The Intersection Deck: An Exploration of Intersectional Value-Driven Design

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Design cards systems are valuable tools for producing rich technology designs, but existing card systems often fail to include diverse, intersectional sets of perspectives and values. Building off prior work in co-design and value-sensitive design (VSD), we propose a system for generating design cards that prompts designers to explore values driven by rich, intersectional identities. First, we present a design process for developing a value-sensitive design card system, along with reflections on the challenges within this design space. We then present the design of The Intersection Deck, a new design card system consisting of physical design cards and a participatory design activity to generate new cards. Finally, we present the results of a two-stage usability study of the system, and provide reflections on the final system and potential areas for further development.

Additional Key Words and Phrases: Design Cards, Intersectionality, Identity Facet

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1 INTRODUCTION

With new technology created every day, there are countless opportunities to create tools that promote and support certain values. Designers therefore play a large role in deciding what values to reflect in the technology they design; however, their values do not necessarily reflect those of the populations they are designing for, particularly underrepresented minority populations. Given that tech artifacts are inherently political [10], this disparity between the values designers imbue into their technologies and the values of minority populations further marginalizes minority voices.

In this paper, we focus on the concept of *intersectionality* as a means of structuring identity that is underutilized in technology design. Intersectionality focuses on the overlaps between different facets of identity, and understanding each person's unique experiences that are derived from their various backgrounds. It is very difficult to ensure intersectional perspectives are represented in a design team, as every person has a unique intersectional perspective; therefore, we consider how to uplift these underrepresented voices within to create a more equitable technology design process.

With this framing in mind, we present *The Intersection Deck*, a card-based design tool for integrating intersectional perspectives into technology design. *The Intersection Deck* has two main components: a design methodology to generate intersectional, value-based design cards with non-designer participants, and a card-based design tool to be used by technologists within the design process. We describe and evaluate both these components within this paper.

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2 RELATED WORK

This section first reviews the efforts of Value-Sensitive Design in bringing human values to the forefront of technological design practices. We then explore existing design card systems, highlighting the gaps presented in the exploration of diverse, intersectional identities and perspectives. Several notable design cards that utilize human-centered design approaches are presented in this section.

2.1 Value-Sensitive Design

Value-Sensitive Design is a concrete, theoretical approach to technical design practices, centering around human value. VSD provides designers with strategical methods to identify and shift the values of direct and indirect stakeholders to the forefront of their design and developmental process. Direct stakeholders are defined as those who are visibly involved with technology, whereas indirect stakeholders are secondary users of technology. VSD highlights the way in which technology both shapes society and is shaped by social factors [6]. A key contribution of this grounded approach is the development of methodological approaches driven by values in the context of technology. The VSD methodology consists of three iterative approaches, which include conceptual, empirical, and technical investigations.

In the first phase, conceptual investigation, identifying the values of stakeholders in a comprehensive manner is the central focus. This investigation examines core human values potentially supported or neglected by design. The empirical investigation involves qualitative and quantitative measures to assess the efficacy of the design. The focus within this phase is to inform designers of the impacts their design has from a value assessment perspective. The final stage is the technical investigation, in which the technical aspects of the design are assessed on how well it supports the values presented in the conceptual investigation. The notable difference between the empirical and technical investigation phase is the examination of design from a human-centered and technical approach.

2.2 Design Cards

Physical cards have been increasingly used to present a tangible way of making knowledge across domains accessible to designers. Design cards' playful, enticing and easy to use format make this tool an effective system for communicating valuable information that is digestible for users. Artefact presents the Tarot Cards of Tech [2], a deck of cards that prompts dialogue around the impacts that technology could have on society. This tool orients around how different groups would use a technological device and explores the general consequences that could arise from the usage of such technology. However, these groups are largely based on cultural trends, rather than specific populations and identity groups. Shinohara et al.'s [9] Social Accessibility Design Cards methodology provides a framework for using and generating design prompts related to social accessibility, and demonstrates how designers can use design card generation as a co-design methodology. Kirchner et al. [7] further explored the utility of design cards as an ideation tool, prompting designers to re-think potentially harmful assumptions in personal health informatics applications. There are dozens of other sets of design cards, many of which are catalogued in Roy et al.'s 2019 survey of design cards [8], but some other notable socially-minded design cards include IVTO's Foresight Cards-STEEP edition [3], Namahn's Human Drive Cards [1], and Bekker and Antle's Developmentally Situated Design (DSD) Cards [5]. However, among the existing cards discussed, none explore how design can serve to address values that are driven by rich, intersectional identity facets.

3 METHODS

3.1 Design

To design our card framework, we first conducted a literature review of existing design card systems to identify an initial set of design parameters for our system. We additionally built on Aarts et al. [4], Wölfel & Merritt [11], and Roy et al.'s [8] meta-reviews of design card systems to establish the various facets for our designs, such as "appearance," "specificity," etc.

Our iterative design process consisted of four rounds, with each round consisting of Brainstorming, Prototyping, Evaluation, and Reflection phases. In the Brainstorming phase, we used a combination of free-form discussion and [various brainstorming methods] to generate a design for a card system that satisfied the current set of design parameters. In the Prototyping phase, we made low-fidelity prototypes of potential cards; this stage allowed us to identify potential challenges in presenting desired content. In the Evaluation phase, we ran brief design exercises with them, attempting to apply them to various hypothetical technologies including smart watches, IoT/smart home devices, and social media; this stage allowed us to evaluate the efficacy of our system, highlighting issues with our system's mechanics and identifying challenges users might have in applying the cards to various technologies. Finally, in the Reflection phase, we summarized the issues uncovered in the Prototyping and Evaluation phases, and proposed a new set of design parameters for the following iteration.

In the final (fourth) round of this design process, we made minor modifications to this process: in the Prototyping phase, we made higher fidelity prototypes, to produce a richer sense of the cards' final design. In the Evaluation phase, we conducted a two-part user study with two groups of five participants to produce a richer evaluation with people not on the research team. (We present the methods of these user studies in the following subsection.) Finally, in the Reflection phase, we conducted a semi-structured design feedback session with the participants from the previous user studies. We present the results of these final evaluation and reflection phases in our Results section.

3.2 Evaluation

For the final Evaluation and Reflection phases of our design process, we conducted several user studies to better evaluate our tool in a more realistic context. For our first user study, we recruited five graduate students from the University of Washington to participate in a participatory design activity to produce their own unique design cards for use within our system. (We further describe this participatory design activity in our Design section.) After completing this activity, we conducted semi-structured interview-style feedback sessions with each participant individually, asking them to reflect on the experience of participating in the design activity.

For our second user study, we recruited five new graduate students from the University of Washington to participate in a mock technology design session that utilized the cards produced from our first user study. These participants were all familiar with technology design sessions and similar design card systems. After completing the design session, we conducted a semi-structured group feedback session with the participants, asking them to reflect on the experience of using the card system, and how they felt the cards affected the end product. We present the results of these studies in the following section.

4 RESULTS

4.1 Card Creation Sessions

Our Card Creation Sessions produced a total of 24 design cards across our five participants, each consisting of a Value a participant shared, the facets of their identity that they felt informed that Value, and additional space for description, context, and specific examples the participant felt

would help designers understand the Value. Three completed cards produced in our Card Creation Sessions can be found in **Figure 1.** (Additional examples of Perspectives and Values can be found in **Table 2** in the Appendix.)

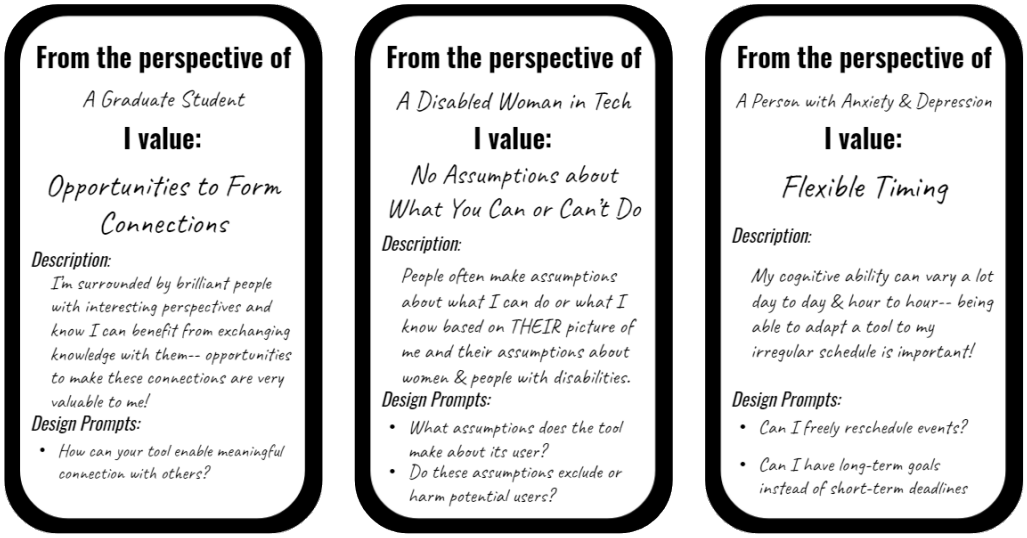

Fig. 1. Sample Intersection Deck Value Cards produced from Card Creation Sessions.

We present further analysis of the Perspectives and Values shared in the participants' cards, as well as the results of our feedback sessions, in the following sections.

4.1.1 Identity Facets that Informed Values.

We found that participants were eager to share perspectives from a wide range of identity facets, including facets related to their gender & sexuality, careers, race, and disability status. The full list of identity facets participants used in their cards can be found in **Table 1** in the Appendix.

Prevalence of Underrepresented Voices. The identities our participants used in their design cards covered a range of both underrepresented voices and well- or over-represented voices within tech & design. However, the majority of the perspectives shared were from underrepresented voices, suggesting that our participants may have been motivated to speak from these underrepresented perspectives. However, acknowledging our small sample size, we leave it to future work to explore if this effect persists on a larger scale.

One of the more notable cards with an "overrepresented" voice was a card from a "White, Nondisabled Male" with a value of "Recognizing One's Own Privilege"– though possibly the exception rather than the rule, this card presents an interesting case where a participant speaking with an overrepresented voice can still produce a meaningful design prompt.

Intersectional Perspectives. Notably, many of the perspectives contributed on the Design Cards were intersectional: 13 of the 24 cards presented a value from more than one facet of a participant's identity. Additionally, all but one participant produced at least one intersectional Design Card, and each participant had at least one card that spoke from a unique perspective not captured in any other participant's cards. **Figure 2** presents the range of intersectional identities encapsulated in our participants' completed cards.

Though it is certainly difficult to predict how this would generalize at scale, we interpret this preliminary result as a testament to our card creation system's focus on intersectionality: by asking

participants to brainstorm values both within each identity facet and across identity facets, our system led participants to produce intersectional value cards that they self-selected as cards they wanted in their completed decks.

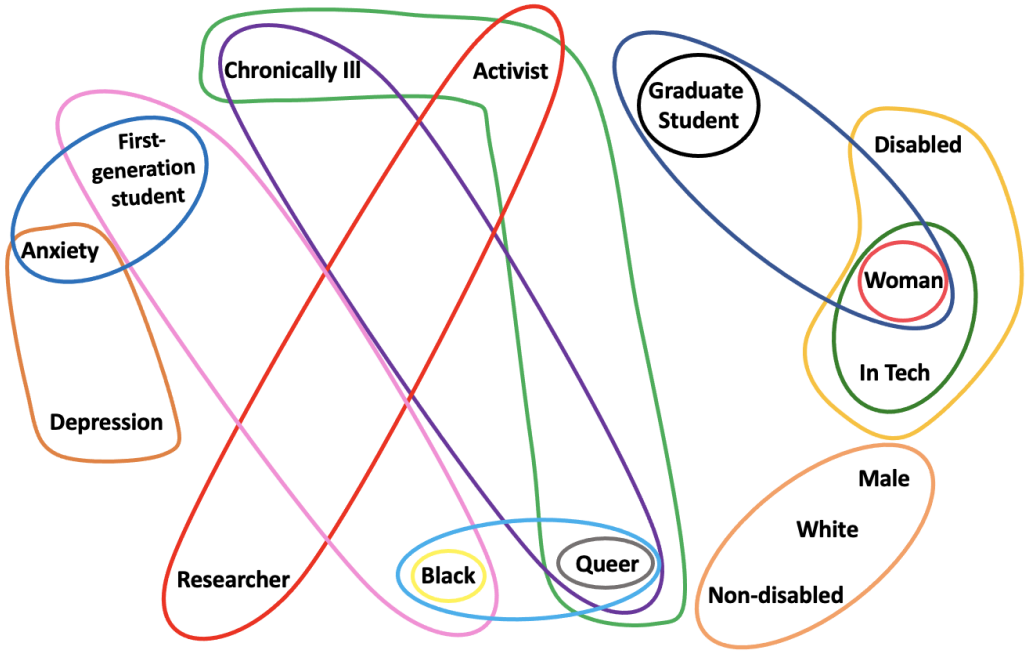

Fig. 2. **Perspectives & Intersectionality.** Each circle represents the one or more identity facets a participant said informed a particular value they shared on a design card. (Duplicate circles have not been included.)

4.1.2 Values.

Our participants included a diverse range of Values in their design cards, ranging from considerations for social interactions (e.g., "Asking about Background Knowledge" and "Candid Discussions of Identity"), to specific design guidelines for technology (e.g., "Asking about Defaults" and "Flexible Timing"), to higher-level societal principles (e.g., "Safety" and "Representation of Black People"). **Appendix B** presents several characteristic Values our participants shared and the corresponding perspectives that informed them.

Some of the Values participants included in their cards were more generalizable than others– the "Candid Discussions of Identity" Value, for instance, has a much narrower set of contexts in which it applies compared to some of the other Values. However, it provides a very clear set of guidelines for the contexts in which it does apply.

We further explore how designers engaged with these varyingly generalizable cards in the Design Prototyping Session subsection of our Results.

4.1.3 Process.

Following the completion of each card creation session, we debriefed with each participant individually, asking them to reflect on their experience throughout each activity. Participants reported that actively engaging in discourse throughout each stage of ideation was constructive and prompted new ways of thinking. This presents an interesting challenge for future iterations of the card

creation system, as it may be difficult to avoid biasing participants' cards when engaging in a dialogue.

4.2 Design Prototyping Session

4.2.1 Design Intervention.

Participants expressed that they felt the Intersection Deck prompted further ideation and increased inclusive brainstorming. P1 noted that the cards aided in the exploration of the impacts design has across communities, stating, "Before the cards, we didn't really discuss how our design would impact different communities." P2 further emphasized the cards' utility in inclusive ideation: "It's hard to think about other people's experiences when you don't face them yourself, so the design cards help in that aspect." P3 commented on the cards' ability to prompt new design considerations, saying they "were able to add additional features after the cards were presented."

In their surveys, all our participants expressed that they felt the design was *more inclusive* after using the deck, and that the design was of a *higher quality* after using the deck.

4.2.2 Participant Feedback.

Although all participants felt the cards improved the inclusivity of their design, some participants also expressed that the sample deck utilized in the design activity left them with the question of 'who else am I leaving out?' Some participants also expressed the desire for a digital format for accessing and adding additional cards.

5 DISCUSSION

5.1 The Intersection Deck: Pros & Cons

Overall, we feel this initial iteration of the Intersection Deck was reasonably successful: it prompted individuals to reflect on their intersectional identities and generate value-based design prompts, and these prompts were successfully utilized by designers in a way that they felt improved the quality and inclusiveness of their design.

One notable shortcoming of the current iteration of this system is its limited size: given more card creation sessions with a broader range of participants, a larger deck can be compiled to include a larger set of values and incorporate even more diverse voices. Ideally, each set of design cards produced in card creation sessions will be included in an expanding communal deck of cards that designers can utilize when creating technology.

5.2 Future Work

Echoing sentiments expressed by our design session participants, a clear next step is to compile a larger set of Intersection Deck cards with a broader range of participants. This would hopefully have a two-part contribution: it would create a larger, more comprehensive deck for designers to use, as well as allow us to build up a deeper understanding of what values people from diverse backgrounds want considered in technology design.

Additionally, though our preliminary results suggest our current system prompts designers to *consider* diverse values, it would be valuable to consult with people who generate Intersection Deck cards to see if they feel their values are adequately incorporated into the resulting designs.

Finally, recognizing the bias inherent in evaluating our tool with UW graduate students, we would also be interested in exploring how the tool is received in a setting with more environmental validity, such as if it were deployed at a larger scale within a professional technology design setting.

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A SUPPLEMENTAL TABLES

Table 1. Identity Facets Used by Participants in Card Creation Sessions

Category	**Shared Identity Facets (Count)**
Gender & Sexuality	Woman (4), Queer (2), Male (1)
Ability/Disability & Health	Disabled (1), Chronically Ill (1), with Anxiety (1), with Depression (1), Nondisabled (1)
Profession / Communities of Engagement	Grad Student (3), Activist (1), Person in Tech/STEM (1), First-generation Student (1)
Race	Black (1), White (1)
Age	Younger Generation (1)
Activity	Person who walks (1)

Table 2. Selected Identity Facets & Values from Card Creation Sessions

Participant's Perspective	Corresponding Values
Person with Anxiety and Depression	**Flexible Timing:** My cognitive ability can vary a lot day to day & hour to hour– being able to adapt a tool to my irregular schedule is important!
Black Woman	**Representation of Black People:** As a Black woman, the surfacing of diverse voices, particularly from the Black community, for storytelling and safety purposes is essential in creating tech that serves for all. A lot of tech fails to serve the Black community and even targets/imposes harmful consequences on us.
Disabled Women in Tech	**Asking about Defaults:** Default settings & options often include various assumptions about the user's identity & ability. I prefer to be asked my preference, rather than be given a default.
Queer & Chronically Ill Person	**Candid Discussions of Identity:** As someone who often needs to disclose parts of my identity, I appreciate when people are politely receptive and don't make a whole ordeal of my disclosure.
Woman	**Safety:** I believe physical and mental safety should be prioritized. Tech should be tested on many groups of people to ensure safety – a lot of tech is tested exclusively on white men
First-generation Student with Anxiety	**Asking about background knowledge:** There's a lot that you're just "supposed" to know as a grad student, but with no prior exposure to academia, it feels like I need to play catch-up; however, my anxiety often makes it hard to ask for explanations. On the flip side, it also sucks when people assume I don't know things that I do actually know.