



# Stakeholder Tokens: a constructive method for value sensitive design stakeholder analysis

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## Abstract

A robust stakeholder analysis requires extensive conceptual and empirical work. Yet it is often unclear how to effectively do so. This paper introduces a new method—the Stakeholder Tokens—for designers to elicit a more inclusive set of stakeholders and gain better understanding of stakeholder interrelationships and dynamics. Stakeholder Tokens present a playful hands-on design approach to support value sensitive design stakeholder analyses by employing a style of role play.

**Keywords** Aid-in-dying · Creative toolkits · Publics · Stakeholders · Stakeholder analysis · Value sensitive design

## Introduction

One of the central aspects of value sensitive design (VSD) is to identify key stakeholders “who are or will be significantly implicated by the technology” under study (Friedman and Hendry (in press), Friedman et al. 2006). Whose values exactly are to be taken into account? Why their values and not others? Value sensitive design asks designers to seek out a robust set of key stakeholders and to legitimize their inclusion in the design process. Furthermore, as technology becomes more pervasive, its implications become increasingly widespread and complex. In turn, more extensive conceptual and empirical work is needed for understanding a broad range of stakeholders.

In this paper I introduce a new method for designers to better understand stakeholders and their dynamic relationships—the Stakeholder Tokens. Inspired by LEGO Serious Play (Cantoni et al. 2009), Stakeholder Tokens employ a style of role play, presenting a playful and holistic approach to VSD stakeholder analysis. In line with the tradition of participatory design (Bjerknes et al. 1987), Stakeholder Tokens emphasize the role of stakeholders’ participation in creative design processes as a way to gain more salient and realistic understanding of the study context. In particular, this new method aims to elicit a more inclusive set of

stakeholders, identify a more robust set of key stakeholders, and develop a more holistic picture of stakeholder dynamics. In the following section, I elaborate on the construct of stakeholders in VSD and how this method advances VSD stakeholder analyses.

## Stakeholders in VSD

In the field of human-computer interaction (HCI), there has been a longstanding and ongoing effort to critique, expand, and reimagine the notion of users (Bardzell and Bardzell 2015; Card et al. 1983; Winograd and Flores 1986). Contributing to this discourse, VSD adopted the concept of stakeholders to reach beyond users, and to systematically take into account all that are (or will be) significantly implicated by the technology (Miller et al. 2007). Importantly, VSD introduced the concepts of direct and indirect stakeholders. Direct stakeholders, on the one hand, refer to those who interact directly with the technology, often characterized as users in HCI. Indirect stakeholders, on the other hand, refer to those who rarely or never interact with the technology but are nonetheless affected by the technology. Furthermore, while VSD primarily focuses on accounting for human values, more recent discourse in VSD attempts to expand the boundaries of stakeholders to engage with non-human entities (e.g., animals, ecosystems, cultural heritage) (Friedman and Hendry (in press)). Given this broad perspective on stakeholders, VSD asks designers to seek out a robust

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set of key stakeholders—those considered most critical to include in the design process.

Over decades, VSD has explored a number of stakeholder-related issues, including: multiple roles and fluctuating boundaries, in which a single person may engage in multiple roles with respect to a given technology (Czeskis et al. 2010); unexpected stakeholders, in which new stakeholders may emerge as new technology is deployed and appropriated in a particular social setting (Miller et al. 2007), and excluded stakeholders, in which designers acknowledge a subset of stakeholders that were not included or rather excluded in the design process (Rector et al. 2015). These issues often emerge from complex social dynamics and defy straightforward methods for identification. Stakeholder analyses, to do them justice, may require extensive conceptual and empirical work. Yet it is often unclear how to do so effectively. Most studies provide a conclusive statement of the key stakeholders without necessarily providing a detailed explanation about the method through which the stakeholders were identified or selected. Addressing this gap, Stakeholder Tokens advance the previous work by exploring a concrete method and tool for conducting stakeholder analyses both with designers and with potential stakeholders.

## Stakeholder Tokens: a new method

The goal of the Stakeholder Tokens method is threefold: (a) to generate a more inclusive set of stakeholders, i.e., by surfacing hidden, overlooked, or neglected stakeholders; (b) to identify a robust set of key stakeholders, i.e., by providing an empirical rationale for their inclusion; and (c) to clarify stakeholder dynamics, i.e., within a complex (and often conflictual) socio-political setting. Stakeholder Tokens aim to do so by employing a style of role play.

Distinct experiential characteristics of Stakeholder Tokens are as follows: (1) The method is *participatory*:

in line with the tradition of participatory design (Bjerknes et al. 1987), Stakeholder Tokens encourage stakeholders to participate in hands-on design activities to put their own life experiences into their making and storytelling. (2) The method is *visual and tactile*: Stakeholder Tokens provide a tangible tool that helps participants to make sense of their mental models of complex stakeholder networks and relationships. And (3) the method is *creative and playful*: in line with ludic design (Gaver 2009), Stakeholder Tokens provide an opportunity for participants to reflect on their inner thoughts and emotions through a form of play.

In this section, I describe a sequence and activities to help plan an informative Stakeholder Tokens research activity:

### 1. Select participants

Researchers, who are familiar with the topic of study, derive an initial list of direct and indirect stakeholders, casting a reasonably wide net. Then, given resource constraints, researchers narrow these to a small subset of stakeholder groups with whom to engage in the research activity. To select the specific groups, researchers may draw on a variety of principles. For example, researchers can either prioritize high-profile (often direct) stakeholder groups to gain a deeper and more nuanced understanding of the pre-identified key stakeholders or, conversely, prioritize under-represented (often indirect) stakeholder groups to gain a broader and more diverse understanding of the marginalized or hidden stakeholders.

### 2. Select token materials

A token is a tangible, visual marker that represents a stakeholder in this design activity. In other words, a token is a miniature stakeholder: it is small enough to hold in one's hand and easy to move around on the tabletop (see Fig. 1). Each token can have a unique identifier such as color, shape, or texture to bring out personality and make each stakeholder easily distinguishable. Its form is intuitive and



**Fig. 1** Example of tokens used in the case study. Each wooden peg doll is 2.5 in. tall and weighs 0.6 ounces (on the left). Other example materials that can be used as tokens (on the right). (Color figure online)

familiar at a visceral level, while still playfully ambiguous to avoid the stereotypical representations of gender, race, age, and so forth. A recommended number of tokens to prepare for each session is between 10 and 20.

### 3. Create a list and labels

Participants may engage in either individual or small group activities. As a first step, ask participants to quickly generate a list of all relevant stakeholders by creating physical labels (see Fig. 2). Use materials such as painter's tape, stickers, or small gift tags. Prompt participants to think about those who are more central to the issue at stake as well as those who are left out of the mainstream:

- *Who are the important people, groups, or communities involved?*
- *Who else do you think would care about this issue and why? Is there anyone who is left out?*

### 4. Attach labels to tokens

Next, ask participants to use the tokens to represent different stakeholders by attaching labels. Depending on context, facilitators can prompt participants to either prioritize their tokens (e.g., bigger tokens mean more important stakeholders) or randomly assign labels.

### 5. Sketch stakeholder interrelationships

Ask participants to place the tokens on a large sheet of paper and to use pens to sketch the interrelationships among those stakeholders (see Fig. 2). As appropriate, prompt participants to indicate what information is communicated within or across stakeholders via what medium. As appropriate, prompt participants to enact a short scenario to illustrate the interaction among stakeholders:

- *What are the relationships among these stakeholders? Please make a drawing to show their relationships.*

- *Please act out a short scenario using your tokens to illustrate some of these relationships.*

## Case study: medical aid-in-dying

### Project synopsis

The genesis of the Stakeholder Tokens method stems from a larger, on-going project that investigates the roles of information and communication technology (ICT) for shaping and cultivating dialogue around issues of public concern. In recent years, publics (sometimes used interchangeably with “civics”) have gained interest in the field of HCI (e.g., DiSalvo 2012; Jenkins et al. 2016; Olivier and Wright 2015). One notable trend in these lines of research is to take an emergent and pluralistic view on *publics* as opposed to *the public* (DiSalvo 2012). Contemporary publics, leveraging the widespread use of social media, are expansive (e.g., Facebook serving as a pseudo-public platform for political actions by leveraging its massive, more than a billion user base). It is also expected that such publics are inclusive and diverse in composition. Publics, according to the principles of liberal democracy, concern everyone from all walks of life regardless of ethnic or racial identity, gender identity, sexual orientation, age, socio-economic status, education level, religious beliefs, and differences in physical and cognitive ability. A question emerges: How do we elicit all the complexity and nuances in publics and then synthesize them into a consolidated, operative image of the *stakeholders*? With this question in mind, Stakeholder Tokens were developed as a method for conducting VSD stakeholder analysis in an on-going case study that focuses on multifaceted issues of medical aid-in-dying in the United States.

Medical aid-in-dying is a nuanced and evolving concept. To date there is no succinct, agreeable definition of what comprises medical aid-in-dying. In the United States, the term has emerged in recent years as a preferred alternative to



**Fig. 2** Participants creating labels (on the left) and making sketches using self-labeled tokens (on the right). (Color figure online)

the much-debated (and still commonly used) term physician assisted suicide (PAS), which carries negative connotations of “auto-killing” or “self-killing.” In contrast to physician assisted suicide, medical aid-in-dying is often used in a conservative manner to refer to a restricted practice in which a physician provides a *terminally ill* patient with a prescription for a lethal dose of medication, *upon the patient’s request and under certain conditions*, for the patient to *self-administer* if she or he chooses to hasten her or his *impending death* (Stark et al. 2013). Yet, others argue that medical aid-in-dying could include other practices that reach beyond the narrow restriction above.

As of this writing in 2017, 6 out of 50 states in the US have implemented laws that codify and allow access to medical aid-in-dying. Notably, in 2015 and 2016, California, Colorado, and the District of Columbia each passed its own version of medical aid-in-dying legislation, creating a momentum among publics to engage in various discussions around the topic. The topic invokes diverse (and often conflicting) perspectives among publics, providing a rich context for exploring stakeholder analyses.

### Data collection and analysis

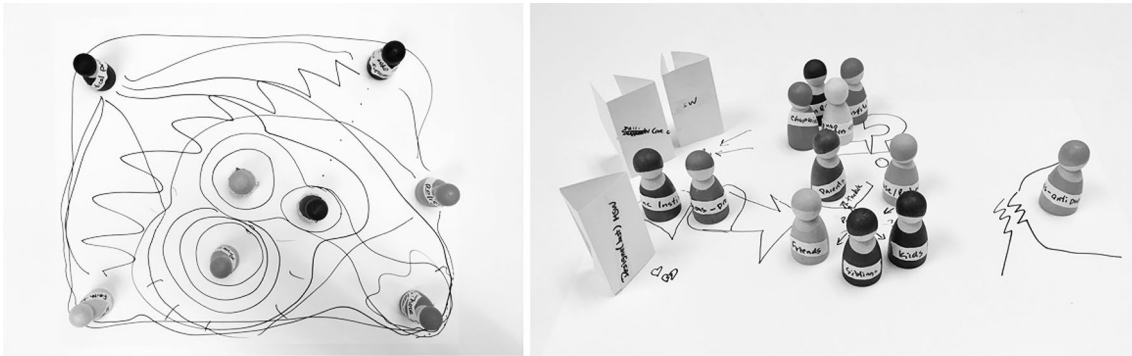
In summer 2016, I explored the Stakeholder Tokens method in work with 27 participants from the state of Washington where medical aid-in-dying was made legal and went into effect in 2009 under the Death with Dignity Act. In this initial case study, I focused on two specific communities: (1) those who are affiliated with local medical institutions including physicians, psychiatrists, nurses (RN), social workers (MSW), hospital chaplains, healthcare administrators, and bioethicists; and (2) those who volunteer for NGOs that offer end-of-life counseling and support services to patients. I recruited 15 participants from medical institutions (10 females, 5 males; age 35–65,  $M=50$ ) and 12 participants from NGOs (7 females, 5 males; age 23–75,  $M=60$ ). All participants had experience in offering end-of-life counseling to patients. Considering the sensitive and taboo nature of the research topic, I used snowball sampling to gain access to potentially hidden populations. Depending on the results of this initial study focused on health care workers and volunteers, I anticipate conducting additional studies with other populations whom I consider to be more vulnerable (e.g., patients and families) or adversarial (e.g., anti-medical aid-in-dying activists).

My main interest for this study was to build a holistic picture of the stakeholder network as oppose to draw a comparison between specific stakeholder groups. Therefore, I collapsed data from the two populations—15 health care workers and 12 volunteers—to conduct holistic analyses over the participant-generated stakeholder labels and sketches. In this case study, each participant enumerated

8–17 stakeholders ( $M=12$ ,  $N=341$ ). I used open coding to generate an initial set of codes, which was refined through an iterative process of evaluation. Next, qualitative analyses were used to look for themes and patterns across the sketches. Specifically, I examined the *sequence* of articulated tokens (e.g., the first and last tokens that participants called out when explaining their sketches) and the *position* of tokens laid out on the page (e.g., tokens that were placed in the center or near the edges of the page). I also paid attention to the relationships among tokens expressed through pictorial means such as symbols, lines, shapes, and annotations. The video recordings of the sketching activities were transcribed and reviewed alongside the drawings for a more accurate understanding of participants’ intentions.

### Preliminary findings and reflections

The benefits of the Stakeholder Tokens method are at least fourfold. First, the capacity to generate a more inclusive and nuanced set of stakeholders. As a result of analyzing the labels, I identified 21 top-level categories of stakeholders with nuanced subcategories. For example, the role of physician was further elaborated into attending physician, prescribing physician, consulting physician, psychiatrist, palliative care physician, and so forth. Second, the capacity to surface hidden or neglected stakeholder groups. Participants identified a number of important yet underrepresented stakeholders such as medical examiners, morticians, authors and artists, military, Baby Boomers and shifting generations. Third, a tool for articulating dynamic and intertwined relationships among multiple stakeholders. The case study findings suggest that relationships among stakeholders are not necessarily linear, but multi-layered and relational, situated in a complex social and political context. Tensions may arise among more than two stakeholders; relationships may change as different stakeholders enter or exit a scene. Movable tokens and freehand drawings allowed participants to express such complexity and dynamics all within a single sketch (see Fig. 3). And forth, a tool for distinguishing core from peripheral stakeholders. Interestingly, in this case study, participants often distinguished their stakeholders in terms of *core* and *peripheral* stakeholders rather than in terms of direct and indirect stakeholders. Participants tend to place core stakeholders in the middle, while placing peripheral stakeholders toward the edges of their sketches. Such identification of core and peripheral stakeholders provides new language and insights into understanding key stakeholders beyond the existing VSD framework of direct and indirect stakeholders.



**Fig. 3** Examples of stakeholder sketches created during the medical aid-in-dying project. (Color figure online)

## Conclusion

In this paper, I introduced the Stakeholder Tokens method and provided preliminary reflections on some of the benefits of its use. A more detailed report of the case study findings is underway. While the Stakeholder Tokens method was developed to account for extremely varied and wide-ranging publics in the case that concerns medical aid-in-dying, I believe it can be useful in more general contexts that engage with fewer stakeholders. Going forward, I hope others working within different contexts will expand the use of Stakeholder Tokens. Still in a nascent stage, this method does not provide a complete answer to the questions: Whose values should be taken into account (i.e., key stakeholders)? Why their values and not others? Yet, Stakeholder Tokens provide a useful tool for expanding our understanding of stakeholders building on a robust empirical investigation. I hope this work will inspire a broader conversation in the value sensitive design community on stakeholders.

## References

- Bardzell, J., & Bardzell, S. (2015). The user reconfigured: On subjectivities of information. In *Proceedings of The Fifth Decennial Aarhus Conference on Critical Alternatives* (pp. 133–144).
- Bjerknes, G., Ehn, P., Kyng, M., & Nygaard, K. (1987). *Computers and Democracy: A Scandinavian Challenge*. Aldershot: Gower Pub Co.
- Cantoni, L., Botturi, L., Faré, M., & Bolchini, D. (2009). Playful holistic support to HCI requirements using LEGO bricks. In *Proceedings of the International Conference on Human Centered Design* (pp. 844–853).
- Card, S. K., Moran, T. P., & Newell, A. (1983). *The Psychology of Human-Computer Interaction*. Mahwah: Lawrence Erlbaum Associates Publishers.
- Czeskis, A., Dermendjieva, I., Yapit, H., Borning, B., Friedman, B., Gill, B., & Kohno, T. (2010). Parenting from the pocket: Value tensions and technical directions for secure and private parent-teen mobile safety. In *Proceedings of the Sixth Symposium on Usable Privacy and Security (SOUPS '16)*, Article No. 15. <https://doi.org/10.1145/1837110.1837130>.
- DiSalvo, C. (2012). *Adversarial Design*. Cambridge: The MIT Press.
- Friedman, B., & Hendry, D. (in press). *Value Sensitive Design: Shaping Technology with Moral Imagination*. Cambridge: The MIT Press.
- Friedman, B., Kahn, P. H., & Borning, A. (2006). Value sensitive design and information systems. In P. Zhang & Galletta, F. (Eds.), *Human-computer Interaction in Management Information Systems: Foundations*. M.E. Sharpe, Inc., (pp. 348–372).
- Gaver, B. (2009). Designing for homo ludens, still. In *(Re)searching the Digital Bauhaus* (pp. 163–178).
- Jenkins, T., Le Dantec, C. A., DiSalvo, C., Lodato, T., & Asad, M. (2016). Object-oriented publics. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '16)*, (pp. 827–839). <https://doi.org/10.1145/2858036.2858565>.
- Miller, J. K., Friedman, B., Jancke, G., & Gill, B. (2007). Value tensions in design: the value sensitive design, development, and appropriation of a corporation's groupware system. In *Proceedings of the 2007 international ACM conference on Supporting group work (GROUP '07)*, (pp. 281–290). <https://doi.org/10.1145/1316624.1316668>.
- Olivier, P., & Wright, P. (2015). Digital civics: taking a local turn. *Interactions*, 22(4), 61–63. <https://doi.org/10.1145/2776885>.
- Rector, K., Milne, L., Ladner, R. E., Friedman, B., & Kientz, J. A. (2015). Exploring the opportunities and challenges with exercise technologies for people who are blind or low-vision. In *Proceedings of the 17th International ACM SIGACCESS Conference on Computers & Accessibility (ASSETS '15)* (pp. 203–214). <https://doi.org/10.1145/2700648.2809846>.
- Stark, H., Dudzinski, D., & White, N. (2013). Physician aid-in-dying. Retrieved January 2017 from: <http://depts.washington.edu/bioethx/topics/pad.html>.
- Winograd, T., & Flores, F. (1986). *Understanding Computers and Cognition: A New Foundation for Design*. Intellect Books.