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Spicing It Up

From Ubiquitous Devices to Tangible Things Through Provocation

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Spicing It Up: From Ubiquitous Devices to Tangible Things Through Provocation

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ABSTRACT
In this pictorial, we conceptualize how modern designs take on the roles of either 'devices' or 'things' to shape everyday practices in fundamentally different ways. Drawing on Borgmann's device paradigm and provocative design, we visually recount how two designs, starting from the same brief using the same materials ultimately culminate in a 'device' and a 'thing'. As householders embedded the two designs in their sustainable practices, different design qualities emerged. We use these householders' experiences to discuss how 'spicing up' a design process with elements of provocation can help people engage more deeply with environmental challenges.

Authors Keywords
Provocation; device paradigm; devices and things, sustainability, Borgmann, energy consumption, practice

CSS Concepts
• Human-centered computing ~ Interaction design ~ Interaction design theory, concepts and paradigms

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INTRODUCTION
Interactive designs are often valued for being useful and useful designs are often envisioned as those that operate quietly in the background of everyday life [48]. This narrative is retold through many of the household technologies designed to promote sustainability values [43]. Here, it is assumed that, as technology facilitates automation and control, it will efficiently produce sustainable household practices, freeing householders from the burdensome task of minding the environmental impact of their practices [21,43,44]. However, the entanglement of everyday life and technology is messy [12]. Thus, relying only on user-centered design approaches [39], alongside their evaluation criteria of usability, simplicity and 'good' user experience [16], may not suffice, if the aim of the design is for everyday people to meaningfully engage with environmental challenges [8,11].

In a pursuit to explore meaningful design alternatives [11], HCI and interaction design researchers have engaged with how tangible [31] and slow design [34] may be part of creating meaningful experiences in a domestic space. Furthermore, we also see design studies [18,26,35,36] using similar means to investigate the sustainable implications of embedding such designs in everyday life.

In this pictorial, we draw on Albert Borgmann's device paradigm [6] to recount two design processes. Each begun from the same design brief but led to different outcomes. The first, utilized a user-centered design process targeting sustainable heating, and the outcome was embedded as a 'device' which successfully backgrounded, disengaged and commodified the sustainable consumption of energy. In the second, the design process was spiced with provocation, it targeted sustainable washing, and the outcome was experienced as a 'thing' which successfully foregrounded, engaged and reflexively enabled households to consume sustainable energy.

Inspired by our second design process that was spiced with provocation, this pictorial employs a cooking book metaphor for presenting both its visual and textual arguments. Thus, images are utilized to highlight important aspects of our argumentation, in a similar manner as cooking books visually bring forward specific ingredients or cooking processes. Furthermore, referenced research papers are presented as ingredients along with 'measurements' of the impact they have in our pictorial, similarly to how cooking books inform their audiences on how much an ingredient is utilized in a cooking process.

Borgmann's Device Paradigm

A brief entanglement with philosophy, technology and everyday life.

INGREDIENTS

500gr of Albert Borgmann. 1987. Technology and the character of contemporary life: A philosophical inquiry.[6].

50gr of Daniel Fallman. 2010. A different way of seeing: Albert Borgmann's philosophy of technology and human-computer interaction. [15]

150ml of Daniel Fallman. 2011. The new good: Exploring the potential of philosophy of technology to contribute to Human-Computer interaction.[16]

1tbsp of James Pierce and Eric Paulos. 2010. Materializing Energy. [35]

1 tsp of Holly Robbins, Elisa Giaccardi, and Elvin Karana. 2016. Traces as an Approach to Design for Focal Things and Practices. [41]

A pinch of Enrique Encinas, Abigail C. Durrant, Robb Mitchell, and Mark Blythe. 2020 Metaprobes, metaphysical workshops and sketchy philosophy [14].

Albert Borgmann's philosophy of technology [6] is commonly referred to as the *'device paradigm'* and conceptualizes the making of technology as 'devices' or 'things' - each characterized by how they become embedded in everyday life. The core of Borgmann's work centers around a dilemma for modern technology. He sees technology as tempting but disengaging. In effect, Borgmann argues that designers tend to create technology which forms a divide between means and ends, as they typically conceal the means (backgrounding) and emphasize the ends (foregrounding) [15].

Resulting from this divide are 'devices'; *"appealingly glamorous technologies, designed to be useful for a limited purpose"*, rather than 'things' that ***"engage our mind and body, center our lives, and connect us with the world"*** [16]. For Borgmann, people using 'devices' leads them to eventually find themselves distracted, detached and disengaged, instead of experiencing 'things' that engage and enrich their everyday life [15,35]. Due to this, technologies go from 'things' which focally engage, to 'devices' delivering commodities simple to consume. Hence, Borgmann argues to move beyond focal things to practices, because a focal practice will engage its' carriers [6]. Consequently, when designers focus only on ends people get detached from the environmental, economic, societal, and even political consequences of their practices [35,41].

The divide between means and ends is visible in contemporary cooking practices, where many modern technologies can be conceived as devices, designed to replace menial cooking tasks (Figure 1). While these devices are extremely successful in doing so, they also hide the sustainable implications of embedding these into everyday practices [18,25,28,43] (e.g. how much electricity they consume while using these devices).

Figure 1: *A microwave is a device that provides cooking effectiveness and efficiency by focusing on the ends - a quick, hassle-free dinner with its functionality to reheat pre-made frozen meals. The hearth is a thing that besides providing heat, can be used for preparing food. It focuses on the means - the social practice of cooking, the sensory experience of tasting, and the experimentation with ingredients to spice up a tasteful dinner.*

Figure 2: *In 1969 Jacques Carelman invented the "Teapot for masochists" and included it in his Catalogue of Impossible Objects. It takes provocation to extremes by being difficult to use by definition. Donald Norman placed it in the cover of "The Design of Everyday Things" [33] to highlight the importance of affordances, but what if it was deployed to the field as a provocation? Could it help a hypothetical designer to learn more about people's tea practices? Could it urge its users to reflect on their own beliefs and behaviors?*

Provocation in HCI

A brief journey on provocation

Provocation appears at different strengths and has throughout centuries proven a powerful tool for artists and activists as a means to challenge the status quo. As examples, in 411BC Aristophanes urged his audience to reflect on the consequences of war through the play "Lysistrata" where women deny men sex until they end the Peloponnesian War, while on 11 June 1963 Thích Quong Đoc shook the world by setting himself on fire to protest for the persecutions of Buddhists in South Vietnam.

We suggest that provocation has a role in HCI, and we can learn from artists and activists, as we perceive all designs we produce as political acts that stirs somebody's status quo. As examples, our technologies impose western views to the world on how people should live [42]. Social media connect us to old friends but at the same time will our personal data be commodified and traded [51]. And algorithms might be useful, but at the same time they do also discriminate [4,47]. Therefore, provocation is an interesting alternative, not only for looking inwards and reflecting on what futures we create, but for looking outwards to help, trigger, and urge our audiences to do the same for their beliefs, practices and behaviors [13].

We will also suggest that provocation's journey into HCI will be quite challenging, since the provocations designed within HCI will involve people closely – people sometimes even living with the provocative artifacts for a period of time (similar to the divide between provocation in first encounters and use, [5]). This leads to various, interesting challenges such as how much provocation is enough, how do we know if it works, and how can we embed it in our designs? For the latter, we draw inspiration from [3], where they suggest that a design can utilize ***conceptual provocation*** (which is about what idea, belief or practice a design is aimed to provoke), ***aesthetic provocation*** (which is about how far away from the prototypical are a design's visual look, style and materials), and ***functional provocation*** (which is about how different is a design in the way it functions from what is typically already out there in the world).

INGREDIENTS

60 gr of Phoebe Sengers. 2011. What I learned on Change Islands: Reflections on IT and pace of life. [42]

50ml of Shoshana Zuboff. The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power. [51]

1 tbsp of Ruha Benjamin. 2019. Race after technology: Abolitionist tools for the new jim code. Polity, [4]

1tbsp of Sara Wachter-Boettcher. 2017. Technically wrong: Sexist apps, biased algorithms, and other threats of toxic tech. [47]

40gr of Laurens Boer and Jared Donovan. 2012. Provotypes for Participatory Innovation. [5]

500gr of Shaowen Bardzell, Jeffrey Bardzell, Jodi Forlizzi, John Zimmerman, and John Antanitis. 2012. Critical Design and Critical Theory: The Challenge of Designing for Provocation. [3]

2tbsp of Helgason, Ingi, Michael Smyth, Enrique Encinas, and Ivica Mitrović. 2020. Speculative and Critical Design in Education: Practice and Perspectives [19].

DESIGN BRIEF AND DIGITAL MATERIALS

A Smart and Sustainable Energy Future?

In pursuing a sustainable energy future, we increasingly see consortiums with partners from industry and research institutions, aiming to design, develop and evaluate new digital technologies that promote sustainable energy behaviors [10]. Often, the purported vision behind these collaborations is that innovative technology alone, can solve the problems and lead us to a bright sustainable future [27,32]. This techno-solutionist narrative is also evident in a growing body of sustainable HCI design studies [1,50]. In such studies, sustainable change is often envisioned through the design of useful and efficient interactions that promote seamless, convenient and aesthetically pleasing experiences [46]. Although promising, others have advocated that different alternatives are needed to challenge the status quo, when designing for sustainable energy futures [7,11,44].

For this design brief, our setting is somewhere in Scandinavia. Here, government, research and industry partners persistently lobby for the production and use of renewable energy sources like solar, wind and waterpower. Yet, availability of renewable energy fluctuates. As weather conditions change, renewable energy is either in surplus or in deficit. Therefore, it is often envisioned that future smart energy technologies will engage householders to "shift" energy usage to times when renewable energy is available [37,38].

This forms the backdrop for a larger research project in which we participated, along with other partners. The projects' overall aim was to define future energy consumption scenarios that would lead to sustainable consumption practices and instantiate these through the design of digital technology. The main objective of the design brief was:

> ***"How can a design engage households to use renewable energy by shifting their consumption?"***

As part of the design brief, we were provided with digital design materials that embody a techno-solutionist vision of a sustainable energy future (figure 3). We summarize these into five digital design materials: ***Smart control*** capable of turning specific energy-consuming devices on and off. ***Consumption data*** representing historic, real-time and predicted consumption data for individual households and devices. ***Dynamic Pricing Data,*** describing locally traded energy prices. ***Local and situated sensor data*** e.g., weather conditions, measured indoor and outdoor temperatures, and energy grid conditions. ***Computational models*** capable of automating the run time of each household's device to better align them to the production of renewable energy.

Figure 3: *The purpose of the design brief was to transcend the tangible, physical world of energy production and consumption, and complement it with five digital materials. The five design materials represented in code form were used in the digital construction of the two designs with the vision of making a smart sustainable future, visible and engaging for householders.*

METHOD

Spicing up a design process with provocation

As part of our participation in the project, the same design brief and the same five digital design materials were used in two separate design processes. The aim of both was to understand how design may facilitate a desirable, sustainable change in an everyday practice.

In the first case, we aimed to engage households with shifting heating consumption by utilizing a traditional user-centered prototyping design process [39]. In the second case, we focused on how householders engage with shifting laundry practices. To purposely trigger practice through design [29], we chose to spice the user-centered prototyping design process with provocation [3,19] in the second case. Thus, we moved from prototyping [39] to provotyping [5,30].

To obtain insights into how the two designs are embedded in a household practice and how they may facilitate a sustainable change, we decided to study everyday practitioners' experiences of living and interacting with these in the messiness of everyday life.

For both studies, we used a combination of qualitative methods, such as interviews and technology home tours, and quantitative measures such as energy consumption and interaction log data. The first design was studied with eight households over a period of 6 to 18 months. The households were recruited by the research project as they were required to have a controllable electrical heat pump to be able to participate. The recruited households lived in rural areas, with three of the families having children living at home. The adult participants aged between 34 and 78 years (mean age = 54), with three of the couples retired. We conducted a total of 20 semi-structured interviews with 12 of the 16 adult householders participating actively in the interviews. 13 interviews were conducted in the participants homes, while 7 were conducted by phone. They lasted between 30 to 115 mins, and a total of 21 hours of audio that was transcribed for analysis.

The second design was studied in situ with four households for a month. The recruitment of participants was achieved via snowball sampling through our social networks. Of the four families, three had children living at home. The adult participants aged between 25 and 61 years (mean age = 46), with seven of adults working and one studying. We conducted eight semi-structured interviews that lasted on average one hour. All eight adult participants took part of these interviews, which were all conducted in the home of the participants. All the interviews were audio-recorded and transcribed. We conducted a structured thematic analysis on both data sets informed by Borgmann's framework of the device paradigm [6]. The result were six overall themes, three for each study.

Figure 4: *The design brief and digital materials were utilized in two design processes. The first followed a typical user-centered design approach; we iteratively ideated, prototyped, built, and evaluated the design. The second design process was spiced up with provocation; we iteratively ideated, provotyped, built and evaluated the design in real life conditions.*

PROTOTYPING

Facilitating Pleasurable Experiences to Background Heating Practice

In the first design case, we identified domestic heating practices as an applicable case to design for shifting. Since semi- to fully automated technology is already embedded in modern heating practices (see Figure 5), it purportedly makes shifting more convenient for householders to engage in [9].

In our design process, we worked in a traditional user-centered prototyping manner [39]. We sketched and prototyped various low and hi-fi designs to portray possible futures. Our focus was to design a pleasurable user experience, taking full advantage of the possibilities afforded by the digital design materials. At first, much design work went into understanding the complexity of the digital design materials and how shifting could be modelled and conceptualized in these. The first prototype portrayed a traditional eco-feedback display [17]. However, research indicates that such displays seldom leads to significant sustainable change [7,44,45].

Consequentially, we shifted our focus, building upon the fact that this experimentation unlocked the technical design space for us. Inspired by Weiser and Brown's vision of calm computing [49], we envisioned a design that conceals the technological complexities, while yet supports households to shift in a seamless, convenient and effective manner. For this, we worked intensely to translate the technological concepts of shifting into how heating is practiced today.

In the end, we conceptualized shifting for heating as a comfort zone. To ensure a pleasurable user experience, smart control and consumption algorithms were designed to compute, manage, and automate shifting tasks, while ensuring the indoor household temperature stays within comfortable boundaries.

Figure 5: *A radiator thermostat dial that allows users to set a temperature and effectively and efficiently experience heating comfort without caring on what happens in the background. It's physical design and functionality acted as an inspiration during ideating and prototyping.*

HeatDial

Simplifying devices

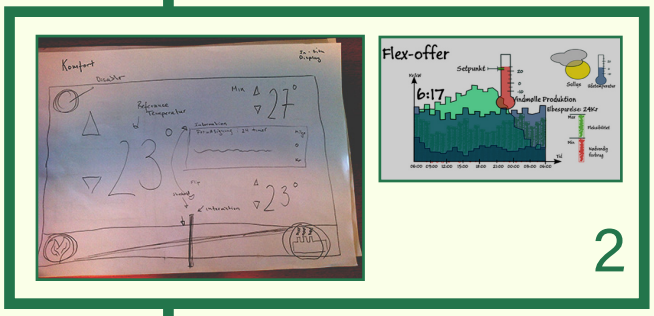


Figure 6: *Inspired by how householders today interact and control their heat we explored different tangible forms of interactions (1), we sketched and prototyped different ways of utilizing the digital data materials (2), explored different digital and interactive forms dials (3), materialized on a mobile platform focusing on an aesthetically pleasant user-friendly expression (4) before deploying it in a field study.*

To design shifting as a useful, seamless and pleasurable experience, we immersed ourselves into a design process that is described in detail in Figure 6. The final prototype, named HeatDial [22,23], operates as a mobile application. HeatDial **conceptualizes** shifting as a comfort zone. Through an interactive dial, households can communicate their shifting needs, by setting their boundaries for comfort. Most menial tasks related to shifting and performance data remain in the background, hidden from households. Instead, smart algorithms and automatic control are materialized extensively in the design and ensure that heating consumption is as much as possible aligned with the production of renewable energy, without compromising comfort.

Designing HeatDial as a mobile app allows householders to control the indoor climate and ensures that **functionality** is accessible at any time and from anywhere. This way, comfort is served instantaneously whether people are at home, at work, or on holiday. Households can base comfort decisions on information data, which illustrate projected effects of choosing different comfort boundaries (saving money and temperature fluctuations).

Finally, our design ensures an **aesthetically** pleasing user experience with an interactive design that conforms to the Nordic styles of simplicity and elegance. For this reason, the interface only serves the necessary information for a householder to decide on how energy production, savings and comfort will be configured.

INGREDIENTS

150 gr of Rikke Hagensby Jensen, Jesper Kjeldskov, and Mikael B. Skov. 2016. HeatDial: Beyond User Scheduling in Eco-Interaction [22]

two portions of Rikke Hagensby Jensen, Jesper Kjeldskov, and Mikael B Skov. 2018. Assisted Shifting of Electricity Use: A Long-Term Study of Managing Residential Heating [23]

A Device in Practice

By designing for a seamlessly and pleasurable shifting experience, HeatDial was successful in becoming a device in practice, and effectively managing to shift heating consumption. We have identified three main reasons on why Heatdial is a Device.

Backgrounding

HeatDial maintains heating to continue to be practiced in the background, by prioritizing a comfortable temperature (the ends), and hiding the inconvenient complexities (the means).

"I now think of it as something that has never existed. It just runs." Anna

"I've looked at it and seen that it makes sense - then I have not thought about it anymore" Peter

"I think it is nice because then I do not have to think about heating [...] we do not have to go around all the time keeping an eye and having to control it. Now it just does it for us." Betty

Disengaging

HeatDial requires minimum interaction, ensuring people are obliged to take action only when their comfort needs are changing. However, not being able to tinkle with its internal mechanisms and not being actively engaged with the complexities of heating practice may lead to a feeling of disengagement.

"I haven't used the system. I don't get turned on by numbers in that way. So, I just let him control it." Debbie

"Not to say it is demotivating, but - I just don't care so much about observing my electricity consumption." Paul

"Well – one could say that you now use your time sitting and checking [the app], but it is not the same hard physical work that we used to have chopping wood." Ella

Commodifying

HeatDial commodifies heating through smart algorithms and automatic control that successfully manage shifting on behalf of the household. It also ensures that using energy and acting sustainable is serviced by others.

"I'm very supportive of it – I like to have others running it because I cannot sit and watch prices of electricity. It is much better to let some others do it – this is not something I can keep an eye on all the time." Franklin

"So, if you can somehow move some power to where it is more appropriate, then it is fine with us. As long as it does not destroy the comfort for us!" Tenna

"Now someone is keeping an eye on it and observing if it is running as it should. And if it doesn't, then there is probably someone out there who is interested in making it run properly." Thomas

***Figure 7:** A householder setting the temperature boundaries for comfort for their home using HeatDial. How this comfort becomes a reality remains in the background and is monitored and controlled by external entities through smart algorithms.*

PROVOTYPING

Staging Provocations to Foreground Washing Practice

The first step in the provotyping phase [5] was to embrace the idea of becoming provocateurs [20,29,30] and decide which everyday domestic practice we would challenge, provoke, and bring into the foreground. Quickly, we realized that the washing practice has almost gone extinct through modern technologies such as washing machines and tumble dryers. This backgrounding did not help householders realize how many resources they were consuming every time they washed.

We started by trying to relate the five digital design materials with the washing practice. Is washing resource consuming? Yes, as we use electricity and water every time we wash. Are these consumptions visible? Not really, as current technology provides very little information about washing consumption data. Can we relate renewable energy and washing? Yes, if we experiment with different configurations of time, price, energy production and motivations. Can we relate washing data to the nuances of each household? Yes, if we treat them as unique places. Do we need an algorithm? Maybe yes, maybe no. Can we use smart control? We can definitely turn on and off the washing machines.

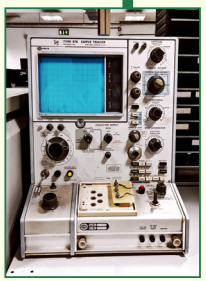
After these initial reflections, the provotyping process started with us trying to figure out how to approach conceptual, functional and aesthetic provocation [3]. Through brainstorming and within the limitations of the design brief, we decided that our provotype would provoke two concepts: the western world belief that electricity is always available, and the idea that people do not need to be informed about the way their electricity is being produced. During the provotype phase, we also engaged in of a series of iterations where we reflected on aesthetical and functional dimensions of our provotypes. For both, we decided to move away from minimal, neat and beautiful designs and took inspiration from old electronics equipment (Figure 8) while constantly asking ourselves, do we challenge the status quo enough? Or do we provoke too much as the teapot for masochists (Figure 2)?

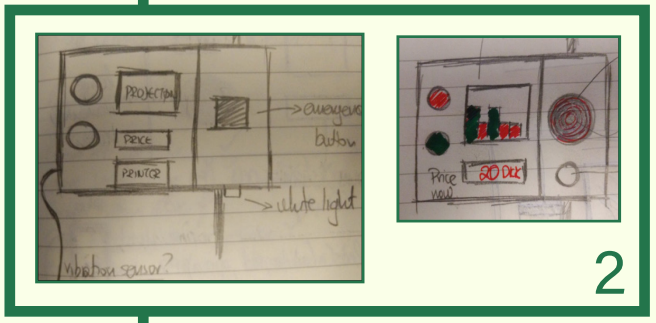
Figure 8: A Tektronix 576 curve tracer from 1969. It requires extensive experience and mastery to be able to analyze the characteristics of discrete semiconductors, as it is demonstrated from its interface that brings all its functionality to the foreground. Its physical design acted as an inspiration during ideating and provotyping.

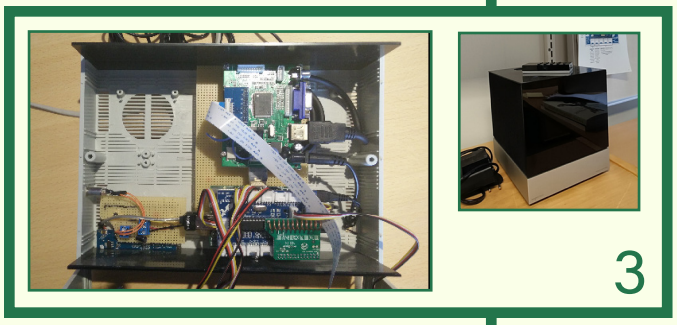
The Box

Complicating things

Figure 9: Inspired by Tektronix 576, we explored different hardware components that we could utilize (1), sketched and provotyped different configurations (2), explored different placements for the hardware inside off-the-shelf boxes (3), and developed the software and tried our provotype in the real world (4) before deploying it in a field study.







In order to provoke for the two identified **concepts**, the outcome of the design process (Figure 9) is The Box [24,40]. It utilizes a clock which materializes the type of electricity in the succeeding 12 hours (red for unsustainable and green for sustainable). A simple algorithm makes this classification of electricity based on actual local wind conditions by assuming that when wind is blowing, wind turbines produce sustainable electricity.

Functional provocation is facilitated through a forced choice. When electricity is green, households can use their washing machine as they please. But when electricity is red, then they cannot use their washing machine at all and are expected to shift their consumption to a later time. In order to defy this rule, householders have to press a big, physical, red override button which affords a reluctance in pressing it by imitating an emergency button. Every time they do break the rule, the price for the electricity is very expensive.

Finally, The Box facilitates aesthetic provocation by deviating from the norm in two ways: by avoiding the mobile application paradigm and by avoiding the dominant minimalistic and beautiful designs. Instead, we opted for a physical provotype that imitates the bulky style of old electronics equipment (Figure 8). Our provocative efforts were completed using two numerical screens that projected how many times the rule has been violated and a savings account.

INGREDIENTS

200 gr of Dimitrios Raptis, Rikke Hagensby Jensen, Jesper Kjeldskov, and Mikael B. Skov. 2017. Aesthetic, Functional and Conceptual Provocation in Research Through Design. [40]

200 gr of Rikke Hagensby Jensen, Dimitrios Raptis, Jesper Kjeldskov, and Mikael B. Skov. 2018. Washing with the Wind: A Study of Scripting towards Sustainability. [24]

A Thing in Practice

By spicing the design brief with provocation, The Box is a Thing that can be easily embedded into households' everyday lives. The Box is a Thing for three reasons.

Foregrounding

The Box transforms the washing practice from hidden and invisible, into a focal one. It brings forward the means that are necessary into reaching the ends, and the carriers of the practice can realize how many resources consume each time they wash.

"I suppose I have been hypocritical about washing temperatures in the past. You can wash in 30° now with the detergents we got [and still have clean clothes]." Paul

"I think I have been more aware of filling the machine when we finally could wash. So, I have properly filled the machine more than you would otherwise have done. I have certainly filled the it to the brim making the portion as big as possible." Anca

"Well, do I need to do it [now]? Is there anyone wanting these clothes at that particular moment? And in most occasions, they weren't important." Elisa

Engaging

Through foregrounding, The Box allows households to engage deeply with the Thing itself and the washing practice as a whole. People will consult it, talk about it, follow its rules, and learn to love and hate it at the same time.

"When I was at home and had nothing else to do I would go and look at the machine." Tim

"I would immediately inform my wife whenever the bloody thing was red." Robert

"I wouldn't cheat and press the button, unless it was absolutely necessary." Anna

"But you swear at it because... ah it could have been more fun to wash in the green period – because we lose points every time we press the button, no?" Richard

Reflecting

Heated debates will take place between the practice carriers and the rest of the household on why the clothes are not washed, what is clean and why is this thing important. Reflections will spark throughout the household that will extend to other energy consuming practices as well.

"Our son has been annoyed that we did not wash exactly the clothes he wanted. We had to explain to him why we unfortunately couldn't do so." Amelia

"Normally the girls always have freshly clothes on every day for school. But now – if the clothes are not dirty, they can wear them for another day" Angelika

"I often just caught myself thinking, well it is now green, so now it is a good time to run the dishwasher" Anthony

***Figure 10**: The Box sitting comfortably on top of a household's washing machine constantly projecting the electricity status for the next following hours, waiting for its provocative rules to be followed or disrupted.*

DISCUSSION AND CONCLUSION

To Device or to Thing?

In this pictorial, we presented two design processes spawn from the same design brief and utilizing the same digital design materials. The result was two very different outcomes.

In the first design process, we followed a traditional user-centered design approach and through prototyping we ended up with HeatDial - a 'device' that backgrounds heating practice, commodifies it and automates households' needs. Households were disengaged with the device, and they did not understand the means of their heating practices. At the same time, the device successfully managed to shift their energy consumption based on their comfort needs.

In the second, we spiced the design brief up with aesthetic, functional and conceptual provocation and through provotyping ended with The Box - a 'thing' that situates the washing practice in the foreground, engages households and urges them to reflect. The households not only shifted their energy consumption but also started to reflect on other energy consuming practices they carried out.

So, the challenge remains. Should we design devices through prototyping or design things through provotyping? It is not our intention to claim that all devices are 'bad', and all things are the 'right' solution to every challenge. In a busy everyday life entangled with technology, we often demand easy, seamless and 'good' interactive experiences. As our studies show, being constantly confronted with difficult and obstructive interactions that complicate things may defeat the purpose of provocation in design when experienced in a messy everyday life [12].

Instead, we simply urge other designers and practitioners to occasionally step out from the 'comfort' of traditional usability and user experience paradigm of what a design should and could be and try alternative approaches [2,11]. To engage with provocation [3], to act as provocateurs of everyday practice [20,30], to challenge the status quo [29], and to provotype and study designs in the real world to fully understand how they shape practice [5]. We hope that the reflections we made in this pictorial will help them in this journey.

Figure 11: Spicing a design process up with provocation will likely lead up to a thing, that will bring a practice in the foreground, and may facilitate engagement and reflections for the carriers of a practice. However, just like many spices can season a meal, different things can be achieved with different forms of provocation.

IMAGE CREDITS

PAGE 1 **Zahrin Lukman.** Unsplash License Image *Slice Food Additives on Brown Cutting Board* **https://unsplash.com/photos/VSNoQdimlQQ**

PAGE 2 Collage by the authors based on Cottonbro - Pexels License image *Silver Microwave Oven on White Wooden Cabinet* https://www.pexels.com/photo/silver-microwave-oven-on-white-wooden-cabinet-4686822/

PAGE 3 Collage by the authors based on Madmax Chef - Unsplash License image *Green Tea with Jasmin Lily Rose* https://unsplash.com/photos/X3Sinj7qZGc

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PAGE 5 Collage by the authors with image by Cottonbro. Unsplash License image *Person Pouring Seasoning on Green Beans on Bowl* https://www.pexels.com/photo/person-pouring-seasoning-on-green-beans-on-bowl-3338497/

PAGE 6 Image by the authors.

PAGE 7 Image by the authors.

PAGE 8 Image by the authors.

PAGE 9 Alex Cioaba. Unsplash License image *Gray igital machine switch off* https://unsplash.com/photos/yrdMFzX6Hu4

PAGE 10 Image by the authors.

PAGE 11 Image by the authors.

PAGE 12 Dan Burton. Unsplash License image *Brown and White Spices on White Ceramic Bowls* https://unsplash.com/photos/G9irkcf9g3Y

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