Transgender Inclusive and Affirming Design in Computing

Madison W. Call[1] iD and Rod D. Roscoe[1]

Abstract

This paper seeks to bring further attention to transgender experiences and issues in the context of software applications. Research on transgender experiences has generally been quite limited, and the majority of that work has focused on non-digital environments. However, we argue that transgender individuals encounter several unique human-computer interaction challenges that are not typically experienced (or perhaps even considered) by cisgender individuals. This paper first articulates general challenges for transgender persons, and then discusses specific manifestations in computing: name display and updating, demographic data forms, and automating gendered assumptions. Potential recommendations are offered.

Keywords

Introduction

Software interfaces and designs can play a meaningful yet overlooked role in how people communicate, construct, and navigate their identity. For example, digital services that require "account creation" often request demographic details (e.g., age, race, and gender) and names, and ask users to choose usernames, display names, avatars, photos, or similar information. Other systems may require legal names, social security numbers, medical history, and so on. These data—whether demanded or volunteered—establishes who we "are" in the system. We may receive ads and notifications addressed to us, or the system may share reports about us to others (e.g., teachers, managers, and doctors). These human-computer interactions thus reflect and/or reveal our identities.

Aside from privacy or security worries, these digital identity issues may be rather trivial for most users. Their identity in the system matches their actual identity. However, for individuals who *change* their identity (e.g., new surname after marriage), it takes effort to update and realign across platforms. These issues are particularly salient for transgender persons for whom identification and *misidentification* have psychological, safety, employment, and other consequences. This paper brings further attention to transgender experiences and issues (see Jennings et al., 2020) in the context of software applications. We focus primarily on social and legal aspects of transgender experiences, which may be most germane to human-computer interaction design (e.g., need and ability to change legal names, display names, usernames, and other personal descriptors) and potential harm stemming from exclusive design.

Fundamental Transgender Concepts and Challenges

There are many concepts that are relevant to understanding transgender people and communities that may be unfamiliar to various audiences. This section offers a brief introduction.

Gender or *gender identity* refers to the gender that people identify with—who they are. Common terms include "woman," "man," or "nonbinary." Importantly, gender is related to but distinct from bodily concepts like *biological sex*. Common biological sex terms include "female," "male," and "intersex." Gender and sex are often conflated (i.e., "man" and "male" are used interchangeably) (Westbrook & Saperstein, 2015) but the distinction is meaningful.

Gender labels and categories are often designated by parents or medical professionals at birth, referred to as *assigned gender-at birth* (AGAB). Historically, such labels have been conflated with visible biological sex traits (e.g., genitals) in a binary fashion (i.e., "female" or "male"). These labels have also tended to enforce binary categories even for intersex infants who possess both "female" and "male" biological traits.

Transgender individuals are people who possess a different gender identity than their AGAB. The term "transgender" is thus very broadly inclusive, spanning people who may be

[1]Human Systems Engineering, Arizona State University, Mesa, AZ, USA

Corresponding Author:
Rod D. Roscoe, Human Systems Engineering, Arizona State University, 7271 E. Sonoran Arroyo Mall, Santa Catalina Hall, Santa Catalina Hall, Suite 150g, Mesa, AZ 85212, USA.
Email: rod.roscoe@asu.edu

transitioning, agender, two-spirit, genderfluid, nonbinary, and more. In contrast, *cisgender* individuals are people whose gender identity matches their AGAB.

The term *transitioning* refers to the process of "changing" or other steps taken to align aspects of biological traits, social perceptions and interactions, legal status, or other qualities with gender identity. When someone's AGAB does not reflect their actual identity, it takes effort to make things right. Transitioning can require any length of time, may occur at multiple times and places, and involve many complexities. Many transgender and transitioning individuals may be "closeted" in various contexts, meaning they do not (or cannot) disclose their real identity for safety, comfort, or other valid reasons.

Indeed, transgender people and communities encounter a variety of obstacles that emerge from their unique identities and journey through society and societal norms. These issues may impact people in diverse aspects of their lives (Reinert, 2019), and can be experienced simultaneously. These general concerns set the stage for HCI-specific issues discussed later.

Outing

For reasons of safety (e.g., physical, social, and financial), transgender individuals must often carefully manage who knows about their identity. *Outing* happens when a third party informs others or reveals that a person is transgender without consent or permission. This event can occur intentionally (e.g., teachers revealing to parents that a student is using "different" pronouns) or inadvertently (e.g., carelessly using an incorrect name in conversation).

Involuntary outing is harmful for many reasons. Transgender individuals and communities face substantial discrimination and stigmatization in many sectors of society, and several states are working to enshrine such policies in law. Transgender people who lack legal identification indicating their name and gender may encounter verbal assault, physical violence, and/or denial of services (Gaskins & McClain, 2021; Hill et al., 2019; Pollitt et al., 2021). Outing has also been linked to an increased incidence of homicide and suicide (HRC Foundation, 2022; Pilkington, 2021). Even when voluntary, the "coming out" process is often emotionally charged, with people experiencing substantial fear and anxiety (Haimson et al., 2015). Being thrust into this situation involuntarily only magnifies the distress and potential for harm.

Deadnaming and Misgendering

Once a person realizes they are transgender, their personal information may change. Many (though not all) transgender individuals change their name, pronouns (e.g., "her" and "his"), and/or titles (e.g., "Mr" and "Mrs") to align with their actual gender. Unfortunately, this means they must now contend with a world where their previously collected personally identifiable data (e.g., legal, school, employment, and bank records) are now fundamentally incorrect. This in turn leads to deadnaming and misgendering.

Deadnaming refers to cases where a person (or software) refers to a transgender individual by their "birth name" instead of their correct, actual name. Usage of a persons' correct name is associated with more positive psychosocial outcomes, whereas deadnaming is associated with depressive symptoms, suicidal ideation and attempts, and loss of self-esteem at home and work (Pollitt et al., 2021).

Misgendering occurs when a person is referred to using pronouns, titles, and/or genders that are incorrect or misaligned with their gender identity. Misgendering can occur in other ways as well, such as when a person is denied access to gendered spaces (e.g., restrooms) based on incorrect perceptions of their gender. As with deadnaming, misgendering is psychologically harmful and associated with anxiety, depression, isolation, and feelings of stigmatization and oppression (James et al., 2016; Pollitt et al., 2021).

Dysphoria

Threats to physical, psychological, and social safety are pervasive concerns for many marginalized and minoritized populations. Another issue includes *gender dysphoria*, which refers to a sense of "psychological distress that results from an incongruence between one's sex assigned at birth and one's gender identity" (DSM-5; Turban, 2020). Transgender persons often, but not always, experience dysphoria, and may combat it by transitioning to attain more alignment or affirmation with their identity. In addition to the above biomedical "diagnosis," gender dysphoria has taken on more colloquial usage as an emotional expression. For example, individuals might say "I am feeling dysphoric right now" to express feelings that do not require a formal diagnosis.

Related to both dysphoria and outing is the scenario of *self- misgendering* (and self-deadnaming), where transgender people must refer to or present themselves in ways that align to their AGAB, deadnames, incorrect pronouns, or similar details. Typically, this occurs in settings where people are not "out" and/or can only access resources using their "old" identity. This experience is a form of misgendering but exacerbated by being "self-inflicted." These experiences can be particularly potent triggers for dysphoria.

Summary

A fundamental principle is that contradictions between assigned identity, actual identity, social perceptions, and interactions can be *distressing*—it can be *harmful* to experience situations that impose or assume an incorrect identity and/or force compliance with that label. Transgender people, by definition, navigate a transition from one gender identity (i.e., AGAB) to another (i.e., actual gender). These experiences entail unique challenges regarding disclosure, personal

information, and psychosocial outcomes related to affirming versus disaffirming interactions and systems.

In the remainder of this paper, we turn our attention to a few ways that software and computing systems participate in inclusion, exclusion, affirmation, and disaffirmation. That is, computing systems might either allow people to choose and use correct names and addresses, or may force people to deadname or misgender themselves. Likewise, software systems may deadname or out users based on interface restrictions or displays. Transgender inclusive and affirming design seeks to prevent and avoid these flawed designs.

Transgender Challenges in Human-Computer Interaction

There are a variety of ways that software systems and interfaces can either affirm transgender identities (e.g., enable correct, up-to-date naming) or communicate disrespect and exclusion. Many of these issues (but not all) pertain to ways that systems participate in outing, deadnaming, misgendering, or otherwise triggering dysphoria or negative feelings. We share examples regarding (a) updating personal information, (b) display names, (c) forms with gender categories, and (d) assuming user gender. This list is not exhaustive and the issues described can vary depending on the context of the systems.

Updating Personal Information

As previously discussed, transitioning may include a variety of steps taken to align one's actual identity to personal, social, and legal identity markers. For instance, one common step is to change (perhaps legally) the name assigned at birth to a name that better reflects one's identity.

Such changes may involve updating personal information on dozens or hundreds of different records, accounts, websites, and other platforms. Without updating, existing services will continue to use incorrect information—resulting in deadnaming and misgendering indefinitely. Maintaining these accounts and details also confer risks of outing if others see the old details. Emails, advertisements, and reports that are generated based on "user info" may cause such harm (e.g., "Dear Mr. John Doe, we are trying to reach you about your car's extended warranty.")

One way that software systems are transgender-exclusive or disaffirming is when they do not allow changes in names, forms of address, or other gender identity details. User names, account names, and email addresses are just a few cases. Ideally, these details should be available and straightforward to update. Moreover, it should be made clear that such updates are even possible (Spiel, Keyes, et al., 2019) or users will not even know they can update their information.

There are several ways that design may impede updating. First, the process often takes significant time and effort, which is multiplied across each system that needs to be updated. If users must submit paperwork or verification (e.g., legal proof), they must incur the costs of requesting the materials, waiting for them to arrive, sending them, and waiting for them to be processed. The potential for outing, deadnaming, and other adverse events persist throughout this liminal period. These burdens add to the workload of users who may be already wrestling with other social, psychological, or physical matters.

Second, some processes require contacting an "official" or "administrator" to implement the changes. This procedure can be problematic because it requires disclosure to the unknown human administrator and contending with their biases (if any). Administrators may deny change requests due to ignorance, or transgender individuals who fear disclosure or reprisal may not even attempt the process. Thus, when human administrators are absolutely necessary, they should be trained to respect and accept requests. However, ideal designs might allow requests to be processed entirely through the software system itself.

Unfortunately, making updating easier is complicated by security concerns. Malicious actors could potentially take advantage of easy-to-update information to cause disruptions or phishing attacks. The solutions to balancing these concerns are context-dependent on how much damage a security breach could do. For instance, a less secure process might be more tolerable for a social media site than a banking site. Designers should ideally find evidence-based research on the specific threats their system(s) might encounter, and then make updating processes as easy as is reasonably possible given that evidence. Thus, to make updating inclusive, the process should be designed to be as easy and automatic as possible in the context of the designed system. Additionally, there should be a clearly defined and publicized process for users to complete desired changes to their information.

Display Name Systems

One potential yet imperfect solution to deadnaming in computing systems is the use of *display names* that show only users' actual name even when a different name is internally required. For example, a banking or university system may have to use names from government-issued identification or records for legal purposes. Nonetheless, in day-to-day and public interactions (e.g., email notifications to users), the system may allow for a different name to be shown that can be updated easily without security concerns. Displays may also allow for customized pronoun and title usage. This approach minimizes the scenarios in which transgender users must encounter potentially harmful system communications that use incorrect information.

Not surprisingly, the actual implementation of display name systems is often incomplete or haphazard. Systems may use a users' display names on one page but a legal name on another page. Often, this occurs even when all of the pages warrant using a display name.

One common pitfall in design is an assumption that the display name systems are intended to merely accommodate "preferred" names or "nicknames." Such systems may use the display name only when trying to be casual or friendly (e.g., "Hey Jay"), but switch to "legal" names for formal contacts (e.g., "Dear Mr. John Doe"). Other systems show display names as mere annotations (e.g., "John (Jay) Doe"). Both of these designs communicate that preferred names are either optional or unimportant, and result in potentially harmful deadnaming, misgendering, and outing.

Another problem occurs when systems report both display names and "legal" names, or only "legal" names, to other users or admins. For example, classroom rosters might be populated with students' deadnames, with actual names displayed only as "nicknames" if at all. Thus, on the first day of class when attendance is taken, transgender students' initial experience may be one of being deadnamed, misgendered, and outed in front of their peers. Such students may then have to decide whether to publicly correct the instructor, which may involve further disclosure or awkward interactions. Notably, this problem also burdens instructors with remembering students' actual names and pronouns despite reinforcement of incorrect information by the system.

A final challenge occurs with how display systems are integrated (or not) across linked platforms. Complex systems may rely on many different services and applications for email, calendars, training, human resources, and more. Each of these systems may possess its own mechanisms for display names (or none at all) and flaws in one system may compromise the rest. For example, a transgender person might schedule a meeting using software that correctly displays their actual name and pronouns. However, this process may trigger an invitational email to colleagues using incorrect information (e.g., "john.doe@company.org is inviting you to a meeting"). One solution to these problems is to mindfully question and then tightly restrict which systems access personal and private information. Course instructors never need to know students' "legal" name, gender status, and so on—good teaching can proceed using only students' actual name and pronouns. In fact, instruction will be better if instructors never (or can never) "get names wrong." Likewise, most day-to-day computing systems have no need for "legal information" to function. It is a cybersecurity hazard for them to needlessly share these details.

Overall, good display name systems may be designed with several traits. First, they reduce the use of deadnaming or misgendering as much as possible. Second, they allow users to use their actual name and gender when feasible. Third, they are consistent and intuitive to avoid errors, such as accidentally sharing private info.

Forms with Gender Categories

Many software systems request or require users to provide personal details (e.g., "account creation"), which may be used to describe user populations or provide a "personalized" experience. Such information gathering typically occurs in a series of forms or surveys where respondents indicate which identity categories they ostensibly belong to (e.g., "Indicate your race. Select all that apply").

Demographic identity data collection must first consider whether the data are appropriate or necessary to request. Does the software *need* to know a person's AGAB, gender identity or expression, sexual orientation, and so on?

If such details *are* needed, it is essential to ask separate questions that permit valid nuance. Gender identity, legal gender, AGAB, biological sex, and transgender status are related but fundamentally distinct concepts. Conflating one for another will generate inaccurate interpretations of data. Using a multi-step process, where each concept is asked about *separately*, is a more inclusive and accurate means of obtaining this information (Lagos & Compton, 2021; Malatino & Stoltzfus-Brown, 2020).

One way that typical demographic forms harm transgender users is by instigating self-misgendering. The respondent is forced to choose incorrect descriptors (e.g., must choose "Male" or "Female" when they are nonbinary) or insulting (e.g., "Other" or "something else"). If this data is used to "personalize" other features, the harm is compounded when these errors are reflected back on the user. Poor form design also undermines trust in the (a) software, (b) software developers, and (c) software purchasers.

Another form of harm emerges from implications or insinuations of "dishonesty." When forms are mandatory yet lack accurate identity categories, transgender individuals may be forced to "lie" or question whether their identity will be viewed as valid by administrators. This dilemma may be highly salient for transitioning individuals for whom personal identity and legal information remain out of sync. Although there may be no real consequences for inputting "incorrect" identity data, the psychological experience of wrestling with these issues— with every new account creation, for example—can take a toll. One solution, alluded to above, is to remove gender from the system and always use gender-neutral language. This prevents many misgendering issues.

If the information is desirable or necessary, the best option is to use text boxes for gender identity, pronouns, and/or titles. These treat all genders, pronouns, and titles equally and allow for all possible self-determined responses. No one is left out or forced to misgender themselves.

There are instances where a text box will not provide enough fidelity. This problem generally occurs when a group wants to conduct analytics on gender, and the sample population is too large to manually code text box responses. In this case, system design should still strive to allow people to identify themselves as exactly and accurately as possible and to respect those wishes. Several steps can be followed:

First, text box options should still be included among the options. Human gender diversity is vast and ever-changing, meaning that it is impossible for any group of designers to

fully list all genders a priori. Text boxes should also be labeled as "prefer to self-describe" or as "not listed"—terminology such as "other" is marginalizing (Puckett et al., 2020). If designers are worried about derogatory inputs in a gender field, Spiel, Haimson, and colleagues (2019) recommend programmatically revealing the text box only if users specifically select the "not listed" option.

Next, all gender questions should be optional. Transgender users may be unable to report their correct gender because they are afraid of being outed or because they are still questioning or uncertain. Forcing these transgender users to respond thus forces them to misgender themselves.

Ideally, the question might adopt a "choose all that apply" format that allows users to select multiple options. Transgender users may have multiple gender identities (e.g., genderfluid users). Pure "multiple choice" questions prevent the rendering of dynamic identities (Bivens, 2017). If this design is not feasible (e.g., statistical techniques cannot account for fluid identities), then this limitation should be mentioned in the analytics report.

Listing several different options besides "man" and "woman" is also encouraged as a means of achieving inclusivity and normalizing nonbinary users. There are, however, some options that should generally not be included in gender identity "multiple choice" items. These problematic questions include "man/woman" when it is paired with "transman/transwoman" or "transgender" as mutually exclusive categories. The implication from these is that being "trans" is fundamentally different from being a man or woman—a message of biological essentialism. This poor design confronts trans individuals with two options that are both correct, but a choice of only one. Many trans individuals might then choose the "man/woman" option instead of the "trans" option (Puckett et al., 2020) expected by the designers. In reality, gender identity is a separate dimension and should be a separate question from transgender identity.

Assuming User Gender

A currently niche but growing concern is the use of automatic gender recognition (AGR) models that use machine learning to attempt to infer or label users' gender based on their data, decisions, or behaviors. These approaches rely on a core misconception: that gender identity can be predicted from gender expression (e.g., appearance or behavior). This is not always true, as gender is an internal trait that may *sometimes* be correlated with external gender expression but not always (Hamidi et al., 2018). This leaves AGR models ripe for inaccuracy. As one example, many AGR models analyze user images, which is a key problem for transgender or transitioning individuals whose gender identity may not match their AGAB or other biological features (e.g., facial bone structure) (Hamidi et al., 2018).

Nonbinary individuals may encounter disproportionately greater problems with AGR due to commonplace assumptions about binary or static gender identity. Logistically, these assumptions "make sense" from the standpoint of classification accuracy—the nonbinary population is estimated at less than 1% of the total human population (Meerwijk & Sevelius, 2017). If further nuance is considered (e.g., agender, demigender, genderqueer, and genderfluid), then these proportions become smaller. For developers, designing for "rare" cases may not seem feasible or worthwhile. However, the result may be that minority populations are systematically ignored, excluded, or further marginalized via design.

Conclusion

Software systems increasingly request and use personal identity information to provide personalized experiences, and many legal, financial, educational, and related institutions require identity data to track or verify access to these institutions. As such, software systems and interfaces directly participate in how we exist in the world as ourselves. For transgender people, these systems can also participate in harmful human-computer interactions that disaffirm one's identity or impose barriers to aligning one's actual identity with external perceptions.

In this paper, we recommended making the processes for updating personal information (e.g., names, usernames, and gender) as easy and clear as possible. In addition, display name systems may reduce deadnaming and misgendering by enabling the use of actual names and genders (that may be distinct from "legal" details required by the system). However, designers must take care to honor the display name system fully and in all interactions—not just as trivial or casual "nicknames." When soliciting demographic data (e.g., account creation forms or user surveys), we recommend the use of nuanced gender items that separate gender, transgender status, AGAB, and so on, and which only collect this data when necessary. Finally, although AGR systems are still quite new, we suggest approaching AGR with significant skepticism.

The issues and design features covered in this paper are not exhaustive; the solutions also likely vary depending on context. Standards for effective design may also change in the future as we continue to learn and grow as a society. To ensure that design remains inclusive, LGBTQ+ organizations and/or individuals should always be agentic co-participants in design. Finally, this paper did not directly address transgender design concerns and solutions outside of digital/virtual contexts. To make a fully transgender-inclusive environment, the ideas shared here are necessarily insufficient. For instance, allowing nonbinary identities to be supported technologically does not stop institutions from setting policies against recognizing identities, nor against discrimination from coworkers or peers.

Nonetheless, we hope that the recommendations here offer a productive and necessary step toward affirming transgender users in digital and online media. This work may also

aid cisgender individuals who seek to change or update their identities, such as newlyweds who choose a new surname or abuse survivors who wish to remove references to their abuser from their name (or prevent being located by a past abuser). We *all* deserve to have our authentic identities respected and affirmed by the technologies we interact with every day.

ORCID iD

Madison W. Call 🔘 https://orcid.org/0000-0001-6118-7778

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