The God-I-Box: Iteratively Provotyping Technology-Mediated Worship Services

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Figure 1: Left: The God-I-Box in use in front of a TV set. Everyday tangible objects are enhanced to allow access to parts of an online worship service when placed on top the God-I-Box. Right: The God-I-Box and multiple tangible objects.

ABSTRACT

The COVID-19 pandemic accelerated the development of alternative formats for religious rituals, such as Protestant online worship services. However, current design approaches focus on problemsolving, and the resulting online solutions merely imitate the offline status quo. To overcome these limitations, we suggest adopting a provotype approach that allows for a more holistic, open-ended dialogue with those affected. To test whether and how provotypes can trigger productive impulses for exploring future technologymediated worship services based on existing experiences and perspectives, we iteratively developed a first provotype in response to tensions found in observation-based field research. The resulting *God-I-Box* exaggerates individuality and allows congregants to act

DIS '23, July 10-14, 2023, Pittsburgh, PA, USA

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almost like liturgists. An analysis of congregants' and pastors' (online) first encounters with the *God-I-Box* revealed three reaction modes: spontaneous emotions, reflective coping, and exploratory imagination. We conclude with reflections and recommendations for provocative research and design in this context and beyond.

CCS CONCEPTS

• Human-centered computing \rightarrow HCI design and evaluation methods; Interaction design process and methods.

KEYWORDS

Provotyping, provocation, method, ritual, prayer, faith, religion, online worship service

ACM Reference Format:

Sara Wolf, Benedikt Steinmüller, Frauke Mörike, Simon Luthe, and Jörn Hurtienne. 2023. The God-I-Box: Iteratively Provotyping Technology-Mediated Worship Services. In *Designing Interactive Systems Conference (DIS '23), July 10–14, 2023, Pittsburgh, PA, USA*. ACM, New York, NY, USA, 14 pages. https://doi.org/10.1145/3563657.3596029

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1 INTRODUCTION

Everyday life changed dramatically due to the COVID-19 pandemic when novel rules and restrictions emerged to avoid spreading the virus. In response, religious communities provided alternative formats to regular worship services to lower the danger of infection in face-to-face meetings. They appropriated technologies such as video conferencing, streaming, or social media for religious rituals [1, 2, 30, 31]. In Germany, the context of this study, about 65% of surveyed Protestant pastors offered online worship services, and only 4% of those did so before the pandemic [30, 35]. Most often, these Protestant online worship services followed the structure and procedure of Sunday worship services, focusing on preserving the existing ritual. Fixing the problem of not being allowed (or able) to meet in person was the primary concern in developing such online worship service formats. Similarly, recent HCI examples focused on preserving existing religious rituals and fixing problems [38, 44].

This approach is rather short-sighted as it neither acknowledges that rituals change when celebrated online and within everyday life [1, 17, 18, 48], nor does it take seriously technological capabilities or traditionally grown community values such as the Protestant "priesthood of all" emphasising that "not a particular ministry but faith alone qualifies a person for pastoral witness" [27, p. 135] [31]. To overcome these limitations, we initiated an interdisciplinary project between theology and HCI dedicated to exploring possible futures of technology-mediated worship services together with those affected and based on a thorough understanding of existing experiences and perspectives.

Searching for a suitable methodological approach, we came across provotypes. Theoretically, provotypes allow for participatory involvement of various stakeholders [8], make tangible and thus discussable emerging tensions [8, 9], invite taking a stand and thus bring comprehensive, design-relevant knowledge to light useful in early project stages [9, 29, 36], and enable a more holistic, openended dialogue that goes beyond an overtly simplistic problemfixing perspective [34]. However, introducing the provotype approach into our context of German Protestant worship services is delicate. The rituals and liturgies of this institutionalised community are long-grown and follow a 500-year line of tradition that is agreed upon by all semi-independent church congregations. They cannot simply be changed. While the umbrella organisation (EKD) recognises that changes in church practice are necessary given that religious feelings and beliefs are not static and can change over time [5], there are contradicting views on the nature of these changes. Any attempt to productively explore possible futures of technology-mediated religious rituals must carefully weigh the different positions and avoid ignoring or offending religious feelings and convictions [45]. While the provotype approach seemed to fit our objectives well theoretically, no practical accounts of its use in the context have been documented, and it was unclear whether the approach could be used productively. So, as a first step and before actually using provotypes in broader participatory workshops in this context, we wanted to understand whether and how provotypes could trigger productive impulses for exploring possible futures of technology-mediated worship services together with those affected and based on a thorough understanding of existing experiences and perspectives at all.

In this paper, we make several contributions: We introduce the provotype approach to the sensitive context of religious rituals and contribute a first provotype, the God-I-Box (see Figure 1), that was iteratively developed based on observations and interviews of Protestant congregants' online worship service experiences [48]. In addition, we contribute an empirical account of congregants' and pastors' reactions to the God-I-Box, along with reflections on the reactions' productivity regarding our objectives and recommendations for future research and design in this context and beyond.

In the Background section (see Section 2), we introduce the two relevant strands of literature: Work on technology-mediated religious rituals and provotypes as a research tool in HCI. We then describe the study's context, our initial field research, and how we iteratively provotyped for technology-mediated worship services ending with a description of our provotype, the God-I-Box (see Section 3). We present congregants' and pastors' initial reactions to the God-I-Box in online first encounters. These can be summarized as three distinct modes of reactions: spontaneous emotions, reflective coping, and exploratory imagination (see Section 4). In the Discussion section (see Section 5), we reflect on the productivity of the reactions triggered by the God-I-Box and conclude with recommendations for future provocative research and design in this context and beyond.

2 BACKGROUND

2.1 HCI and Technology-Mediated Religious Rituals

Apart from being relevant to many people worldwide, technologies for the religious or spiritual context place novel demands on technology design, pose exciting methodological challenges to HCI and can bring new impetus to other areas of HCI [e.g., 7, 13, 47, 49]. However, while HCI has long recognized the value of research in this context [49], most technological examples originated from within the practice (e.g., from congregants, pastors) and go largely unnoticed by HCI research [14]. The pandemic reinforced this trend: More and more religious and spiritual rituals, such as online worship services, were mediated by interactive technologies [30]. Consequently, few HCI scholars have explicitly addressed technology-mediated worship service experiences in their research, and we expand our review of previous research to cover technology-mediated participation in religious/spiritual rituals more generally. The previous research can be categorized into two broad strands, (1) exploratory work focused on designing novel technology-mediated rituals and (2) participatory work focused on solving pragmatic problems.

Much of the more exploratory work is based on Buddhist remembrance rituals for closely related deceased ones [e.g., 42, 43] or public memorials [40]. Researchers took inspiration from existing Japanese rituals to develop novel artefacts. A first example is the SenseCenser, an interactive artefact that senses incense smoke and displays photos of deceased ones, thereby meditating typical Japanese remembrance rituals technologically [42]. The researchers imagined the SenseCenser to be used within everyday life to support Japanese remembrance rituals. The SenseCenser's design draws on many elements from existing rituals, such as incense smoke, light, sound, and photos. The unusual combination of these elements creates a novel ritual [42]. Once smoke is detected, light, sound, and photos are activated. A similar design approach was used for ThanatoFenestra, an artefact that technologically enhances typical Japanese family altars for remembering the deceased [43]. Like SenseCenser, ThanatoFenestra aims to support remembrance within everyday life and uses light and photos of deceased loved ones [43]. ThanatoFenestra was further developed into Fenestra, a more consolidated and robust artefact deployed in the field [41]. Fenestra also fused and expanded existing elements of memorial rituals in new ways and thus enabled completely novel rituals, which was observed in a field deployment [41]. The above artefacts were designed without much participation of those affected and for individual, domestic use only. Therefore, the design did not need to consider the conflicting perspectives of various stakeholders or the institutional structures of a religious community.

Community was considered in two further examples, AltarNation and SenseVase [25, 40]. AltarNation was developed to connect physically isolated individuals of a virtual faith community in their prayers [25]. It is an altar niche where congregants can light candles to pray together. All lightened candles are visible in community members' AltarNations as dots of light to create a sense of community while praying. Again, the design was inspired by existing practices such as lighting candles and exchanging prayers but merged and enhanced these elements to create an entirely novel ritual [25]. Similarly, SenseVase took inspiration from existing floral tributes and online memorials [40]. The concept roughly comprises placing flowers in a vase at home and thus adding a floral tribute at a virtual memorial [40]. It was presented online to various experts using a video for validation and should serve as an example of how virtual reality communities could conduct memorial rituals in a more embodied way [40]. Both examples addressed communities, but they did not report on how pre-existing structures or the (conflicting) perspectives of various stakeholders were dealt with.

In summary, it seems common practice in the first strand for designers to get inspired by, adopt, and merge existing ritual elements. All examples are innovative and focus on exploring possible futures rather than solving current problems. However, their scope is limited to personal, highly individualised rituals within domestic environments rather than existing rituals within formally organised communities (e.g., online worship services) that require consideration of existing (power) structures and traditions going beyond individual experiences. Designing for technology-mediated rituals of formally organised communities such as Protestant worship services comes with additional requirements: The communities must be involved early on since simply imposing a new ritual from the outside will not work given the existing structures and traditions. Decisions about emerging rituals cannot be left to the power of individual designers.

The second research strand focused more on solving (pragmatic) problems and involving those affected. Interestingly, the respective examples also cover technology-mediated worship services directly. The first example is a case study of funeral webcasting in Japan. Uriu et al. [44] spontaneously set up a webcasting system in response to travel and meeting restrictions that prevented people from attending their loved one's funerals. The setup consisted of various cameras streaming the funeral's activity for remote mourners [44]. The project was initiated by the deceased's wife, who had asked the researchers for help when relatives were not allowed

to attend the funeral in person. So some persons affected were involved in the process early on [44].

Another example is a co-design project on social participation involving elderly citizens of a rural area that resulted in setting up a streaming platform for worship services [38]. Here, various local actors, such as the pastor or citizens, were involved in all phases of the two-year design process. In realising the streaming platform, much effort went into solving problems such as the area's poor internet connection or the variety of devices that needed support [38]. The problem-solving approach to designing technologymediated worship services often opened up new problems, like various distractions that only arose due to the novel context or setup [17, 18, 48]. Overall, the second research strand highlights the importance of involving affected parties early when designing technology-mediated worship services. Unfortunately, no paper in this strand shared details of the design processes, e.g., how they recognised and worked with (potentially conflicting) perspectives of the various stakeholders involved. Also, all technological solutions presented in the second research strand were less exploratory and more dedicated to fixing existing problems.

In this paper, we want to combine the two strands of research: working with those affected and allowing for a more exploratory perspective beyond problem-solving. This is essential for our project as we work in a domain where rituals have evolved over centuries, are managed by institutions, and affect various stakeholders. In this context, simply imposing new rituals from the outside will not work. In addition, we expect more exploratory approaches to lead to more significant and novel contributions because, in practice and research, it is mainly the problem-solving perspective that has been applied to technology-mediated worship services. These considerations require an approach combining all objectives: understanding and building on existing experiences, involving various stakeholders and potentially contrasting perspectives, enabling dialogue, and allowing for open-ended exploration.

2.2 **Provotyping as a Research Tool**

The DIS community has a long history of engaging with various forms of provocation as a means to challenge existing norms, engaging with design spaces "where asking questions is as important as solving problems" [32, p. 2], or applying provocations in various contexts [e.g., 4, 8, 12, 34, 36]. The spectrum of approaches to provocation ranges from extreme ("hyper dystopian" [36, p. 1514]) to moderate ones. In critical design, deemed more extreme, provocation is a means to critique the status quo with the ultimate goal of initiating reflection rather than satisfying needs [10, 19]. While initiating reflection resonated with our endeavour to overcome current technology-mediated worship service perspectives, we also wanted to better understand existing experiences and perspectives and initiate participatory exploration of possible futures. So our goals and focus were diverse and resembled the various perspectives that researchers often take in research through design projects (engineers, anthropologists, behavioural scientists) [34, 50].

A seemingly suitable approach is the provotype (provocative prototyping) approach that emerged in the systems development context [29]. Inspired by Activity Theory and prototyping, Mogensen [29] used provocation in prototypes to provoke the takenfor-granted of existing practices. Thereby, system designers could eventually understand better tacit aspects of practices and ultimately design better systems [29]. Since then, provotypes have become more popular and have been applied in various contexts such as homes (e.g., sustainable behaviours [8, 34], mobile phone usage [12], new parenthood [12], family life [16]), or workplaces (e.g., unequal pay [3], sensitive conversations in hospitals [39]).

The numerous studies consolidated several key characteristics of the provotype approach: Provotypes are functional artefacts rooted in ethnographic work and embodying or exposing existing tensions [8, 9]. As such, provotypes share the characteristic of deploying functional artefacts with other approaches such as technology probes [26] or material speculation [46]. However, provotypes put a unique emphasis on actively addressing tensions found in fieldwork to initiate participatory discussions on the subject matter [8, 9]. Often, such tensions can be traced back to discrepancies between different goals, different elements of a practice or prescribed and actual practices [29]. Therefore, provotypes are particularly helpful in the early design phases when it comes to gaining a comprehensive understanding of the context, uncovering conflicting goals of various stakeholders, and working constructively with emerging tensions [9, 36]. It is essential to understand that provotypes are not final products that satisfy user needs or merely support users in completing tasks but means to gain a deeper understanding of a context and explore possible future [34]. As such, provotypes can be understood as designerly approaches to engaging with and understanding contexts [8], similar to cultural probes [23]. In addition, provotypes can be applied in research through design projects and participatory settings such as participatory workshops [8, 34, 36]. In summary, the provotype approach closely aligned with our goals of learning more about existing experiences, perspectives, and tensions, and exploring possible futures with those affected.

Apart from these key characteristics, the previous literature has also compiled guidelines for designing provocations. First, designers of provocation need a "critical sensibility, [which] at its most basic, is simply about not taking things for granted, to question and look beneath the surface" [21]. With this attitude in mind, the task is then to design a technology that is "slightly strange" [20, p. 63] and a bit "mysterious" [8, p. 396]. Approaches that support slight strangeness and mystery are ambiguity [4, 24] or defamiliarisation [6, 22]. Also, previous work highlighted the importance of design authorship when designing provocations, meaning that not all design decisions have to be rooted in users' needs but can originate from designers' intuition [33, 34]. Although not applied in their project, Raptis et al. [34] suggested integrating stakeholders iteratively during provotype design to make provocations of the final provotype more targeted. Provotypes are expected to trigger provocations in three different moments, in first encounters, in use, and upon reflection, each requiring different sorts of provocations [8]. For example, provocations in first encounters, such as presentations of provotypes in exhibitions or workshops, can be extreme. In contrast, provocations in use should be more subtle to allow adoption over time [8]. Provotypes should "provide handles for exploration" [8, p. 396] to get people to engage with them in

the first place and provoke at various levels such as conceptual, functional, or aesthetic [4, 34].

The above summary provides a valuable starting point for applying the provotype approach to the unique domain of technologymediated religious rituals. However, given that no previous work designed provotypes for this sensitive context, it was essential for us first to understand whether and how provotypes could be designed so they would trigger productive impulses for exploring possible futures of technology-mediated worship services together with those affected and based on a thorough understanding of existing experiences and perspectives. Thus, the paper at hand focuses on the careful, iterative development of a provotype, the God-I-Box, and the initial reactions it triggered in congregants and believers to ensure that it can trigger productive impulses in this next step (e.g., participatory workshops) without ignoring or offending religious feelings and convictions.

3 ITERATIVELY PROVOTYPING FOR TECHNOLOGY-MEDIATED WORSHIP SERVICES

The broader project to which the work of this paper contributes is dedicated to exploring possible futures of technology-mediated worship services with those affected. It was established in response to the increase of online worship service formats during the COVID-19 pandemic in Germany and brings together Protestant theology and HCI [30, 35]. All steps reported were planned and guided by an interdisciplinary team of one HCI researcher and one Protestant theologian and pastor in training. In addition, several HCI students supported individual activities. To include many different perspectives, we recruited new participants for each step who fit the respective objectives. In this way, we could integrate 25 people during the development of the provotype while keeping their effort as low as possible, given that we could not compensate them on a larger scale (e.g., monetarily).

3.1 Understanding Experiences of Online Worship Services

Our initial literature and online searches and the exchange with Protestant theologians provided many insights into the pastoral and institutionalised perspective on Protestant online worship services. Protestant worship services are communicative gatherings of believers who invoke an external power and seek to make it tangible for those gathered [28, 48]. While the basic structure of worship services builds on a long tradition, the details can vary between communities or types of worship services. This flexibility is due to the particular structure of the German Protestant Church: All communities share their confessions and are united in one organisation (EKD) but still independent as a community. Pastors usually plan the worship services, sometimes with congregants. However, there is a general understanding of the priesthood of all, meaning that every believer can preach and is invited to take active roles.

To understand congregants' experiences and perspectives better, we virtually observed and interviewed eight congregants during and after participation in online worship services (reported in more detail in [48]). We recruited congregants of various ages (range: 23-69 years), from different church communities, and with varying online worship service participation rates (1-5 times per month) through targeted invitation emails to established mailing lists of various communities. In each session, we informed the congregants about the study, obtained their consent, and then (virtually) observed them during participation in an online worship service. Subsequently, we asked the congregants to talk us through their experience and detail their feelings about actions performed such as pausing, skipping, or talking. Our findings, presented in more detail in [48], can be summarised as follows.

Overall, we uncovered a series of tensions emerging from current online worship service experiences that position "believers in a field of tension between faith, everyday life, individuality, and community" [48, p. 4]. These tensions arose from the discrepancies between different goals and elements of the practice [29]. They often became evident from the discrepancy between what the participants said and how they behaved during our observations and can be summarised in three central themes.

First, we observed a tension between the desire to experience something extraordinary when participating in worship services and the ordinariness of the actual experiences. Congregants appreciated the extraordinary nature of worship services that interrupt everyday life (e.g., taking place at a dedicated place and time, wearing neat clothes). However, with online worship services, they could participate at any time - even from the breakfast table - which did not evoke the desired extraordinary experience. In onsite worship services, rituals and procedures are prescribed "from the outside", whereas online worship services do not support this structure in any way, especially not if they remain online forever after the first transmission. Instead, congregants were invited by the flexible and accessible design of current online worship services and, accordingly, participated as one would participate in watching any other online content (i.e., pausing, skipping, watching at another time).

The second tension concerned the perceived contradictions between the centrality of faith and an infotainment atmosphere. The systems used for online worship services did not necessarily create an atmosphere supporting faith. Instead, they contradicted it through their infotainment and consumerism character, triggered by interactive options such as pausing, skipping, or participating anywhere and anytime. These elements were associated with infotainment rather than worship service experiences and triggered what was perceived as an inappropriate emotional state for worship services. In addition, some participants questioned the centrality of faith and content when online worship services were produced with high quality. "Streamed online worship services quickly become self-dramatisation if one focuses too much on production quality instead of content" (B7). Accordingly, the lack of mistakes (B2) led to the assumption that the quality of the infotainment-like videos was the main focus, not the content and faith.

Third, we found a tension between community and individuality. Community was described as essential to worship service experiences, but the flexibility of online worship services was appreciated as well or at least frequently used. Some participants found it convenient to be able to skip "bad" songs but did not like the feeling of "falling for consumerism" (B1, B2, B3, B7). It was possible, and therefore it was done, even though it felt terrible when consciously reflecting on it. Overall, these three tensions demonstrated how congregants often looked for something else but were "seduced" by the possibilities of online worship services. The few participants who reflected on this "seduction" felt very bad. After identifying these tensions, we were unsure how to proceed with the project. Previous approaches applied in the sensitive context of technology-mediated rituals focused on either exploring potential futures or closely involving those affected, and they seldomly detailed how tensions were dealt with. So we looked for an approach combining these different requirements.

As stated in the previous section, the provotype approach seemed to offer what was needed - at least theoretically: It (1) is useful for early design-phases [29, 36], (2) allows to involve various stakeholders participatory by confronting them with a provotype and learning about their perspectives [8], (3) makes emerging tensions tangible and therefore discussable [8, 9], (4) invites taking a stand and thus brings design-relevant knowledge to light [9, 29, 36], and (5) is useful for both, better understanding current practices and future opportunities and engaging in a more holistic, open-ended dialogue that goes beyond a problem-fixing perspective [34]. In theory, the provotype approach was a perfect match. However, as there is no documented practical experience of provotypes in the sensitive context of religious rituals, we first had to understand whether a provotype could trigger productive impulses in this context at all without offending religious feelings and beliefs.

3.2 From Tensions to Provotype

To design a provotype reflecting the tensions identified, we roughly followed the guidelines summarised from the literature (see Section 2.2). In line with our decision to first explore the suitability of the provotype approach for the sensitive context of religious rituals, we followed the suggestion from Raptis et al. [34] and developed the provotype iteratively to ensure that it would (1) invite open exploration, (2) be easy to understand, and (3) trigger productive reactions. Given that we wanted to present the provotype to various stakeholders in different settings in the future, we focused on designing provocations for first encounters [8].

Supported by various HCI students, we performed several ideation sessions to create provocative ideas based on our theoretical and empirical understanding of the context and respective tensions. We then clustered the ideas by commonality and recognised, for example, that most involved tangible objects or unique devices. This is common for provotypes [e.g., 3, 8, 34] and also had contentrelated reasons. Introducing unique devices to worship especially picked up on the first tension because it materialised the extraordinariness of worship services. The idea of using tangible objects was also rooted in the existing practice of pastors who often use everyday tangible objects in their worship services to illustrate connections between Bible texts and everyday life. Another central theme among the ideas was integrating everyday tangible objects and making them interactive to reach a slight strangeness based on the familiar [20] and creating an atmosphere less connected to high production quality (tension 2). Thus, by integrating everyday tangible objects, an alternative atmosphere could be created that emphasises individuality, personality, care, and everyday life. A

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Figure 2: The evolution of the provotype over three iterations. Left: The first provotype made from cardboard resembling an interactive table. Middle: The second provotype consisting of a transformed wooden coffee table and an additional attendance indicator. Right: The third provotype consisting of a small, 3D-printed, pedestal-like enclosure.

third theme among the ideas addressed the flexible and individualised participation patterns, such as only participating in the parts of an online worship service that one likes. Many ideas imagined splitting online worship services into meaningful parts (e.g., one part = one prayer) and making those parts accessible through dedicated tangible objects. Thus, the individualised behaviour of only participating in parts of an online worship service would be exaggerated, made tangible, and even invited by the provotype, while community would be neglected (tension 3).

Guided by these themes, we developed a first provotype vision through joint discussion. We envisioned a dedicated device, such as a transformed living room table, that would allow access to parts of online worship services by placing appropriate tangible objects on it. These tangible objects could not only serve as a means of access but also arouse curiosity and guide congregants' attention to some aspects of the connected, "hidden" content. For example, a cut-out newspaper article on Ukrainian war refugees could be used to give access to respective intercessions. To leave parts mysterious [8], we envisioned including "loose ends" in the overall concept and leaving parts open to speculation, such as how or when tangible objects would be provided if the God-I-Box was actually in use.

Based on this vision, we created a first provotype that consisted of an interactive table made from cardboard and a set of 15 tangible objects (see Figure 2, left). The pastor in training involved in the project curated an entire worship service for the provotype by choosing everyday tangible objects and respective content of an online worship service video produced by him. The table detected tangible objects placed on it and played the corresponding parts of an online worship service on a connected screen. In this way, congregants could act almost like liturgists by deciding which parts to experience when.

We performed two iterations of testing and adapting to understand whether the provotype would invite open exploration and be easy to understand regarding its basic interaction mechanisms. For the first iteration, we invited four students with different academic backgrounds interested in encountering a novel technology for worship services. After giving informed consent, participants freely explored the provotype while thinking aloud and learned about several usability-related issues. For example, participants expected the playback to pause when removing tangible objects from the table, which was not the case. These usability-related issues proved particularly problematic because they led participants to reflect on interactions only instead of the more conceptual provocations. Also, we recognised that the cardboard version was too provisional for participants to consider its adoption and, thus, potential consequences and provocations.

Therefore, we produced a second provotype with a more sophisticated and unobtrusive design and transformed a wooden coffee table to contain and conceal all the electronics (see Figure 2, middle). Also, we adapted the interaction to match participants' expectations better. We added additional content to explore further opportunities for provocation, such as an attendance indicator of (simulated) other congregants to support a sense of community and more experimental worship service content like meditative experiences with peaceful forest scenes. We presented the novel provotype to another seven participants after two pilot tests. Participants gave informed consent and then freely explored the provotype while thinking aloud. Thereby, we learned about novel usability-related issues. For example, participants struggled to understand the interaction of placing tangible objects in a dedicated area, given that the area was designed less conspicuously than the first version. In addition, some participants deemed the table's style unsuitable for their homes, dismissed it as impractical, and thus seldomly imagined its adoption. The attendance indicator of (simulated) other congregants was rarely noticed, making the overall concept too complex to understand in first encounters. The more experimental content was received controversially, something we considered positive from a provocation's point of view.

Based on the two iterations' results, we adapted the provotype again. Given that the table design was inappropriate in several respects, we ideated on a different form and aesthetic. Most importantly, it should have an explicit affordance for placing tangible objects on it and be abstract, small, and inconspicuous to invite imagination about its adoption. In the end, we came up with a device resembling a small pedestal that is 3D-printed and looks unlike any familiar object. In the following, we describe the final provotype that we named God-I-Box (see Figure 2, right), with a focus on its conceptual, aesthetic and functional provocations [4, 34]. The God-I-Box

3.3 The God-I-Box

The God-I-Box consists of a black cylindrical 3D-printed enclosure with a frosted acrylic glass plane on top (see Figure 3). The enclosure houses an RFID reader to recognise the tangible objects and a ring of 32 RGB LEDs underneath the glass to signal different states, either a green pulse effect for playback or a static yellow light for idle. All the electronics are connected to and controlled by a Raspberry PI 4 running Raspberry OS. The custom software is written in Python and uses open-source libraries for video playback and interfacing with the LEDs. The God-I-Box comes with a set of everyday tangible objects, each providing access to a specific part of an online worship service when placed on the God-I-Box (see Figure 1). Each tangible object is tagged with a symbol (e.g., notes) to indicate the sort of content that is "hidden" behind it and can be accessed with it (e.g., music). Again, the pastor in training involved in the project curated the content and respective tangible objects.





Conceptual provocation refers to the ideas or concepts that will be challenged or stimulated [4, 34]. The God-I-Box concept challenges the traditional worship service liturgy by breaking with some key elements. It breaks with the traditional structure and replaces it with the freedom to create one's worship service, which is a strong provocation from a theological perspective. By dividing the online worship service into small sections of a few minutes each, the God-I-Box also stimulates reflection on its fit into the everyday. The openness of the concept in terms of who/when/how the tangible objects and their content are chosen or exchanged stimulates reflection on the concept of a worship leader: Congregants could exchange their tangibles among themselves or even add some themselves. This is further supported by the unusual content elements, such as the meditative experiences that are equally integrated with tangible objects and thus challenge existing conceptions of worship service contents and who determines them. With the chosen name, God-I-Box, we wanted to highlight the concept's openness while connecting it to current practices. "GoDi" is a commonly used abbreviation for worship services (German: "Gottesdienst") amongst German pastors. Using the changed spelling ("God-I"), it can be read differently, e.g., "God I" or "God Interaction". We explicitly do not give a reading here.

Functional provocation describes how far from the norm a design operates [4, 34]. The God-I-Box allows congregants to control an online worship service by placing tangible objects on its

surface. Thereby, congregants take more active roles than in current worship service formats. In addition, the tangible objects have a thought-provoking relationship to the "hidden" content, expanding their functionality. They are not only triggers but may guide attention and influence how the content is perceived. Also, the physical presence of the God-I-Box functions as a visible cue so others can see that someone participates in an online worship service.

Aesthetic provocation pertains to manipulating the design's visual style to challenge or stimulate the viewer's perceptions and expectations of what is considered normal [4, 34]. The God-I-Box is a pedestal-like 3D-printed device designed to be unobtrusive to fit seamlessly into various congregants' homes. The aesthetic style of the device, with no reference to religious content, deviates from an expected aesthetic and instead has a more abstract, minimalist appearance. In addition, the 3D-printed material hints at a do-it-yourself-culture and should thus stimulate reflection on its production and potential adoption. We deliberately kept the design abstract to encourage reflection on customisation and adaptation.

4 INITIAL REACTIONS TO THE GOD-I-BOX

So far, our primary focus in developing the provotype was whether it invited exploration and was easy to understand, which we researched using open exploration and think-aloud sessions. However, we also wanted to understand how various stakeholders would actually react to the God-I-Box in first encounters and whether or not these reactions would be productive in terms of our greater goal to explore possible futures of technology-mediated worship services together with those affected and based on a thorough understanding of existing experiences and perspectives. This step was essential before the actual use of the provotype in participatory workshops (will be reported elsewhere) because there the provotype can only trigger productive impulses if it does not hurt religious feelings or merely triggers rejection without further discussion, but if it succeeds in getting various stakeholders to reveal their perspectives and values and to speculate about future possibilities. Therefore, we chose a less interactive method for the next iteration's test that better reflected the original conception of provocations in first encounters as "provocations in the presentation of provotypes with complementary textual and verbal comments" [8, p. 396]. We expected this adaptation to allow participants to focus more on the God-I-Box's provocation and concept rather than interaction (as in the previous iterations). To learn about the potential reactions of various stakeholders to the God-I-Box (e.g., pastors, congregants) at an early stage and keep the effort for participants, especially the hard-to-recruit group of full-time pastors, as low as possible, we decided to present the God-I-Box in online meetings. Inspired by Uriu et al. [40], we produced a short video of the God-I-Box presenting its basic concept, function, and aesthetics (see Figure 4). The video presents the God-I-Box similarly to how one would present it in offline first encounters [8]. We did not add voiceovers to the video but described it personally in the online meetings.

After an arduous recruitment process through public appeals and emails to church communities and pastors that produced little to no response, we finally recruited six participants for online first encounters with the God-I-Box by directly addressing individuals within the collaborating theologian's extended network. Four active

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Figure 4: Two annotated video stills that were shown to participants in online first encounters to demonstrate the God-I-Box's concept, function, and aesthetics. Left: Still of the God-I-Box in use in a homely setting to demonstrate its concept. Right: Still of a closeup to demonstrate the God-I-Box's function and aesthetics.

members of various Protestant communities and two pastors with experiences in both offline and online worship services encountered the God-I-Box online (see Table 1).

Table 1: Details on the six participants, congregants (C) and pastors (P), who first encountered the God-I-Box online.

ID	Age	Gender	Number of online worship services
C1	50	male	10-20 visited
C2	35	female	none visited
C3	46	female	1-10 visited
C4	39	male	1-10 visited
P1	37	female	1-10 organized and visited
P2	46	male	50+ organized, 1-10 visited

After a date was settled, participants received information and consent forms via e-mail. All meetings lasted about 30 minutes and were audio-recorded for data analysis. Each meeting began with a brief introduction and confirmation of consent. We then asked participants about basic demographic data and visions of a perfect online worship service before presenting the God-I-Box using verbal descriptions and the above-described video (see Figure 4). The central part of the meeting was dedicated to talking about participants' perceptions of the God-I-Box and exploring potential futures with (or without) it. Participants did not receive any compensation. We transcribed all audio files (one was broken, so we used our backup notes) and thematically analysed the data inductively using MAXQDA [11]. Guided by our research objectives, we were particularly interested in understanding the nature of responses to the God-I-Box and their productivity concerning our overarching goals. We found three overarching themes reflecting distinct modes of reactions that the God-I-Box triggered in online first encounters.

4.1 Mode 1: Spontaneous Emotions

As a first reaction, the God-I-Box triggered spontaneous emotional responses, often the entry point and prerequisite for more reactions.

This was particularly evident in the most common spontaneous emotional reactions **curiosity** and **surprise**.

Um, I find it interesting. So it's such a surprise effect. [...] Yes, so you didn't expect it like that. I would have expected that we would have a screen and that someone would present the worship service. So, the usual form. In principle, like when I sit in the pew at church or at the cinema, but that I then also become active [pause, thinking....] so at least I understand it that way: It's there and you become active yourself and intervene in what's happening.... and yes, that you put a note [a tangible object shown in the video, a lyrical greeting] on it and then the bells ring - yes, that's something special, yes. (P2)

Like P2, most participants were surprised because the God-I-Box did not match their expectations of what "normal" technology for worship services should or could look like. For example, P2 expected a less active role for congregants to participate in online worship services. He was surprised by the opportunity to activate parts of an online worship service by placing tangible objects on the God-I-Box. Such forms of surprise sparked interest towards learning more about the God-I-Box's objective and concept and were an essential prerequisite for further engagement.

However, the God-I-Box also sparked feelings of **unclarity** and **confusion** and, in a few cases, **rejection** and **resistance**. Such feelings were especially prevalent when participants discovered further provocations, tensions, or "loose ends", such as the open questions of who decides on the tangible objects and their distribution. In some conversations, the ambivalence and evolution of initial feelings were reflected in the participants' statements:

If there is actually, I'll say, a new sermon every Sunday that can be called up for a week via the sermon tangible object that you can put on it, then that definitely has, uh, an attraction. Because [...] you can choose which content you want, um [pause, thinking] Yes, I'm currently thinking about whether I really think that's good... So, according to the motto 'now I'll just skip the intercessions because I can roughly imagine what's going to happen there'. That does have some value if you want to fit it [the worship service] into less time. However, I think I'm a bit disturbed by the idea that you can just change the given framework that's always been there in worship services. (C4)

Although C4 was initially attracted by the flexibility of choosing one's own worship service content and order, this attraction vanished over time and turned into confusion and resistance. However, this resistance was helpful because it uncovered personal perspectives. Triggered by how the God-I-Box questioned the importance of structure and order of worship services through its flexibility, C4 shared that the long-evolved structure of worship services was vital to him personally.

4.2 Mode 2: Reflective Coping

The spontaneous emotions were often followed by more cognitive, reflective reactions that reflected participants' various ways of coping with the God-I-Box. The most prevalent reactions of reflective coping were **appraisals (good/bad)** in combination with respective reasons. Participants either expressed more **general reasons for their appraisals** or **reasons tied to their perspectives on worship services**.

What I find really cool about it is that you can determine the length of the bell ringing yourself [...] and if you want to have 20 minutes of bell ringing, then you just let it ring for 20 minutes! [...] I don't mind if the liturgy is interrupted [laughs, ...] It can also be in a different order. I don't have to stand up to say my creed or anything like that. So, I don't find that problematic. (C2)

This quote is an example of how participants initially shared appraisals justified with more general reasons (e.g., the God-I-Box is liked for allowing autonomy) that, over time, evolved into justifications tied to the context of worship services (e.g., the God-I-Box is liked for allowing autonomy because worship services do not necessarily have to follow traditional procedures). Both sorts of justifications, especially when they appeared together, were helpful in learning more about participants' perspectives.

Another common form of coping reaction was **asking questions**. Given God-I-Box's provocations, some participants felt insecure about whether they had understood the concept in its entirety "correctly" and tried to **find out more about our intentions** by ending sentences with questions such as "that's the idea, isn't it?" (C4). Also, some questions related more to **curiosity about technical details** such as "how does the device recognise what is currently on it?" (C3). Such reactions were active invitations for us to enter into a conversation and detail or justify the design of the God-I-Box. However, while such conversations helped deepen the shared understanding of the provotype and the subject matter, there was also a danger that the conversation would only focus on the designer's perspective.

Yet another way of reflective coping was the search for **familiar associations and metaphors**. Participants used familiar metaphors and associations to describe or categorise the God-I-Box. Associations were searched for both concrete and abstract elements. For example, some compared the interaction with that of a widely used children's music player, and one participant came up with a unique association to describe his perception of being confronted with numerous hidden contents:

I mean, that would be a bit like the Advent calendar principle. Um, but then maybe it's a bit like, well, as a little kid I know there's chocolate everywhere and when I'm really curious I take out all 24 and then I'm disappointed because I can't open any more. (C4)

As reflected by this example, the search for familiar associations and metaphors provided information about how the participants perceived the God-I-Box and which elements were particularly central to them. Moreover, such reactions gave us an insight into the participants' world of experience and cultural imprints.

A last way of reflective coping was **imagining the God-I-Box's fit into one's environment**. Participants frequently fused the description of the God-I-Box with concrete ideas of its application within their everyday life.

And then I just thought it would also be something for the nursing home [...] one could also choose songs or prayers and if he [a resident] wants to use it, then he can choose for himself, I would find that interesting somehow. So for people who are no longer mobile and cannot come to the worship service. So it could also somehow expand worship spaces, because it's quite easy to transport. (P1)

As this quote demonstrates, such reactions were particularly helpful in learning more about the reality of the participant's life and their perspectives on the subject matter. For P1, for example, inclusivity was essential to implement in worship services. In addition, P1's quote shows how the imagined appropriation of the God-I-Box was often accompanied by the third reaction mode, the exploratory imagination of future possibilities.

4.3 Mode 3: Exploratory Imagination

While the first two themes reflected reactions more oriented towards the status quo of the God-I-Box and participants' past experiences, the God-I-Box also triggered **exploratory imagination on adapted or novel features** or **entirely new concepts**. Adapted and novel features were invented on the fly in response to negative appraisals or the imagined appropriation of the God-I-Box. For example, our participants suggested small-scale changes such as changing the God-I-Box's light colour (C1, C2) or shape (C1), but also **specifications** concerning "loose ends":

> So if you use it regularly, it would of course be practical if you could always use the same tangible objects. I mean, otherwise you would have to get a package with tangible objects every week. That would certainly be a bit too much in the long run. (C3)

In this quote, C3 weighs different options for one of the "loose ends" that raises the question of when and how to access a new online worship service. In doing so, C3 bases his considerations pragmatically on his own possible use of the God-I-Box and thus provides information about what would be conceivable for him personally. Apart from such ideas generated in response to "loose ends" that we explicitly included in the God-I-Box's concept, our participants also created more **exploratory ideas concerning its embedding** into their environments.

But it might also work the other way round! Yes, that would also be funny! For example, if you make these tangible objects available [to congregants] and ask them to choose something [respective worship service content] and give it back - that would also be funny! So [...] ideas would come back to me from different parts of the community and we would then celebrate the service together. That would be fun too! (P1)

Novel ideas were not only developed at dedicated points, such as in response to "loose ends", but participants also developed ideas concerning their own objectives more generally. For P1, for example, it was essential to celebrate worship services together in one place, so she imagined how she could use the God-I-Box to support this objective. While most ideas were connected to the God-I-Box, few moved beyond it and imagined entirely new concepts. Interestingly, all ideas connected to this category were about elements we deliberately did not address through God-I-Box's design, such as community. One participant imagined an interactive photo wall that should be placed within the church to represent community members that participate from a distance (C1). Another idea aimed at increasing the interaction between community members:

Something like, uh, an exchange about the sermon, about the worship service, that at a fixed time [...] you have the opportunity to come together in the context of a zoom conference with the participants who want to talk about the sermon. (C4)

Through inventing novel engagements with worship services at a distance like the ones described here, participants explored potential future technology-mediated worship services independent of the God-I-Box and communicated topics of importance to them concerning the subject matter, such as exchange with community members.

5 DISCUSSION

Although technology-mediated religious rituals such as Protestant online worship services are widespread and impact millions of congregants, scholarly reflection on their design and impact is still rare in HCI. To move the field forward, we sought to explore whether the provotype approach can be used productively in this sensitive context to explore possible futures of technology-mediated worship services with those affected based on a thorough understanding of existing experiences and perspectives. Introducing the provotype approach into the context of German Protestant worship services is a delicate matter, given that contradicting perspectives exist on whether and how religious rituals should change in light of technological developments and that it might risk offending religious feelings and convictions. Thus, we iteratively developed the God-I-Box, presented it to congregants and pastors in online meetings, and analysed their initial reactions. In the following sections, we summarise and reflect on what we learned for the future use of provotypes. We believe these insights are also relevant for other applications of provotypes in first encounters [8] that aim to explore potential futures with various stakeholders based on a thorough

understanding of existing experiences and perspectives. In addition, we reflect on some preliminary insights we have gained on technology-mediated worship services.

5.1 Provotypes: Reflections and Recommendations

5.1.1 Consider different reactions for different purposes. First encounters with the God-I-Box triggered three distinct modes of reactions in pastors and congregants: (1) spontaneous emotions, (2) reflective coping, and (3) exploratory imagination. Each reaction mode led to unique productive impulses, contributing to our greater goal of exploring possible futures of technology-mediated worship services based on a thorough understanding of existing experiences and perspectives.

The first mode of reactions showed a range of different, spontaneous emotions with which people reacted to their first encounter with the provotype. Especially emotions such as curiosity and surprise demonstrate that the God-I-Box sparked interest in congregants and pastors. These reactions show that the God-I-Box successfully "[provided] handles for exploration" [8, p. 396], which is a crucial prerequisite for further engagement and participatory stakeholder involvement [8, 9]. Furthermore, spontaneous emotional reactions were often a useful starting point for further insights into participants' perspectives on the subject matter. For example, C4 became increasingly resistant to the God-I-Box over time. Reflecting on this emotion, he shared that the long-evolved structure of worship services was vital to him personally. Spontaneous emotional reactions are not always automatically meaningful information. They indicate how a person feels about a provotype at a particular moment, but only in combination with further reflections on why they occurred can they help bring out the otherwise invisible views of stakeholders [15]. Especially regarding negative emotions as a reaction to a provotype, it is essential to create an atmosphere in which doubt and resistance are welcome, and the provotype can be questioned at any time.

The second mode of reactions, reflective coping, most clearly responded to the God-I-Box's invitation to take a stand, share their perspectives, and thus react to tensions made tangible [9, 29, 36]. For example, the God-I-Box was designed to make tangible existing tensions such as community vs individuality [8, 9, 48]. All participants took up this tension in their reflective coping reactions through, for example, arguing with themselves about the importance of both values (e.g., C4). In addition, the concrete, provocative artefact often served as a trigger for appraisals with corresponding reasons. It thus allowed conclusions to be drawn about what was essential to the participants. When interested in better understanding stakeholders' perspectives on a subject matter, focusing on reflective coping reactions seems helpful.

The usefulness of exploratory imagination reactions seems obvious regarding our greater goal to explore future technologymediated worship services. We expected the God-I-Box to invite engagement in a more holistic, open-ended dialogue beyond problemsolving [34], and participants exploratory imaginations demonstrated God-I-Box's capacity to do this in principle. However, not all ideas concerned possible futures, and many suggested fixing problems of the God-I-Box or changing small features like its light (C1, C2) or shape (C1). The imagination of more exploratory ideas was relatively rare in participants' expressions but worked particularly well when participants speculated on the God-I-Box's integration into their life. For example, P1 imagined using it "the other way round" (P1) for crowd-sourcing content for her next worship service to be put together and celebrated in the church. When interested in an open-ended exploration of possible (technological) futures using provotypes, it seems helpful to encourage stakeholders to imagine the potential integration of the provotype into their lives.

5.1.2 Develop Provotypes Iteratively with Changing Foci. While Raptis et al. [34] suggested developing provotypes iteratively, we are unaware of any previous work reporting on the iterative development of a provotype involving stakeholders early on. Therefore, our work can serve as a guide for others who want to develop provotypes iteratively. As guiding principles for the iterations, we focused on whether the provotype would (1) invite open exploration, (2) be easy to understand, and (3) trigger productive reactions. Given that the first two principles are somewhat preconditions for the third principle [8], we decided to focus on those first in iterative testing. This allowed us to quickly identify and solve small-scale usability issues that distracted participants and left no space for conceptual reflections. This iterative approach also allowed us to get a feel for what provocations can be perceived in first encounters and where the boundaries lie [34]. For example, we quickly learned that integrating a reference to (the absence) of community through a simulated attendance indicator in the second iteration rendered the concept too complex to be understood in first encounters.

Only after revising the provotype several times did we focus on whether the provotype could elicit productive reactions in first encounters. To do this, we presented the God-I-Box online using a short video and verbal descriptions to demonstrate its basic concept, functionality, and aesthetics. We deliberately chose this less interactive format to better match original conceptions of provocations in first encounters [8] and in the hope that participants would think more about the concept itself than the interaction's features (as in the first two iterations). Overall, this strategy worked well, and we quickly learned more about the provocative potential of the God-I-Box - especially concerning its functional and conceptual provocations. Nevertheless, offline encounters with the God-I-Box could trigger discussions that were not possible online. One example is its aesthetics, which played a rather subordinate role in participants' comments. We assume a setting where the interaction can be tested, and the God-I-Box can be looked at and touched would elicit more aesthetics-related comments. Overall, we recommend developing provotypes iteratively, focusing on their potential to invite exploration, their comprehensibility, and the reactions they trigger.

5.1.3 Design Provocations Context- and Goal-Based. So far, the literature suggests that provocations in first encounters should be extreme [8, 34], but the case of technology-mediated religious rituals presented here demonstrates that this principle might not be applicable in all first encounters. In our project, we deliberately decided against rather extreme ideas, such as a provotype that only integrates content produced decentralised (without pastors' authority) since we wanted to integrate all stakeholders in the discussion

(e.g., congregants and pastors). If we had made the provocation too extreme, this could have been perceived as ignoring or offending religious feelings and convictions, leading to closed-mindedness or mere rejection. However, when working towards participatory innovation, as in our project, it is essential that everyone feels invited to share their perspective. Therefore, we believe that more extreme forms of provocation are not necessarily beneficial for all first encounters and all domains but are more valuable for exhibitions or projects without the aim of participatory innovation. A thorough understanding of the context is necessary to understand what exactly is an extreme or less extreme provocation in a particular domain. In our case, having a domain expert (a Protestant pastor in training) within the team was very useful to at least get a sense of provocation in this context. Thus, we recommend designing the level of provocation based on a thorough understanding of the context and according to a project's overarching goals.

5.1.4 Consider the Individuality of Perceived Provocation and Strangeness. Throughout the iterative development, we recognised that our provotype was not similarly provocative or similarly "slightly strange" [20, p. 63] for everyone. Both aspects highly depended on individual experiences, values, and perspectives. For example, the God-I-Box might not be provocative for some - like for HCI researchers and designers who know little about the domain and only see a (technically not spectacular) device. However, from some congregants' viewpoint, the God-I-Box was very provocative - especially when it was reflected in the light of the century-old tradition and structure of worship services. However, while some highlighted the importance of the given form, others considered it less important and thus felt less provoked by the God-I-Box. It would be exciting to examine this connection between perceived provocation and subsequent reactions more closely in future studies.

Reacting to the provotype and confidently raising one's voice not only depended on being provoked but also on whether the provotype was (only) "slightly strange" [20, p. 63]. In our case, it turned out that the degree of perceived strangeness varied between participants and that the God-I-Box, which we expected not to be too strange or unusual, nevertheless posed a challenge for some. For example, one participant was overloaded when being asked how she would adapt it: "I have never seen anything like this before! So this is completely new to me." (C3) If, as in our project, the focus is on integrating various perspectives (e.g., also those of less techsavvy people), it is just as crucial as provocation that a provotype is not too unusual and strange, but is oriented towards the ordinary so that everyone can have a say and feels able to respond to it. We, therefore, recommend that when designing provotypes and their deployments, it is vital to consider various possible perceptions of provocation and slight strangeness early on.

5.1.5 Consider the Political Dimension of Provotype Deployments. We designed the God-I-Box to exaggerate individuality and allow congregants to act almost like liturgists. To do so, we divided the usual structure of worship services into parts like music, prayer, sermon, or blessing. P2 highlighted that worship service structures and content are currently under debate within the Protestant institution. The topicality of the issue and the existence of an ongoing debate within the institution made us reflect on the importance of the broader political dimension of deploying provotypes. Because who exactly we involve and how not only impacts our research but could also impact existing societal debates. For example, presenting the God-I-Box to congregants and pastors at a public church day might contribute to initiating a debate on future worship services outside institutionalised structures. In this way, the God-I-Box could potentially broaden the debate space to include congregants who, prompted by the God-I-Box, might reflect on the topic, form an opinion, and perhaps even share it. We therefore recommend considering the broader impacts that (non-)deployments and encounters with provotypes might have.

5.2 Technology-Mediated Worship Services: Reflections and Recommendation

Although this paper focused on the methodological contribution of transferring provotypes to the domain of technology-mediated religious rituals such as online worship services, we also gained domain-specific insights that we briefly share and discuss.

5.2.1 Conceptualise Online Worship Services as Extensions or Novel Rituals. So far, in practice and HCI research, online worship services are thought of more in terms of replacements or preservations of existing rituals [e.g., 38, 44]. Accordingly, the focus in design is often on recreating "the same" experience from a distance. We do not consider this approach helpful because participation from a distance is not the same [48]. Participants' ideas of how they would integrate the God-I-Box into their life demonstrated that it is helpful to think about online worship services not in terms of replacing traditional worship services but in terms of extending them or being novel rituals. Doing so also dissolved the often encountered online/offline duality and established a culture of digitality [37] as reflected by P1's idea to invite community members to choose content for specific tangible objects that is then put together and celebrated in the church. Thus, we recommend conceptualising online worship services as extensions or novel rituals.

5.2.2 Consider community and individuality as legitimate, relevant needs. Through participants' expressions, we learned about an existing tension between community and individuality. Initially, this tension seemed to encompass irreconcilable opposites. While community is a significant focus in traditional worship services, online worship services seem to foster individuality through their design. Interestingly, both pastors indicated that they see community and individuality not as contradictions but legitimate needs for each of which there should be offers. A more individuality- or communityoriented approach might be preferred by congregants, depending on the setting, mood, or personality. The pastors saw the expansion of contact points or maintenance as an important goal for which new technological means could and should be developed. However, both stressed that "a completely isolated, individual approach would not necessarily be the goal or what I wanted to convey" (P1). Moreover, P2 highlighted that it is essential to ensure "that they [online congregants] feel accepted. [..] In other words, that a relationship is established. This is actually the point, that they know they are being addressed and that they are important". Thus, we recommend considering community and individuality not as contradictions but as legitimate needs that should both be addressed in technology-mediated worship services.

5.3 Limitations and Future Work

Since the present work's focus was on transferring the provotype approach to the novel domain of technology-mediated religious rituals such as online worship services and on gaining first insights into whether and how a provotype could trigger productive impulses, we did not yet report on participatory workshops with multiple stakeholders with the final provotype and insights gained about the subject matter. For the contributions presented in this paper, we involved 25 people, yet we aim to use the final provotype in more extensive participatory workshops. Therefore, we are currently using the God-I-Box in various settings, such as a pastor's convention and a formal pastoral training workshop, and are planning to present it at a public church day. This will allow us to learn more about the type of setting's influence on the kind of findings gained with the provotype approach. In addition, these participatory workshops will allow us to compile insights on the subject matter: What can future technology-mediated worship services look like?

Participants in this study imagined interesting adoptions of the God-I-Box like P1, who imagined using it in traditional worship services to fuse online and offline participation or C2, P1, and P2, who suggested using the God-I-Box in educational contexts (e.g., school or confirmation classes). We think such ideas are worth exploring, so we currently search for communities that would be open to exploring the God-I-Box for their worship service practices. Also, exploring provotypes' potential for educational settings seems highly interesting for future research given that provotypes' goals, such as reflection and discussion, suit the goals of religious education quite well.

6 CONCLUSION

What should the worship services of the future look like? In this paper, we proposed adopting a provotype approach to technologymediated religious rituals such as Protestant online worship services to overcome the limitations of previous approaches that focussed on problem-solving or top-down decision-making only. Provotyping allows various stakeholders' participatory involvement, making existing tensions tangible and thus discussable. It invites taking a stand, elicits design-relevant knowledge, and enables to engage in a more holistic, open-ended dialogue going beyond a problem-fixing perspective. However, introducing the provotype approach into the context of German Protestant worship services is a delicate matter, given that contradicting perspectives exist on whether and how religious rituals should change in light of technological developments. Thus, this paper explored whether and how a provotype approach can trigger productive impulses for exploring possible (technological) futures in this sensitive context. We iteratively developed the God-I-Box, a provotype that reflects existing tensions between faith, everyday life, individuality and community. It allows access to parts of an online worship service through dedicated tangible objects, thus dividing the worship service into small units and allowing congregants to act almost as liturgists of their online worship service. To learn more about the initial reactions the God-I-Box might trigger in first encounters, we presented it to six congregants and pastors in online meetings. An analysis of their first encounters with the God-I-Box uncovered three modes of reactions, namely (1) spontaneous emotions, (2)

reflective coping, and (3) exploratory imagination. Knowing about these different reactions and their respective contributions to a better understanding of stakeholders' perspectives and the exploration of possible (technological) futures is useful for the future applications of provotypes. To ease the application of our results, we present reflections and recommendations for future work concerning provotypes and technology-mediated worship services more generally. Ultimately, we hope to contribute to advancing the design approaches to technology-mediated rituals so they can be designed with relevant stakeholders and better fit their values and contexts while inspiring them to explore entirely new forms.

ACKNOWLEDGMENTS

We would like to thank all participants for sharing their experiences and perspectives with us and Tabea Hofmann, Rahel Schneider, Daniel Schuhmann, and Andreas Balser for their contribution to the initial data collection. Parts of the research have been funded by the Federal Ministry of Education and Research (BMBF) in the project CoTeach (project number 01JA2020).

REFERENCES

- Heidi Cambpell (Ed.). 2020. The distanced church: Reflections on doing church online. OAKTrust Digital Repository, TX, USA. https://doi.org/10.21423/distancedchurch
- [2] Heidi Cambpell (Ed.). 2021. Revisiting the distanced church. OAKTrust Digital Repository, TX, USA. https://doi.org/10.21423/revisitingthechurch
- [3] Naja Kathrine Kollerup Als, Julie Corlin Mikkelsen, and Dimitrios Raptis. 2022. The Troubling Cups: Making trouble at work about inequalities in pay. In Nordic Human-Computer Interaction Conference (Aarhus, Denmark) (NordiCHI '22). Association for Computing Machinery, New York, NY, USA, Article 45, 12 pages. https://doi.org/10.1145/3546155.3546679
- [4] Shaowen Bardzell, Jeffrey Bardzell, Jodi Forlizzi, John Zimmerman, and John Antanitis. 2012. Critical design and critical theory: The challenge of designing for provocation. In Proceedings of the Designing Interactive Systems Conference (Newcastle Upon Tyne, United Kingdom) (DIS '12). Association for Computing Machinery, New York, NY, USA, 288–297. https://doi.org/10.1145/2317956.2318001
- [5] Heinrich Bedford-Strohm, Michael Herbst, and Tobias Faix. 2015. Vernetzte Vielfalt. Kirche angesichts von Individualisierung und Säkularisierung [Networked Diversity. Church in the Face of Individualisation and Secularisation]. Gütersloher Verlagshaus, Gütersloh, Germany.
- [6] Genevieve Bell, Mark Blythe, and Phoebe Sengers. 2005. Making by making strange: Defamiliarization and the design of domestic technologies. ACM Trans. Comput.-Hum. Interact. 12, 2 (2005), 149–173. https://doi.org/10.1145/1067860. 1067862
- [7] Mark Blythe and Elizabeth Buie. 2021. Designs on transcendence: Sketches of a TX machine. Foundations and Trends® in Human–Computer Interaction 15, 1 (2021), 1–131. https://doi.org/10.1561/1100000082
- [8] Laurens Boer and Jared Donovan. 2012. Provotypes for participatory innovation. In Proceedings of the Designing Interactive Systems Conference (Newcastle Upon Tyne, United Kingdom) (DIS '12). Association for Computing Machinery, New York, NY, USA, 388–397. https://doi.org/10.1145/2317956.2318014
- [9] Laurens Boer, Jared Donovan, and Jacob Buur. 2013. Challenging industry conceptions with provotypes. *CoDesign* 9, 2 (2013), 73–89. https://doi.org/10.1080/ 15710882.2013.788193
- [10] S. J. Bowen. 2007. Crazy ideas or creative probes?: Presenting critical artefacts to stakeholders to develop innovative product ideas. In Proceedings of EAD07: Dancing with Disorder: Design, Discourse and Disaster. http://shura.shu.ac.uk/959/
- [11] Virginia Braun and Victoria Clarke. 2006. Using thematic analysis in psychology. Qualitative Research in Psychology 3, 2 (2006), 77–101. https://doi.org/10.1191/ 1478088706qp0630a
- [12] Anders Bruun, Rikke Hagensby Jensen, Jesper Kjeldskov, Jeni Paay, Camilla Mejlby Hansen, Katarína Leci Sakácová, and Mette Hyllested Larsen. 2020. Exploring the non-use of mobile devices in families through provocative design. In Proceedings of the 2020 ACM Designing Interactive Systems Conference (Eindhoven, Netherlands) (DIS '20). Association for Computing Machinery, New York, NY, USA, 813–826. https://doi.org/10.1145/3357236.3395428
- [13] Elizabeth Buie. 2016. Transcendhance: A game to facilitate techno-spiritual design. In Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems (San Jose, California, USA) (CHI EA '16). Association for Computing Machinery, New York, NY, USA, 1367–1374. https://doi.org/10. 1145/2851581.2892536

- [14] Elizabeth Buie and Mark Blythe. 2013. Meditations on YouTube. In Proceedings of the 6th International Conference on Designing Pleasurable Products and Interfaces (Newcastle upon Tyne, United Kingdom) (DPPI '13). Association for Computing Machinery, New York, NY, USA, 41–50. https://doi.org/10.1145/2513506.2513511
- [15] Michael Burmester, Marcus Mast, Kilian Jäger, and Hendrik Homans. 2010. Valence method for formative evaluation of user experience. In *Proceedings of* the 8th ACM Conference on Designing Interactive Systems (Aarhus, Denmark) (DIS '10). Association for Computing Machinery, New York, NY, USA, 364–367. https://doi.org/10.1145/1858171.1858239
- [16] Peter Knøsgaard Christensen, Christoffer Øland Skovgaard, and Marianne Graves Petersen. 2019. Together together: Combining shared and separate activities in designing technology for family life. In Proceedings of the 18th ACM International Conference on Interaction Design and Children (Boise, ID, USA) (IDC '19). Association for Computing Machinery, New York, NY, USA, 374–385. https://doi.org/10.1145/3311927.3323141
- [17] Caroline Claisse and Abigail C Durrant. 2023. 'Keeping our faith alive': Investigating Buddhism practice during COVID-19 to inform design for the online community practice of faith. In Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (Hamburg, Germany) (CHI '23). Association for Computing Machinery, New York, NY, USA, Article 554, 19 pages. https://doi.org/10.1145/3544548.3581177
- [18] Caroline Claisse and C. Durrant, Abigail. 2022. Practicing Buddhism Online: Exploring Alternative Futures for Community Practice of Faith Beyond the Pandemic. https://sites.google.com/view/futureofparticipation/submissions Workshop Contribution at NordiCHI'22 Co-Imagining Participatory Design in Religious and Spiritual Contexts.
- [19] Anthony Dunne. 2008. Hertzian tales: Electronic products, aesthetic experience, and critical design. MIT press, Cambridge, MA, USA.
- [20] Anthony Dunne and Fiona Raby. 2001. Design noir: The secret life of electronic objects. Birkhäuser, Basel, CH.
- [21] Anthony Dunne and Fiona Raby. 2009. Interpretation, Collaboration, and Critique: Interview with Dunne and Raby. http://dunneandraby.co.uk/content/bydandr/ 465/0
- [22] Abigail C. Durrant, David S. Kirk, Diego Trujillo-Pisanty, and Sarah Martindale. 2018. Admixed Portrait: Design to understand Facebook portrayals in new parenthood. In Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (Montreal QC, Canada) (CHI '18). Association for Computing Machinery, New York, NY, USA, Article 12, 14 pages. https://doi.org/10.1145/ 3173574.3173586
- [23] Bill Gaver, Tony Dunne, and Elena Pacenti. 1999. Design: Cultural probes. interactions 6, 1 (1999), 21–29.
- [24] William W. Gaver, Jacob Beaver, and Steve Benford. 2003. Ambiguity as a resource for design. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (Ft. Lauderdale, Florida, USA) (CHI '03). Association for Computing Machinery, New York, NY, USA, 233–240. https://doi.org/10.1145/642611.642653
- [25] Michelle Hlubinka, Jennifer Beaudin, Emmanuel Munguia Tapia, and John S. An. 2002. AltarNation: Interface design for meditative communities. In CHI '02 Extended Abstracts on Human Factors in Computing Systems (Minneapolis, Minnesota, USA) (CHI EA '02). Association for Computing Machinery, New York, NY, USA, 612–613. https://doi.org/10.1145/506443.506509
- [26] Hilary Hutchinson, Wendy Mackay, Bo Westerlund, Benjamin B. Bederson, Allison Druin, Catherine Plaisant, Michel Beaudouin-Lafon, Stéphane Conversy, Helen Evans, Heiko Hansen, Nicolas Roussel, and Björn Eiderbäck. 2003. Technology probes: Inspiring design for and with families. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (Ft. Lauderdale, Florida, USA) (CHI '03). Association for Computing Machinery, New York, NY, USA, 17–24. https://doi.org/10.1145/642611.642616
- [27] Isolde Karle. 2020. Praktische Theologie (Lehrwerk Evangelische Theologie 7) [Practical Theology (Textbook Protestant Theology 7)]. Evangelische Verlagsanstalt, Berlin, Germany.
- [28] Michael Meyer-Blanck. 2011. Gottesdienstlehre [Doctrine of Worship]. Mohr Siebeck, Tübingen, Germany.
- [29] Preben Mogensen. 1992. Towards a provotyping approach in systems development. Scandinavian Journal of Information Systems 4 (1992), 31–53.
- [30] Ilona Nord, Wolfgang Beck, and Georg Lämmlin. 2021. Ergebnisse zur CONTOC-Studie, Sektion Deutschland, aufbauend auf die erste ökomenische Tagung am 13.04.2021 [Results on the CONTOC study, Section Germany, building on the first ecumenical meeting on 13.04.2021]. https://contoc.org/de/ergebnisse-contoc-de/
- [31] Ilona Nord and Swantje Luthe. 2020. Hope-storytelling in the age of corona: How pastors foster the community of faith. In *The distanced church: reflections* on doing church online, Heidi Campbell (Ed.). OAKTrust Digital Repository, TX, USA, Chapter 23, 67–70. https://doi.org/10.21423/distancedchurch
- [32] Deger Ozkaramanli and Pieter Desmet. 2016. Provocative design for unprovocative designers: Strategies for triggering personal dilemmas. In Proceedings of DRS 2016, Design + Research + Society - Future-Focused Thinking (DRS International Conference Series, Vol. 1), Peter Lloyd and Erik Bohemia (Eds.). The Design Research Society, 2001–2016.

- [33] James Pierce, Phoebe Sengers, Tad Hirsch, Tom Jenkins, William Gaver, and Carl DiSalvo. 2015. Expanding and refining design and criticality in HCI. In Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems (Seoul, Republic of Korea) (CHI '15). Association for Computing Machinery, New York, NY, USA, 2083–2092. https://doi.org/10.1145/2702123.2702438
- [34] Dimitrios Raptis, Rikke Hagensby Jensen, Jesper Kjeldskov, and Mikael B. Skov. 2017. Aesthetic, functional and conceptual provocation in research through design. In Proceedings of the 2017 Conference on Designing Interactive Systems (Edinburgh, United Kingdom) (DIS '17). Association for Computing Machinery, New York, NY, USA, 29–41. https://doi.org/10.1145/3064663.3064739
- [35] Thomas Schlag and Ilona Nord. 2021. Kirche in Zeiten der Pandemie: Erfahrungen - Einsichten - Folgerungen [Church in times of the pandemic: experiences insights - conclusions]. https://www.pfarrerverband.de/pfarrerblatt/aktuellebeitraege?tx_pvpfarrerblatt_pi1%5Baction%5D=show&tx_pvpfarrerblatt_pi1% 5Bcontroller%5D=Item&tx_pvpfarrerblatt_pi1%5Bitem%5D=5339&cHash= 6e7442a2eb59d87235e9da695745afb8
- [36] Michael Shorter, Bettina Minder, Jon Rogers, Matthias Baldauf, Aurelio Todisco, Sabine Junginger, Aysun Aytaç, and Patricia Wolf. 2022. Materialising the immaterial: Provotyping to explore voice assistant complexities. In Designing Interactive Systems Conference (Virtual Event, Australia) (DIS '22). Association for Computing Machinery, New York, NY, USA, 1512–1524. https: //doi.org/10.1145/3532106.3533519
- [37] Felix Stalder. 2016. Kultur der Digitalität [Culture of Digitality]. Suhrkamp Verlag, Berlin, Germany.
- [38] David Struzek, Martin Dickel, Dave Randall, and Claudia Müller. 2019. How live streaming church services promotes social participation in rural areas. *Interactions* 27, 1 (2019), 64–69. https://doi.org/10.1145/3373263
- [39] Josephine Raun Thomsen, Peter Gall Krogh, Jacob Albæk Schnedler, and Hanne Linnet. 2018. Interactive interior and proxemics thresholds: Empowering participants in sensitive conversations. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (Montreal QC, Canada) (*CHI* '18). Association for Computing Machinery, New York, NY, USA, 1–12. https: //doi.org/10.1145/3173574.3173642
- [40] Daisuke Uriu, Noriyasu Obushi, Zendai Kashino, Atsushi Hiyama, and Masahiko Inami. 2021. Floral tribute ritual in virtual reality: Design and validation of SenseVase with virtual memorial. In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems. Association for Computing Machinery, New York, NY, USA, Article 628, 15 pages. https://doi.org/10.1145/3411764. 3445216
- [41] Daisuke Uriu and William Odom. 2016. Designing for domestic memorialization and remembrance: A field study of Fenestra in Japan. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (San Jose, California, USA) (*CHI '16*). Association for Computing Machinery, New York, NY, USA, 5945–5957. https://doi.org/10.1145/2858036.2858069
- [42] Daisuke Uriu, William Odom, Mei-Kei Lai, Sai Taoka, and Masahiko Inami. 2018. SenseCenser: An interactive device for sensing incense smoke and supporting

memorialization rituals in Japan. In *Proceedings of the 2018 ACM Conference Companion Publication on Designing Interactive Systems (DIS '18 Companion)*. Association for Computing Machinery, New York, NY, USA, 315–318. https://doi.org/10.1145/3197391.3205394

- [43] Daisuke Uriu and Naohito Okude. 2010. ThanatoFenestra: Photographic family altar supporting a ritual to pray for the deceased. In Proceedings of the 8th ACM Conference on Designing Interactive Systems (Aarhus, Denmark) (DIS '10). Association for Computing Machinery, New York, NY, USA, 422–425. https://doi.org/10.1145/1858171.1858253
- [44] Daisuke Uriu, Kenta Toshima, Minori Manabe, Takeru Yazaki, Takeshi Funatsu, Atsushi Izumihara, Zendai Kashino, Atsushi Hiyama, and Masahiko Inami. 2021. Generating the presence of remote mourners: A case study of funeral webcasting in Japan. In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems. Association for Computing Machinery, New York, NY, USA, Article 629, 14 pages. https://doi.org/10.1145/3411764.3445617
- [45] Michael Utsch. 2022. Emotion und Religion religionspsychologische Perspektiven [Emotion and Religion - Perspectives on the Psychology of Religion]. Theo-Web Zeitschrift für Religionspädagogik 21, 3 (2022), 27–40. https: //doi.org/10.23770/tw0273
- [46] Ron Wakkary, William Odom, Sabrina Hauser, Garnet Hertz, and Henry Lin. 2015. Material speculation: Actual artifacts for critical inquiry. In Proceedings of The Fifth Decennial Aarhus Conference on Critical Alternatives (Aarhus, Denmark) (CA '15). Aarhus University Press, Aarhus N, 97–108. https://doi.org/10.7146/ aahcc.v1i1.21299
- [47] Sara Wolf, Simon Luthe, Lennart Baumeister, Frauke Moerike, Vyjayanthi Janakiraman, and Jörn Hurtienne. 2023. Designing for uncontrollability: Drawing inspiration from the Blessing Companion. In Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (Hamburg, Germany) (CHI '23). Association for Computing Machinery, New York, NY, USA, Article 845, 14 pages. https://doi.org/10.1145/3544548.3581421
 [48] Sara Wolf, Frauke Moerike, Simon Luthe, Ilona Nord, and Jörn Hurtienne.
- [48] Sara Wolf, Frauke Moerike, Simon Luthe, Ilona Nord, and Jörn Hurtienne. 2022. Spirituality at the breakfast table: Experiences of Christian online worship services. In Extended Abstracts of the 2022 CHI Conference on Human Factors in Computing Systems (New Orleans, LA, USA) (CHI EA '22). Association for Computing Machinery, New York, NY, USA, Article 316, 7 pages. https://doi.org/10.1145/3491101.3519856
- [49] Susan P. Wyche and Rebecca E. Grinter. 2009. Extraordinary computing: Religion as a lens for reconsidering the home. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Boston, MA, USA) (*CHI '09*). Association for Computing Machinery, New York, NY, USA, 749–758. https://doi.org/10. 1145/1518701.1518817
- [50] John Zimmerman, Jodi Forlizzi, and Shelley Evenson. 2007. Research through design as a method for interaction design research in HCI. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (San Jose, California, USA) (*CHI '07*). Association for Computing Machinery, New York, NY, USA, 493–502. https://doi.org/10.1145/1240624.1240704