

DISCUS: The Discussion Promoting Disc

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Fig. 1. DISCUS

Committed citizens are increasingly demanding participation in local projects. The involvement of urban society is also an important concern for the Berlin Senate. But implementation is not always easy: the bureaucratic effort is too high and usually only a few voices are heard. Residents also sometimes learn about projects in their direct surroundings far too late, often only after they can no longer contribute to the discussion. Yet participation is a necessary component of successful democratic structures.

DISCUS - developed in a process based on design-thinking - is a tool that aims to close this gap. As an autonomous mediator between the administration and the citizens, it appears in public space taking on the task of informing everyone about the project and inviting them to further discussion rounds or meetings. This opportunity for participation strengthens the citizens' identification with the project and their city. Discuss invites people to express, argue or reconsider their own opinions, which improves self-esteem and strengthens democracy.

Additional Key Words and Phrases: participation, interaction design, sovereignty, deliberative democracy

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1 INTRODUCTION

The sovereignty of governments in the digital sphere has grown in importance since the dawn of the Internet, and there is ample evidence that its value has exploded since the beginning of the century in both authoritarian and democratic governments. The main indicator is the clear tendency of those governments that are trying to reinstate the nation-state. This trend does not appear to be slowing down anytime soon [5].

Part of the modern understanding of digital sovereignty at the government level is to extend the expectation of a state's citizens that the state will protect their security and privacy to the digital realm [5]. Another interpretation of digital sovereignty is found at the individual level. Combining both interpretations, the result is the notion of citizen-centric digital sovereignty. This primarily encompasses the sovereign actions of citizens within a political system, contextualized at the digital level. In the wake of Wikileaks, Edward Snowden, and the concerns raised about the manipulability of individuals on digital platforms, European political discourse on digital sovereignty has further accentuated privacy as a substantive part of sovereignty.

It is with this understanding of digital sovereignty that we have proceeded in "Coding IxD" and sought to develop a product that promotes political participation while preserving individual digital sovereignty.

2 CONCEPT

At the beginning of our research, the project was called "(re)designing democracy," based on our ambition to strengthen democracy using the modern approaches of deliberative or direct democracy. Therefore, we approached different actors working in this field to interview them and find an approach for the product. This led us to three interviews with actors from "Mehr Demokratie e.V.", "nexus Institut" and "liquid democracy e.V". In the interviews, we addressed the most effective approaches to direct participation in Germany: "Bürger:innenbegehren" (Citizen initiatives), "Volksentscheid" (Referendum) and "Bürger:innenrat" (Citizens' council). The general problem identified was that these are expensive procedures that either involve only a small group of citizens or are lengthy and bureaucratic. In addition, getting citizens to participate in these processes proved to be more complicated than desired.

In the interview with Carolin Klingsporn from "liquid democracy e.V", we talked about the process of planning local projects at the district and sub-district level, which seemed to be a promising field for our project, as it covered a relatively shorter time frame and opened participation to all local citizens. Like all the approaches discussed, this one had a specific problem, namely accessibility.

Berlin has a platform called meinBerlin (mein.berlin.de) to support local projects in terms of accessibility and to promote their consultation. As with analog participation formats, accessibility here is limited by various factors, but primarily by the discrepancy in digital literacy along generations and social strata [4]. Therefore, a more analog approach to increasing the visibility and accessibility of this participation offering is more appropriate and so we are trying to close this gap with DISCUS.

Trying to reconcile the aspects of digital sovereignty, citizen participation and "neo-analogy" proved to be the biggest challenge in conceptualization the product. Nevertheless, it was clear from the beginning that the system should meet the criteria of autonomy, follow the principle of data sparsity, and comply with most accessibility guidelines.

After defining the basic principles of our project, we had the opportunity to examine the state of research on deliberative and direct democracy in more detail [6] [2] [1]. This allowed us to define some application points:

- Informing
- meeting opposing views

- facilitating participation of unreached groups
- visualizing local sentiments.

A relatively thorough review of current approaches to promoting local participation led us to some innovative but simple approaches such as pop-up democracy [3]. With a clear definition of the project principles, knowledge of the abstract theoretical concepts, and some modern implementation approaches, we had a better understanding of the territory we would be navigating in the design process.

3 USE CASE AND DESIGN PROCESS



Fig. 2. KiezHub's first physical prototype

Already in the research phase, we developed a comprehensive user flow diagram (Figure 3) with all possible functions that the (then still called) "KiezHub" could have. The goal was to clearly narrow down the scope of our design. This proved to be a real help in identifying specific user stories, based on which we further developed our prototypes, and so in a low-fi "KiezHub" prototype we had five modules (visualization, haptic input, audio panel, log-in and info-output). These modules were used in 3 theoretical user stories, each covering a few application points:

- Votable:
 - Used modules in order: Log-in → audio panel(output) → haptic input → audio panel (input) → visualisation
 - Covered applications: informing, visualizing local sentiments
- Informe:
 - Used modules in order: Log-in → info-output
 - Covered applications: informing, facilitating participation of unreached groups
- KiezComm:
 - Used modules in order: Log-in → haptic input → audio panel(output) → audio panel (input)
 - Covered applications: meeting opposing views, facilitating participation of unreached groups

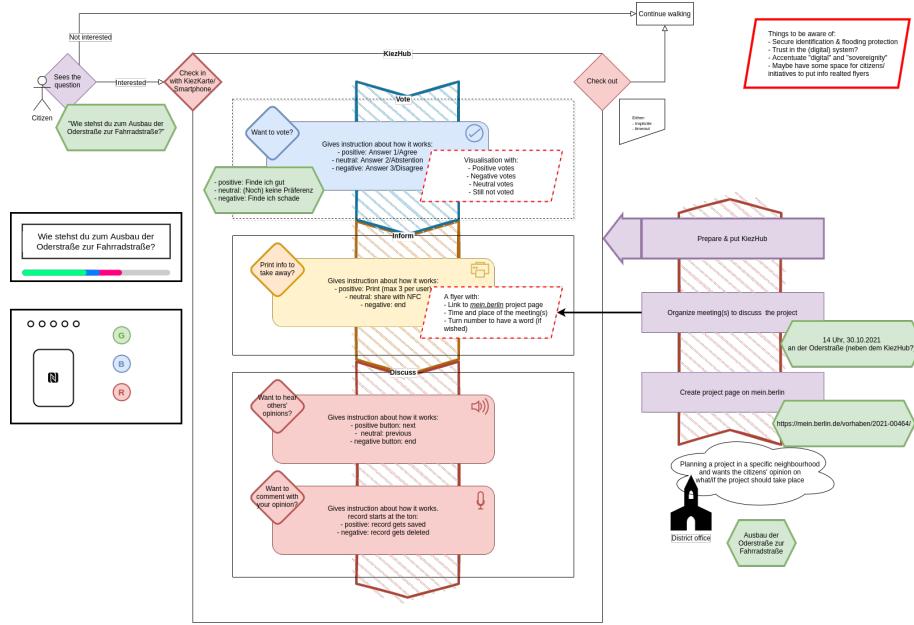


Fig. 3. KiezHub's comprehensive user flowchart v3

In the next step, we wanted to reduce the selection to one user story, which we would then try to stretch to cover most of the application points, and so we decided on "Informe" and made informing citizens the number one feature of the planned final design.

To expand the concept to cover more application points, we created two new variants of the user flow diagram (Figure 4), each of which included some of the user stories excluded in the previous step. We then evaluated both, considering feasibility and effective added value (in a normative, deliberative manner). Our choice then fell on Variant A, which combines the information and voting functions with a further small addition of opposing opinion to the output users receive from voting. This choice was made in light of the fact that the navigation function of local opinions in Variant B would increase the duration of interaction with the device and thus be less attractive, as it would otherwise complicate accessibility.

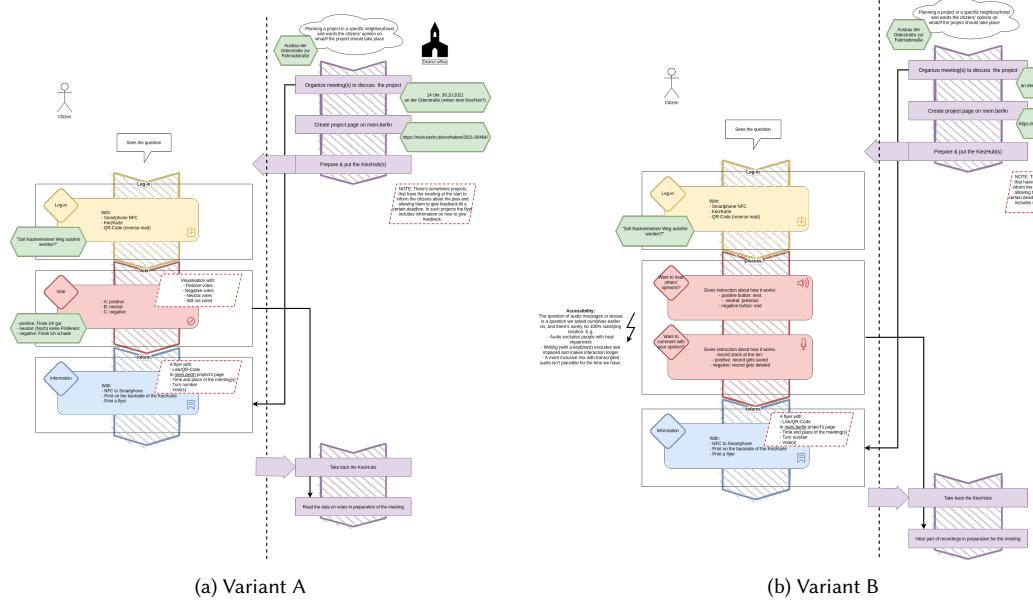


Fig. 4. KiezHub's user flowcharts v4

One of the last questions we had to answer before starting the implementation phase was the log-in function. In this context, we had a list of variants, each with at least one specific pro and con:

Log-in variant	Pro	Con	Conclusion
Using QR Codes	A widely accessible technology	The least secure and requires additional infrastructure (e.g., online server)	Unacceptably low security
Using smartphone NFC	Based on an existing secure solution	Lowest accessibility among the solutions under consideration	Unacceptably low accessibility
Using an NFC "Kiez-Karte" (Neighbourhood Card)	Higher initial visibility	Relatively expensive one-time process by which citizens receive their "Neighborhood Cards"	Realistic, but requires more resources
Omit log-in	Interaction with the lowest threshold	No reliable outcome of the vote	A realistic compromise

After lengthy discussions, it was clear that the log-in function had to go. This allowed us to get down to implementation and move away from the idea of the "KiezHub" to a contextual design. Specifically, we had three functions to implement: Voting Interaction, Informing through Output, and Confronting the Opposing Opinion.

The voting interaction is crucial in two ways: as motivation for the first interaction and as input to be able to produce a (more or less) personal output that enables the encounter with the counter-opinion and is more personal than e.g. a

comprehensive brochure. And so the voting interaction was clearly a UX/UI-centric question, while the other two had a clear technical accent.

Even in our first physical prototype, we envisioned using a small thermal printer to generate the output. Based on our concrete concept, the produced flyer should have different parts, one to inform citizens about the proposed project, another to force the confrontation with an opposing opinion and a last part to facilitate local participation. We translated these into three modules using some examples of such planned projects in our first prototypes of the flyer:

- Information about sources for further information and about the discussion platform meinBerlin.
- Confronting citizens with an opposing opinion, enabling a rethinking process.
- Inviting citizens to participate in the planned discussion rounds on the project, where they have the opportunity to influence project's planning and decisions.

The flyer should be automatically generated out of the project's data. This was realised using Processing visual programming language engine and through reading from a JSON file. To make generating the JSON file easy and thus the setup of the device simple, we developed a simple app with a graphical interface to fill in the project's data and create the file. The app can be also used to manage multiple projects.

In the last design phase we went ahead and revised the possible UI, going away from buttons interaction to something more fun, and landed by the disc design which brought the long search for a proper name to an end.

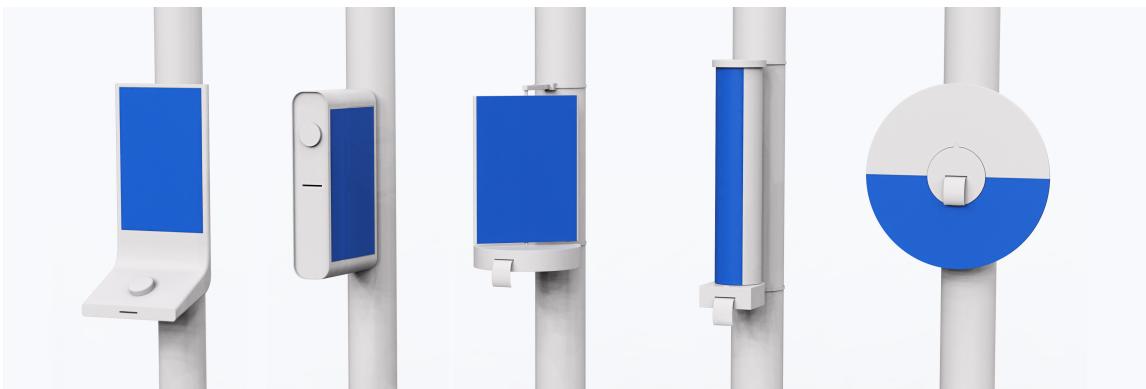


Fig. 6. Five prototypes of the formal design

4 DESIGN IMPLICATIONS

DISCUS, with its circular shape, is - as described by some exhibition visitors - an interaction magnet that invites you to find your way to it, while at the same time being self-explanatory. Through our relative lengthy research into tangible interaction possibilities, and through iterating on different designs for different parts of the proposed product, we had the opportunity to explore some of the interesting interaction possibilities. For us, the circular form not only meets the tangibility criterion, but also invites interaction, even if the user only wants to read the available information.

The flyer, on the other hand, plays a crucial role in the DISCUS system, providing users with an output they can take home and helping to establish a lasting connection between the project and the citizens. This connection, based on the functions of the flyer, is three-dimensional:

- an integrative dimension: an object that resembles an everyday object (receipt).

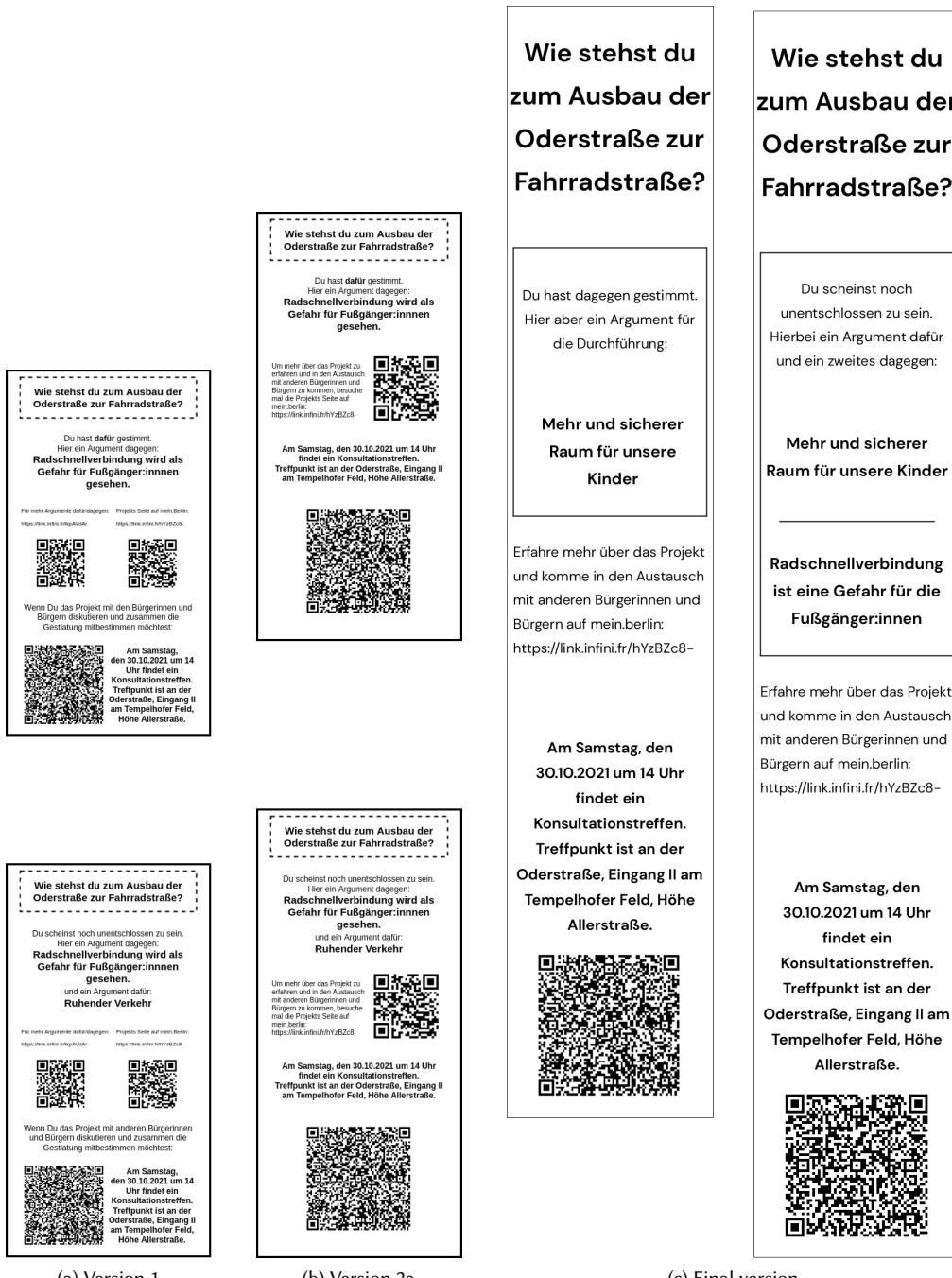


Fig. 5. The flyer's design

- a stimulating dimension: conveying arguments and encouraging more involvement.
- a communicative dimension: it is written in a direct and personal way, allowing to quickly and easily enter an appointment in the calendar.

DISCUS does not create its own system, but fits into and adapts to an existing structure. Therefore, it was inevitable that DISCUS takes on some characteristics of its environment. One of them is the color scheme of the panel, which we adopted from the color scheme of meinBerlin. Another aspect of this integration is the fact that DISCUS is context dependent and therefore most effective when placed near the planned project, but also where it is easy for citizens to reach.

5 CONCLUSION AND FUTURE WORK

For the exhibition we had to choose plan B, where we use the Python library of the printer to write the flyer, because the planned solution with this printer would be very slow (about 1:30 minutes for a flyer). For this reason, we would choose a more powerful printer if we were to fully implement the concept. Another improvement we can imagine in a second iteration of the concept is the implementation of a login function based on the neighborhood map, which would allow to get reliable voting results opening the door for further use cases. Another improvement could be the creation of another Processing script to automate the creation of the poster.

In summary, DISCUS has been designed to facilitate interaction between different actors and strengthen their integration. In terms of its theoretical value, we can imagine that DISCUS can serve as a cornerstone or illustrative example for other projects that promote civic engagement through real-world artifacts.

Both client's code and the scripts are publicly accessible on Github [7], [8].

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