A Design Provocation for Humble Designers and Empowered Users

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Abstract. Designs are ultimately imbued with the values and judgments of the designers who made them. This means that there is an inherent power imbalance between designers and users. Some design philosophies embrace the position of designer as empowered architect (*libertarian paternalism*), while others try to shift power to users by integrating them into the design process (*participatory design*). In this paper we present a third approach called "*use-time nudge*," which maintains the authority of designer at *design-time*, yet grants the users more power at *use-time*. Use-time nudge challenges designers to question the values they imbue into their work at design-time and respond by deliberately deferring those judgments to the user to be made at use-time.

Keywords: Use-time nudge · Design provocation · Libertarian paternalism
Participatory design

1 Introduction

1.1 Re-imagining Designer-User Relationship

In his 1980 article, "Do Artifacts Have Politics?" Langdon Winner pointed out that no design is free from embedding designers' beliefs—designs inevitably represent designers' cultural, political, philosophical, religious, ethical, or aesthetic values [18]. No design is value neutral, and the act of designing is a form of articulating the designers' constant efforts to configure user activities (and users). As such, designers are destined to shape users' experiences in some way.

In this paper, we explore two established philosophies for navigating designer-user relationships: *participatory design*, which seeks to ameliorate the designer-user power imbalance, and *libertarian paternalism* [16], which embraces the position of designer as empowered experience architect. We then use these philosophies to introduce the idea of *use-time nudge* as a design provocation. We see use-time nudge as a way (1) for designers to reflect on the values they bring to their work, and (2) for users to design their experience with an artifact *after* the design of the artifact has been completed.

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1.2 Philosophies on Designer-User Relationship

Different design professionals and researchers have tried to either embrace the imbalance of power in designer-user relationships or ameliorate it through different design practices.

For example, stemming from a Marxist commitment to democratize workplaces and empower workers, participatory design engages users in the design process [12]. Participatory design aims to democratize the design process and offset the unequally distributed power between designers and users by endowing users with opportunities to affect design decisions [3, 12].

On the other hand, we find approaches like that advocated by "Nudge: Improving Decisions About Health, Wealth, and Happiness" [16]. Drawing from social science findings, Thaler and Sunstein argue that people oftentimes make bad decisions—"decisions they would not have made if they had paid full attention and possessed complete information, unlimited cognitive abilities, and complete self-control [16, p. 5]." Based on this premise, they advocate the idea of designer as choice architect, whose responsibility it is to create designs that nudge people into making better decisions. To distance their idea of nudge from coercion, the authors introduce the term *Libertarian Paternalism* as a subtle and nonintrusive way of guiding users' behaviors [16]. This philosophy both acknowledges that designers have power over users and encourages designers to embrace that power as a *paternalistic figure*, strengthening (in a supposedly positive way) the inequality between designers and users.

While these two opposing approaches differ in how they view the roles of users and designers, they both inherently differentiate design practices from use practices. Such separation between "the setting of design (design-time) and the setting of use (use-time)" is often thought of as a by-product of the industrialization of design [10]. Design-time is seen as belonging to the design professionals whose job is to create completed design artifacts, while use-time is associated with unpredictable situations in which the artifacts are deployed into the ever-changing user context [10]. *Participatory Design* aims to reform the relationship between the designer and the user by shifting user involvement from use-time into design-time, whereas *Libertarian Paternalism* focuses on the designers' responsibilities and authority in design-time.

As opposed to the design praxis and theories that differentiate design-time and use-time, it has also been argued that design does not end when designers produce designed artifacts, but encompasses the entirety of use practices in which the designed artifacts are taken, appropriated, redefined and reconfigured by the users. Users and designed artifacts co-define and constantly reconfigure each other in situ [13, 17]. Design in this sense is an on-going process in which users are always a legitimate part. However, this account of design does not indicate how designers can actively aid users' design involvement in use-time.

2 Design Provocation

We propose *use-time nudge* as a design provocation and alternative way of design-thinking on the designer-user relationship. Our approach draws from the ideas of *participatory design* and *libertarian paternalism*, taking a situated perspective in understanding design praxis. Like participatory design, we advocate designer-user equality. Like libertarian paternalism, we accept that designers influence users. What makes our approach unique is a commitment to designing systems such that users can create and design their own interactions at *use-time*.

2.1 A Thought Experiment: Three Different Approaches to a Design Problem

In this section, we present an example of a design problem the authors have encountered first-hand. We then examine how our approach to this design problem changes if we take a participatory design, libertarian paternalism, or use-time nudge approach.

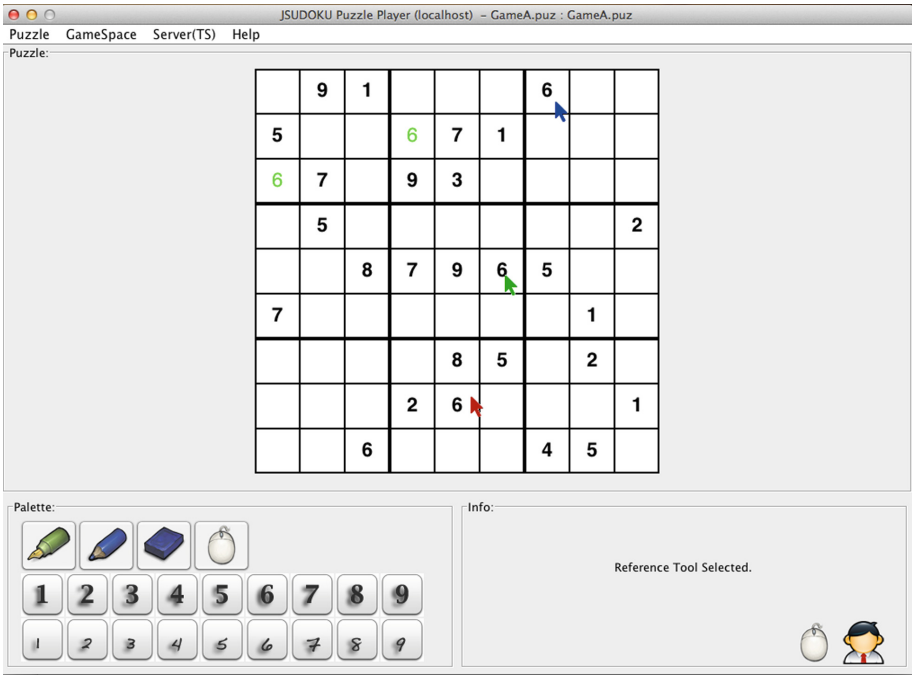

Fig. 1. Team Sudoku (Multi-pointer version) (Color figure online)

Design Task: Team Sudoku
Team Sudoku is a multi-user, parallel-distributed form of the Sudoku game. Sudoku presents the player with a 9 × 9 board with digits between 1 and 9 in some cells.

The goal of Sudoku is to fill the board so that each of the nine columns, nine rows and nine distinct 3×3 blocks contain exactly one instance of each digit from 1 to 9. Games are differentiated from one another by the number and location of starting digits. In the computerized form, each distinct game initially contains digits that cannot be written over or changed except by starting a new game, and that are a different color (black) from those that are in play (green).

Team Sudoku provides users three distinct features for manipulating the board. A pen tool enables users to insert entries on the board, and a pencil tool allows users to tentatively mark possibilities (note-entries). Users can delete any entries on the game board with an eraser tool. Team Sudoku is a multi-user collaborative variation of Sudoku in which players have their own computers with their own copies of the shared game board. When one player fills in a number, erases a number, or uses an indicating tool, the results are promptly shared on all players' screens.

Four different versions of Team Sudoku that vary in the support they provide for indicating were developed in-house. The four versions are a multi-pointer (shown in Fig. 1), a shared-pointer, a highlighter, and a no-pointer (no-help). In all cases, individual players use their private mouse indicators privately on their own screens. In the no-help condition, there is no explicit help for shared reference. In the multi-pointer condition, each person has a pointer that becomes visible to all the others in real time when the multi-pointer is selected, and the mouse button is depressed. This is a slight variation to the commonly implemented multi-pointer solutions. Unlike most other multi-pointer solutions that provide pointers always visible to the others, the multi-pointer used in Team Sudoku is only made visible by the activation mechanism. The design rationale for this variation is to make the activation mechanisms in all conditions compatible to each other. In the shared-pointer condition, each player has control of the single communal pointer when he/she has selected the shared-pointer and depresses the mouse button. In the highlighter condition, players select the kind of object they wish to designate (cell, row, column, block) by clicking and dragging the mouse over the object to show the other players what they mean.

Each player is assigned a color at system start up. When a player activates referential pointers or highlighters, his/her color appears on all the screens (e.g., if a player's assigned color is red, his/her multi-pointer/shared-pointer appears red on everyone's screen, or when s/he highlights a row, that row appears outlined in red on all screens).

The multi-pointer and shared-pointer conditions are context-free, that is, they involve a general sort of pointing. The highlighter condition is board-specific, that is, it is tailored to the particular items that the players are most likely to want to indicate. The no-help condition uses the verbal referential skills that we know from ordinary life and that are available in all other conditions.

Through a series of studies [4–6, 8], we explored interactions among collocated players in a collaborative Sudoku game. In these studies, we noticed that, in some groups, if a player made a critical mistake, the mistake would seemingly go unnoticed. However, subsequent data analysis revealed that many of the mistakes were noticed by the players, they simply decided not to discuss it. Some groups even decided not to exchange a single word during the entire gameplay [8].

As designers, we reflected on why some teams would hesitate to initiate social interaction even when it seemed critical in order to complete the game. This eventually

led us to search and consider possible design interventions to remedy those situations and foster meaningful user interactions.

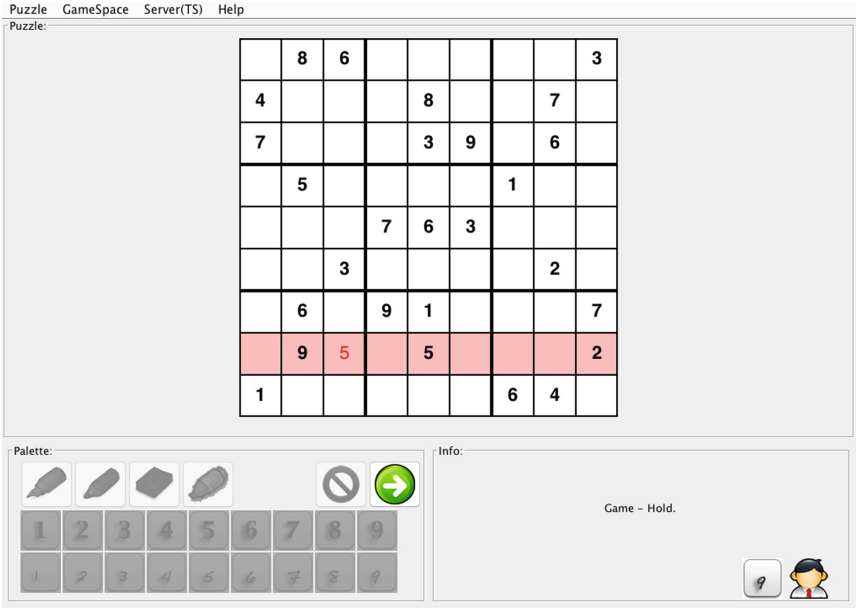

Fig. 2. Control Disabler (Hold-On/Freeze) Implemented in Team Sudoku: A player can click on the pause button to instantly put a hold on every player's game control buttons except the un-hold button.

Participatory Design Approach

First, a participatory design approach would lead us to actively involve users in designing the next phase of Team Sudoku. This could take the form of collaborative workshops, in which users discuss, sketch, and ultimately design solutions that account for their own values and desired experiences while playing the Team Sudoku game.

Libertarian Paternalism Approach

Alibertarian paternalism approach would lead us to design a solution that encourages users to behaviors we deem optimal. For instance, if we, designers, believe that mistakes need to be corrected quickly for optimal game play, we could make the Team Sudoku software monitor user entered numbers and alert the users when they make a mistake on the game board.

Similarly, if we believe that establishing "verbal equity" [1, 19] amongst group members is pivotal for an ideal group experience, we can design the software to monitor individual group member's contributions to the conversation, and to display each player's contributions to the group discussion (the amount of talk) on screen. In this way, we as designers *paternalistically* nudge users into making *better* behavioral decisions.

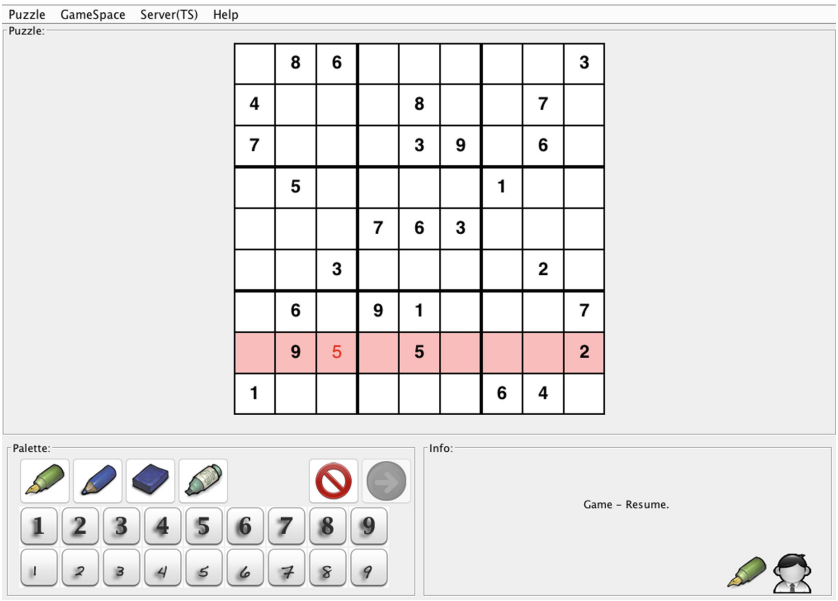

Fig. 3. Control Disabler (Hold-On/Freeze) Implemented in Team Sudoku: When all players click on their un-hold buttons, the game resumes on everyone's screen.

Use-Time Nudge Approach

Instead of taking an approach that tries to shape user-to-user interactions in design-time, we could try to enable users to find a solution to the problem during use-time. This section illustrates two sample examples of use-time nudge. By activating these interaction disruptors, users can create seamful moments in their interactions, and try to appropriate the moments to initiate desired social interactions. These designs are not intended to enforce certain kinds of user behaviors (e.g., talking), but only provide users opportunities to create seams in interaction. Users can use these disruptors to shape their interactions and influence other people's behaviors.

The first example (Figs. 2 and 3) is a "hold-on" button. The hold-on button would allow any of the participants to "hold" or "freeze" the game board until everyone in the group pushed the "un-hold" button.

Clicking the "hold-on" button would trigger a substantial, disruptive event during game play, encouraging user-to-user discussion. However, the decision to use the "hold-on" button is made completely by the users themselves during use-time. It grants them the ability to significantly shape their experience of the game.

The second example of interaction disruptors is a reverse-highlighter (Fig. 4). When activated, a reverse highlighter dims all the un-highlighted parts in the software on everyone's screen, creating visual distractions for other players. The group then can decide whether to ignore or appropriate the interactional opportunity initiated by one player.

These examples illustrate how designers in design-time can create features that nudge users, yet, by taking a use-time nudge approach, defer some value judgments to

users at use-time. Users can thoughtfully leverage these affordances to shape their own experience as well as the experience of collocated collaborators.

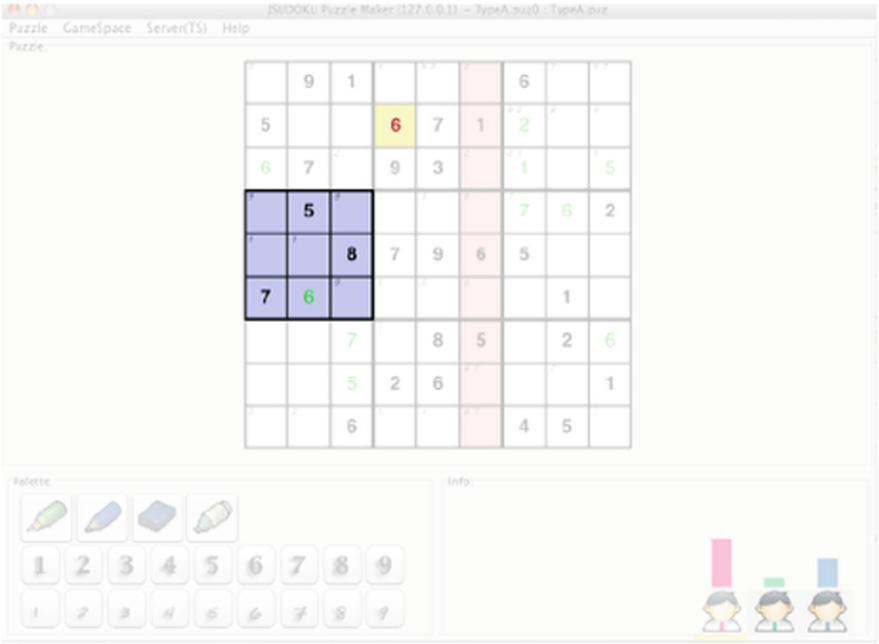

Fig. 4. Reverse highlighter implemented in Team Sudoku

3 Discussions

Processless design [7, 9] proposed and extended by the first author argues that intentional omission of embedding processes into digital artifacts delegates design responsibilities and powers to users, allowing users to construct more spontaneous, opportunistic and meaningful experiences and interactions in situ.

Like processless design, the idea of use-time nudge also enables and helps users to create and design their own situated experiences. Indeed, these two design concepts can collectively be used as conceptual guides for designing collaborative systems.

Yet, these two design ideas are mutually contradictory; by creating use-time nudge, designers inevitably embed processes into the system; by removing processes (that is, practicing processlessness), designers are forgoing opportunities to provide use-time nudge.

However, these two design ideas should not be understood as design axioms that must be practiced unconditionally. Nor should they be seen as constituent parts of possible design solutions in an ontological morphological design box (see [2]). Choosing to practice processlessness does not necessarily mean not designing use-time nudge, and designing use-time nudge should not be seen as refraining from processlessness. Instead,

processlessness and use-time nudge should be understood as incommensurate dichotomous design concepts that constitute a *design tension* [14] between the two. In other words, the tension between the two competing ideas of processlessness and use-time nudge "conceptualize design not as problem solving but as goal balancing" [14, p. 415]. The acts of designing in this sense are designers' continual efforts and praxes to find a proper equilibrium within the continuum of two opposing design forces (see Fig. 5).

Fig. 5. Design tension between *Processlessness* and Use-Time Nudge

How then can designers go about balancing two contending design goals and design collaborative systems? The design tension between processlessness and use-time nudge does not provide bullet-listed design implications, but only works as a conceptual guide for design. It offers designers space to consider the different interactional possibilities their designs enable (or disable) in the moment of use. In addition, the idea of tension is not tied to any specific design methodology and can indeed be easily incorporated into many existing design methods. For instance, the conceptual tension between processlessness and use-time nudge can be handled effectively by scenario-based design which has been known to provide "simultaneously concrete and flexible" ways of handling the "complex [and] uncertain nature of design" [11, p. 26]. *Claims* [11] that augment the scenario-based design process by providing critical parameters for design choices can also provide an effective way to put the design tension idea into practice. Claims can also help designers capture their design practice of using the tensions into a reusable knowledge base (see [11] for in depth descriptions of *claims* and *critical parameters*). By requiring designers to generate design tradeoffs (*upsides* and *downsides*), claims help designers to recognize the different interactional possibilities their design—what they put in or what they leave out—can create or hinder. Table 1 shows an example of a typical claim for a control disabler (Hold-On/Freeze) feature.

Table 1. Claim for control disabler

Hold-On/Freeze
+ users can initiate disabling process to forcefully capture other people's attention
+ users can appropriate the seamful moment created by the control disabler to design desired social interaction
– control disable can be an annoyance
– control disable can be a distractor

Both *processless design* and *use-time nudge* embrace and augment *Zensign*, the idea that what we leave out of a design is as important as what we put in it [15]. These design provocations can be seen as radical ideas, yet they are still important alternatives to existing design thinking. These two ideas constitute a design tension which in turn can help to create designs that are open to multiple interactional possibilities. Yet, designers also have to acknowledge that even with such designs, they cannot anticipate the innumerable ways that users and designed artifacts can interact. Users and designed artifacts reform, reformulate and redefine each other. This in turn mandates research on how users behave around the newly designed artifacts. This is a dialectic relationship in which studies in qualitative research and studies in design research affect each other and trigger reformation on both sides iteratively.

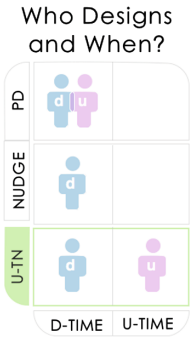

Fig. 6. Who Designs and When? We propose use-time nudge (U-TN, highlighted in green) as a new design philosophy. Participatory Design (PD) emphasizes design-time collaboration between designer and user. Nudge emphasizes design-time activities of the designer. However, use-time nudge emphasizes the design-time activities of the designer as well as the use-time activities of the user.

4 Conclusion

Artifacts have politics. That is, the values of designers are infused into their designs and ultimately affect users. In this paper we proposed that designers can acknowledge and embrace this power without resorting to paternalistic design framing (as in libertarian paternalism), and can share the design process with users without design-time user engagement (as in participatory design). The alternative we offer is the use-time nudge, a design philosophy that draws both user and designer as empowered, situated actors. Figure 6 summarizes these three different design philosophies.

Use-time nudge distributes power between designer and user roles. In design-time, the designer has ultimate authority over the process, but is reflective and humble. The designer deliberately leaves pieces of the interaction design unfinished, and defers some values, judgments and system behaviors to be determined at use-time. At use-time, the user is mindful, active, and empowered. The user is afforded opportunities

to reflect on and actively shape the interactions they and other users have with the artifact.

We see use-time nudge as a means of adding deliberate reflection into the design process. It challenges designers to identify and question the values imbued in their work, and scale their designs back to make space for the user.

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