

Inclusive Personalities for Conversational User Interfaces: A Preliminary Discussion

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Abstract—Conversational user interfaces (CUIs) such as chatbots and voice assistants are increasingly used to deliver services not just in industry but in government. Therefore, it is increasingly important for CUIs to provide good experiences for constituents with diverse backgrounds and abilities. Existing research on CUI personality focuses on engaging typical target users. Synthesizing existing literature on CUI personalities with principles for inclusive design, we discuss how to design CUI personalities that provide good experiences for diverse users. Key considerations are to consider the user’s unique situation, their expectations and preferences toward technology, and their purpose in using the technology. Our intent is to identify challenges for future research and to move towards a set of guidelines for inclusive CUI design.

Keywords- chatbot; personality; inclusive design; equitable design; cross-cultural design; accessibility.

I. INTRODUCTION

Conversational User Interfaces (CUIs) such as text-based chatbots and voice-based assistants have become a popular solution for commercial services and are increasingly used to deliver government services as well. While companies are motivated to design CUI personalities that reflect their brands and engage target customers, government services must be accessible to all constituents. Therefore, in this discussion, we go beyond the question of how to craft a CUI personality that relates well to users: We focus on how to craft a CUI personality that relates well to diverse groups of users with disparate needs, wants, and expectations. In other words, how does a CUI’s personality include or exclude sections of the population, and what research questions should be answered to ensure CUIs do not unintentionally alienate the people being served?

Some existing research explores how a CUI’s content and interface should account for diverse needs, often by adapting existing web content standards to the complexities of CUIs [1][2]. These include standards for fonts and colors on the screen, reading level for text content, how elements can be navigated on a webpage, and how they should be labeled and placed. However, existing standards do not explicitly address the novel problem space of artificial personality.

In this paper, we bring together research on CUI personality with principles for inclusive design and

introduce topics to consider when designing inclusive CUI personalities. Our goal is to take a step towards guidelines for CUI personalities that serve all people.

Section II introduces inclusive design principles and CUI personality and describes how the former can be applied to the latter. Section III discusses some of the challenges involved in designing CUI personalities that satisfy inclusive design principles. Section IV offers recommendations to help manage those challenges. Section V concludes the paper.

II. BACKGROUND

A. Inclusive Design

Inclusive design is an approach seeking to ensure all can access and are included in the design and outcome of a service or product. This perspective encompasses ability, age, gender, culture, ethnology, race, socioeconomics, power, and vulnerability, among other characteristics. Inclusive design practitioners are expected to investigate their own biases, hire diverse teams, and consider “design for/with/by” approaches to process. Using design tools, frameworks, language, and processes that are accessible and inclusive is a key tenet of inclusive design. At the start of a project, it is a best practice to define a list of who the outcome may exclude, then use that to guide decision-making. Being mindful of who is included or excluded is a key guidepost.

In service of inclusive design, it is helpful to take a “design by” approach, bringing the service consumer into the design of outcomes. Hiring for lived experience is a tremendous asset to bringing awareness to inclusive processes. Design workshops that bring consumers into the design and development processes are incredibly valuable in ensuring outcomes serve diverse audiences.

Government services are especially relevant for inclusive design due to the range of experiences served. Where else does a service have an audience with such diversity in geography, culture, economics, ability, etc.? Most commercial products are willing to exclude those with low incomes, yet those are some of the critical users for whom government services may be a matter of life or death. Many government agencies already use CUIs to deliver or supplement key public services [3].

B. CUI Personality

Personality for CUIs, in a broad sense, is a topic of interest for researchers and industry. Personality shapes a CUI's response content, either by carefully designing each piece of content [4] or by training the CUI's language model on a particular data set [5]. Web-based CUIs often have a visual component like a headshot that can reflect a particular kind of personality. When considering voice-based systems, different voice types can similarly reinforce different kinds of personalities [6]. Some industry experts offer strategies for how to design CUI personalities. These include identifying personality traits the CUI should have, which can be based on established models of personality [7] or brand values [8]; and identifying kinds of people to use as models for the CUI's behavior. Persson et al. [9] refer to these two strategies as *trait schemas* versus *social role schemas*; though it is possible to use both together, for instance as recommended by Google [10] when developing for Google Assistant.

C. Application of Inclusive Design to CUI Personality

Community experts provide six Inclusive Design Principles [11]; here, we give examples to illustrate their applicability to CUI personality. As we discuss challenges in this paper, we will refer to the principles most applicable to each.

1. **Provide comparable experience:** A CUI should use simple straightforward language so that people who cannot fluently read the CUI's language can complete tasks with success similar to those who can.
2. **Consider situation:** A CUI should use empathy if users are likely to be under pressure.
3. **Be consistent:** A CUI should adhere to familiar conversational conventions, such as Grice's maxims (see [12]).
4. **Give control:** A CUI should give the user plenty of opportunities to steer the conversation.
5. **Offer choice:** A CUI should be responsive to different language styles and registers.
6. **Prioritize content:** A CUI should convey only content most relevant to the conversation topic so the user can stay focused.
7. **Add value:** A CUI should not engage in talk or offer conversation paths that do not improve user experience or satisfaction.

III. CHALLENGES FOR INCLUSIVE CUI PERSONALITIES

A. Grace, Respect, Empathy, and Mindful Language

What sort of personality will best serve the user's purpose and scenario? That is likely to vary depending on the individual's perspective, which may itself vary based on culture, gender, age, ability, or any of several factors. To bring grace, respect, and empathy to the CUI personality,

the design team must conduct inclusive research with a broad range of human experience to design mindful, effective (and possibly affective) conversation.

Empathy can improve adoption of CUIs and improve human mood [13][14]. However, inaccurate empathy such as unmerited sympathy can decrease the user's trust [15].

Consider how a person's background may influence the perception of personality, and how that might impact the acceptance of a CUI. Taking a casual tone may be perceived as disrespectful or create comfort; using dark humor could build rapport or offend; over time the bot's personality could adapt to the relationship's evolution or maintain a purely transactional perspective, depending upon the goal of the CUI service and user needs.

Follow the Inclusive Design Principles, "provide comparable experience," "consider situation," "be consistent," "give control," "offer choice," and "add value."

B. User's Self-Identification

Imagine, if you will, that a CUI refers to you regularly as a different gender than you identify as, or refers to abilities that you do not have; how would you feel? An individual's identity is a personal statement reflecting their history, experience, values, and mission. How might a CUI welcome the full range of human identity, which may vary in language, lingo, tone, and even code switching?

When designing a CUI's personality, the development team should be aware of any biases and stereotypes informing the design and how this could interact with users' self-identification. For instance, a digital assistant modeled after a young female secretary might appeal to certain users but offend others [16].

Follow the Inclusive Design Principles, "consider situation," "give control," and "offer choice."

C. User's Situation and Mood

There are situations that may be particularly stressful for people, such as navigating an unfamiliar city. Google Maps anticipated this by offering character voices such as Morgan Freeman or Santa Claus, which can defuse tension. Additionally, conversations between passengers and drivers tend to be simple and concise to account for their divided attention [17][18].

The user's mood, like situation, affects conversational priorities. While an impatient user needs answers quickly, other users might appreciate additional content acknowledging their emotional state, such as potential targets of fraud [19].

Follow the Inclusive Design Principles, "consider situation," "be consistent," and "prioritize content."

D. Politeness

What level of formality and politeness should a CUI show its human user? The wrong level of politeness in language and behavior can easily offend or annoy, such as over-politeness among friends or rudeness among acquaintances.

Politeness theory distinguishes between positive and negative *face*. Positive face can be thought of as the desire for affirmation and acceptance, while negative face can be thought of as the desire to maintain personal autonomy. Polite language such as “if you don’t mind” appeals to negative face, allowing room to politely refuse [20]. However, politeness is more than specific phrases. It is important to identify the range of face needs for the CUI’s intended users. Someone reporting a scam may feel ashamed of having been fooled. The CUI can consider the user’s positive face by showing empathy and understanding [19]. Meanwhile, technological assistants for people with disabilities need to consider negative face and assist only as needed and requested [21].

Humans expect the politeness of an interaction to be appropriate to the social relationship between the two parties [20]. Therefore, it is important to ask first whether users are likely to approach the CUI as a social partner, and if so whether the CUI is viewed as a close peer or as a formal representative of some organization.

Follow the Inclusive Design Principles, “consider situation,” “give control,” “offer choice,” and “add value.”

E. Different Interaction Styles and Preferences

When speaking with CUIs assisting with chronic disease management, patients preferred different healthcare provider interaction styles, such as paternalistic, informative, and deliberative, based on their ages and the nature of their disease [22]. In domains like healthcare that have clear taxonomies of interaction styles, CUI designers need to determine what user attributes will influence their preferences, or simply test a range of interaction styles with a large representative sample of target users to understand which are preferred.

Follow the Inclusive Design Principles, “consider situation,” “give control,” “offer choice,” and “prioritize content.”

IV. RECOMMENDATIONS FOR INCLUSIVE CUI PERSONALITIES

A. Know Your Users, and Be Aware of Who You Are Including and Excluding

When designing a CUI, understand your audience through user research, interviews, and contextual inquiry. Some teams document a list of those they are willing to exclude (for example, users of Internet Explorer 7 since it is well-past the sell-by date) and keep the list in mind throughout the design and development to guide decision-making. Providing a text-based chatbot along with any audio is a way to be inclusive of those with hearing considerations. For Veteran survivors of military sexual trauma, future research may reveal that some personality features may be too “soft” and make the Veteran feel they are not understood. Get to know your audience, and provide personalities that suit their needs.

B. Offer a Range of Personalities for a Range of People

Offering a selection of personalities is one avenue that some interfaces offer. For example, Siri offers a selection of voices, as well as languages from a range of countries and regions. Each has a slightly different personality, and some users select their language from a particular region because of the personality they associate with it, such as a U.S. user choosing a U.K. accented voice. Microsoft’s Clippy virtual assistant evolved to offer alternative avatars with different personalities. An important rule of thumb, though, is: “No matter what you choose, avatars won’t cure bad interactions. Just ask Clippy” [23]. In other words, personality choices must be targeted and not just for the sake of variety.

C. Make Sure the Bot’s Personality Enhances Its Purpose

Understanding the user’s purpose is key in designing suitable services. Depending on the audience, the bot may need to be formal or casual; humor and even conflict may be used to provoke critical thinking, such as with “Bots of Conviction” [24]. In this case study, the bot asked the user if they would bury their loved ones beneath their bed. Users generally were surprised, which allowed the bot to reveal that in some ancient cultures they did this to keep their loved ones close. The bot’s personality is confidently of another culture, eliciting discourse and reflection. In helping Veterans ready for life after active duty, a bot may need to be both compassionate and challenging, as it reminds users to go to training, submit forms, and attend to other tasks. In contrast, the Amazon customer service bot is friendly, upbeat, and apologetic as it addresses customer service issues. If it took a humorous approach, that would likely offend some customers already upset about a product issue.

D. Understand Users’ Tendency to Anthropomorphize

Some of the challenges mentioned in this paper depend on whether users are likely to view the CUI as a social partner or a transactional means to an end. Factors affecting a user’s tendency to anthropomorphize technology include age, gender, computer anxiety, and need for interaction [25]. Users likely to anthropomorphize CUIs can be expected to appreciate social conventions such as appropriately polite and empathic language.

E. Involve Diverse People in the Development Process

Because people from different cultures and backgrounds have different expectations for conversations, the surest way to accommodate a range of people is to involve them in product design and testing. Politeness conventions, for example, differ between individualistic and collectivistic cultures [26].

Radar Pace, a virtual coach developed by Oakley and Intel, adjusts its personality by locale. In Spanish-speaking locales, the coach’s voice is female and gives responses that are “firm and authoritative”, while in French-speaking locales it has a male voice and is “encouraging and cooperative” [8]. Cross-cultural feedback was necessary to

create an application that could be taken seriously as a coach by a variety of users.

V. CONCLUSION

In this paper we presented challenges that should be systematically addressed in research to move toward inclusive CUI personalities, as well as some overarching recommendations or themes to guide development. Studies exploring the impacts of empathy and politeness in conversational robots and software need to be integrated with studies of how diverse users respond to manifestations of social cues in technology. CUI development teams should take full advantage of user-centered research and design tools, such as personas, user stories, and structured interviews [27], to understand and anticipate the range of needs, attitudes, and expectations of their users.

Most CUIs take an initially neutral personality and when an interaction becomes more complex transfers the conversation to a human being. Until a CUI can precisely adapt to a user's preferences, that approach remains among the most inclusive. However, ambitious research, synthesis, and tool development can bring us closer to CUIs that serve all potential users at all times of day.

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