details and what kind of problems it would tackle were not defined a priori, since we expected the research itself to be outlined through cooperative participation. Next, we describe the foundations of the adopted critical paradigm and their influence in decisions regarding the methodology approached.

6.4.1 Axiology

Assuming that human rights are universal, regardless of sexual orientation and gender identity, it follows that people should be entitled to such rights even if not legally seen as cisgender and heterosexual. Therefore, empowerment should not involve changing or hiding their identity through the adoption of a cis-heterosexual performativity. Conversely, it involves embracing the disruption of expected gendered performativities [8].

Michel Foucault defined power as something that takes place in local relations between people and institutions [14]. Reflexivity, the self-assessment about whether our own participation is reproducing social oppressions, must then be a keyword [3]. This is an important remark to Ponterotto [42]'s claim that critical inquirers "expect their value biases to influence the research process and outcome" and from tendency by critical authors to play intellectually authoritative roles [19]. The values that drive this work are directly related to critical theory objectives – the belief that human dignity, equality, and the right to live should be for all.

6.4.2 Ontology and Epistemology

A historicist view advocates for the study of how discourses shape sexual practices, rather than regarding them as an essentialist category [13]. There are remarking differences, e.g., between the social function of same-sex relations in early Greece, and the current rigid and ambivalent Western homo and heterosexual categories [18]. A similar argument can be observed in cross-cultural regards to gender, like the absence of a binary man-woman classification in some non-Western societies (e.g., 49).

To better understand interaction, theorists have been turning to Semiotics as a framework. Semiotics, not to be confused with Saussurean Semiology, has its formal roots in Charles S. Peirce's work. For him, all ways through which we experience the world are mediated by signs, "anything which is so determined by something else, called its object, and so determines an effect upon a person, which effect I call its interpretant, that the latter is thereby mediately determined by the former." [38]

An alternative definition is sign as "something by knowing which we know something more" [37]. Hence, any object can only be represented by a sign that produces in one's mind some other representation also related to the object, but now mediated by the sign [46]. Epistemologically, it follows that there is always the mediation of our senses and our interpretative schemas involved in decoding the sign, not only a pure subject-object relation [47].

6.4.3 Methodology

A proper methodology should help to lessen prejudiced biases, gather knowledge about social and structures and embody it in a product. A helpful HCI branch on this matter is PD. At its core remain the provision of methods to give people influence in what affects them, assuming they are the experts in their own lives [4].

One participatory approach with a semiotic rationale is provided by the codesign methodology, hereby discussed as “the action of jointly working with people, using diverse artifacts (…) to clear up meanings they build to what a product may become, engender a shared vision about the product and involve the parties, specially the most interested (…) in the design process.” [2] It is drawn upon Ronald Stamper’s OS.

In OS theory, an organization or a “social system in which people behave in an organized manner by conforming to a certain system of norms” is composed by an informal, a formal, and a technical layer or information system [33]. The former comprises meaning-making practices such as intentions, habits, beliefs, values, and commitments, bureaucratized by the second in form of laws, norms, and rules. The third one refers to artifacts which mediate actions in previous levels. Codesign aims to traverse informal and formal layers to clarify and construct meanings to be embedded in the technical product (see Figure 6.1), which will then mediate processes at the external ones. The process is grounded in periodic workshops, meetings with interested parties where PD and OS artifacts are used to guide and inform design activities [2].

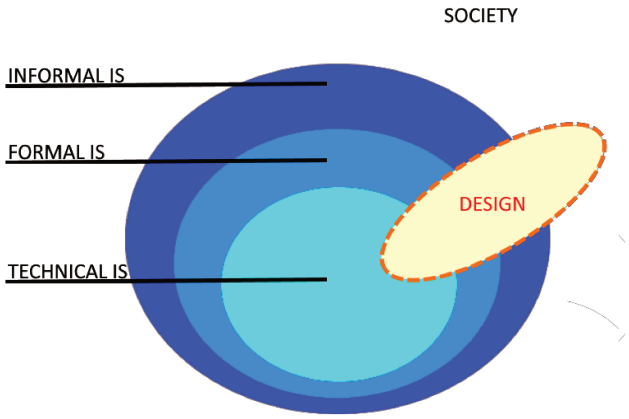


Figure 6.1 - Representation of organizational layers and the inscription of design activities

6.5 Codesign and LGBT empowerment

6.5.1 Volunteers

In order to recruit participants to our research, we made a post in our personal Facebook timelines and reached local LGBT organizations and groups, and asked those who were interested to broadcast the invitation to people they knew. In the end, we randomly selected people from the set of volunteers to reach a proper size for workshops and a balanced representation of each identity.

The group who participated in at least one activity, including researchers, is comprised by 24 people: 1 heterosexual transgender woman and 1 bisexual travesti; 1 transgender gay man; 1 pansexual, 1 bisexual and 1 homosexual genderqueers[38]; 4 gay, 2 bisexual, and 2 heterosexual cisgender men; 1 lesbian, 4 bisexual women, and 5 heterosexual cisgender women.

6.5.2 Ethics construction

This research was approved by an Ethics Committee[39] prior to any recruitment. All volunteers signed a consenting term before joining the workshops. One of them complimented our procedure stating that, in particular, transgender

[38] The term refers to people who do not see themselves within the frame of men and women binaries.

[39] Certificate of Presentation for Ethical Consideration: 58185916.3.0000.5404. See term of consent for participation in Appendix E.

people are a very vulnerable group and often regarded as “experiment rats” by researchers.

Since we might be subject to reproducing offensive treatments, in the beginning of the workshops, we apologized in advance for any possible prejudice and urged attendants to feel comfortable in correcting us and pointing mistakes out.

6.5.3 Methods and tools

The workshops were divided in two major phases: organization and context, to clear up the problem domain, and codesign, which includes requirements development to prototypes evaluation. Volunteers were asked to give a name to each workshop to pay homage to an important LGBT icon. Between each workshop, we asked questions in Google Forms or Consider.It website, based on previous discussions as an online warm-up for the following meeting. The activities here described occurred between November, 2016 and November, 2017.

The first workshop was named Alan Turing, father of several Computer Science fields. We spread on a table 50 cards with news headlines or icons representing politics, quotidian, places, occasions, society or emotions. Each participant randomly selected two cards – one headline and one other – and was invited to tell two stories, a positive and a negative one, related to politics, LGBT, or activism. Then, we discussed how technology could have altered them.

Before the second workshop, we assessed the appropriateness of geolocation for apps intending to fight LGBTphobia. Then, we invited them to navigate two systems chosen according to suggestions given in the first workshop: the app Espaço Livre, which aims to create a map of homophobia in Brazil, and the website of Brazilian National Chamber of Deputies. The workshop was named David Bowie, the British pop icon deceased in the beginning of 2016.

The next workshop was named Canadian actress Ellen Page. For the warm-up, volunteers discussed if a collaborative assessment such as made by the Waze driving app would fit to validate LGBTphobia reports to create a trustworthy map of violence. We also collectively fulfilled two artifacts: the stakeholders diagram, which lists interested parties in the problem or solution, and the evaluation frame, which helps to forecast issues that might impact stakeholders. Based on it, we placed

a set of requirements in the semiotic ladder, an OS tool that helps assessing organizations' communicative levels.

In the fourth workshop, participants engaged in a brainwriting activity, where they were asked to write things that defined how the system should be or what it should do. The results were later used to update the semiotic ladder. Then, we invited them to draw a paper prototype in a braindraw activity. Both had the same functioning: the participant wrote/drew a start point in a paper for 1 minute and then it was forwarded to the next one, who had another 1 minute to complete the writing/drawing or criticize it. It was repeated until the paper reached back its first owner. The workshop was named after Dandara dos Santos, a travesti beaten to death by a group of men in Fortaleza, who later posted the video of the homicide in Facebook.

We transformed the paper prototype into a digital functional prototype. Volunteers were asked to reflect about the importance of accessing information about LGBT rights. The workshop was named Cássia Eller, a popular Brazilian lesbian musician, dead in early 00s. Participants navigated the prototype and made critiques on it. We also realized online warm-ups in order to validate the set of features.

Some sensible features still had open questions, which were discussed during the Laerte workshop, named after a famous Brazilian transgender cartoonist. These questions were related to how to prevent malicious people to exploit the application, spanning from login to content moderation.

The last workshop was named Freddie Mercury, the leading musician from the rock band Queen and is described in more details in next sections. Between the last workshops, we also conducted an evaluation with HCI experts based on the laws of simplicity by John Maeda [35].

6.5.4 App conceptualization

The idealized app is characterized by the following features: a) a panic button which, when pressed, sends a pre-defined message to nearby users and registered contacts; b) creation of three types of user content: stories, mobilizations, and reports; c) contact with registered partners in order to obtain assistance for

sensible issues; d) an information portal with links to external pages related to LGBT awareness (blogs, governmental pages, non-governmental organizations, etc.); e) an advertising area for divulgation of services towards LGBT people.

The application allows two kinds of users – partners who are stablished organizations or activists capable of assisting LGBT people undergoing related issues and regular users who were invited by someone already registered. This is part of the mechanism of prevention of malicious people discussed in Laerte workshop. All content created can be reported and after a threshold, it is shut down. All posts display how many reports it received and why. A moderation group is to be established in the future.

The application contains 6 sections, accessible from 2 menus. The landing page is the map section, where users can see geolocated shared content. Such content is available in an alternative visualization as a scrolling list in the timeline section. Both screens are depicted in Figure 6.2. The bottom leftmost button is the information portal and the rightmost the profile page. Finally, in the “ask for help” screen, users are provided with a list of registered partners and can reach them via a contact form. This form collects the type of aid is needed (e.g., home expelling, legal questions, among others) and additional details and send them to the partners in an internal chat. Finally, the panic button is the only element in the top menu and it leads to a screen with a chronometer which, when finished, triggers the panic call.

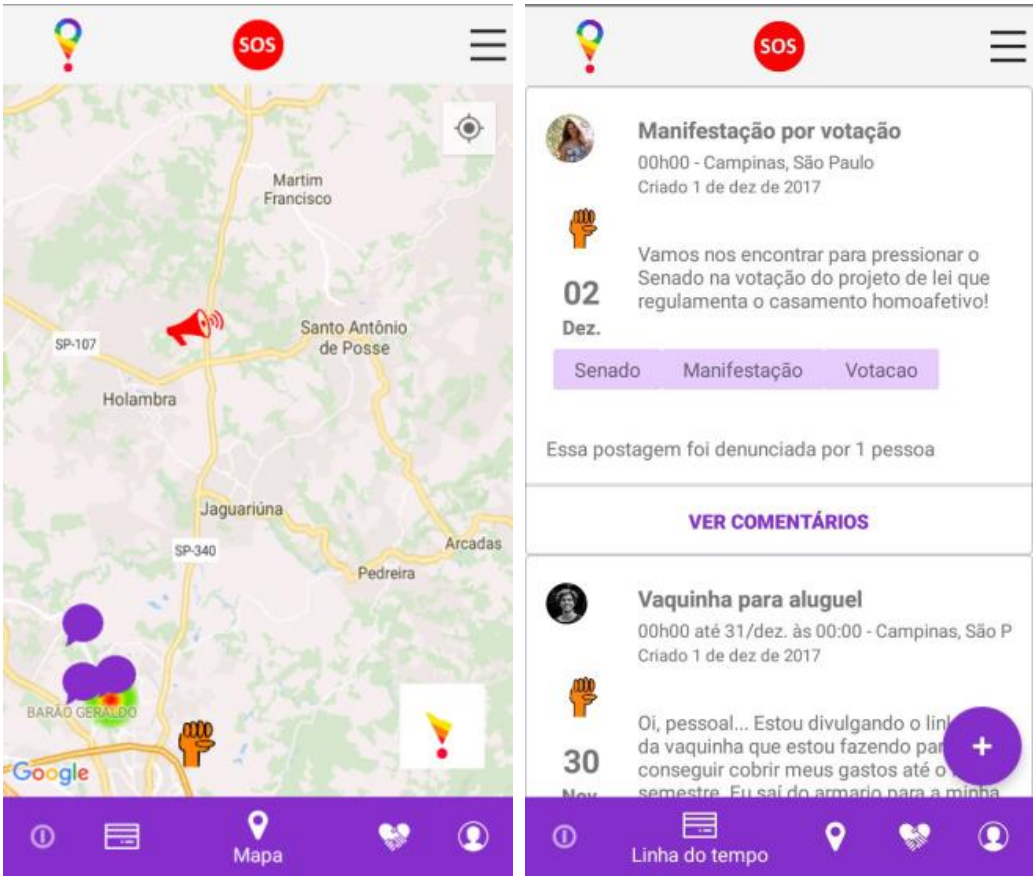


Figure 6.2 - Screenshots of LGBTrust pages featuring user content

6.6 A value-sensible evaluation

6.6.1 The 10 building blocks of culture

In his book "The silent language," the U.S.-American anthropologist Edward Hall [22] proposes a method to study culture by analyzing it in terms of ten building blocks[40] we briefly describe next.

a) Interaction: as pointed by Hall, "everything man does involves interaction with something else." Such interaction might be as simple as the irritability of simple forms of life or as complex as speech. b) Association: started when cells bonded to form simple colonies. Animals associate in different ways for different purposes. Similarly, societies have created different structures and components to organize associations. c) Subsistence: life demands some resources in order to continue. Food, oxygen, shelter, as well as work, deals, infrastructure, and economic systems are examples of what societies need to subsist. d) Bisexuality: how societies

[40] Also referred to as "isolates," "primary message systems" (PMS), or hereby simply as "areas."

deal with the anatomic difference between sexes motivates different consequences on gender and sexuality. It includes gender roles, masculinity/femininity, sexual practices, and sex taboos, among others. e) Territoriality: it describes the relation between living organisms and a territory. Human societies not only occupy geographical areas, but also organize where activities should (or not) be realized. f) Temporality: the passage of time can be perceived in a vast range of subjects. Situatedness in time and its regards on rhythm, cycle, and history are deeply coupled to life. g) Learning: the accumulation of knowledge is a distinct feature of evolution, from genetic transmission to educational systems. h) Play: it is related to emotion, pleasure, and humor. It might serve as a catalyst for other areas. i) Defense: living organisms develop different defensive strategies and devices. Human beings do it as well in a range of subjects, from warfare to law. j) Exploitation: this area refers to mechanisms through which our technical capabilities might be expanded by appropriating the environment.

Each area is rooted in observed widespread biological activities. Furthermore, they are also self-contained in a way that understanding one does not require understanding the rest. At the same time, all areas are related among themselves and with language. Just to give few examples, the voice tone used by a person might reflect their position in a hierarchical association; fun is often a desired mechanism when interacting to people; language allows the learning process to occur along the time; among others.

6.6.2 Freddie Mercury workshop

Although the process is conceived to be iteratively executed, the application coding did not involve the volunteers and not all screens and navigation flows were designed in group. The last workshop in our codesign cycle, Freddie Mercury, was intended to evaluate the overall process we conducted through the year. From a critical perspective, it was important to assess if the participants' voice was heard. An alternative definition is to assess if their values are represented in the final product.

Hall's PMS inspired the OS valuation framing (VF) artifact, a tool to raise interests by groups of stakeholders' in respect to their own cultural systems [33]. This

valuation of the organization and context allows one to have a deeper understanding of how a technical innovation will affect each stakeholder. Pereira et al. [41] conducted an extensive literature review to list values of "social software." These values were mapped to each PMS in the VF4SS (VF for social software) artifact [40], intended to aid designers to identify and reflect upon the values embedded in the constructed system.

We adapted the VF to the last workshop activity. First, we briefly explained the culture areas to the present group[41]. Then, we provided a VF[42] where, for each area, participant could give a grade, from 1 to 5, where 5 indicates that the application successfully embeds values regarded by the volunteer as important for that area and 1, the opposite. We also provided them with examples of questions to assist the reflection on each area. The participants were instructed to freely explore the application while evaluating it and a debriefing was conducted in the end.

6.6.3 Results

6.6.3.1 Interaction

The average of grades for the first isolate was 4.0. Besides the interaction with the application itself, volunteers listed the mediated interactions with people sharing content, registered partners, emergency contacts, and the geographical environment itself via the map.

In the downsides, volunteers mentioned the uncertainty about whom you would be interacting with and the absence of statistics of use. *"This is more an Internet issue, but I cannot be sure about who is in the other side of the communication. This might be dangerous depending on what is talked."* (P1)[43] *"There is not much indication about the community behind the application, such as how many users there are, how much content was posted or how many people were helped."* (P2)

[41] See auxiliary material in Appendix C.

[42] Both artifacts rename the area "bisexuality" to "classification" and "defense" to "protection." We chose to just rename "bisexuality" to "gender and sexuality."

[43] All quotes from volunteers were translated from Portuguese by the authors.

Another participant mentioned that we are never sure about whom we are interacting with. *“Even in real life we might be talking to someone and do not know this person.”* (P3) In addition to the report of posts, volunteers suggested a mechanism of reporting others’ profiles. Another suggestion was to provide metrics of usage information.

6.6.3.2 Association

This PMS received average grades of 3.7. The mobilization feature was highlighted as a way of creating groups. The share of stories was also mentioned as an element that brings people together, by allowing people with similar backgrounds to interact with each other. *“I believe the content in the timeline draws attention to the cause; it does not directly create a group, but helps.”* (P4)

Some feel that other forms of local associations should be further explored by allowing, for instance, exchange/sale of goods like in a local virtual market. These forms of association might be hidden by the term “mobilization” – *“The word ‘mobilization’ has a political connotation.”* (P3)

Among the suggestions, there was the inclusion of more events-related features for mobilizations, such as seeing who is attending and integration with other social media. The option of recommending places as a complement to reporting episodes of violence was also pointed as a missing associative element. Finally, one suggestion mentioned that elements of interaction with the posts should be added such as reacting and seeing comments more easily.

6.6.3.3 Subsistence

Participants gave an average grade of 4.5 for subsistence. The application was said to foster autonomy, collaboration, well-being, self-esteem, safety, and health. *“It might provide more safety and confidence to users, not only through testimonials from other people but also through the help functionalities as well.”* (P4) *“It strengthens the feeling of community.”* (P6)

The sharing of experiences and the help features were often mentioned as positive highlights. *“Not only people can be helped, but simply speaking out something that has happened already helps who went through problems.”* (P1) The

information portal was also mentioned as a source of autonomy and awareness. Again, the creation of micro virtual markets was given as an improvement suggestion.

6.6.3.4 Gender and sexuality

This area was mentioned as the most prominent. Its average grade was 4.3. The application was said to give visibility to all and to care with people protection regardless of sexual orientation and gender identity. *"It is a welcoming environment and it gives the feeling of shelter to see that it gives an equal space and visibility to everyone, with no discrimination."* (P4)

The need for moderation was mentioned once again. The explanation about terms and concepts when completing the profile and in the information portal was also complimented. It was noted, nonetheless, that the application targets a specific audience and provides less features to supporters or neutral people. A suggestion included a lighter version of the information portal to be available without authentication, including graphs, FAQ, and socioeconomic data about the LGBT population.

6.6.3.5 Territoriality

Territoriality received an average grade of 4.3. The navigation within the map and privacy concerns were the most mentioned. *"The application allows you to post stories in any place in the map and you can use it anywhere as long as you have Internet connection."* (P1) *"It also preserves each person personal space."* (P3)

The use of the application in the absence of Internet connection was debated in the debriefing. *"Is it possible to have some information in the map available offline, such as shelters, organizations, and supporting places? In case of an emergency where someone needs to find a place, but has no access to Internet..."* (P5)

Another debate took place around the placement of stories which cannot or should not be placed in an accurate spot in the map, such as stories that happened in someone's house or in multiple localities. The suggested solution for

this was to group stories with no defined location in a special marker placed in the cities center.

6.6.3.6 Temporality

Temporality isolate received average grades of 4.0. It was perceived mostly in the timeline organization and the dynamic update of the map according to when mobilizations happen. *"It allows differing on-going events from future ones."* (P3)

Some volunteers mentioned organization issues in the timeline, which displays a list of user content organized by creation date. Some possibilities of grouping were mentioned such as creating a calendar of mobilization and providing more time navigation mechanisms.

Another suggestion was to allow cloning mobilizations - for instance, some events might have multiple simultaneous editions across the country. In such cases, it was said it would be interesting to have a way to easily create multiple related instances of the same event.

6.6.3.7 Learning

This isolate received average grades of 4.3. Regarding learning about the application itself, volunteers mentioned it offers a simple navigation and is intuitive. Regarding other subjects of learning, participants noted that educational information is present in formal and informal levels across the features – via information portal, shared testimonials, help requests, personal meeting with other people in events, and commentaries. *"I believe that learning might happen in the user-user interaction in posts. In the information section, it is possible to include historical news and even curiosities to raise users' knowledge."* (P4)

6.6.3.8 Play

The average of grades for play PMS was 3.7. In general, the application's aesthetics was complimented but it was said to tend to be "heavy" rather than "fun." *"I think the colors were well chosen to make it balanced and pleasant without looking like a carnival."* (P1) *"It gives the feeling of safety but it is more inclined towards a heavy and serious environment."* (P4)

The term “mobilization” was highlighted as a particular symbol of this concern. Volunteers pointed the term suggests a more political involvement which might overshadow other possible intentions for collective events. *“Are parties a type of mobilization? It sounds too serious.”* (P3) A suggestion was to relabel other types of events to differ those more explicitly political from others. However, the group did not reach consensus around whether the application should intentionally focus on a political perspective or not.

6.6.3.9 Defense

Defense’s average grades were also 4.7. Multiple features were mentioned as related to this PMS – *“Reports of violence episodes, panic button, help from other users, mobilizations.”* (P6) In the downsides, volunteers once again mentioned the possibility of people becoming targets or not getting proper help. *“There is a slight chance of creating an illusion of safety, but safety is the main goal of the app and it looks like a proper approach.”* (P2) *“It is impossible to guarantee 100% of safety in any application. Even if a testimonial is posted anonymously, it can be recognized and can generate a target.”* (P1)

Some improvement suggestions were given. Instead of choosing which type of help the user needs, the application could provide a text field where user types something and a back-end artificial intelligence is able to give directions in simple scenarios. Also, regarding the panic button, since the link with police during panic calls depend on available systems on the police station side, the application could not automatically reach officers in most parts of the country. However, the application could just open the phone call screen with the police number already displayed. Finally, when a panic call is triggered, volunteers also suggested sharing user location with the helpers and allowing sending a notification when the person is in safety.

6.6.3.10 Exploitation

The last isolate received average grades of 4.6. The application was said to create a community feeling, to provide an environment for free expression, and to raise awareness and citizenship consciousness. *“Group, citizenship, protection, and territory awareness.”* (P3) *“Users feel the liberty to express themselves, to talk*

comfortably." (P5) As an improvement, the support for local groups was mentioned again.

6.7 Discussion

Grades for all isolates were higher than 3, suggesting the application did embody participants' values. Defense, exploitation, and subsistence were the best graded areas, reflecting the goal of empowerment and emancipation of LGBT people across the features from navigating through the shared content in the map to get immediate help. Play and association received the lesser grades, partly due to the serious and political overall aspect of the product and to the lack of other forms of encounters.

The need of immediate protection motivated the panic button, which was mentioned while discussing the defense PMS. Other kinds of assistance and guidance were initially discussed in David Bowie workshop - when we evaluated the Chamber of Deputies website -, and resulted in the "ask for help" feature, noticed in the defense, subsistence, and learning PMS. Sharing personal experiences was first mentioned in Alan Turing workshop as a means to bond with other people and was present in the timeline and map features. They were highlighted in interaction, association, subsistence, territoriality, temporality, learning, defense, and exploitation PMS. Formal educational aspects were transformed in the information portal, also mentioned in subsistence, gender and sexuality, and learning PMS. Concerns with privacy and hate speech were also highlighted in interaction, association, and defense PMS. Therefore, social aspects emerged during the process, motivated features, and were recognized in the evaluation. We believe this is illustrative of the well-succeeded goal of embodying social awareness in the product. Moreover, we argue not only the final product was successful, but the overall methodology was also adequate to our critical aims.

The oppressions interleave spontaneously emerged from discussions. Subjects such as rise of violence against women and discrimination against black people appeared in some activities. It must be noted that the expected outcome of research is not a generalizable answer or a statistical evaluation. Though we aimed to accommodate as much diversity as possible, what made the final group were

people interested in the subject reached by our recruitment method. It would be imprudent to say this conceived app can be readily used to help other disenfranchised groups, but volunteers shared meaningful experiences about the big picture of oppressed groups in Brazil.

When faced with the proposal of software, project reviewers from the university or funding agencies often asked what the software will be. This was impossible to be answered in details, since the software would be progressively outlined along the workshops realization, and our focus was not narrowed to the development, but to all knowledge obtained through codesign itself. It was also an issue to some volunteers, who asked to know what the app would be prior to confirming participation.

While PD is more commonly used in well-delimited contexts, we aimed to gather people from different environments. Possibly as a consequence, the group physically attending the workshops was often small and varying from one event to another. 5 people became closer, participating in most workshops. Others often reached us to make follow-up questions – this and high rate of online participation might be evidence of an interest in the subject and group engagement, nevertheless. The distance between university and society in Brazil and the reputation of researchers that exploit LGBT suffering for the sake of their careers must also be considered.

Being the LGBT group marginalized and often approached by non-LGBT authors, it may be hard to find representative information in academic sources. Transgender men and genderqueers, in particular, have only recently consolidated movements and their demands still lack in literature. Social media and personal blogs have been useful tools for LGBT people to voice out their issues, while they progressively gain space in scientific authorship. By using such sources to contextualize some discussions, we hope to also promote voices not heard otherwise.

Finally, disenfranchisement and social inequality are not exclusive from LGBT group and within it there are still plenty of different situated demands to be explored. We hope our experience inspire passionate practitioners to engage into action.

6.8 Conclusion

Light et al. [31] called HCI practitioners to stay aware and responsive to ongoing worldwide changes. LGBT lives are at stake in varied locations, including Brazil, a liberal yet conservative, diverse yet intolerant country. By adopting a critical stance, we aimed to build a mobile app which could add up an empowered social actor to this reality. Critical reasoning motivated us to choose a semioparticipatory approach, with a group of online recruited stakeholders, which resulted in a mobile application targeted at LGBT people. From a critical perspective, the research should provide an opportunity for people to be heard. In this paper, we provided a case study of Hall's building blocks of culture as a framework for assessing the overall process by mapping the values and concerns the final product reflects. Moreover, we framed the fight against LGBTphobia in Hall's theory of culture and how its multiple aspects relate to each other.

6.9 Acknowledgments

This work is funded by CNPq, #308618/2014-9 and CNPq, #132272/2016-4. We also thank the NIED for its material provision, our colleagues from InterHAD, and the volunteers for the inspiring participation.

6.10 References

1. ABGLT (Associação Brasileira de Lésbicas, Gays, Bissexuais, Travestis e Transexuais). Pesquisa nacional sobre o ambiente educacional no Brasil 2015: as experiências de adolescentes e jovens lésbicas, gays, bissexuais, travestis e transexuais em nossos ambientes educacionais. ABGLT (2016).

2. Baranauskas, M. C. C.; Martins, M. C.; Valente, J. A. Codesign de redes digitais. Penso (2013).

3. Bardzell, S.; Bardzell, J. Towards a feminist HCI methodology: social science, feminism, and HCI. In: *Procs. of the SIGCHI Conference on Human Factors in Computing Systems*. ACM Press (2011). 675-684.

4. Basballe, D. A.; Halskov, K.; Hansen, N. B. The early shaping of participatory design at PDC. In: *Procs. of the 14th Participatory Design Conference: Short Papers*, Interactive Exhibitions, Workshops, 2. ACM Press (2016). 21-24.

5. Beirl, D.; Zeitlin, A.; Chan, J.; Loh, K. I. A.; Zhong, X. GotYourBack: an Internet of Toilets for the trans* community. In: *Procs. of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems*. ACM Press (2017). 39-45.

6. Blackwell, L.; Hardy, J.; Ammari, T.; Veinot, T.; Lampe, C.; Schoenebeck, S. LGBT parents and social media: advocacy, privacy, and disclosure during shifting social movements. In: *Procs. of the 16 CHI Conference on Human Factors in Computing Systems*. ACM Press (2016). 610-622.

7. Blodgett, B. M.; Xu, H.; Trauth, E. M. Lesbian, gay, bisexual and transgender (LGBT) issues in virtual worlds. *ACM SIGMIS Database: the DATABASE for Advances in Information Systems*, 38 (4). ACM Press (2007). 97-99.

8. Butler, J. Gender trouble: feminism and the subversion of identity. Routledge (1999).

9. Champagne, R.; Guerra, J.; Tsai, C.-H.; Monahan, J.; Farzan, R. Fuzziness in LGBT non-profit ICT use. In: *Procs. of the Seventh International Conference on Information and Communication Technologies and Development*. ACM Press (2015).

10. Deen, M.; Nack, F.; Haggis, M. Diversity through specificity: design lessons learned from the Games (4Diversity) Jams. In: *Procs. of the 12th International Conference on Advances in Computer Entertainment Technology*. ACM Press (2015).

11. Dumaresq, L. O cisgênero existe. In: *Transliteração*. https://goo.gl/MeVXkj (2014). Accessed in May, 2017.

12. Facchini, R. Histórico da luta de LGBT no Brasil. In: São Paulo Regional Council of Psychology (CRP-SP). *Cadernos temáticos CRP-SP*, 11 – Psicologia e diversidade sexual. CRP-SP (2011). 10-19.

13. Foucault, M. História da sexualidade I – a vontade de saber. Graal (1988).

14. Foucault, M. Les intellectuels et le pouvoir. Dits et écrits I. Gallimard (2001).

15. GGB (Grupo Gay da Bahia). Assassinato de LGBT no Brasil: Relatório 2015. https://goo.gl/Hq5qZO (2015). Accessed in April, 2017.

16. Gonzales, A.; Fritz, N. Prioritizing flexibility and intangibles: medical crowdfunding for stigmatized individuals. In: *Procs. of the 2017 CHI Conference on Human Factors in Computing Systems*. ACM Press (2017). 2371-2375.

17. Green, J. N.; Quinalha, R. Ditadura e homossexualidades: repressão, resistência e a busca da verdade. EDUFSCAR (2014).

18. Greenberg, D. F. The construction of homosexuality. University of Chicago Press (1988).

19. Guba, E. G.; Lincoln, Y. S. Competing paradigms in qualitative research. In: Denzin, N. K.; Lincoln, Y. S. Lincoln. *Handbook of qualitative research*. SAGE (2nd ed., 1994). 105-117.

20. Haimson, O. L.; Brubaker, J. R.; Dombrowski, L.; Hayes, G. R. Disclosure, stress, and support during gender transition on Facebook. In: *Procs. of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing*. ACM Press (2015). 1176-1190.

21. Haimson, O. L.; Brubaker, J. R.; Hayes, G. L. DDFSeeks same: sexual health-related language in online personal ads for men who have sex with men. In: *Procs. of the SIGCHI Conference on Human Factors in Computing Systems*. ACM Press (2014). 1615-1624.

22. Hall, E. The silent language. Doubleday & Company, Inc (1959).

23. Hardy, J.; Lindtner, S. Constructing a desiring user: discourse, rurality, and design in location-based social networks. In: *Procs. of the 17 ACM Conference on Computer Supported Cooperative Work and Social Computing*. ACM Press (2017). 13-25.

24. Homan, C. M.; Lu, N.; Tu, X.; Lytle, M. C.; Silenzion, V. M. B. Social structure and depression in TrevorSpace. In: *Procs. of the 17th ACM Conference on Computer Supported Cooperative Work & Social Computing*. ACM Press (2014). 615-625.

25. Horkheimer, M. Traditional and critical theory. In: Groff, R. *Subject and object: Frankfurt School writings on epistemology, ontology, and method*. Bloomsbury (2014). 185-233.

26. ILGA (International Lesbian, Gay, Bisexual, Trans and Intersex Association). State Sponsored Homophobia 2016: A world survey of sexual orientation laws: criminalisation, protection and recognition. https://goo.gl/weJBTk (2016). Accessed in April, 2017.

27. Kannabiran, G.; Petersen, M. G. Politics at the interface: a Foucauldian power analysis. In: *Procs. of the 6th Nordic Conference on Human-Computer Interaction: Extending Boundaries*. ACM Press (2010). 695-698.

28. Kincheloe, J. L.; McLaren, P. L. Rethinking critical theory and qualitative research. In: Denzin, N. K. Denzin; Lincoln, Y. S. *Handbook of qualitative research*. SAGE (3rd ed., 2005). 303-343.

29. Kuhn, T. A estrutura das revoluções científicas. Perspectiva (1998).

30. Latour, B. On technical mediation - philosophy, sociology, genealogy. In: *Common Knowledge*, 3 (2). 1994. 29-64.

31. Light, A.; Shklovski, I.; Powell, A. Design for Existential Crisis. In: *Procs. of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems*. ACM Press (2017). 722-734.

32. Lincoln, Y. S.; Lynham, S. A.; Guba, E. G. Paradigmatic controversies: contradictions, and emerging confluences, revisited. In: Denzin N. K.; Lincoln Y. S. (Eds.), *The SAGE handbook of qualitative research*, 4. SAGE (2011). 97-128.

33. Liu, K. Semiotics in information systems engineering. Cambridge University (2004).

34. Lucciola, L. Entenda a diferença entre travesti, transexual, cross dresser e drag queen. In: Extra. https://goo.gl/8jt4Yj (2014). Accessed in April, 2017.

35. Maeda, J. The laws of simplicity. Design, technology, business, life. 1st edition. The MIT Press, Cambridge (2006).

36. Pacheco, C. Apenas cinco hospitais fazem cirurgia transgenital pelo SUS no Brasil. In: *Correio 24 horas*. https://goo.gl/9S7Am6 (2016). Accessed in June, 2017.

37. Peirce, C. S. Correspondência – trecho de cartas para Lady Welby. In: da Motta, O. S.; Hegenberg, L. *Semiótica e filosofia*. Cultrix (1975). 135-147.

38. Peirce, C. S. Excerpts from letters to Lady Welby. In: *The essential Peirce: selected philosophical writings*, 2. Peirce Edition Project. 1998. 477-492.

39. Pereira, G. C.; Baranauskas, M. C. C. Opressões de identidade de gênero e orientação sexual percebidas em interfaces de usuário de sistemas digitais: um estudo exploratório. In: *Procs. of the 14th Brazilian Symposium on Human Factors in Computing Systems.* ACM Press (2015).

40. Pereira, R.; Baranauskas, M. C. C. Seeing social software analysis and evaluation through the lenses of culture. In: Zhang R.; Zhang J.; Zhang Z.; Filipe J.; Cordeiro J. (eds.) Enterprise Information Systems. *ICEIS 2011*. Lecture Notes in Business Information Processing, vol 102. Springer, Berlin. 374-387 (2012).

41. Pereira, R.; Baranauskas, M. C. C.; da Silva, S. R. P. Softwares sociais: Uma visão orientada a valores. In: *Proceedings of the 9th Brazilian Symposium on Human Factors in Computing Systems*. ACM Press (2010).

42. Ponterotto, J. Qualitative research in counseling psychology: a primer on research paradigms and philosophy of science. *Journal of Counseling Psychology*, 52 (2). American Psychological Association (2005). 126-136.

43. Pretes, E. P.; Vianna, T. História da criminalização da homossexualidade no Brasil: da sodomia ao homossexualismo. In: Lobato, W.; Sabino, C.; Abreu, J. F. (orgs.). *Iniciação científica: destaques 2007*. PUC Minas (2008). 313-392.

44. Rodovalho, A. M. O cis pelo trans. In: *Estudos Feministas*, 25 (1). UFSC (2017).

45. Rosenberg, A. The Brazilian paradox: the lesbian, gay, bisexual, and transgender battle for human rights. In: Nowakowski, A. (ed.). *Revisiting human rights in Latin America*. University of Denver (2009). 16-30.

46. Santaella, L. O que é semiótica. Brasiliense (1983).

47. Santaella, L. Epistemologia Semiótica. In: *Cognitio*, 9 (1). EDUC (2008). 93-110.

48. TransgenderEurope. Trans murder monitoring 15. TGEU Transgender Europe. https://goo.gl/0oYrdY (2015). Accessed in April, 16.

49. Vanhomrigh, E. Memoirs of a Samoan, Catholic, and Fa'afafine. PublishAmerica (2007).

50. L. Vassallo. Juiz libera cura gay por psicólogos. In: *Estadão*. https://goo.gl/cgVczM (2017). Accessed in October, 2017.

51. Yeo, T. E. D.; Fung, T. H. Relationships form so quickly that you won't cherish them: mobile dating apps and the culture of instantaneous relationships. In: *Procs. of the 7th International Conference on Social Media & Society*. ACM Press (2016).

52. de Wiele, C. V.; Tong, S. T. Breaking boundaries: the uses & gratifications of grindr. In: *Procs. of the 14 ACM International Joint Conference on Pervasive and Ubiquitous Computing*. ACM Press (2014). 619-630.

Chapter 7

Conclusions

This MSc study aimed at a critical goal of supporting empowerment of the LGBT population in Brazil, by addressing the codesign of software. It started with an exploratory study on the reproduction of LGBTphobia in systems user interfaces and a review of states of art and technique related to LGBT issues in HCI and mobile applications. Then, after a careful reflection, the SAC framework was adopted using the codesign methodology to develop a novel mobile application.

Our online survey revealed that some elements of prejudice against LGBT people are also prone to be reproduced in virtual interactions, facilitated by the user interface. Focusing on social media, the participants from the study mentioned the perception of oppressions in content generated by users, content generated by the system itself, and also in interface elements such as form fields or profile images. Concerns with moderation and privacy also emerged. In this setup, LGBT users were more sensible to perceive oppressions, but there was a general discontent with the current state of how social media address such issues.

Our systematic reviews showed that LGBT experience has been increasingly considered in HCI. Most of them have considered LGBT people as users of various systems, with more exemplars of dating applications. However, few works propose new systems or explicitly adopt critical theory as a philosophical background to design. There is also a predominance of dating applications in mobile systems targeting at LGBT people. Existing systems might target parts of the fight against LGBTphobia, but there seems to be a disconnection between such parts as depicted in our study on David Bowie workshop. Few systems make explicit an emancipatory goal in their description, but some of the self-disclosures might be misleading since some of these systems might even reinforce prejudice.

In order to develop a novel application, a codesign methodology was adopted. Volunteers took an active role in all parts of the product development, except the coding itself. Throughout the workshops and online activities, issues in

daily life were discussed as well as how (and if) they could be treated in the system. The resulting application was named LGBTrust and articulates protective, educational, and social features. Again, privacy and content moderation were major concerns but solutions were implemented and extensively discussed.

Being the subject inherently complex, we adopted an evaluation using the simplicity laws by John Maeda. The activity raised pros and cons both from a design perspective and from a conceptual stance. Overall, the application received positive grades and some suggestions were made for future redesigns. We also conducted a process assessment using Edward Hall's theory of culture. Participants in the workshop were able to list pros and cons of the application in all the Primary Message Systems (PMS), which in Hall's theory, represent blocks upon which every culture is drawn. Again, the application received positive grades with some side notes regarding playfulness and formation of local groups. Most importantly, the assessment also provided us with redesign suggestions and it served as an evaluation of the process. Since participants stated that their values were embedded in the application, we conclude that the adopted methodology was adequate to develop an application with a critical goal. It was also confirmed during online and in-person discussions.

7.1 Contributions

The main contributions from this study are:

- An analysis of how elements in social media reproduce prejudice against LGBT people and how to lessen it;
- A state of art and technique reviews on LGBT issues in HCI literature and mobile applications;
- A prospection of how technological features might affect the fight against LGBTphobia and the support of LGBT people;
- A reflection upon the use of SAC as a critical framework for the development of emancipatory systems;
- An instance of Maeda's laws of simplicity in a critical context;

- An instance of Hall's theory of culture as a tool for critical evaluations;
- A functional mobile application targeted at supporting LGBT people to be released;
- The inclusion of people who had been historically persecuted and omitted from mainstream narratives (scientific included) in a formal process intended to listen to their voices.

7.2 Research answers

The study contributions can also be seen from the perspective of the objective questions listed in Chapter 1.

1. How oppressions related to sexual orientation and gender identity prejudice can be perceived in digital systems?

As any other kind of bias, prejudice against LGBT people can also be embedded in digital systems. Arguably, the most evident is the treatment of prejudiced content. The presence of LGBTphobe content in social media demands a proper answer from moderation instances, which often does not match users' expectations. This is worsened with the perception that some measures exclude LGBT people, such as the "real name" policies. Automated features might also reproduce prejudiced content in sponsored publications or also create discomfort by showing prejudiced people, events, or pages. The exclusion of genders outside the male/female binary and the consequent misuse of pronouns are a common issue in registration forms. Privacy concerns are also closely related to LGBT interests, since configuration possibilities offered by social media might be confusing or inefficient.

2. How has LGBT issues appeared in HCI literature?

The subject LGBT has gained popularity in the past years. Most part of the HCI works focus on the experience of LGBT people as users. A wide range of aspects have been studied, including the experience of transiting transgender people, LGBT parents, and rural users of dating applications. Even though the lessons raised by these works are inherently related to LGBTphobia, the emancipatory goal is not explicit in most of them – more precisely, besides the

analysis presented in Chapter 2, only one work we found during the review explicitly considered a critical perspective. There are also few exemplars of proposals of new applications in literature.

3. How current systems address LGBT issues?

Such as in HCI literature, mobile applications aiming at LGBT people are mostly dating applications. There is a wide range of how existing applications might help this group, but few explicitly aim at emancipation. The report of violence episodes is present in some applications, but they lack the clarity on how this information is used after the report. Some information portals have been developed, but some users might feel it as something more specific to a certain situation and somewhat disconnected from emergencial protection. Several applications offer exclusively LGBT content, such as audiovisual streaming, news, and travel guides. While this might raise some alterity and awareness, it might also create a "bubble effect," by constraining what is considered LGBT and displacing it from a broader context. Other applications such as health monitors and tools to call for help are also available. Finally, some applications might even reinforce prejudice by stereotyping the LGBT experience.

4. Which features and characteristics could a novel meaningful system have and how would they be associated with LGBT experience?

Throughout all workshops, the discussed features varied between protective, educational, and social aspects. From a protective perspective, there are three groups of issues that might be addressed – emergencies, concerns involving specific institutions, and general help. The emergencies might be treated with a panic button, which alerts acquaintances or surroundings that the user is in danger. The system should consider accidental triggers as well as the creation of a false feeling of safety after hitting the button. Some challenges faced by LGBT people such as home expelling or legal orientation are sensible topics which take place in emotional contexts. In such cases, it is needed to minimize the risk of exposing the person needing help to bad intentioned or unprepared users. One possibility is the direct contact only with trusted partners. For other kinds of help, social features might be adapted to allow people to reach each other.

An educational perspective is essential for the long-term fight against prejudice. It might target a general audience to clarify questions related to LGBT people or also to LGBT people to provide orientation. Such features raise the awareness and might provoke users to empathize with others. However, an isolated educational perspective might not suffice to this end. Portals of legal or political information, for example, might be used only in moments of need or elections periods. In daily life, users might prefer to use social media in order to get informed.

Finally, direct or indirectly, all previous features relate to the creation of social ties. Through the sharing of experiences, plenty of benefits might be approached – users can get emotional relief; empathy, alterity, and awareness might be stimulated; people with similar interests and backgrounds might reach each other; friendly and dangerous places might be listed; groups might gather for specific purposes. Privacy and moderation are major concerns. A system should prevent the proliferation of prejudiced content, as well as the exposure of sensitive issues to harmful users. A human moderation is the best alternative, since this task cannot be automated. However, reporting and ranking mechanisms, as well as regulation of who is allowed to join the system, might add to this end.

5. How complexity emerges in the system in this context?

Maeda's laws consider the tradeoffs between simplicity and complexity. In this context, simplicity is reinforced by usability aspects that allow users to access core features with minimal hurdles, as approached by Laws 1-4; the articulation of diverse elements in the context surrounding the subject; the feeling of safety and trust. The Law 9 (Failure) is especially helpful to detect aspects that are inherently complex – for instance, the registration process cannot be simplified if the system wants to prevent the access of prejudiced users. Conversely, the laws are also useful to detect the limits of simplification – during the prototypes construction, for instance, we did not consider an intermediary form of help between emergency and sensible requests.

6. How to evaluate both the outcome and the construction process from a critical perspective?

A critical stance highlights the goal of “listening to the voice of disenfranchised people.” We approached this goal by a cultural valuation perspective. The 10 building blocks of culture by Edward Hall served as a framework for classification of values considered important by participants. The framework was easily understood and applied and during the discussions, participants highlighted all the ways through which the application could contribute to the lives of LGBT people guided by the broad range of aspects offered by Hall. It allowed us to compare the ideas brainstormed in the first activities to the final result and, through the assessment of the product, to obtain a solid artifact to describe the adequacy of the process.

7.3 Limitations

As previously described, the SAC methodology focus on a local context. Although the results might arguably be expanded to other contexts, this reflection was not hereby made. Moreover, the number of volunteers was appropriate for the participatory activities, but it is not representative of all experiences that people interested in LGBT issues might have. Also, not all volunteers were present in all activities, which also contributes to the possibility of new knowledge to emerge in other setups. In particular, no intersex or asexual people participated in the workshops and all volunteers were from the same region. Other geographical contexts might also favor new contributions. Finally, the application was no yet launched and its actual impact outside the research environment is still unknown.

7.4 Future work

The state of art and technique reviews pointed out a wide room of opportunities for researches in critical setups and related to LGBT people. Firstly, other systems could be evaluated, besides social media. Other technologies could be experimented, besides mobile applications. Other methodologies could be assessed in a critical context, besides SAC. Other groups might be considered, either LGBT people from other social contexts as well as other disenfranchised populations. The relation between LGBTphobia and other kinds of oppressions could also be explored. Also, the constructed system could be evaluated outside the research setup and its features be assessed throughout the time and real usage.

Bibliography

Associação Brasileira de Lésbicas, Gays, Bissexuais, Travestis e Transexuais (ABGLT). “Pesquisa nacional sobre o ambiente educacional no Brasil 2016: As experiências de adolescentes e jovens lésbicas, gays, bissexuais, travestis e transexuais em nossos ambientes educacionais.” Available in https://goo.gl/8AU3eB (2016). Accessed in May, 2017.

Acquisti, A.; Gross, R. “Imagined communities: awareness, information sharing, and privacy on the Facebook.” In *Privacy Enhancing Technologies*. Springer (2006), 36–58.

Affonso, J.; Macedo, F. “Levy Fidelix é condenado em R$ 25 mil por declarações homofóbicas.” In *Estadão.* Available in https://goo.gl/zW8Cst (2017). Accessed in January, 2018.

Andrews, P.; da Silva, F. S. C. “Using Parliamentary Open Data to Improve Participation”. In *Proceedings of the 7th International Conference on Theory and Practice of Electronic Governance*. ACM Press (2013). 242-249.

Anglia Ruskin University. “Gays and lesbians face CV bias – study” (2014). Available in https://goo.gl/tafSGs. Accessed in May, 2015.

Antunes, P. P. S. “Travestis envelhecem?”. *MSc Dissertation*. Pontifícia Universidade Católica de São Paulo (2010).

Avendaño, T. C. “Rio 2016 se transforma na Olimpíada mais gay da história.” In *El País Brasil*. Available in https://goo.gl/Njri5q (2016). Accessed in November, 2016.

Baranauskas, M. C. C. “Social awareness in HCI.” In *Interactions*, 21 (4). ACM Press (2014).

Baranauskas, M. C. C.; Martins, M. C.; Hayashi, E. C. S. “E-cidadania na linha do tempo.” In Baranauskas, M. C. C.; Martins, M. C.; Valente, J. A. (orgs.). *Codesign de Redes Digitais: Tecnologia e Educação a Serviço da Inclusão Social*. Penso (2013). 65-84.

Baranauskas, M. C. C.; Martins, M. C.; Valente, J. A. “Codesign de redes digitais.” Penso (2013).

Baranauskas, M. C. C.; Schimiguel, J.; Simoni, C. A. C.; Medeiros, C. M. B. “Guiding the Process of Requirements Elicitation with a Semiotic Approach.” In *Proceedings of 11th International Conference on Human-Computer Interaction*. Springer (2005). 100-111.

Bardzell, J.; Bardzell, S. “Humanistic HCI.” Morgan and Claypool (2015).

Bardzell, S.; Bardzell, J. “Towards a feminist HCI methodology: social science, feminism, and HCI.” In *Proceedings of the 2011 SIGCHI Conference on Human Factors in Computing Systems*. ACM Press (2011). 675–684.

Bardzell, S. “Utopias of participation: design, criticality, and emancipation.” In *Proceedings of the 2014 SIGCHI Conference on Human Factors in Computing Systems*. ACM Press (2014). 189-190.

Bargh, J. A.; McKenna, K. Y. A.; Fitzsimons, G. M. “Can you see the real me? Activation and expression of the ‘true self’ on the Internet.” In *Journal of Social Issues*, 58 (1). Springer (2002). 33–48.

Barkhuus, L.; Brown, B.; Bell, M.; Hall, M.; Sherwood, S.; Chalmers, M. “From Awareness to Repartee: Sharing Location within Social Groups.” In *Proceedings of the 2008 SIGCHI Conference on Human Factors in Computing Systems*. ACM Press (2008). 497-506.

Basballe, D. A.; Halskov, K.; Hansen, N. B. “The early shaping of participatory design at PDC.” In *Proceedings of the 14th Participatory Design Conference: Short Papers*, Interactive Exhibitions, Workshops, 2. ACM Press (2016). 21-24.

de Beauvoir, S. “Le Deuxième Sex.” Gallimard Education (1986).

Beirl, D.; Zeitlin, A.; Chan, J.; Loh, K. I. A.; Zhong, X. GotYourBack: An Internet of Toilets for the Trans* Community. In *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems*. ACM Press (2017). 39-45.

Bennett, R. “For many people, gender identity is more complex than just "male" or "female" …” (2014). Available in https://goo.gl/Ln9xZ8. Accessed in May, 2015.

Bivens, R. “The gender binary will not be deprogrammed: ten years of coding gender on Facebook.” In *Social Science Research Network*, 19 (6). SAGE (2015). 880-898.

Blackwell, L.; Hardy, J.; Ammari, T.; Veinot, T.; Lampe, C.; Schoenebeck, S. “LGBT Parents and Social Media: Advocacy, Privacy, and Disclosure during Shifting Social Movements.” In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. ACM Press (2016). 610-622.

Blodgett, B. M.; Xu, H.; Trauth, E. M. “Lesbian, gay, bisexual and transgender (LGBT) issues in virtual worlds.” In *ACM SIGMIS Database* 38 (4). ACM Press (2007). 97-99.

Bocchinio, R.; Talento, B.; “Candidatos fazem promessas para a população LGBT”. In *A Tarde*. Available in https://goo.gl/RjX1n3 (2016). Accessed in November, 2016.

Bond, B. J.; Hefner, V.; Drogos, K. L. “Information-seeking practices during the sexual development of lesbian, gay, and bisexual individuals: the influence and effects of coming out in a mediated environment.” In *Sexuality & Culture*, 13 (1). Springer US (2009). 32-50.

Brazilian Constitution, articles 3 (item IV) and 5 (caput and item I). 1988.

Brennan, C. “Angela Merkel overheard confronting Mark Zuckerberg over the need to 'do some work' about racist posts on Facebook.” In Daily Mail UK (2015). Available in https://goo.gl/PNn6uv. Accessed in December, 2015.

Breslin, S.; Wadhwa, B. “EnGendering interaction design.” In *3rd International Conference on User Science and Engineering*. IEEE (2014). 292-295.

Breslin, S.; Wadhwa, B. “Exploring nuanced gender perspectives within the HCI community.” In *Proceedings of the India HCI 2014 Conference on Human Computer Interaction*. ACM Press (2014). 45.

Brito, K.dos S.; Costa, M. A. da S.; Garcia, V. C.; Meira, S. R. L. “Assessing the Benefits of Open Government Data: The Case of Meu Congresso Nacional in Brazilian Elections 2014.” In *Proceedings of the 16th Annual International Conference on Digital Government Research*. ACM Press (2015). 89-96.

Butler, J. “Gender trouble: feminism and the subversion of identity.” Routledge (1999).

Butler, J. “Sex and gender in Simone de Beauvoir’s Second Sex.” In Yale French Studies, 72. *Simone de Beauvoir: witness to a century* (1986). Wengel, H. V. (ed.). 35-49.

Cancian, N. “Ministério tira 'identidade de gênero' e 'orientação sexual' da base curricular.” In *Folha de São Paulo*. Available in https://goo.gl/UdMxS5 (2017). Accessed in October, 2017.

Cardoso, C., “Confira! Globais que “saíram do armário” e você não sabia.” In *Blasting News*. Available in https://goo.gl/B2v6W8 (2016). Access in November, 2016.

Champagne, R.; Guerra, J.; Tsai, C.-H.; Monahan, J.; Farzan, R. “Fuzziness in LGBT non-profit ICT use”. In *Proceedings of the Seventh International Conference on Information and Communication Technologies and Development*. ACM Press (2015). Article no. 30.

Connell, B. R.; Jones, M.; Mace, R.; Mueller, J.; Mullick, A.; Ostroff, E.; Sanford, J.; Steinfeld, E.; Story, M.; Vanderheiden, G. “The principles of universal design.” Version 2.0 (1997). Available in https://goo.gl/uW6mqn. Accessed in May, 2015.

Cox, C. “I want to apologize to the affected community of drag…” (2014). Available in https://goo.gl/2Bq9Vz. Accessed in May, 2015.

Deen, M.; Nack, F.; Haggis, M. “Diversity through specificity: design lessons learned from the Games [4Diversity] Jams”. In *Proceedings of the 12th International Conference on Advances in Computer Entertainment Technology*. ACM Press (2015). Article no. 5.

Diniz, P. “Brasil patina no combate à homofobia e vira líder em assassinatos de LGBTs”. In *Folha de São Paulo* (2017). Available in https://goo.gl/JIcavi. Accessed in May, 2017.

Duarte, E. F.; Baranauskas, M. C. C. Revisiting the Three HCI Waves: A Preliminary Discussion on Philosophy of Science and Research Paradigms. In *Proceedings of the 15th Brazilian Symposium on Human Factors in Computing Systems*. ACM Press (2016). Article no. 38.

Dumaresq, L. “O cisgênero existe.” In *Transliteração*. https://goo.gl/MeVXkj (2014). Accessed in May, 2017.

EPTV. “Pai e filho são confundidos com casal gay e agredidos por grupo em São João da Boa Vista, SP.” In *O Globo*. Available in https://goo.gl/4GWKHD (2011). Accessed in January, 2018.

Facebook Diversity. “When you come to Facebook to connect with the people…” (2014). Available in https://goo.gl/ctdwQo. Accessed in May, 2015.

Facebook Diversity. “Last year we were proud to add a custom gender option…” (2015). Available in https://goo.gl/TSf5hv. Accessed in May, 2015.

Facebook help. “What names are allowed on Facebook?” (2016). Available in https://goo.gl/ZxSwHv . Accessed in May, 2015.

Facchini, R. “Histórico da luta de LGBT no Brasil.” In São Paulo Regional Council of Psychology (CRP-SP). *Cadernos temáticos CRP-SP*, 11 – Psicologia e diversidade sexual. CRP-SP (2011). 10-19.

Faria, C. F. “Can people help legislators to make better laws?: the Brazilian parliament's e-democracia”. In *Proceedings of 4th International Conference on Theory and Practice of Electronic Governance*. ACM Press (2010). 301-306.

Ferrario, M. A.; Simm, W.; Newman, P.; Forshaw, S.; Whittle, J. “Software Engineering for ‘Social Good’: Integrating Action Research, Participatory Design, and Agile Development.” In *Companion Proceedings of the 36th International Conference on Software Engineering*. ACM Press (2014). 520-523.

Flanagan, M.; Howe, D. C.; Nissenbaum, H. “Embodying values in technology: theory and practice,” In van den Hoven, J.; Weckert, J. (eds.). *Information Technology and Moral Philosophy*. Cambridge University Press (2008). 322-353.

Folha de São Paulo. “Pabllo Vittar passa RuPaul, a drag queen mais famosa do mundo, em rede social.” Available in https://goo.gl/V4kYnF (2017). Accessed in January, 2018.

Foucault, M. “L’archéologie du savoir.” Gallimard (1969).

Foucault, M. “Surveiller et punir: naissance de la prison.” Gallimard (1993).

Foucault, M. “L’histoire de la sexualité I – La volonté de savoir.” Gallimard (1994).

Foucault, M. “Les intellectuels et le pouvoir. Dits et écrits I.” Gallimard (2001).

Freeman, G.; Bardzell, J.; Bardzell, S.; Herring, S. C. “Simulating marriage: gender roles and emerging intimacy in an online game,” In *Proceedings of the 18th ACM conference on Computer-Supported Cooperative Work and Social Computing*. ACM Press (2015). 1191-1200.

G1, “Alunos fazem protesto e pedem volta de professor afastado em Campinas.” Available in https://goo.gl/awsMJQ (2016). Accessed in November, 2016.

G1, “Mesmo sem apoio, Parada LGBT de Campinas arrasta multidão pelas ruas.” Available in https://goo.gl/BErt3R (2016). Accessed in November, 2016.

G1, “Para 75% dos jovens existe preconceito contra gays no trabalho, diz pesquisa.” Available in https://goo.gl/DvUagb (2016). Accessed in November, 2016.

G1 CE. “Travesti Dandara foi apedrejada e morta a tiros no Ceará, diz secretário.” In *G1*. Available in https://goo.gl/p2KUr5 (2017). Accessed in May, 2017.

Gatehouse, C. “Feral Screens: Queering Urban Networked Publics.” In *Proceedings of the 2016 ACM Conference Companion Publication on Designing Interactive Systems*. ACM Press (2016). 99-104.

Gazeta Online, “Bancos já liberam uso de nome social em cartão de crédito.” Available in https://goo.gl/Mht7LX (2016). Accessed in November, 2016.

GGB (Grupo Gay da Bahia). “Assassinato de homossexuais (LGBT) no Brasil: Relatório 2014.” (2014). Available in https://goo.gl/ETfFpP. Accessed in May, 2015.

Giusti, I. “Vídeo de mãe agredindo filha que se diz lésbica viraliza.” In *Ondda*. Available in https://goo.gl/kCqYTE (2016). Access in November, 2016.

Google+. “When we launched Google+ over three years ago, we had a lot of restrictions…” (2014). Available in https://goo.gl/bzeS6r. Accessed in May, 2015.

Gonzales, A.; Fritz, N. Prioritizing Flexibility and Intangibles: Medical Crowdfunding for Stigmatized Individuals. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*. ACM Press (2017). 2371-2375.

Green, J. N.; Quinalha, R. “Ditadura e homossexualidades: repressão, resistência e a busca da verdade.” EDUFSCAR (2014).

Greenberg, D. F. “The construction of homosexuality.” University of Chicago Press (1988).

Guba, E. G.; Lincoln, Y. S. “Competing paradigms in qualitative research.” In Denzin, N. K.; Lincoln, Y. S. Lincoln. *Handbook of qualitative research*. SAGE (2nd ed., 1994). 105-117.

Guerra, R. “Bolsonaro perde recurso e é condenado a pagar R$ 150 mil a fundo de defesa LGBT.” Available in https://goo.gl/yqoDRo (2017). Accessed in January, 2018.

Haimson, O. L.; Bowser, A. E.; Melcer, E. F.; Churchill, E. F. “Online Inspiration and Exploration for Identity Reinvention”. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*. ACM Press (2015). 3809-3818.

Haimson, O. L.; Brubaker, J. R.; Dombrowski, L.; Hayes, G. R. “Disclosure, stress, and support during gender transition on Facebook.” In

Proceedings of the 18th ACM conference on Computer-Supported Cooperative Work and Social Computing. ACM Press (2015). 1176-1190.

Haimson, O. L.; Brubaker, J. R.; Hayes, G. R. "DDFSeeks same: sexual health-related language in online personal ads for men who have sex with men." In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM Press (2014). 1615-1624.

Hall, E. "The silent language." Doubleday & Company, Inc (1959).

Hardy, J.; Lindtner, S. Constructing a Desiring User: Discourse, Rurality, and Design in Location-Based Social Networks. In *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work and Social Computing*. ACM Press (2017). 13-25.

Haugen, F. "July 12, 2011 - Google+ Update" (2011). Available in https://goo.gl/Bqd6Ai. Accessed in May, 2015.

Heng, M. S. H. "Using Semiotic Framework to study social consequences of IT." In Liu, K.; Clarke, R. J.; Andersen, P. B.; Stamper, R. K. (eds.). *Coordination and communication using signs: Studies in Organizational Semiotics 2*. Kluwer Academic Publishers (2002). 167-178.

Homan, C. M.; Lu, N.; Tu, X.; Lytle, M. C.; Silenzio, V. M. B. "Social structure and depression in TrevorSpace." In *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work & Social Computing*. ACM Press (2014). 615-625.

Horkheimer, M. "Traditional and critical theory." In Groff, R. *Subject and object: Frankfurt School writings on epistemology, ontology, and method*. Bloomsbury (2014). 185-233.

Huff, C.; Cooper, J. "Sex bias in educational software: the effect of designers' stereotypes on the software they design." In *Journal of Applied Social Psychology*, 17 (1987). 519-532.

Huffpost Brasil, “Os EUA já podem se orgulhar da eleição de uma governadora LGBT.” Available in https://goo.gl/UUWcZd (2016). Accessed in November, 2016.

ILGA (International Lesbian, Gay, Bisexual, Trans and Intersex Association). “State Sponsored Homophobia 2016: A world survey of sexual orientation laws: criminalisation, protection and recognition.” Available in https://goo.gl/weJBTk (2016). Accessed in April, 2017.

Kannabiran, G. “Themself: critical analysis of gender in Facebook.” In *Feminism and Interaction Design Workshop at the 2011 SIGCHI Conference on Human Factors in Computing Systems.* Available in https://goo.gl/moQebQ (2011). Accessed in May, 2015.

Kannabiran, G.; Bardzell, J.; Bardzell, S. “How HCI talks about sexuality: discursive strategies, blind spots, and opportunities for future research.” In *Proceedings of the 2011 SIGCHI Conference on Human Factors in Computing Systems.* ACM Press (2011). 695-704.

Kannabiran, G.; Bardzell, S.; Bardzell, J. “Designing (for) desire: a critical study of technosexuality in HCI.” In *Proceedings of the 7th Nordic Conference on Human-Computer Interaction: Making Sense Through Design*. ACM Press (2012). 655-664.

Kannabiran, G.; Petersen, M. G. “Politics at the interface: a Foucauldian power analysis.” In *Proceedings of the 2010 Nordic Conference on Human-Computer Interaction.* ACM Press (2010). 695-698.

Kincheloe, J. L.; McLaren, P. L. “Rethinking critical theory and qualitative research.” In Denzin, N. K.; Lincoln, Y. S. (eds.). *Handbook of qualitative research*, 2nd ed. Sage (2000). 279–313.

Koyani, S. J.; Bailey, R. W.; Nall, J. R. “Research-based web design & usability guidelines.” Available in http://guidelines.usability.gov/. Accessed in May, 2015.

Kriplean, T.; Morgan, J.; Freelon, D.; Borning, A.; Bennett, L. “Supporting Reflective Public Thought with ConsiderIt.” In *Proceedings of the ACM 2012 conference on Computer Supported Cooperative Work*. ACM Press (2012). 265-274.

Kuhn, T. “A estrutura das revoluções científicas.” Perspectiva (1998).

Kvasny, L. “Triple jeopardy: race, gender and class politics of women in technology.” In *Proceedings of the ACM SIGMIS Computers and People Research 2003 Conference.* ACM Press (2003). 112-116.

Laborão, V. “Para ativistas, fama gay de Campinas gera 'falsa imagem' de liberdade LGBT.” In G1. Available in https://goo.gl/BahSn6 (2014). Accessed in November, 2016.

Las Casas, D.; Magno, G.; Cunha, E.; Gonçalves, M. A.; Cambraia, C.; Almeida, V. “Noticing the other gender on Google+.” In *Proceedings of the 2014 ACM Conference on Web Science.* ACM Press (2014). 156-160.

Latour, B. “On technical mediation - philosophy, sociology, genealogy.” In *Common Knowledge*, 3 (2). 1994. 29-64.

Light, A. “HCI as heterodoxy: technologies of identity and the queering of interaction with computers.” In *Interacting with Computers,* 23 (5). 2011. 430–438.

Light, A.; Shklovski, I.; Powell, A. “Design for Existential Crisis.” In *Proceedings. of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems*. ACM Press (2017). 722-734.

Lincoln, Y. S.; Lynham, S. A.; Guba, E. G. “Paradigmatic controversies: contradictions, and emerging confluences, revisited.” In Denzin N. K.; Lincoln Y. S. (eds.), *The SAGE handbook of qualitative research*, 4. SAGE (2011). 97-128.

Liu, K. “Employing MEASUR Methods for Business Process Reengineering in China.” *Ph.D. Thesis*. University of Twente (2001).

Liu, K. “Semiotics in information systems engineering.” Cambridge University (2004).

Lucciola, L. “Entenda a diferença entre travesti, transexual, cross dresser e drag queen.” In *Extra*. Available in https://goo.gl/8jt4Yj (2014). Accessed in April, 2017.

Lyons, K.; Oh, C. “SOA4DM: Applying an SOA Paradigm to Coordination in Humanitarian Disaster Response.” In *Proceedings of the 37th International Conference on Software Engineering - Volume 2*. IEEE Press (2015). 519-522.

Maeda, J. “The laws of simplicity. Design, technology, business, life.” The MIT Press (1st edition, 2006).

McAteer, O. “Native Americans booted off Facebook for having ‘fake’ names like Creepingbear.” In *Metro UK* (2015). Available in https://goo.gl/KrdqRQ. Accessed in May, 2015.

Madejski, M.; Johnson, M.; Bellovin, S. M. “The failure of online social network privacy settings.” Technical report. Columbia University (2011). Available in https://goo.gl/QUZtJc. Accessed in May, 2015.

McKay, T. “One map shows where you can still be fired for being gay in 2015.” In *Mic* (2015). Available in https://goo.gl/4iWGjf. Accessed in November, 2015.

O Globo. “Ellen Page confronta Jair Bolsonaro em cena de documentário.” https://goo.gl/ue5y7m (2016). Accessed in October, 2017.

O Tempo, “Senado abre votação pública para criminalização sobre homofobia.” Available in https://goo.gl/mMUtHQ (2016). Accessed in November, 2016.

Osofsky, J.; Gage, T. “Community support FYI: improving the names process on Facebook.” In *Newsroom FB* (2015). Available in http://newsroom.fb.com/news/2015/12/community-support-fyi-improving-the-names-process-on-facebook/. Accessed in January, 2016.

Pacheco, C. “Apenas cinco hospitais fazem cirurgia transgenital pelo SUS no Brasil.” In *Correio 24 horas*. https://goo.gl/9S7Am6 (2016). Accessed in June, 2017.

Pereira, G. C.; Baranauskas, M. C. C. “Opressões de identidade de gênero e orientação sexual percebidas em interfaces de usuário de sistemas digitais: um estudo exploratório.” In *Proceedings of the 14th Brazilian Symposium on Human Factors in Computing Systems*. ACM Press (2015).

Pereira, G. C.; Baranauskas, M. C. C. “Supporting people on fighting lesbian, gay, bisexual, and transgender (LGBT) prejudice: a critical codesign process.” In *Proceedings of the 16th Brazilian Symposium on Human Factors in Computer Systems*. ACM Press (2017).

Pereira, G. C.; Baranauskas, M. C. C. “Developing user requirements for emancipatory applications directed to lesbian, gay, bisexual, and transgender (LGBT) issues: a case study.” 2017.

Pereira, G. C.; Baranauskas, M. C. C. “Empowering lesbian, gay, bisexual, and transgender (LGBT) people with codesign: a critical evaluation through the lens of simplicity.” 2018.

Pereira, G. C.; Baranauskas, M. C. C. “From critical theory to practice: culturally-aware reflections on mediated empowerment of lesbian, gay, bisexual, and transgender (LGBT) people in codesign.” 2018.

Pereira, R.; Baranauskas, M. C. C. “Seeing social software analysis and evaluation through the lenses of culture.” In Zhang R.; Zhang J.; Zhang Z.; Filipe J.; Cordeiro J. (eds.) Enterprise Information Systems. *ICEIS 2011*. Lecture Notes in Business Information Processing, vol 102. Springer (2012). 374-387.

Pereira, R.; Baranauskas, M. C. C.; da Silva, S. R. P. Softwares sociais: Uma visão orientada a valores. In *Proceedings of the 9th Brazilian Symposium on Human Factors in Computing Systems*. ACM Press (2010).

Peirce, C. S. “Correspondência – trecho de cartas para Lady Welby.” In da Motta, O. S.; Hegenberg, L. *Semiótica e filosofia*. Cultrix (1975). 135-147.

Peirce, C. S. “Excerpts from letters to Lady Welby.” In Peirce Edition Project (eds.). *The essential Peirce: selected philosophical writings*, 2. Indiana University Press (1998). 477-492.

Pollo, L., Mori, M., “Eleições de LGBT crescem quase 2000% em 20 anos.” In *Exame*. Available in https://goo.gl/KHuofy (2016). Accessed in November, 2016.

Ponterotto, J. G. “Qualitative Research in Counseling Psychology: A Primer on Research Paradigms and Philosophy of Science.” In *Journal of Counseling Psychology* 52, 2. APA (2005). 126-136.

Pretes, E. P.; Vianna, T. “História da criminalização da homossexualidade no Brasil: da sodomia ao homossexualismo.” In Lobato, W.; Sabino, C.; Abreu, J. F. (orgs.). *Iniciação científica: destaques 2007*. PUC Minas (2008). 313-392.

Rathus, A. S.; Nevid, J. S.; Fichner-Rathus, L. “Human sexuality: in a world of diversity.” Allyn & Bacon (2007).

Rede TV. “Cantora gospel faz post homofóbico e gera "vomitaço" no Facebook.” Available in https://goo.gl/iXT9mU (2016). Accessed in November, 2016.

Resk, F. “Só de homofobia, são 98 investigações abertas por mês.” In *Estadão*. Available in https://goo.gl/SKT9hC (2016). Accessed in November, 2016.

Rich, A. “Compulsory Heterosexuality and Lesbian Existence.” Onlywomen Press Ltd. (1981).

Rodovalho, A. M. “O cis pelo trans.” In *Estudos Feministas*, 25 (1). UFSC (2017).

Rosenberg, A. “The Brazilian paradox: the lesbian, gay, bisexual, and transgender battle for human rights.” In Nowakowski, A. (ed.). *Revisiting human rights in Latin America*. University of Denver (2009). 16-30.

Rossi, M.; Novaes, M. “Os direitos básicos aos quais transexuais e travestis não têm acesso.” In *El País Brasil* (2015). Available in https://goo.gl/Yv7Bs4. Accessed in November, 2015.

Rubin, G. “The traffic in women: notes on the ‘political economy’ of sex.” In Reiter, R. R. *Toward an anthropology of women*. Monthly Review Press (1975). 157-210.

Saldaña, P. “73% dos jovens LGBT dizem ter sido agredidos na escola, mostra pesquisa.” In *Folha de São Paulo*. Available in https://goo.gl/2Wj7gp (2016). Accessed in November, 2016.

Sandoval-Almazan, R.; Steibel, F. “Benchmarking Mexico & Brazil open government websites: model and metrics.” In *Proceedings of the 7th International Conference on Theory and Practice of Electronic Governance*. ACM Press (2013). 372-373.

Santaella, L. “O que é semiótica.” Brasiliense (1983).

Santaella, L. “Epistemologia Semiótica.” In *Cognitio*, 9 (1). EDUC (2008). 93-110.

Scalei, V. “Em 43 anos, Globo produziu 62 novelas com personagens LGBTs, aponta pesquisa.” In *Zero Hora*. Available in https://goo.gl/88MJgK (2015). Accessed in November, 2016.

Sobrinho, W. P. “Duas em cada dez empresas se recusam a contratar homossexuais no Brasil.” In Carta Capital (2015). Available in https://goo.gl/A4SA4f. Accessed in May, 2015.

Souza, N., Caram, B., “Congresso eleito é o mais conservador desde 1964, afirma Diap.” In *Estadão*. Available in https://goo.gl/BccNs7 (2014). Accessed in November, 2016.

Stamper, R. K. “Information in Business and Administrative Systems.” John Wiley and Sons (1973).

Stamper, R. K. “Social norms in requirements analysis – an outline of MEASUR.” In Jirotka, M.; Goguen, J.; Bickerton, M. (eds.) *Requirements Engineering, Technical and Social Aspects*. Academic Press (1993).

Stamper, R. K.; Althaus, K.; Backhouse, J. “MEASUR: Method for Eliciting, Analyzing and Specifying User Requirements.” In Olle, T. W.; Verrijn-Stuart, A.; Bhabuts, L. (eds.). *Computerized Assistance During the Information Systems Life Cycle*. Elsevier Science (1988). 67–116.

Stephanidis, C. “User interfaces for all: concepts, methods, and tools.” Lawrence Erlbaum (2001).

Stoller, R. “Sex and gender: On the development of masculinity and femininity.” Science House (1968).

Taylor, S. H.; Hutson, J.; Alicea, T. R. “Social Consequences of Grindr Use: Extending the Internet-Enhanced Self-Disclosure Hypothesis.” In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (CHI ’17). ACM Press (2017). 6645-6657.

Terra, “Ministério lança guia para atendimento de turistas LGBT.” Available in https://goo.gl/mMDa1A (2016). Accessed in November, 2016.

Toledo, L. F. “Travestis e transexuais poderão descer do ônibus fora do ponto de ônibus.” In *Estadão*. Available in https://goo.gl/Lko1bQ (2016). Accessed in November, 2016.

Tomaz, K.; Acayaba, C. Travesti fica desfigurada após prisão; Defensoria diz haver indício de tortura. In *G1*. Available in https://goo.gl/8CISN3 (2015). Accessed in May, 2017.

TransgenderEurope (TGEU). “Trans murder monitoring 2015.” Available in https://goo.gl/oxtAZo (2015). Accessed in May, 2015.

Vanhomrigh, E. “Memoirs of a Samoan, Catholic, and Fa’afafine.” PublishAmerica (2007).

Vassallo. L. “Juiz libera cura gay por psicólogos.” In *Estadão*. https://goo.gl/cgVczM (2017). Accessed in October, 2017.

Viana, R., “Travesti doutoranda e prostituta, Amara Moira narra sua vida em livro.” In *Folha de São Paulo*. Available in https://goo.gl/Anud9u (2016). Accessed in November, 2016.

W3C. “Web Content Accessibility Guidelines (WCAG) 2.0”. Available in http://www.w3.org/TR/WCAG20/ (2008). Accessed in May, 2015.

Wang, Y.; Komanduri, S.; Leon, P. G.; Norcie, G.; Acquisti, A.; Cranor, L. F. "'I regretted the minute I pressed share': a qualitative study of regrets on Facebook." In *Proceedings of the 7th Symposium on Usable Privacy and Security*. ACM Press (2011). Article no. 10.

Wang, Y.; Leon, P. G.; Acquisti, A.; Cranor, L. F.; Forget, A.; Sadeh, N. "A field trial of privacy nudges for Facebook." In *Proceedings of the 2014 SIGCHI Conference on Human Factors in Computing Systems.* ACM Press (2014). 2367-2376.

de Wiele, C. V.; Tong, S. T. "Breaking boundaries: the uses & gratifications of Grindr." In *Proceedings of the 2014 ACM International Joint Conference on Pervasive and Ubiquitous Computing*. ACM Press (2014). 619-630.

Winner, L. "Do artifacts have politics?" In Winner, L. *The whale and the reactor: a search for limits in an age of high technology*. University of Chicago Press (1988). 121-136.

Wollstonecraft, M. "A vindication of the rights of woman." Courier Corporation (1792).

Yeo, T. E. E.; Fung, T. H. "Relationships form so quickly that you won't cherish them: mobile dating apps and the culture of instantaneous relationships." In *Proceedings of the 7th International Conference on Social Media & Society*. ACM Press (2016). Article no. 2.

Appendix A

Questionnaire from online survey about LGBTphobia in digital systems

Questionário sobre LGBTfobia em redes sociais

Página 1[44]

O questionário a seguir tem como objetivo entender como algumas opressões são reproduzidas pela construção de sistemas na Internet. Durante todo o questionário, a palavra "LGBTfobia" será usada como sinônimo de qualquer desconforto ou constrangimento causados por discriminação de identidade de gênero ou orientação sexual.

Caso tenha presenciado ou sofrido alguma situação de discriminação, é importante detalhar em que parte do sistema isso ocorreu. Além disso, ao relatar detalhes sobre essas experiências, busque indicar o sistema em que o fato ocorreu e o porquê você o considera LGBTfóbico.

1. Qual é sua idade, em anos?*[45]

[18 - 85][46]

2. Você estuda na UNICAMP?*

( ) Sim ( ) Não[47]

3. Você utiliza redes sociais?*

( ) Sim ( ) Não

[44] Accessible only after accepting the term of consent.
[45] * denotes an obligatory question.
[46] Combo box ranging from 18 to 85.
[47] ( ) denotes a radio button component.

Página 2[48]

4. Quais destas redes sociais você utiliza? *

[ ] Facebook[49]

[ ] Google+

[ ] Instagram

[ ] Twitter

[ ] Linkedin

[ ] Youtube

[ ] Badoo

[ ] Ask.fm

[ ] Outro: _____[50]

5. Quanto tempo semanal você gasta utilizando essas redes, aproximadamente? *

( ) Menos de 1 hora

( ) Entre 1 e 3 horas

( ) Entre 3 e 7 horas

( ) Entre 7 e 15 horas

( ) Mais de 15 horas

6. Você já se deparou com algum conteúdo LGBTfóbico em postagens em redes sociais que você utiliza? *

( ) Sim

( ) Não

---

[48] Accessible if the answer to question 3 was affirmative.
[49] [ ] denotes a checkbox component.
[50] _____ denotes a text field component.

7. Se sim, o conteúdo era de que tipo?

[ ] Foto

[ ] Vídeo

[ ] Texto (atualização de status, tweet, nota, etc.)

[ ] Comentário em publicação

[ ] Outro: _____

8. Que ação você tomou na rede social após essa situação?

[ ] Bloqueei o autor

[ ] Excluí o autor da minha lista de contatos

[ ] Deixei de seguir as publicações do autor

[ ] Ocultei a publicação

[ ] Denunciei a publicação

[ ] Deixei uma resposta ou comentário

[ ] Fiz uma publicação sobre a situação

[ ] Não tomei nenhuma ação na rede

[ ] Outro: _____

9. Se desejar, use o espaço a seguir para fornecer mais detalhes sobre o conteúdo LGBTfóbico e o que ocorreu após você ter tomado a atitude relatada.

_____

10. Numa escala de 1 a 5, como você classifica os mecanismos fornecidos pelas redes mencionados na questão 8, considerando sua eficiência em lidar com postagens LGBTfóbicas?

( ) 1 (Completamente ineficientes)

( ) 2

( ) 3

( ) 4

( ) 5 (Completamente eficientes)

11. O que você considera que as redes deveriam fornecer para serem mais eficientes no combate a postagens LGBTfóbicas?

_____

12. Você já se deparou com algum conteúdo automático LGBTfóbico em sugestões feitas pela redes sociais que você utiliza? *

( ) Sim

( ) Não

13. Se sim, o conteúdo era de que tipo?

[ ] Exibição de “tópicos quentes”, isto é, postagens, links ou hashtags populares no momento

[ ] Sugestão de amigos, contatos ou seguidores

[ ] Sugestão de páginas

[ ] Sugestão de grupos

[ ] Sugestão de eventos

[ ] Propagandas

[ ] Outro: _____

14. Que ação você tomou na rede social após essa situação?

[ ] Ocultei o tópico

[ ] Excluí a sugestão

[ ] Denunciei o aplicativo, amigo, página, grupo ou evento sugerido

[ ] Fiz uma publicação sobre a situação

[ ] Não tomei nenhuma ação na rede

[ ] Outro: _____

15. Se desejar, use o espaço a seguir para fornecer mais detalhes sobre o conteúdo automático LGBTfóbico e o que ocorreu após você ter tomado a atitude relatada.

_____

16. Numa escala de 1 a 5, como você classifica os mecanismos fornecidos pelas redes mencionados na questão 14, considerando sua eficiência em lidar com postagens LGBTfóbicas?

( ) 1 (Completamente ineficientes)

( ) 2

( ) 3

( ) 4

( ) 5 (Completamente eficientes)

17. O que você acha que as redes deveriam fornecer para que o usuário evite sugestões automáticas LGBTfóbicas?

_____

18. Você já se deparou com algum conteúdo LGBTfóbico pertencente à interface da própria rede social? Por exemplo, nos menus ou botões, no slogan, nos formulários, nos textos de notificações, nos termos e condições de uso, entre outros. *

( ) Sim

( ) Não

19. Se sim, o que era problemático nessa interface?

[ ] Texto impróprio ou ofensivo

[ ] Campos de formulário (cadastro, perfil pessoal, login, etc.) impróprios ou ausentes

[ ] Elementos gráficos (cores, figuras, imagens de perfil, botões, entre outros)

[ ] Outro: _____

20. Por que o item escolhido na pergunta anterior era problemático?

_____

21. Numa escala de 1 a 5, como você classifica as interfaces das redes sociais que você utiliza, considerando a presença ou não de componentes LGBTfóbicos?

( ) 1 (Péssimas)

( ) 2

( ) 3

( ) 4

( ) 5 (Excelentes)

22. O que você acredita que deveria ser mudado nessas interfaces?

_____

Página 3

23. Quais mecanismos você já utilizou para manter sua privacidade em relação à sua identidade de gênero ou orientação sexual?

[ ] Criei múltiplos perfis

[ ] Alterei a configuração de privacidade de minhas postagens

[ ] Utilizei nome ou imagem de perfil fictícios

[ ] Parei de realizar postagens

[ ] Apaguei meu perfil

[ ] Nenhum

[ ] Outro: _____

24. Se desejar, use o espaço a seguir para fornecer mais detalhes.

_____

25. Numa escala de 1 a 5, como você classifica os mecanismos fornecidos pelas redes mencionados na questão 23 para manter sua privacidade?

1 (Completamente ineficientes)

2

3

4

5 (Completamente eficientes)

26. Se desejar, use o espaço a seguir para fornecer mais detalhes sobre o que você acha que a rede deveria prover ou o que deveria ser melhorado para manutenção da privacidade de seus usuários.

_____

Página 4

27. Se desejar, use o espaço abaixo para relatar situações onde você tenha presenciado algum tipo de LGBTfobia em redes sociais ou outros sistemas na Internet.

_____

28. Além do que já foi mencionado nas perguntas anteriores, que mecanismos ou funcionalidades você acredita que uma rede social ou outro sistema na Internet deve prover para desencorajar a LGBTfobia? E para puni-la?

_____

29. De 1 a 5, que nota você daria para redes sociais ou outros sistemas na Internet e seus mecanismos de prevenção e combate à LGBTfobia, em geral? Justifique. *

_____

30. Numa escala de 1 a 5, que importância tem os mecanismos de prevenção e combate à LGBTfobia oferecidos na sua decisão de utilizar um sistema? *

1 (Nenhuma)

2

3

4

5 (Essencial)

31. Numa escala de 1 a 5, como você se sente ao utilizar um sistema sem mecanismos apropriados de prevenção e combate à LGBTfobia? *

1 (Muito desconfortável)

2

3

4

5 (Muito confortável)

32. Você se considera uma pessoa transgênera ou não se identifica com seu gênero designado no nascimento, de algum modo? *

( ) Sim

( ) Não

33. Com qual gênero você mais se identifica atualmente? *

( ) Feminino

( ) Masculino

( ) Agênero

( ) Bigênero

( ) Outro: _____

34. Com qual orientação sexual você mais se identifica atualmente? *

( ) Assexual

( ) Bissexual

( ) Homossexual

( ) Heterossexual

( ) Outro: _____

35. Se desejar, use o espaço abaixo para fazer comentários adicionais sobre outras experiências ou qualquer ponto dessa pesquisa que julgar conveniente.

_____

Appendix B

Picture cards used during Alan Turing workshop

Figure 1 – Figures from "emotions" category

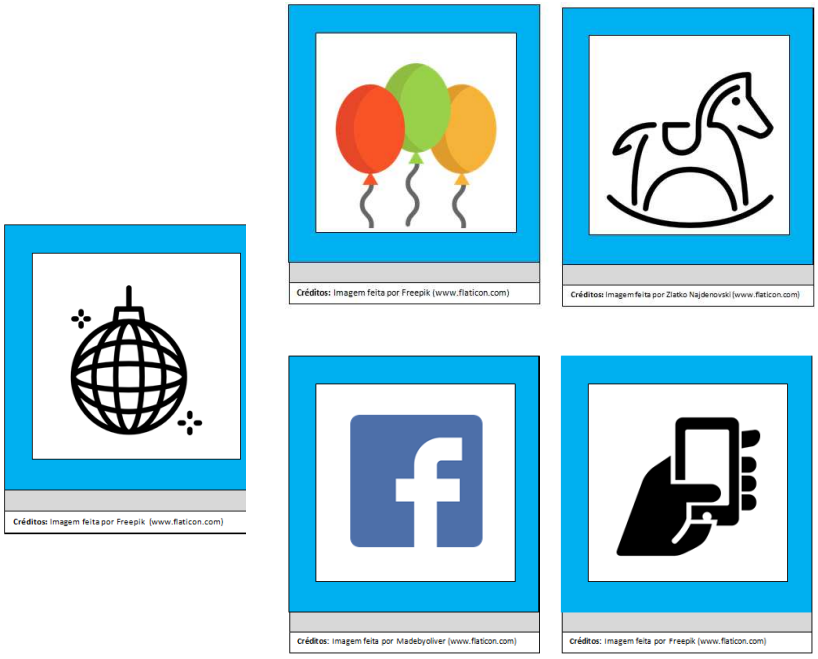


Figure 2 – Figures from "quotidian" category

Figure 3 – Figures from "places" category

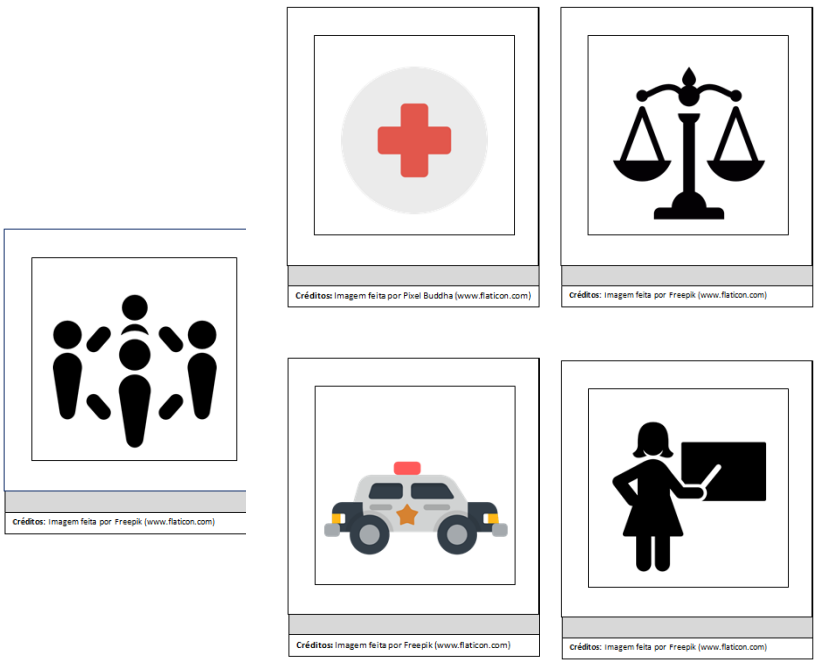


Figure 4 – Figures from "society" category

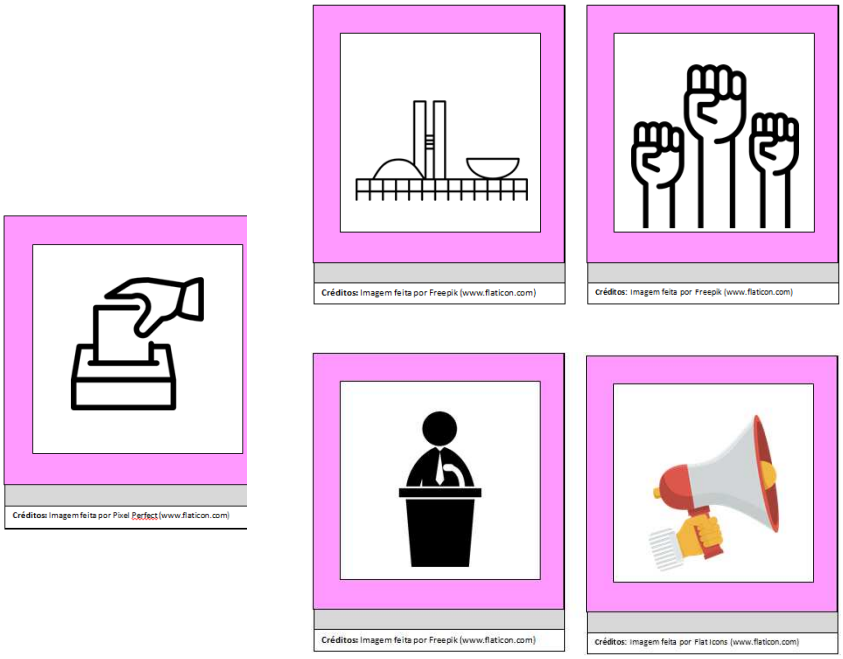


Figure 5 – Figures from "politics" category

Figure 6 – Figures from "occasions" category

Figure 7 – Figures from "news" category. The headlines are presented in the References section.

Acknowledgments

We credit the following authors for the icons hereby used: Freepik, Madebyoliver, Trinh Ho, Zlatko Najdenovski, Pixel Buddha, Pixel Perfect, Flat Icons (from www.flaticon.com) and Виктория Шаховая (from iconfinder.com)

References

Avendaño, T. C., "Rio 2016 se transforma na Olimpíada mais gay da história." In El País Brasil. Available in https://goo.gl/Njri5q. Access in Nov. 23, 2016.

Bocchinio, R., Talento, B., “Candidatos fazem promessas para a população LGBT”. In A Tarde. Available in https://goo.gl/RjX1n3. Access in Nov. 23, 2016.

Cardoso, C., “Confira! Globais que “saíram do armário” e você não sabia.” In Blasting News. Available in https://goo.gl/B2v6W8. Access in Nov. 23, 2016.

Toledo, L. F., “Travestis e transexuais poderão descer do ônibus fora do ponto de ônibus.” In Estadão. Available in https://goo.gl/Lko1bQ. Access in Nov. 23, 2016.

G1, “Alunos fazem protesto e pedem volta de professor afastado em Campinas.” Available in https://goo.gl/awsMJQ. Access in Nov. 23, 2016.

G1, “Mesmo sem apoio, Parada LGBT de Campinas arrasta multidão pelas ruas.” Available in https://goo.gl/BErt3R. Access in Nov. 23, 2016.

G1, “Para 75% dos jovens existe preconceito contra gays no trabalho, diz pesquisa.” Available in https://goo.gl/DvUagb. Access in Nov. 23, 2016.

Gazeta Online, “Bancos já liberam uso de nome social em cartão de crédito.” Available in https://goo.gl/Mht7LX. Access in Nov. 23, 2016.

Giusti, I., “Vídeo de mãe agredindo filha que se diz lésbica viraliza.” In Ondda. Available in https://goo.gl/kCqYTE. Access in Nov. 23, 2016.

Huffpost Brasil, “Os EUA já podem se orgulhar da eleição de uma governadora LGBT.” Available in https://goo.gl/UUWcZd. Access in Nov. 23, 2016.

Laborão, V., “Para ativistas, fama gay de Campinas gera 'falsa imagem' de liberdade LGBT.” In G1. Available in https://goo.gl/BahSn6. Access in Nov. 23, 2016.

Resk, F. “Só de homofobia, são 98 investigações abertas por mês.” In Estadão. Available in https://goo.gl/SKT9hC. Access in Nov. 23, 2016.

Scalei, V. “Em 43 anos, Globo produziu 62 novelas com personagens LGBTs, aponta pesquisa.” In Zero Hora. Available in https://goo.gl/88MJgK. Access in Nov. 23, 2016.

O Tempo, “Senado abre votação pública para criminalização sobre homofobia.” Available in https://goo.gl/mMUtHQ. Access in Nov. 23, 2016.

Pollo, L., Mori, M., “Eleições de LGBT crescem quase 2000% em 20 anos.” In Exame. Available in https://goo.gl/KHuofy. Access in Nov. 23, 2016.

Rede TV, “Cantora gospel faz post homofóbico e gera "vomitaço" no Facebook.” Available in https://goo.gl/iXT9mU. Access in Nov. 23, 2016.

Saldaña, P., “73% dos jovens LGBT dizem ter sido agredidos na escola, mostra pesquisa.” In Folha de São Paulo. Available in https://goo.gl/2Wj7gp. Access in Nov. 23, 2016.

Souza, N., Caram, B., “Congresso eleito é o mais conservador desde 1964, afirma Diap.” In Estadão. Available in https://goo.gl/BccNs7. Access in Nov. 23, 2016.

Terra, “Ministério lança guia para atendimento de turistas LGBT.” Available in https://goo.gl/mMDa1A. Access in Nov. 23, 2016.

Viana, R., “Travesti doutoranda e prostituta, Amara Moira narra sua vida em livro.” In Folha de São Paulo. Available in https://goo.gl/Anud9u. Access in Nov. 23, 2016.

Appendix C

Guide to Hall's primary message systems given to volunteers during Freddie Mercury workshop

1. Interação:

Quais são os meios de interação disponibilizados (com a aplicação, com outras pessoas, com outros sistemas)? Eu sei com quem estou interagindo? Quais são os possíveis impactos dessa interação? Etc...

2. Associação:

A aplicação favorece a aproximação de pessoas? Quais são seus possíveis impactos coletivos? Como a formação de grupos é mediada pela aplicação? Etc…

3. Subsistência:

A aplicação ajuda pessoas a terem autonomia? A colaboração entre pessoas é estimulada? A aplicação pode ter efeitos na saúde e bem-estar das pessoas? Etc…

4. Gênero:

A aplicação acomoda pessoas com identidades e histórias variadas? É discriminatória? Ela reflete valores igualitários? Etc…

5. Territorialidade:

Eu tenho controle dos espaços onde compartilho informações pessoais? A aplicação é invasiva? Em que lugares ela pode ser usada? Etc…

6. Temporalidade:

A aplicação reflete a passagem do tempo em suas formas de interação? O que acontece com ações realizadas com o passar do tempo? Ela acomoda mudanças? Etc…

7. Aprendizado:

De que formas a aplicação pode ser educativa? De que modo pessoas com diferentes níveis de conhecimentos podem aprender sobre o tema ou sobre a própria aplicação através do seu uso? Etc…

8. Diversão:

O uso da aplicação é agradável? Que emoções podem ser associadas ao seu uso? Ela pode ter que impactos no humor? Etc…

9. Defesa:

De que modos a aplicação pode proteger pessoas interagindo com ela? A aplicação pode ferir ou prejudicar alguém? Ela respeita e protege minha privacidade? Etc…

10. Exploração:

Quais tarefas, objetivos, necessidades são facilitados através do uso da aplicação? Quais possibilidades novas são permitidas por ela? Ela oferece recursos para também ser explorada? Etc…

Appendix D

Term of consent for participation in the online survey about LGBTphobia in digital systems

LGBTfobia em sistemas na Internet

TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO

Opressões de identidade de gênero e orientação sexual percebidas em interfaces de usuário de sistemas digitais

Guilherme Colucci Pereira

Maria Cecilia Calani Baranauskas

Número do CAAE: 43706615.0.0000.5404

Você está sendo convidado a participar como voluntário de uma pesquisa. Este documento, chamado Termo de Consentimento Livre e Esclarecido, visa assegurar seus direitos como participante e é disponível virtualmente nesse questionário.

Por favor, leia com atenção e calma, aproveitando para esclarecer suas dúvidas. Se houver perguntas antes ou mesmo depois de aceitá-lo, você poderá esclarecê-las com o pesquisador. Se preferir, você pode imprimir o documento e consultar seus familiares ou outras pessoas antes de decidir participar. Se você não quiser participar ou retirar sua autorização, a qualquer momento, não haverá nenhum tipo de penalização ou prejuízo para você.

Justificativa e objetivos:

O planejamento de interfaces é o processo através do qual se estabelecem os elementos audiovisuais, as formas de interação e as funcionalidades que um sistema oferece. Para que o uso do produto final seja confortável, é necessário levar em consideração características sociais e individuais do usuário, entre elas, a orientação sexual e a identidade de gênero.

O estudo visa identificar quais elementos da interface de um sistema de informação reproduzem situações discriminatórias, tais como homofobia e transfobia, e como

essa experiência é percebida. Com isso, será possível avançar nos estudos de como construir sistemas universalmente confortáveis e inclusivos.

Procedimentos:

Participando do estudo você está sendo convidado a: responder um questionário disponível online, com perguntas sobre sua experiência com o uso de sistemas de informação do seu cotidiano, como Facebook, Youtube, Google+ ou Instagram. O tempo de preenchimento estimado do questionário não ultrapassa 30 minutos e sua submissão pode ser feita a partir do meio que for mais conveniente.

Desconfortos e riscos:

Você não deve participar deste estudo se o preenchimento do questionário causar qualquer desconforto físico devido ao uso do computador. Além disso, eventualmente algumas perguntas podem trazer à memória lembranças emocional ou psicologicamente desconfortáveis, visto que o objeto de estudo é a experiência pessoal com discriminações.

O questionário foi elaborado de forma a buscar minimizar o cansaço advindo do seu preenchimento. Seu preenchimento pode ser interrompido a qualquer momento, sem quais quer sanções, em virtude de qualquer desconforto.

Benefícios:

Não há benefícios diretos na participação desse estudo.

Acompanhamento e assistência:

Os pesquisadores responsáveis se colocam à disposição para elucidar quaisquer dúvidas ou dificuldades durante ou ao término do preenchimento, através das formas de contato abaixo.

Sigilo e privacidade:

Você tem a garantia de que sua identidade será mantida em sigilo e nenhuma informação será dada a outras pessoas que não façam parte da equipe de pesquisadores. Na divulgação dos resultados desse estudo, seu nome não será citado.

Ressarcimento:

Não haverá ressarcimento de despesas relacionadas ao acesso virtual ao questionário.

Contato:

Em caso de dúvidas sobre o estudo, você poderá entrar em contato com os pesquisadores:

• Guilherme Colucci Pereira.

o Telefones: -

o E-mail: colucciguilherme@gmail.com

• Maria Cecilia Calani Baranauskas.

o Telefone: (19) 3521-5870

o E-mail: cecilia@ic.unicamp.br

o Endereço profissional: Av Albert Einstein, 1251 – Cidade Universitária Zeferino Vaz, Campinas/SP - Universidade Estadual de Campinas - Instituto de Computação, Departamento Sistemas de Informação.

Em caso de denúncias ou reclamações sobre sua participação e sobre questões éticas do estudo, você pode entrar em contato com a secretaria do Comitê de Ética em Pesquisa (CEP) da UNICAMP das 08:30hs às 13:30hs e das 13:00hs as 17:00hs na Rua: Tessália Vieira de Camargo, 126; CEP 13083-887 Campinas – SP; telefone (19) 3521-8936; fax (19) 3521-7187; email: cep@fcm.unicamp.br

Consentimento livre e esclarecido:

Após ter recebido esclarecimentos sobre a natureza da pesquisa, seus objetivos, métodos, benefícios previstos, potenciais riscos e o incômodo que esta possa acarretar, aceito participar do estudo. O consentimento é expresso a partir do clique no botão de “Li e concordo com os termos de participação na pesquisa” no formulário online.

Responsabilidade do Pesquisador:

Asseguro ter cumprido as exigências da resolução 466/2012 CNS/MS e complementares na elaboração do protocolo e na obtenção deste Termo de Consentimento Livre e Esclarecido. Asseguro, também, ter explicado e fornecido uma via deste documento ao participante, através da disponibilização online de seu conteúdo. Informo que o estudo foi aprovado pelo CEP perante o qual o projeto foi apresentado. Comprometo-me a utilizar o material e os dados obtidos nesta pesquisa exclusivamente para as finalidades previstas neste documento ou conforme o consentimento dado pelo participante.

Appendix E

Term of consent for participation in the semioparticipatory workshops

TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO

Mediação de processos de codesign de sistemas e o empoderamento de pessoas lésbicas, gays, bissexuais e transgêneras (LGBT)

Guilherme Colucci Pereira

Maria Cecilia Calani Baranauskas

Número do CAAE: 58185916.3.0000.5404

Você está sendo convidado(a) a participar como voluntário(a) de uma pesquisa. Este documento, chamado Termo de Consentimento Livre e Esclarecido, visa assegurar seus direitos como participante e é elaborado em duas vias, uma que deverá ficar com você e outra com o pesquisador.

Por favor, leia com atenção e calma, aproveitando para esclarecer suas dúvidas. Se houver perguntas antes ou mesmo depois de assiná-lo, você poderá esclarecê-las com o pesquisador. Se preferir, pode levar este Termo para casa e consultar seus familiares ou outras pessoas antes de decidir participar. Não haverá nenhum tipo de penalização ou prejuízo se você não aceitar participar ou retirar sua autorização em qualquer momento.

Justificativa e objetivos:

Estamos passando por uma grande crise política e econômica no país, levando muitas pessoas a expressarem desconfiança e indignação em relação aos processos políticos. Além disso, vivemos em tempos onde nos deparamos cotidianamente com o preconceito e violência contra pessoas trans, travestis e gays, lésbicas e bissexuais de diversas identidades.

Este estudo visa construir uma aplicação computacional que promova o debate sobre tais preconceitos, facilitando o conhecimento de políticas públicas por cidadãos interessados, e que auxilie a prevenir e combater tais formas de violência através de recursos tecnológicos. Para isso, realizaremos atividades de co-design, trabalhando em conjunto na concepção de tal sistema, sua construção, testes e avaliação de uso. O co-design de sistemas é uma metodologia de design, que não implica em compartilhamento de direitos autorais.

Procedimentos:

Participando do estudo você está sendo convidado a: participar de encontros periódicos, chamados de oficinas semioparticipativas, onde serão realizadas atividades em conjunto com outros participantes, tais como: avaliar sistemas computacionais já existentes, aplicativos móveis e websites na Internet; desenhar telas para a aplicação a ser construída; preencher alguns questionários; refletir e sugerir funcionalidades ou outras características para a aplicação construída; conversar sobre o andamento do estudo, experiências de preconceito sofridas ou atividades políticas realizadas.

Estão previstas entre 5 e 10 oficinas no total, e distribuídas nos meses de Novembro de 2016 a Junho de 2017. As oficinas serão realizadas preferencialmente em sábados, das 14h às 16h, no prédio 3 do Instituto de Computação da UNICAMP, localizado na rua Saturnino de Brito, 573 ou em outro local acordado com os participantes.

O dia exato da oficina e eventuais mudanças de local ou horário serão comunicados com antecedência. A duração do estudo pode ser diminuída ou prolongada, dependendo do andamento e das necessidades da pesquisa.

Não haverá aluguel de vans ou ônibus para o deslocamento ao local, mas buscaremos facilitar a organização de caronas. Algumas atividades serão registradas por filmagens, fotografias ou anotações.

Desconfortos e riscos:

Você não deve participar deste estudo se não for maior de 18 anos, não estiver confortável em realizar atividades em grupo ou compartilhar histórias

sensíveis ou dolorosas, se tiver alguma necessidade física que necessite atendimento médico especializado ou se não tiver celular para acesso à Internet.

Algumas perguntas realizadas durante algumas avaliações terão como objetivo identificar preconceitos sofridos e dificuldades enfrentadas, a fim de tratá-los através da aplicação que construiremos em conjunto. Você está livre para não participar de atividades (ou do estudo), recusar fornecer informações, solicitar que alguma atividade seja feita individualmente e se ausentar das oficinas a qualquer momento, sem qualquer prejuízo. As oficinas terão duração máxima prevista de 2 horas, a fim de evitar cansaço.

Benefícios:

Participando desta pesquisa, você terá a oportunidade de ter contato e aprender a utilizar outros sistemas computacionais que tratam o assunto, conhecer outras pessoas e histórias, entender como um aplicativo pode ser construído, vivenciar uma experiência científica, melhorar seu voto nas eleições, discutir formas de reivindicar direitos e acompanhar a vida política. Não estão previstos benefícios diretos.

Acompanhamento e assistência:

As oficinas semioparticipativas serão conduzidas por professores e pesquisadores de Interação Humano-Computador da UNICAMP, os quais estarão disponíveis a, em qualquer momento, esclarecer dúvidas, auxiliar no uso das aplicações, discutir discordâncias, fiscalizar e combater discriminações ocorridas durante as oficinas. Não será oferecido atendimento médico ou psicológico especializado nas oficinas.

Sigilo e privacidade:

Você tem a garantia de que sua identidade será mantida em sigilo e nenhuma informação será aberta a outras pessoas que não façam parte da equipe de pesquisadores. Na divulgação dos resultados desse estudo, seu nome não será citado. Os registros feitos durante os encontros serão mantidos pelos pesquisadores enquanto durar essa pesquisa e permanentemente excluídos de todos os locais de

armazenamento em seguida. Nenhum trecho será divulgado de forma a revelar a identidade de qualquer um.

Ressarcimento e Indenização:

Não haverá ressarcimento de despesas relacionadas a transporte até o local de realização das oficinas, alimentação ou diária de trabalho. Também não haverá reembolso ao acesso à Internet, por meio de dados móveis (3G ou 4G) ou banda larga, para utilizar o aplicativo fora dos horários das oficinas. Você terá a garantia ao direito a indenização diante de eventuais danos decorrentes da pesquisa.

Contato:

Em caso de dúvidas sobre o estudo, você poderá entrar em contato com os pesquisadores:

- Guilherme Colucci Pereira.
  - Telefones: -
  - E-mail: colucciguilherme@gmail.com
- Maria Cecilia Calani Baranauskas.
  - Telefone: (19) 3521-5870
  - E-mail: cecilia@ic.unicamp.br
  - Endereço profissional: Av Albert Einstein, 1251 – Cidade Universitária Zeferino Vaz, Campinas/SP - Universidade Estadual de Campinas - Instituto de Computação, Departamento Sistemas de Informação.

Em caso de denúncias ou reclamações sobre sua participação e sobre questões éticas do estudo, você poderá entrar em contato com a secretaria do Comitê de Ética em Pesquisa (CEP) da UNICAMP das 08:30hs às 11:30hs e das 13:00hs as 17:00hs na Rua: Tessália Vieira de Camargo, 126; CEP 13083-887 Campinas – SP; telefone (19) 3521-8936 ou (19) 3521-7187; e-mail: cep@fcm.unicamp.br.

O Comitê de Ética em Pesquisa (CEP).

O papel do CEP é avaliar e acompanhar os aspectos éticos de todas as pesquisas envolvendo seres humanos. A Comissão Nacional de Ética em Pesquisa (CONEP) tem por objetivo desenvolver a regulamentação sobre proteção dos seres humanos envolvidos nas pesquisas. Desempenha um papel coordenador da rede de Comitês de Ética em Pesquisa (CEPs) das instituições, além de assumir a função de órgão consultor na área de ética em pesquisas.

Consentimento livre e esclarecido:

Após ter recebido esclarecimentos sobre a natureza da pesquisa, seus objetivos, métodos, benefícios previstos, potenciais riscos e o incômodo que esta possa acarretar, aceito participar e declaro estar recebendo uma via original deste documento assinada pelo pesquisador e por mim, tendo todas as folhas por nós rubricadas:

Nome do (a) participante:

_____

Contato telefônico:

_____

e-mail (opcional):

_____

_____

Data: ____/_____/_____.

(Assinatura do participante ou nome e assinatura do seu RESPONSÁVEL LEGAL)

Responsabilidade do Pesquisador:

Asseguro ter cumprido as exigências da resolução 466/2012 CNS/MS e complementares na elaboração do protocolo e na obtenção deste Termo de Consentimento Livre e Esclarecido. Asseguro, também, ter explicado e fornecido uma via deste documento ao participante. Informo que o estudo foi aprovado pelo

CEP perante o qual o projeto foi apresentado. Comprometo-me a utilizar o material e os dados obtidos nesta pesquisa exclusivamente para as finalidades previstas neste documento ou conforme o consentimento dado pelo participante.

_____

Data: ____/_____/_____.

(Assinatura do pesquisador)

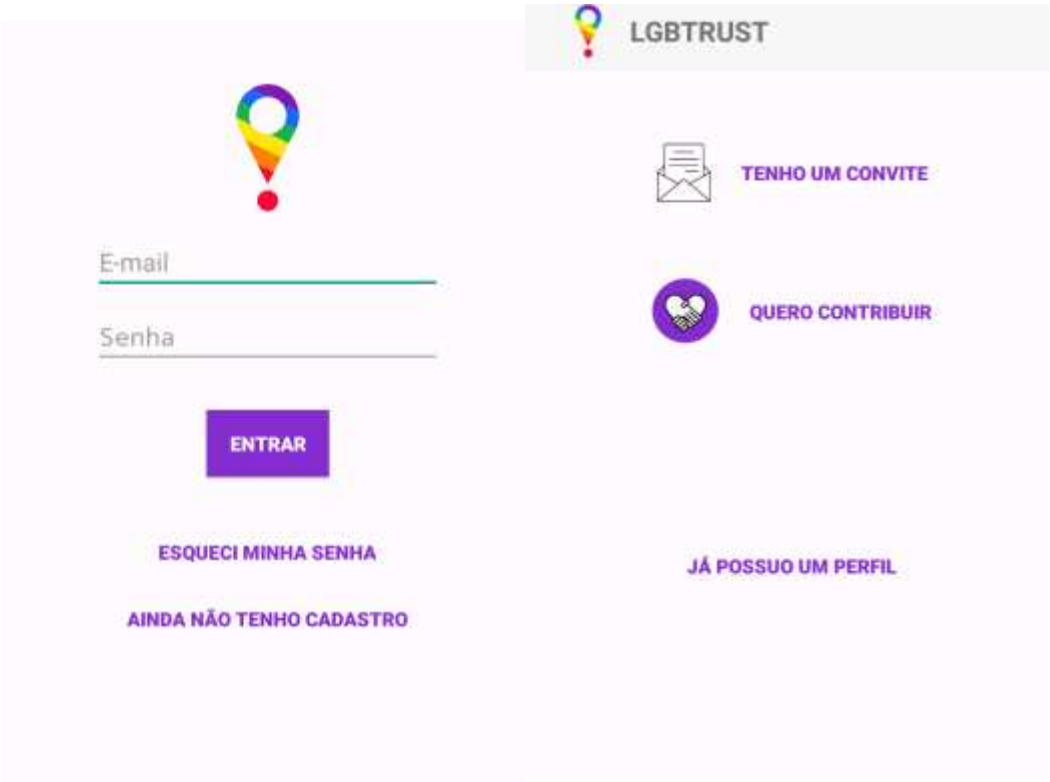
Appendix F

LGBTrust digital prototype

For the evaluation activities, an .apk installer was stored on the researcher's Google Drive account and made available to volunteers during the activity period. The database and the web service were stored in the Heroku cloud platform, for posterior remote access in the evaluations. The features implemented during this project were: the user content feed, the map, the panic button, the call to help form, and the regular user registration.

The prototype was built as a native Android application. Its components were modelled using the MVC pattern and coded in Java. Profile information, stories, mobilizations, events, and reports were stored in a MySQL server, accessible via a RESTful web service implemented using PHP Slim framework.

The landing page for unauthenticated users is the login page (Figure 9). The login form could be used to access the application or a new user could be created by pressing the "Ainda não tenho cadastro" button. As a new user, two types of profile can be created: a regular user and a partner profile (Figure 10). The process for regular users demands an invitation code from someone already registered. After providing it, user is asked to inform a mobile phone number to which the system sends another machine-generated code. After validating it, user is finally requested to provide their personal information. The screens related to registration process can be seen in Figure 10. HCI experts recommended the simplification of this process during the simplicity evaluation.



Figures 9 and 10 - Login page and choice of profile type

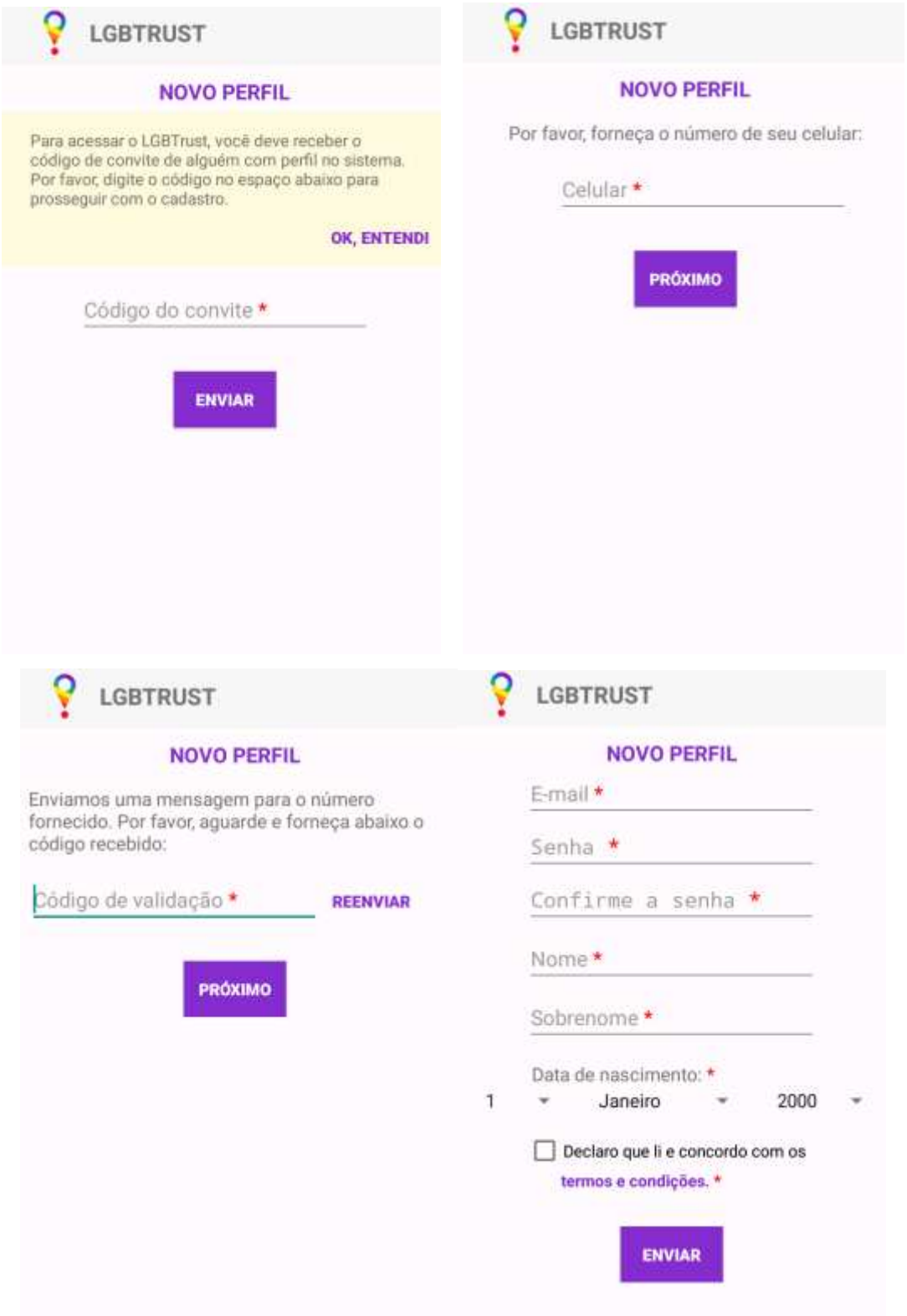
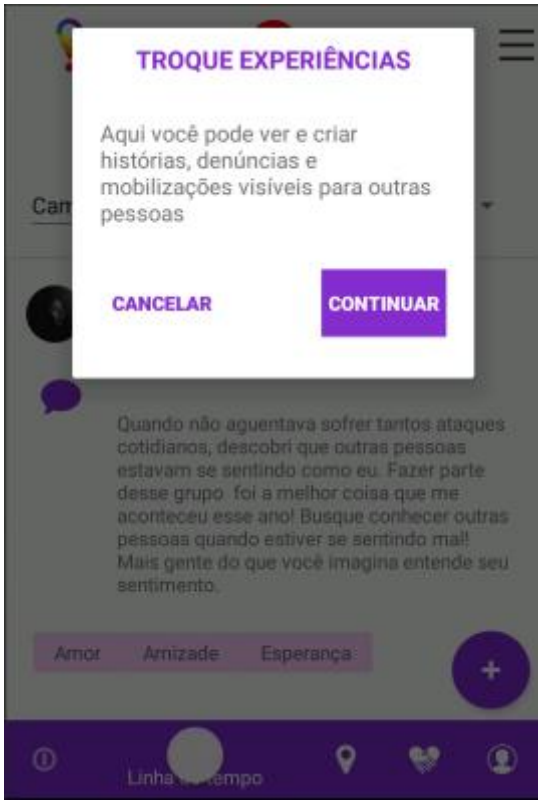
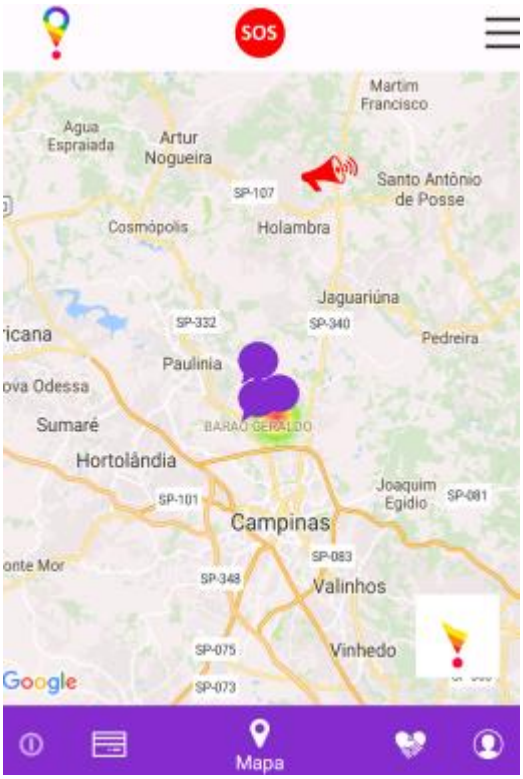


Figure 11 – Regular user registration process. From left to right, top to bottom: the invitation code, mobile phone, mobile phone code and sign-up screens

On the first access, users are presented with a tutorial with concise explanations about its main features, as exemplified in Figure 12. For all subsequent access, the landing page for logged users is the map screen, depicted in Figure 13. The bottom navigation menu items redirect, from left to right, to the information portal, the timeline, the map, the ask for help, and the profile pages. In the top menu, there are three elements – from left to right, the application chosen logo, the panic button, and a broad general menu.





Figures 12 and 13 – Regular user registration process. From left to right, top to bottom: the invitation code, mobile phone, mobile phone code and sign-up screens

The map is centered and zoomed on user current location. It displays stories, mobilizations, and reports using different icons which display a window with the corresponding content when clicked. It also contains a heat map that gets more intense as more users are nearby. It was a suggestion given during the workshops in order to promote trust on the panic button, while avoiding to provide a false safety guarantee. In the right bottom corner, there is a button that shows a range of users nearby with the same intention as the heat map. In this image, the button contains

part of the application logo – one of the suggested ideas was to complete the logo image as the number of nearby users grows. Both the heat map and the button were not discussed on evaluations.

Stories, reports, and mobilizations are also presented as a list in the timeline page (see Figure 14). Each contains the following information: author image, author name, content type, date and time of happening, a summary, a description, and tags. Author information is omitted if user chooses to post anonymously. An example of content is depicted in Figures 14 and 15. When reported, an indication of the number of people who reported is added to the post. When this indication is clicked, it presents the motivation for the reports chosen when creating it. The screens related to post reports are presented in Figure 16.

Figures 14 and 15 – Timeline page and a story open by clicking the map icon

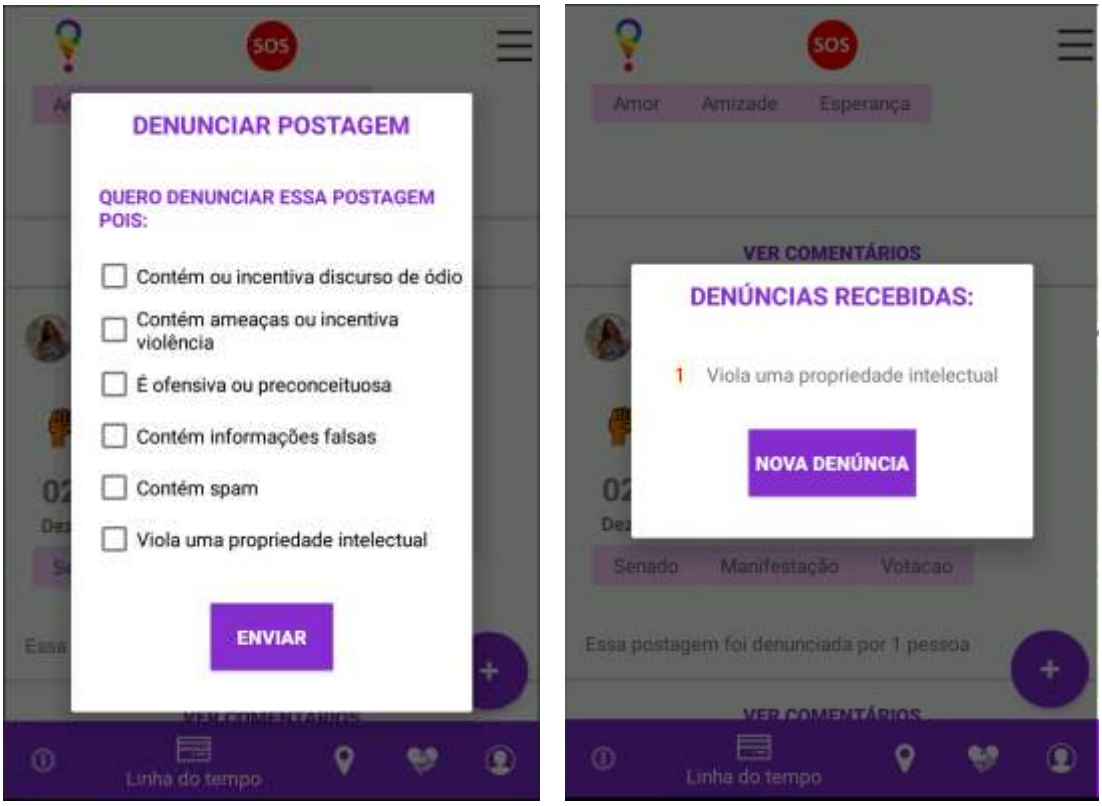


Figure 16 – New report and received reports screens. Behind the overlay in the figure in the right, the indication of people reporting is displayed

The ask for help page contained 3 tabs, presented in Figure 17. The leftmost contains a contact form, where user can choose a kind of help and send it to a partner able to respond or provide it. The other two sides – not implemented - are, respectively, a chat screen to get in touch with the partners and a list of registered partners, as suggested in the workshops.

The panic button is available in all screens. When tapped, a larger version of it (see Figure 18) is presented along a red marker that takes 30 seconds to draw a circle around the button. If either the user hits the button or the time elapses a message is sent to phone numbers and other users registered as emergency contacts.

Figures 17 and 18 – The ask for help form and the panic button screens

Finally, the profile screen displays and allows the edition of the following information: picture, name, birth date, and name of user who invited to the app for all users; gender, sexual orientation, whether the user is transgender or cisgender, and whether the user is intersex or not for users who provided the information; and name of people to whom an invite was sent, and emergency contacts for users who had used these features. The profile page is depicted in Figure 19.

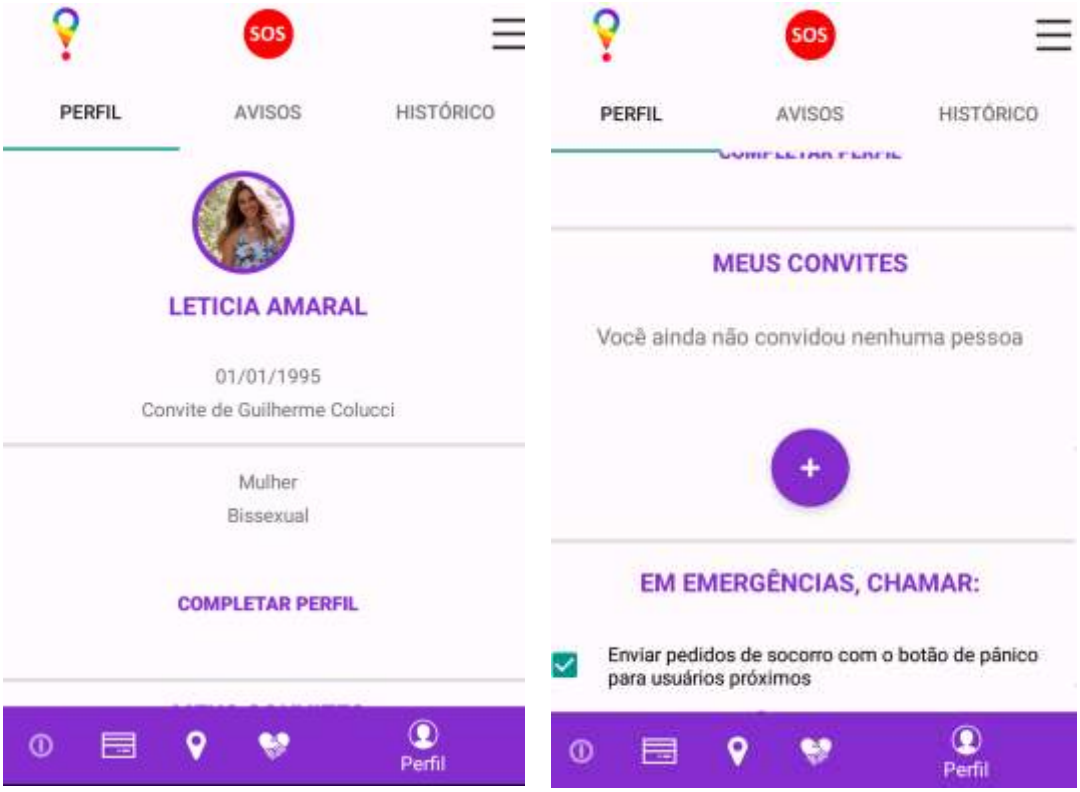


Figure 19 – Profile page

Appendix G

Permission from publishers

ACM Publishing License and Audio/Video Release

Title of the Work: Gender identity and sexual orientation perceived oppressions in digital systems user interfaces: an exploratory study
Submission ID:146793
Author/Presenter(s): Guilherme C. Pereira: Universidade Estadual de Campinas; M. Cecília C. Baranauskas: Universidade Estadual de Campinas
Type of material: Full Paper

Publication and/or Conference Name: XIV Brazilian Symposium on Human Factors in Computer Systems Proceedings

1. Glossary

2. Grant of Rights

(a) Owner hereby grants to ACM an exclusive, worldwide, royalty-free, perpetual, irrevocable, transferable and sublicenseable license to publish, reproduce and distribute all or any part of the Work in any and all forms of media, now or hereafter known, including in the above publication and in the ACM Digital Library, and to authorize third parties to do the same.

(b) In connection with software and "Artistic Images and "Auxiliary Materials, Owner grants ACM non-exclusive permission to publish, reproduce and distribute in any and all forms of media, now or hereafter known, including in the above publication and in the ACM Digital Library.

(c) In connection with any "Minor Revision", that is, a derivative work containing less than twenty-five percent (25%) of new substantive material, Owner hereby grants to ACM all rights in the Minor Revision that Owner grants to ACM with respect to the Work, and all terms of this Agreement shall apply to the Minor Revision.

☑ A. Grant of Rights. I grant the rights and agree to the terms described above.

☐ B. Declaration for Government Work. I am an employee of the national government of my country and my Government claims rights to this work, or it is not copyrightable (Government work is classified as Public Domain in U.S. only)

Are any of the co-authors, employees or contractors of a National Government?
○ Yes ◉ No

---

3. Reserved Rights and Permitted Uses.

(a) All rights and permissions the author has not granted to ACM in Paragraph 2 are reserved to the Owner, including without limitation the ownership of the copyright of the Work and all other proprietary rights such as patent or trademark rights.

(b) Furthermore, notwithstanding the exclusive rights the Owner has granted to ACM in Paragraph 2(a), Owner shall have the right to do the following:

(i) Reuse any portion of the Work, without fee, in any future works written or edited by the Author, including books, lectures and presentations in any and all

media.

(ii) Create a "Major Revision" which is wholly owned by the author

(iii) Post the Accepted Version of the Work on (1) the Author's home page, (2) the Owner's institutional repository, (3) any repository legally mandated by an agency funding the research on which the Work is based, and (4) any non-commercial repository or aggregation that does not duplicate ACM tables of contents, i.e., whose patterns of links do not substantially duplicate an ACM-copyrighted volume or issue. Non-commercial repositories are here understood as repositories owned by non-profit organizations that do not charge a fee for accessing deposited articles and that do not sell advertising or otherwise profit from serving articles.

(iv) Post an "Author-Izer" link enabling free downloads of the Version of Record in the ACM Digital Library on (1) the Author's home page or (2) the Owner's institutional repository;

(v) Prior to commencement of the ACM peer review process, post the version of the Work as submitted to ACM ("Submitted Version" or any earlier versions) to non-peer reviewed servers;

(vi) Make free distributions of the final published Version of Record internally to the Owner's employees, if applicable;

(vii) Make free distributions of the published Version of Record for Classroom and Personal Use;

(viii) Bundle the Work in any of Owner's software distributions; and

(ix) Use any Auxiliary Material independent from the Work.

When preparing your paper for submission using the ACM TeX templates, the rights and permissions information and the bibliographic strip must appear on the lower left hand portion of the first page.

The new ACM Consolidated TeX template Version 1.3 and above automatically creates and positions these text blocks for you based on the code snippet which is system-generated based on your rights management choice and this particular conference.

Please copy and paste the following code snippet into your TeX file between \begin{document} and \maketitle, either after or before CCS codes.

```
\copyrightyear{2015}
\acmYear{2015}
\setcopyright{acmlicensed}
\acmConference[IHC 2015]{XIV Brazilian Symposium on Human Factors
in Computer Systems}{November 3--6, 2015}{Salvador, Brazil}
```

\acmBooktitle{IHC 2015: XIV Brazilian Symposium on Human Factors in Computer Systems, November 3--6, 2015, Salvador, Brazil}
\acmPrice{15.00}\acmDOI{10.1145/3148456.3148466}
\acmISBN{978-1-4503-5362-5/15/11}

ACM TeX template .cls version 2.8, automatically creates and positions these text blocks for you based on the code snippet which is system-generated based on your rights management choice and this particular conference.
Please copy and paste the following code snippet into your TeX file between \begin{document} and \maketitle, either after or before CCS codes.

\CopyrightYear{2015}
\setcopyright{acmlicensed}
\conferenceinfo{IHC 2015,}{November 3--6, 2015, Salvador, Brazil}
\isbn{978-1-4503-5362-5/15/11}\acmPrice{$15.00}
\doi{https://doi.org/10.1145/3148456.3148466}

If you are using the ACM Microsoft Word template, or still using an older version of the ACM TeX template, or the current versions of the ACM SIGCHI, SIGGRAPH, or SIGPLAN TeX templates, you must copy and paste the following text block into your document as per the instructions provided with the templates you are using:

IHC 2015, November 3–6, 2015, Salvador, Brazil

ACM ISBN 978-1-4503-5362-5/15/11...$15.00
https://doi.org/10.1145/3148456.3148466

NOTE: Make sure to include your article's DOI as part of the bibstrip data; DOIs will be registered and become active shortly after publication in the ACM Digital Library

---

4. ACM Citation and Digital Object Identifier.

(a) In connection with any use by the Owner of the Definitive Version, Owner shall include the ACM citation and ACM Digital Object Identifier (DOI).
(b) In connection with any use by the Owner of the Submitted Version (if accepted) or the Accepted Version or a Minor Revision, Owner shall use best efforts to display the ACM citation, along with a statement substantially similar to the following:

> "© [Owner] [Year]. This is the author's version of the work. It is posted here for your personal use. Not for redistribution. The definitive version was published in {Source Publication}, https://doi.org/10.1145/{number}."

5. Audio/Video Recording

I hereby grant permission for ACM to include my name, likeness, presentation and comments in any and all forms, for the Conference and/or Publication.

I further grant permission for ACM to record and/or transcribe and reproduce my presentation as part of the ACM Digital Library, and to distribute the same for sale in complete or partial form as part of an ACM product on CD-ROM, DVD, webcast, USB device, streaming video or any other media format now or hereafter known.

I understand that my presentation will not be sold separately as a stand-alone product without my direct consent. Accordingly, I give ACM the right to use my image, voice, pronouncements, likeness, and my name, and any biographical material submitted by me, in connection with the Conference and/or Publication, whether used in excerpts or in full, for distribution described above and for any associated advertising or exhibition.

Do you agree to the above Audio/Video Release? (•) Yes ( ) No

6. Auxiliary Material

Do you have any Auxiliary Materials? ( ) Yes (•) No

7. Third Party Materials

In the event that any materials used in my presentation or Auxiliary Materials contain the work of third-party individuals or organizations (including copyrighted music or movie excerpts or anything not owned by me), I understand that it is my responsibility to secure any necessary permissions and/or licenses for print and/or digital publication, and cite or attach them below.

(•) We/I have not used third-party material.
( ) We/I have used third-party materials and have necessary permissions.

8. Artistic Images

If your paper includes images that were created for any purpose other than this paper and to which you or your employer claim copyright, you must complete Part IV and be sure to include a notice of copyright with each such image in the paper.
(•) We/I do not have any artistic images.
( ) We/I have any artistic images.

9. Representations, Warranties and Covenants

The undersigned hereby represents, warrants and covenants as follows:

(a) Owner is the sole owner or authorized agent of Owner(s) of the Work;

(b) The undersigned is authorized to enter into this Agreement and grant the rights included in this license to ACM;

(c) The Work is original and does not infringe the rights of any third party; all permissions for use of third-party materials consistent in scope and duration with the rights granted to ACM have been obtained, copies of such permissions have been provided to ACM, and the Work as submitted to ACM clearly and accurately indicates the credit to the proprietors of any such third-party materials (including any applicable copyright notice), or will be revised to indicate such credit;

(d) The Work has not been published except for informal postings on non-peer reviewed servers, and Owner covenants to use best efforts to place ACM DOI pointers on any such prior postings;

(e) The Auxiliary Materials, if any, contain no malicious code, virus, trojan horse or other software routines or hardware components designed to permit unauthorized access or to disable, erase or otherwise harm any computer systems or software; and

(f) The Artistic Images, if any, are clearly and accurately noted as such (including any applicable copyright notice) in the Submitted Version.

☑ I agree to the Representations, Warranties and Covenants.

10. Enforcement.

At ACM's expense, ACM shall have the right (but not the obligation) to defend and enforce the rights granted to ACM hereunder, including in connection with any instances of plagiarism brought to the attention of ACM. Owner shall notify ACM in writing as promptly as practicable upon becoming aware that any third party is infringing upon the rights granted to ACM, and shall reasonably cooperate with ACM in its defense or enforcement.

11. Governing Law

This Agreement shall be governed by, and construed in accordance with, the laws of the state of New York applicable to contracts entered into and to be fully performed therein.

DATE: **10/10/2017** sent to colucciguilherme@gmail.com at **16:10:03**

ACM Publishing License and Audio/Video Release

Title of the Work: Supporting people on fighting lesbian, gay, bisexual, and transgender (LGBT) prejudice: a critical codesign process
Submission ID:172584
Author/Presenter(s): Guilherme Colucci Pereira:UNICAMP;Cecilia Baranauskas:UNICAMP
Type of material: Full Paper

Publication and/or Conference Name: XVI Brazilian Symposium on Human Factors in Computer Systems Proceedings

1. Glossary

2. Grant of Rights

(a) Owner hereby grants to ACM an exclusive, worldwide, royalty-free, perpetual, irrevocable, transferable and sublicenseable license to publish, reproduce and distribute all or any part of the Work in any and all forms of media, now or hereafter known, including in the above publication and in the ACM Digital Library, and to authorize third parties to do the same.

(b) In connection with software and "Artistic Images and "Auxiliary Materials, Owner grants ACM non-exclusive permission to publish, reproduce and distribute in any and all forms of media, now or hereafter known, including in the above publication and in the ACM Digital Library.

(c) In connection with any "Minor Revision", that is, a derivative work containing less than twenty-five percent (25%) of new substantive material, Owner hereby grants to ACM all rights in the Minor Revision that Owner grants to ACM with respect to the Work, and all terms of this Agreement shall apply to the Minor Revision.

☑ A. Grant of Rights. I grant the rights and agree to the terms described above.

☐ B. Declaration for Government Work. I am an employee of the national government of my country and my Government claims rights to this work, or it is not copyrightable (Government work is classified as Public Domain in U.S. only)

Are any of the co-authors, employees or contractors of a National Government?
○ Yes ◉ No

---

3. Reserved Rights and Permitted Uses.

(a) All rights and permissions the author has not granted to ACM in Paragraph 2 are reserved to the Owner, including without limitation the ownership of the copyright of the Work and all other proprietary rights such as patent or trademark rights.

(b) Furthermore, notwithstanding the exclusive rights the Owner has granted to ACM in Paragraph 2(a), Owner shall have the right to do the following:

(i) Reuse any portion of the Work, without fee, in any future works written or edited by the Author, including books, lectures and presentations in any and all media.

(ii) Create a "Major Revision" which is wholly owned by the author

(iii) Post the Accepted Version of the Work on (1) the Author's home page, (2) the Owner's institutional repository, (3) any repository legally mandated by an agency funding the research on which the Work is based, and (4) any non-commercial repository or aggregation that does not duplicate ACM tables of contents, i.e., whose patterns of links do not substantially duplicate an ACM-copyrighted volume or issue. Non-commercial repositories are here understood as repositories owned by non-profit organizations that do not charge a fee for accessing deposited articles and that do not sell advertising or otherwise profit from serving articles.

(iv) Post an "Author-Izer" link enabling free downloads of the Version of Record in the ACM Digital Library on (1) the Author's home page or (2) the Owner's institutional repository;

(v) Prior to commencement of the ACM peer review process, post the version of the Work as submitted to ACM ("Submitted Version" or any earlier versions) to non-peer reviewed servers;

(vi) Make free distributions of the final published Version of Record internally to the Owner's employees, if applicable;

(vii) Make free distributions of the published Version of Record for Classroom and Personal Use;

(viii) Bundle the Work in any of Owner's software distributions; and

(ix) Use any Auxiliary Material independent from the Work.

When preparing your paper for submission using the ACM TeX templates, the rights and permissions information and the bibliographic strip must appear on the lower left hand portion of the first page.

The new ACM Consolidated TeX template Version 1.3 and above automatically creates and positions these text blocks for you based on the code snippet which is system-generated based on your rights management choice and this particular conference.

Please copy and paste the following code snippet into your TeX file between \begin{document} and \maketitle, either after or before CCS codes.

```
\copyrightyear{2017}
\acmYear{2017}
\setcopyright{acmlicensed}
\acmConference[IHC 2017]{XVI Brazilian Symposium on Human Factors
in Computer Systems}{October 23--27, 2017}{Joinville, Brazil}
\acmBooktitle{IHC 2017: XVI Brazilian Symposium on Human Factors in
```

Computer Systems, October 23--27, 2017, Joinville, Brazil}
\acmPrice{15.00}
\acmDOI{10.1145/3160504.3160522}
\acmISBN{978-1-4503-6377-8/17/10}

ACM TeX template .cls version 2.8, automatically creates and positions these text blocks for you based on the code snippet which is system-generated based on your rights management choice and this particular conference.
Please copy and paste the following code snippet into your TeX file between \begin{document} and \maketitle, either after or before CCS codes.

\CopyrightYear{2017}
\setcopyright{acmlicensed}
\conferenceinfo{IHC 2017,}{October 23--27, 2017, Joinville, Brazil}
\isbn{978-1-4503-6377-8/17/10}\acmPrice{$15.00}
\doi{https://doi.org/10.1145/3160504.3160522}

If you are using the ACM Microsoft Word template, or still using an older version of the ACM TeX template, or the current versions of the ACM SIGCHI, SIGGRAPH, or SIGPLAN TeX templates, you must copy and paste the following text block into your document as per the instructions provided with the templates you are using:

IHC 2017, October 23–27, 2017, Joinville, Brazil

ACM ISBN 978-1-4503-6377-8/17/10...$15.00
https://doi.org/10.1145/3160504.3160522

NOTE: Make sure to include your article's DOI as part of the bibstrip data; DOIs will be registered and become active shortly after publication in the ACM Digital Library

---

4. ACM Citation and Digital Object Identifier.

(a) In connection with any use by the Owner of the Definitive Version, Owner shall include the ACM citation and ACM Digital Object Identifier (DOI).
(b) In connection with any use by the Owner of the Submitted Version (if accepted) or the Accepted Version or a Minor Revision, Owner shall use best efforts to display the ACM citation, along with a statement substantially similar to the following:

> "© [Owner] [Year]. This is the author's version of the work. It is posted here for your personal use. Not for redistribution. The definitive version was published in {Source Publication}, https://doi.org/10.1145/{number}."

5. Audio/Video Recording

I hereby grant permission for ACM to include my name, likeness, presentation and comments in any and all forms, for the Conference and/or Publication.

I further grant permission for ACM to record and/or transcribe and reproduce my presentation as part of the ACM Digital Library, and to distribute the same for sale in complete or partial form as part of an ACM product on CD-ROM, DVD, webcast, USB device, streaming video or any other media format now or hereafter known.

I understand that my presentation will not be sold separately as a stand-alone product without my direct consent. Accordingly, I give ACM the right to use my image, voice, pronouncements, likeness, and my name, and any biographical material submitted by me, in connection with the Conference and/or Publication, whether used in excerpts or in full, for distribution described above and for any associated advertising or exhibition.

Do you agree to the above Audio/Video Release? (•) Yes ( ) No

6. Auxiliary Material

Do you have any Auxiliary Materials? ( ) Yes (•) No

7. Third Party Materials

In the event that any materials used in my presentation or Auxiliary Materials contain the work of third-party individuals or organizations (including copyrighted music or movie excerpts or anything not owned by me), I understand that it is my responsibility to secure any necessary permissions and/or licenses for print and/or digital publication, and cite or attach them below.

(•) We/I have not used third-party material.
( ) We/I have used third-party materials and have necessary permissions.

8. Artistic Images

If your paper includes images that were created for any purpose other than this paper and to which you or your employer claim copyright, you must complete Part IV and be sure to include a notice of copyright with each such image in the paper.
(•) We/I do not have any artistic images.
( ) We/I have any artistic images.

9. Representations, Warranties and Covenants

The undersigned hereby represents, warrants and covenants as follows:

(a) Owner is the sole owner or authorized agent of Owner(s) of the Work;

(b) The undersigned is authorized to enter into this Agreement and grant the rights included in this license to ACM;

(c) The Work is original and does not infringe the rights of any third party; all permissions for use of third-party materials consistent in scope and duration with the rights granted to ACM have been obtained, copies of such permissions have been provided to ACM, and the Work as submitted to ACM clearly and accurately indicates the credit to the proprietors of any such third-party materials (including any applicable copyright notice), or will be revised to indicate such credit;

(d) The Work has not been published except for informal postings on non-peer reviewed servers, and Owner covenants to use best efforts to place ACM DOI pointers on any such prior postings;

(e) The Auxiliary Materials, if any, contain no malicious code, virus, trojan horse or other software routines or hardware components designed to permit unauthorized access or to disable, erase or otherwise harm any computer systems or software; and

(f) The Artistic Images, if any, are clearly and accurately noted as such (including any applicable copyright notice) in the Submitted Version.

☑ I agree to the Representations, Warranties and Covenants.

10. Enforcement.

At ACM's expense, ACM shall have the right (but not the obligation) to defend and enforce the rights granted to ACM hereunder, including in connection with any instances of plagiarism brought to the attention of ACM. Owner shall notify ACM in writing as promptly as practicable upon becoming aware that any third party is infringing upon the rights granted to ACM, and shall reasonably cooperate with ACM in its defense or enforcement.

11. Governing Law

This Agreement shall be governed by, and construed in accordance with, the laws of the state of New York applicable to contracts entered into and to be fully performed therein.

DATE: **11/12/2017** sent to colucciguilherme@gmail.com at **15:11:31**

Consent to Publish

Lecture Notes in Computer Science

Springer

Title of the Book or Conference Name: HCI INTERNATIONAL 2018

Volume Editor(s):

Title of the Contribution: Empowering lesbian, gay, bisexual, and transgender (LGBT) people with codesign: an evaluation through the lens of simplicity

Author(s) Name(s): Guilherme Oliveira Pereira, Maria Cecília Calani Baranauskas

Corresponding Author's Name, Address, Affiliation and Email: Guilherme Oliveira Pereira, 1251 Albert Einstein avenue, Cidade Universitária, Campinas - São Paulo - Brazil, Institute of Computing - State University of Campinas (UNICAMP), oliveiraguilherme@gmail.com

When Author is more than one person the expression "Author" as used in this agreement will apply collectively unless otherwise indicated.

§ 1 Rights Granted

Author hereby grants and assigns to Springer International Publishing AG, Cham (hereinafter called Springer) the exclusive, sole, permanent, world-wide, transferable, sub-licensable and unlimited right to reproduce, publish, distribute, transmit, make available or otherwise communicate to the public, translate, publicly perform, archive, store, lease or lend and sell the Contribution or parts thereof individually or together with other works in any language, in all revisions and versions (including soft cover, book club and collected editions, anthologies, advance printing, reprints or print to order, microfilm editions, audiograms and videograms), in all forms and media of expression including in electronic form (including offline and online use, push or pull technologies, use in databases and networks for display, print and storing on any and all stationary or portable end-user devices, e.g. text readers, audio, video or interactive devices, and for use in multimedia or interactive versions as well as for the display or transmission of the Contribution or parts thereof in data networks or seach engines), in whole, in part or in abridged form, in each case as now known or developed in the future, including the right to grant further time-limited or permanent rights. For the purposes of use in electronic forms, Springer may adjust the Contribution to the respective form of use and include links or otherwise combine it with other works. For the avoidance of doubt, Springer has the right to permit others to use individual illustrations and may use the Contribution for advertising purposes.

The copyright of the Contribution will be held in the name of Springer. Springer may take, either in its own name or in that of copyright holder, any necessary steps to protect these rights against infringement by third parties. It will have the copyright notice inserted into all editions of the Contribution according to the provisions of the Universal Copyright Convention (UCC) and dutifully take care of all formalities in this connection in the name of the copyright holder.

§ 2 Regulations for Authors under Special Copyright Law

The parties acknowledge that there may be no basis for claim of copyright in the United States to a Contribution prepared by an officer or employee of the United States government as part of that person's official duties. If the Contribution was performed under a United States government contract, but Author is not a United States government employee, Springer grants the United States government royalty-free permission to reproduce all or part of the Contribution and to authorize others to do so for United States government purposes.

If the Contribution was prepared or published by or under the direction or control of Her Majesty (i.e., the constitutional monarch of the Commonwealth realm) or any Crown government department, the copyright in the Contribution shall, subject to any agreement with Author, belong to Her Majesty.

If the Contribution was created by an employee of the European Union or the European Atomic Energy Community (EU/Euratom) in the performance of their duties, the regulation 31/EEC, 11/EAEC (Staff Regulations) applies, and copyright in the Contribution shall, subject to the Publication Framework Agreement (EC Plug), belong to the European Union or the European Atomic Energy Community.

If Author is an officer or employee of the United States government, of the Crown, or of EU/Euratom, reference will be made to this status on the signature page.

§ 3 Rights Retained by Author

Author retains, in addition to uses permitted by law, the right to communicate the content of the Contribution to other scientists, to share the Contribution with them in manuscript form, to perform or present the Contribution or to use the content for non-commercial internal and educational purposes, provided the Springer publication is mentioned as the

original source of publication in any printed or electronic materials. Author retains the right to republish the Contribution in any collection consisting solely of Author's own works without charge subject to ensuring that the publication by Springer is properly credited and that the relevant copyright notice is repeated verbatim.
Author may self-archive an author-created version of his/her Contribution on his/her own website and/or the repository of Author's department or faculty. Author may also deposit this version on his/her funder's or funder's designated repository at the funder's request or as a result of a legal obligation. He/she may not use the publisher's PDF version, which is posted on SpringerLink and other Springer websites, for the purpose of self-archiving or deposit. Furthermore, Author may only post his/her own version, provided acknowledgment is given to the original source of publication and a link is inserted to the published article on Springer's website. The link must be accompanied by the following text: "The final publication is available at link.springer.com".
Prior versions of the Contribution published on non-commercial pre-print servers like ArXiv/CoRR and HAL can remain on these servers and/or can be updated with Author's accepted version. The final published version (in pdf or html/xml format) cannot be used for this purpose. Acknowledgment needs to be given to the final publication and a link must be inserted to the published Contribution on Springer's website, accompanied by the text "The final publication is available at link.springer.com".
Author retains the right to use his/her Contribution for his/her further scientific career by including the final published paper in his/her dissertation or doctoral thesis provided acknowledgment is given to the original source of publication. Author also retains the right to use, without having to pay a fee and without having to inform the publisher, parts of the Contribution (e.g. illustrations) for inclusion in future work, and to publish a substantially revised version (at least 30% new content) elsewhere, provided that the original Springer Contribution is properly cited.

§4 Warranties

Author warrants that the Contribution is original except for such excerpts from copyrighted works (including illustrations, tables, animations and text quotations) as may be included with the permission of the copyright holder thereof, in which case(s), Author is required to obtain written permission to the extent necessary and to indicate the precise sources of the excerpts in the manuscript. Author is also requested to store the signed permission forms and to make them available to Springer if required.
Author warrants that he/she is entitled to grant the rights in accordance with Clause 1 "Rights Granted", that he/she has not assigned such rights to third parties, that the Contribution has not heretofore been published in whole or in part, that the Contribution contains no libelous statements and does not infringe on any copyright, trademark, patent, statutory right or proprietary right of others, including rights obtained through licenses; and that Author will indemnify Springer against any costs, expenses or damages for which Springer may become liable as a result of any breach of this warranty.

§5 Delivery of the Work and Publication

Author agrees to deliver to the responsible Volume Editor (for conferences, usually one of the Program Chairs), on a date to be agreed upon, the manuscript created according to the Springer Instructions for Authors. Springer will undertake the reproduction and distribution of the Contribution at its own expense and risk. After submission of the Consent to Publish form Signed by the Corresponding Author, changes of authorship, or in the order of the authors listed, will not be accepted by Springer.

§6 Author's Discount

Author is entitled to purchase for his/her personal use (directly from Springer) the Work or other books published by Springer at a discount of 33 1/3% off the list price as long as there is a contractual arrangement between Author and Springer and subject to applicable book price regulation. Resale of such copies or of free copies is not permitted.

§7 Governing Law and Jurisdiction

This agreement shall be governed by, and shall be construed in accordance with, the laws of Switzerland. The courts of Zug, Switzerland shall have the exclusive jurisdiction.

Corresponding Author signs for and accepts responsibility for releasing this material on behalf of any and all Co-authors.

Signature of Corresponding Author: **Date:** 02/04/2018

☐ I'm an employee of the US Government and transfer the rights to the extent transferable (Title 17 §105 U.S.C. applies)

☐ I'm an employee of the Crown and copyright on the Contribution belongs to Her Majesty

☐ I'm an employee of the EU or Euratom and copyright on the Contribution belongs to EU or Euratom