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From Abstractness to Concreteness – experiential knowledge and the role of prototypes in design research

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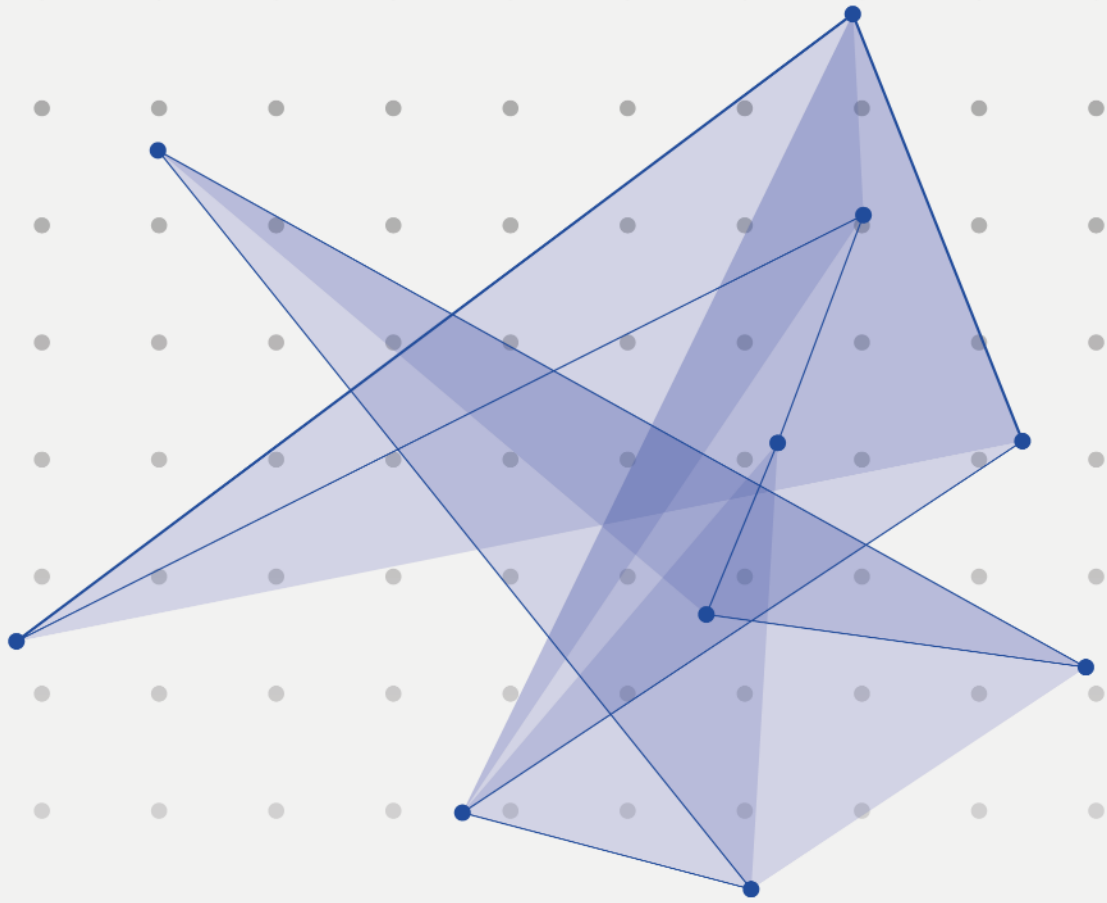
Table of Content



Track 2: Service design and Policy making

- Prototyping for Policy Making: Collaboratively Synthesizing Interdisciplinary Knowledge for Climate Neutrality

- The hidden arena: prototyping as a political experience of design

- Oxymoron in Prototyping Digital Artifacts: Reviews of Digitalised Product-Service System (DPSS) Development Projects of Global Tech Companies

- Design prototyping for public technological solutions as a social learning practice for policymaking

- Prototyping in service design: the case of CHECKD. - an automatic booth for Covid-19 testing

Prototyping in service design: the case of CHECKD. – an automatic booth for Covid-19 testing

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Abstract

Prototyping is a core phase in the design process. In service design, this activity has been less explored: differently from physical products, services entail the representation of complex systems of people, contexts, artefacts and interactions. Service prototyping poses a great challenge to designers who have to manage a combination of tangible and intangible aspects which spans through time. Drawing on the background knowledge available on the topic, this paper discusses a service prototyping case study: named Checkd., it concerns the development of an automatic booth for Covid-19 testing. Prior to prototyping, a context analysis and user research were carried out and co-design workshops were held to refine the idea. Then, two rounds of service prototyping were accomplished. In the first one a service encounter (sample collection procedure) was tested with users, adopting the experience prototyping technique and low-fidelity props. The second round reproduced the complete service experience, adopting a service walkthrough technique and mixed-fidelity artefacts, where participants could understand the full journey in a situated way.
Building upon these prototypes, we elaborated three main considerations. One first takeaway deals with the relationship between purpose and fidelity level. Low/mixed fidelity prototypes drove a purpose change, from evaluative to explorative, as the 'unfinished' nature of the set-up allowed more user interpretation and proposal of personal ideas. A second takeaway concerns iterations that must be planned with different levels of focus and resolution, keeping the flow of co-design and re-design open allows to fully approach service complexity. A third takeaway is about the role(s) of the designer/author. He/she should be more than a mere facilitator by enacting mechanisms of the experience itself: continuously shifting roles and relating with a variety of users, he/she becomes an advocate of the whole user experience and, more in general, an advocate of a broader prototyping culture.

Service design; Service prototyping; Experience prototyping; Service walkthrough; Co-design

Background knowledge about prototyping in service design

Prototyping is a well-established area of the design practice and process (McElroy, 2017; Kelley, 2001; Budde et al.,1992; Floyd, 1984). The design research approaches this subject in different ways, proposing a variety of perspectives and frameworks (to mention a few: Sanders and Stappers, 2014; McCurdy et al., 2006; Kammersgaard, 1983). In addition, most of the available studies focus on product (both physical and digital) and interaction design (McElroy, 2016).

Less explored, instead, is prototyping in the service design field (Blomkvist, 2011; Passera et al., 2012). Most of the existing knowledge comes from the dissertations of Blomkvist (2011,

2014) who explores the difference with ‘traditional’ prototyping and identifies the challenges that service designers have to face when approaching such activity. Prototyping services entails, in fact, replicating complete, holistic experiences, where highly elaborated systems of both tangible and intangible elements come together (Blomkvist, 2011, 2014; Passera et al., 2012). The intangible nature of a service itself dependent of time and inherently unique and personal (Zomerdijk & Voss, 2010) raises the complexity of service prototyping, but at the same time it is a promising field of research, where investigation is still largely needed (Blomkvist, 2011).

Blomkvist (2014) considers service prototypes any representation of a future situation, either of them being sketched (‘definite’) or enacted (‘ongoing’) and defines them as surrogates that exists in a liminal state, that can be tested and explored freely and without time limitation. He also addresses other critical aspects of service prototyping (Blomkvist, 2011), such as benefits and levels of participation and the connection with the service environment (the so-called servicescape) and experiences (Blomkvist, 2014). In conjunction with other researchers, he also proposes a new technique, the service walkthrough (Arvola et al., 2012; Blomkvist, 2011; Blomkvist et al., 2012; Blomkvist & Bode, 2012; Blomkvist, 2014; Blomkvist & Arvola, 2014), building upon the already existing experience prototype, bodystorming and pluralistic walkthrough techniques (Buchenau & Suri, 2000). The service walkthrough can bring to life, in a somewhat realistic way, a service in its completeness (end-to-end) by having people physically enacting the sequence of carefully orchestrated steps of the service and live the experience as close as possible to the ideal version.

Finally, and most importantly for the scope of this paper, he outlines a framework for service prototyping, highlighting its multiple dimensions: position in process, purpose, audience, technique, fidelity and representation (Blomkvist, 2011). Passera et. Al. (2012), building upon Blomkvist’s work, propose the ‘Service Prototyping Practical Framework’, which is characterised by a more applied perspective. They provide a series of guidelines, defining them as an “aid for thinking and asking fundamental questions when prototyping” (Passera et al., 2012, p.5) and we believe that they are extremely useful to orient the work and better plan the whole process.

Here is a summary of such framework elaborated by Passera et al. (2012).

First, like in the original version, the position in the process and the purpose of the prototype (exploration, evaluation, or communication) are set, basing on the question ‘what is the service hypothesis I am testing? What do I want to learn?’; following, it approaches the Author (the person who defines and plans the prototype set up) and the resources (‘what is the simplest available way to implement the best possible experiment? To what resources do we have access?’), also outlining a set of heuristics (location, users, staff, props) to assess them; as a fourth point, they mention the technique (‘which technique? How to plan it? What data can I expect?’); then, the fidelity/resolution aspect is approached, by suggesting the development of a ‘resolution graph’ that can support in keeping each service dimension separate for a better understanding (‘what needs to look and feel verisimilar for the prototype to succeed? What needs to be functional, and to what degree?’); then, they analyse the validity (‘how generalizable are the results of the experiment? What exactly did I learn from what I tested?’); finally, plausibility is evaluated in relation with the audience of the prototype itself (‘was the prototype plausible for my audience? Was their feedback reliable?’).

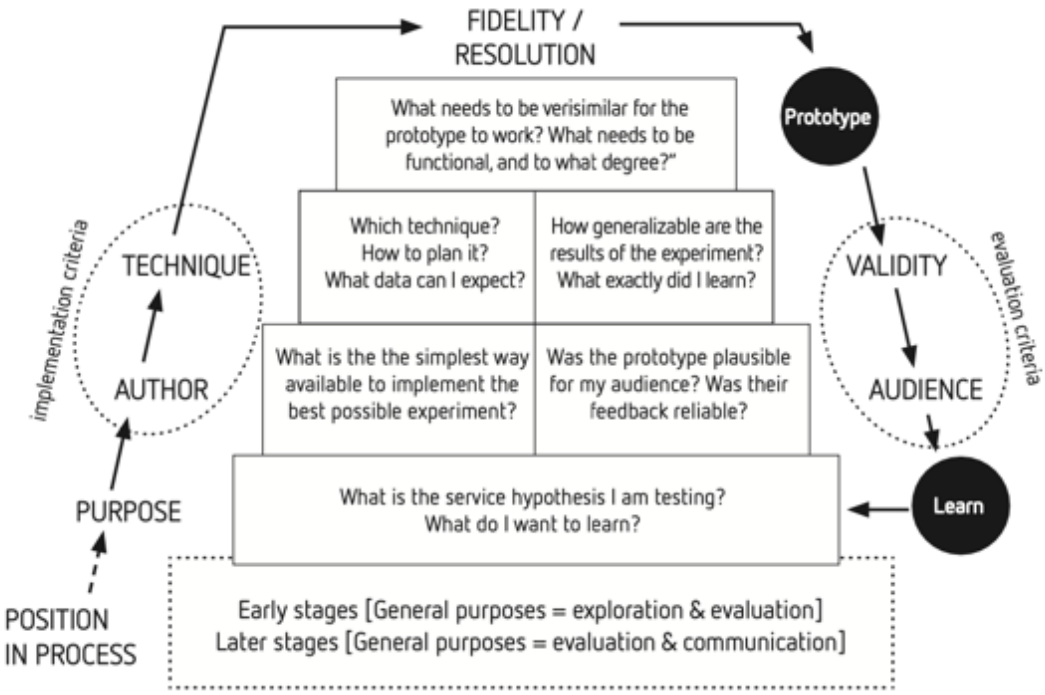

Figure 1: The Service Prototyping Practical Framework developed by Passera et al. (2012).

This paper precisely builds upon the Service Prototyping Framework developed by Passera et al. (2012) to discuss the case study of Checkd. This project's context was an experimental master thesis, done in collaboration multiple actors: the Department of Chemistry and Applied Biosciences at the Eidgenössische Technische Hochschule (ETH) Zürich (as the main host institution), Diaxxo AG, a biotech startup and spin-off of ETH's Functional Materials Laboratory, PD|Z, a group within ETH that focuses on system-oriented product development and innovation and the Department of Design of Politecnico di Milano supervising the whole thesis. The main objective was to leverage the innovative technologies advanced by the startup Diaxxo AG (devices capable of running PCR[1] analysis in a very small amount of time) to develop an automatic booth for Covid-19 testing, to be placed in public spaces, by designing the different elements related both to the product and the service experience.

The Case Study of Checkd

The design of Checkd. Encompassed 3 main phases: context and user research; co-design and concept refinement; prototyping. For the purposes of this paper, we will briefly describe the first two phases and we will focus mainly on the third phase, where a prototype was made operational in short time, aiming to lay the foundation for a whole product-service system solution to be implemented in future.

[1] PCR stands for Polymerase Chain Reaction a method widely used to rapidly make millions to billions of copies (complete or partial) of a specific DNA sample.

Phase 1: Context and user research

The first phase explored Covid-19 testing options (antigen and molecular). We shared a survey with a diverse pool of people: motivations, feelings and behaviours when experiencing both solutions were captured and integrated with desk research into ‘testing experience maps’, useful to analyse pain and pleasure points.

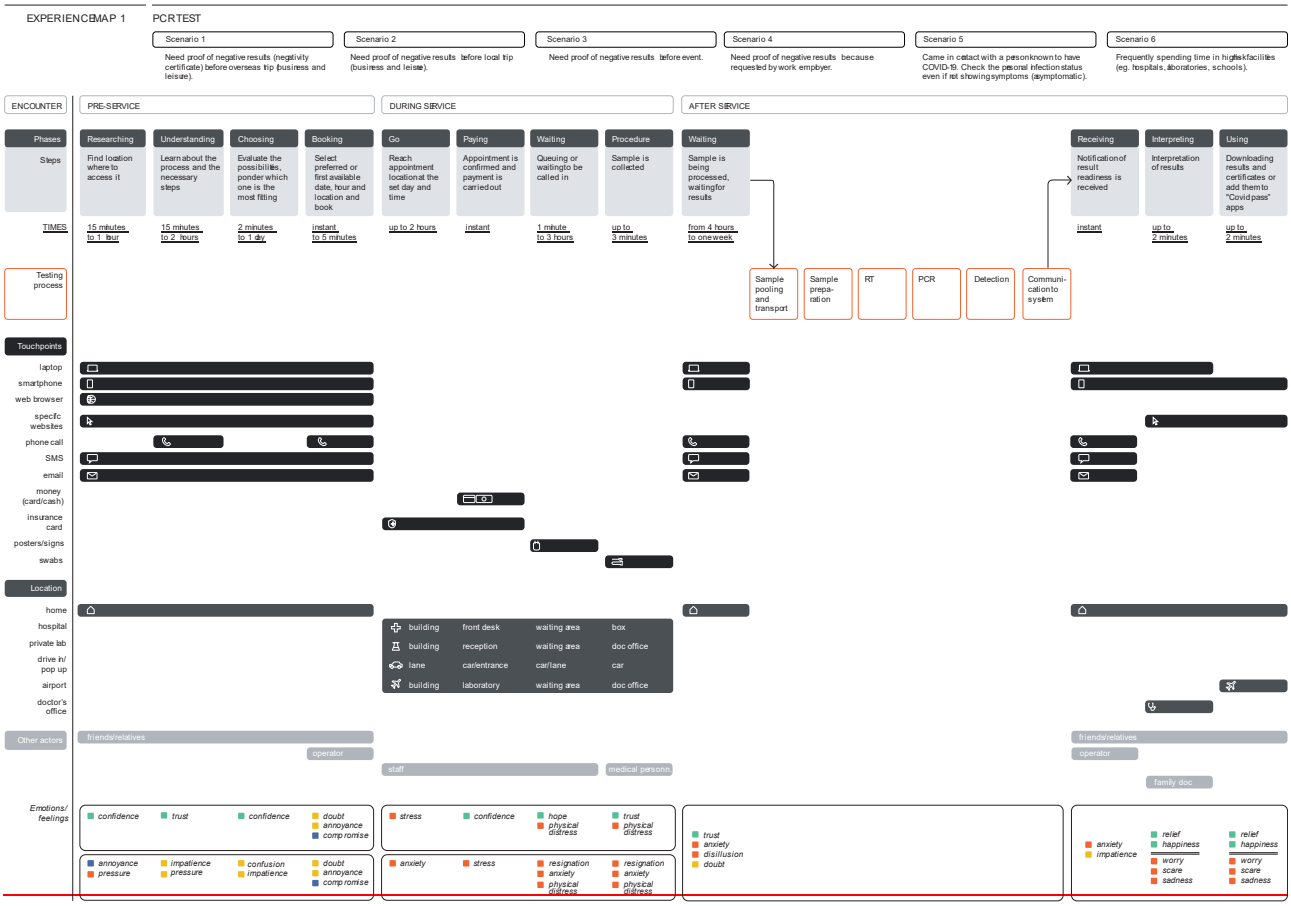

Figure 2: The testing experience map concerning the PCR/molecular test typology.

In parallel, we analysed the rough existing concept for the booth proposed by the startup: we expanded on the journey linked to it, highlighting what did work, what did not and future opportunities.The outputs of this first phase, discussed with all the stakeholders, created the basis for the ensuing co-design stage.

Phase 2: Co-design and concept refinement

We held 7 co-design workshops with 16 participants, identified among possible user categories. Virtually ‘anyone’ could have been a user, but, building upon the startup’s initial work, we decided to focus on travellers as the suggested location for the booths would be airports and train stations.

The workshops aimed to guide the choices for developing an effective and pleasant user experience, as well as discuss structural features of the booth and user interactions with technological elements.

The sessions were structured in three parts: warm-up, intermezzo, and core.

After introductory activities in the ‘warm-up’, participants’ first impressions about a ‘booth for disease testing’ were captured in an individual activity named ‘intermezzo’ (tool shown in figure 3).

Figure 3: The tool used in the “intermezzo” phase.

In the core, we presented a draft service journey with multiple paper boards. The participants expanded on the contents, completing steps, and filling out blank spots with a deck of cards depicting various elements of the service (touchpoints, actors, actions, places). The physical dimension (structural features) of the booth were also discussed, through role-playing and sketching activities. In the end, we asked participants to re-fill again the **‘**intermezzo**’** template, to gather their renewed impression of the automatic booth.

Figure 4: Co-design workshops, users and tools.

Benefitting from the results of the co-design workshops, we developed an exemplar version of the user journey and detailed 'architectural' requirements for the booth. The latter were then translated into a structure concept that took into consideration building complexity, forecasted cost (materials and construction), accessibility and aesthetics.

Phase 3: Prototyping

As already introduced in paragraph 1, to present the actual prototyping phase, this paper adopts as a basis the Service Prototyping Practical Framework proposed by Passera et al. (2012) and mainly refer to their terminology and definitions. We tackled Checkd. Through two levels of prototyping: as we followed a 'zoom-out' approach, we first prototyped one service moment only, i.e. the sample collection procedure. Second, as a progression, we prototyped the full-service experience.

Phase 3.1: Prototyping the sample collection procedure

Position in process and purpose

The co-design workshops produced an exemplar version of the Checkd. Customer journey.

We focused in particular on one service moment: the sample collection procedure (defined in this paper “procedure #1”), meaning the main sequence of interactions happening inside the booth when the user delivers their biological sample (eg. Sputum) to the machine.

Despite being in harmony with user needs and behaviours, it still sparked scepticism in the stakeholders, and it was deemed critical under an implementation point of view. The status of the technology running the PCR tests and its automation level, was, in fact, not advanced enough to implement the users’ proposal, especially in a short time. It was, though, still considered as a valuable vision for future developments.

In a discussion with the startup two new procedures (“procedure #2 and #3”), both compatible with the current version of the technologies, were outlined.

Assumptions on possible pain points and problems the users could face were also identified. For example, procedure #2 was deemed the fastest and with less risk of contamination, while procedure #1 and #2 the most prone to user error.

What we did was carry out an evaluative prototyping session that included the three mentioned procedures. Why, to tackle the need of understanding which one to implement in the service-system. The ‘How’ will be described in the following paragraphs.

Author/resources

In this case the Author was responsible for both the prototype design and development and session management.

Here below the list of resources involved:

1. A ‘service prototyping lab’ solution was selected, since the servicescape was deemed not immediately fundamental to reach the prototyping goals.
2. Real users were involved, keeping as much diversity as possible, to address some specific hypothesis, mainly connected to older users. For example, actions in procedure #2 and #3 were judged too complex for this user category. 21 people were involved, aged 22 to 83 yeas old, from both business travellers and leisure travellers, with a balanced mix of both genders.
3. The ‘staff’ heuristic was not present, as Checkd. Can be categorized as a ‘self-service’ type of service (Blomkvist, 2011).
4. A mix of mock-ups and real props were used. Some devices that needed to be implemented did not exist yet (eg. Swab collection mechanism), so they were ‘performed’ by the Author; others were too difficult to get, due to time constraints, or were not crucial touchpoints (Passera et al., 2012). Other elements, instead, were real, meaning existing biomedical products.

Technique and process

As the sample collection procedure is a service moment that entails specific interactions, we

decided to adopt the experience prototype technique. This approach, proposed originally by Buchenau & Suri (2000), “tries to replicate an existing situation or construct a new one, in which participants can understand, in an embodied way, what it feels like to interact with something” (Arvola et al., 2012, p.2). It aligns with the need of evaluating this peculiar service moment, which is not a singular contact with a touchpoint, but a mini-journey, a sequence of interactions with various interfaces and objects.

In the activity, the Author briefly introduced the meaning and purpose of prototyping, to then touch upon the general ‘booth’ concept, its link to Covid-19 and the number of procedures to be tested. Secondly, the procedures were simulated one after the other. Finally, an interview was carried out, starting with a very broad prompt question to allow ‘free speech’, to eventually pointing out specific questions, about steps’ details (safety, hygiene, instructions, comfortability).

Fidelity-resolution

The prototype resolution was medium-low and the fidelity of distinct aspects mixed. As proposed by Passera et Al. (2012) we developed a resolution graph, to frame the fidelity dimensions.

In the low-fidelity range we positioned the look and feel of the props and the technology, realism of the location: they did not directly impact the aspects that needed to be observed and therefore deemed less relevant. The functionality of the props and the technology, and the realism of the experience were medium fidelity. Implementing a good level of functionality, for both technology and props, was critical to guarantee the correct timing of the procedure.

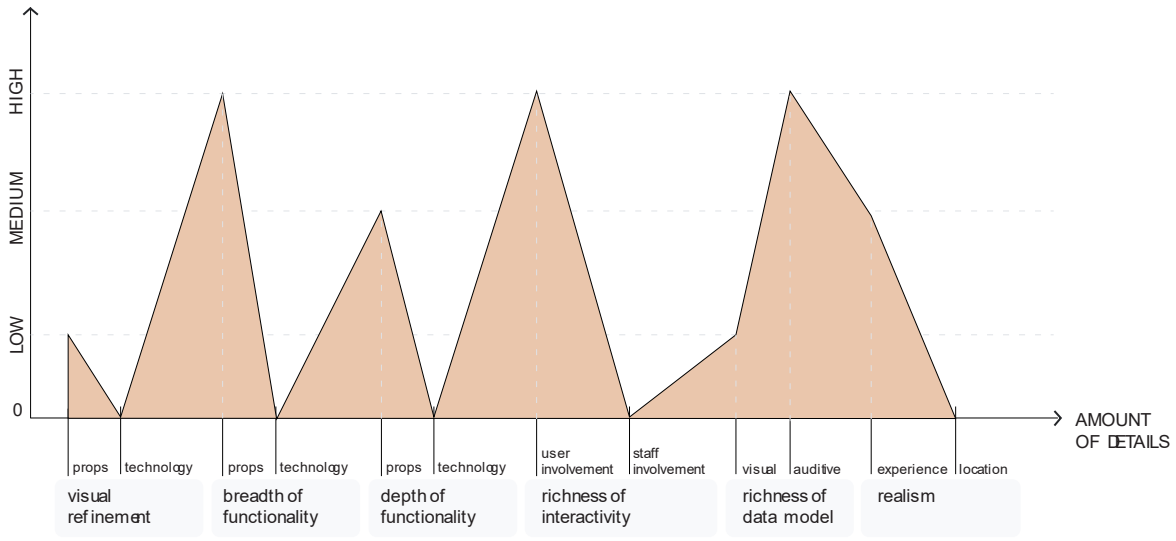

Figure 5 – The figure represents an adapted resolution graph regarding the prototyping the sample collection procedure.

We built the prototype set-up scene with cardboard panels and backstage elements (eg. Swab containers) with paper. Elements for procedure #2 and #3 were assembled from existing biomedical products (eg. Swabs and tubes, figure 6). For procedure #1, since the actual object did not exist, it was simulated using a marker (figure 7).

The Author, placed behind the panels, orchestrated the different elements, simulating the

machine mechanics and giving instructions by voice (figure 8). No other video or audio support was given on purpose, so it was possible to understand the essential needs of the users on the matter.

Validity

Validity was limited in the sense that the setting hardly approximated the intended implementation context, despite only real users were involved. The servicescape, though, was not deemed a priority or for the goal of the prototyping moment.

Plausibility

Since the audience was kept into consideration while designing the prototype, as Blomkvist (2011) suggests, participants all provided very detailed and extensive feedback and engaged organically in explaining their own point of view.

Results

For each procedure, both quantitative and qualitative date were collected. On the quantitative side we gathered: total time of completion, completions with/without errors, number and type of errors. We considered ‘errors’ all the actions that deviated from the correct procedure steps (ex. Dropping swab, throw away wrong parts). Qualitative knowledge was gathered with open questions, regarding perceived hygiene, easiness of steps, physical comfortability.

We reviewed each session, as all of them were video recorded and noted following: procedure start and end (time), happening of errors, comments from participant, facial/physical reaction/behaviour, answers of final interview.

Insights were extrapolated from the gathered data by comparing the three procedures’ completion times and number of errors, but also recognizing recurring errors and their causes.

Figure 6: On the left elements used and re-assembled during procedure #2 (tube, saliva funnel, preservation solution). On the right the element used for procedure #3 (lolliswab).

Figure 7: The tool used in procedure #1 to simulate a swab having the same concept of a marker, the red tape signaled a “no-touch” zone.

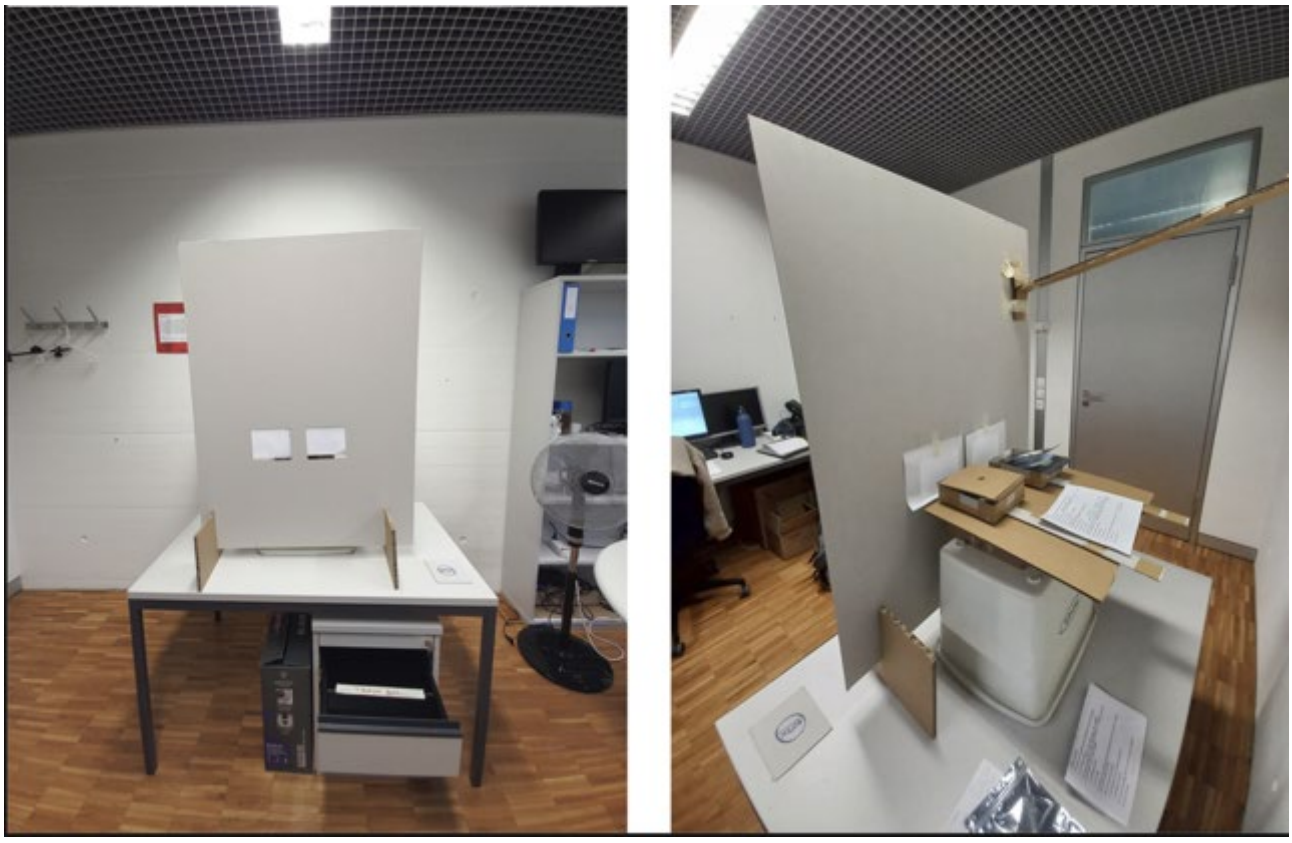

Figure 8: The set-up put in place for procedure #2, both front-stage and backstage.

Figure 9: User during the experience prototype of procedure #2 and the Author orchestrating the backstage.

Figure 10: Users during the experience prototype of procedure #1 and the Author orchestrating the backstage.

Phase 3.2: Prototyping the full-service experience

Position in process and purpose

The insights from the prototyping sessions just described allowed to select one procedure as the most fitting: it was procedure #3, as it demonstrated to be the most intuitive for the user

and the most feasible form a technology perspective (it entailed relatively simple automation).

As this service moment was now defined, what we did after was a progressive step: prototype the full-service experience. This was fundamental to evaluate the experience from a holistic perspective, understand the effectiveness of the designed product-service system and get concrete recommendations to improve the Checkd. In its entirety.

Author/resources

The Author and the responsibilities were the same as the sample procedure prototype.

Here below the list of resources involved:

1. In this case, the location is ambiguous. Since Checkd. Can be defined a ‘location-oriented service’ (Blomkvist, 2011), executing the session in a realistic context was necessary. Primary sites for Checkd. Are transportation hubs, which were not available. The session was held in a university building, which is an actual secondary-choice location for the Checkd. Booths. For scenario purposes, we applied modifications to the environment and mainly considered it as an airport, but during initial parts of the prototyping, that entailed the user being ‘at home’.
2. Real users were involved. Due mostly to time constraints, hard-to-reach site and length of activities, we had to restrict the user categories and focus mostly on younger people, both for business and leisure travel, which were easily reachable available to collaborate. 14 people were involved, with a balanced mix of both genders, from 21 to 33 years old.
3. The ‘staff’ was not present, as Checkd. Can be categorized as a ‘self-service’ type of service (Blomkvist, 2011).
4. A mix of mock-ups and real props were used. Physical artefact included real objects (booth, computer, screens, suitcase, hand sanitizer, gloves, swabs) and mocked elements (mostly the automation system: trays, doors, which were not yet developed). Digital artefacts were: Checkd. Website wireframing, two booth interfaces (outside and inside), digital receipt (email), digital test results (email).

Figure 11: The saliva solution and the swab for sample collection created in a sterile environment and assembled with real biomedical products.

Figure 12: Mock-ups used to simulate the automation system of the swab trays: on the left elements before assembling, on the right same elements in the prototyping setting.

Figure 13: The Checkd. Booth 1:1 scale prototype. In order: front and back, zoom on front (check in interface, doors, information panel), interior left wall (hand sanitization, saliva generation slot), interior centre wall (signage, procedure interface, sample slots), interior right wall (luggage area).

Technique and process

In this case the idea was to prototype the full-service experience: we adopted the Service Walkthrough technique, as it allows to represent the ideal service journey “in an embodied and holistic way” (Blomkvist & Bode, 2012, p.1).

Starting from the ideal customer journey, we selected critical service moments that could enact the most basic scenario, with the rule of having at least one from the three main service encounters (pre, during and post service), to then create all the artifacts and props necessary to give life to the ‘surrogate’ (Blomkvist, 2014) and find ways to coherently and smoothly orchestrate all the mise-en-scène.

All the activities were carried out the same day, while the sessions themselves were scheduled along a full week. The participants were first introduced to the practice of service prototyping, followed by the proposal of a set scenario (Covid-19 certification needed for a travel) and establishment of three main goals (with the main one of obtaining the fit to fly certification): understand what the service is about/how it works; book a test appointment; go to the appointment. We provided the users with a laptop and an interactive, but wireframe-level version of the Checkd. Website, where they started the roleplay exploring the website.

They continued going through the registration procedure, in which they had to deal with multiple document mock-ups and spend time typing in real information, to then carry out the booking procedure. After they received their personalized booking confirmation (programmed email sent by the Author during the prototyping session) the Author would ‘push’ the scenario forward in time, at the day of the booking and invite the user to autonomously reach the location, by following the instructions on the email, also providing contextual props (suitcase, bags, phone).

Different wayfinding elements were placed along the way to guide the user. Once reached the location the participants would ‘check-in’ at the booth, go through the full swabbing procedure and receive, on the spot, another personalized email with their fit-to-fly certification.

Finally, we carried out an interview, by initially asking a very broad prompt question to allow free speech, to eventually pointing out specific questions, about the different aspects of the experience.

At the end of the interview some brand identity elements related to Checkd. (logo and palette) were ‘parallel prototyped’, with participants invited to provide their feedback.

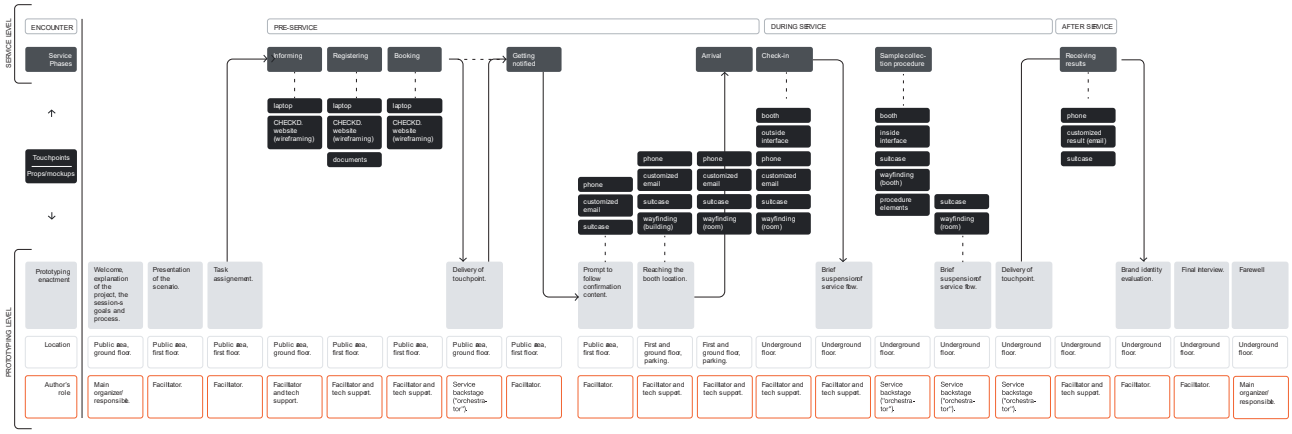

Figure 14: Diagram of the service walkthrough: on the top part (service level) are represented the service steps selected for the prototyping, while in the bottom part (prototyping level) the parallel breakdown of activities, locations and Author's role.

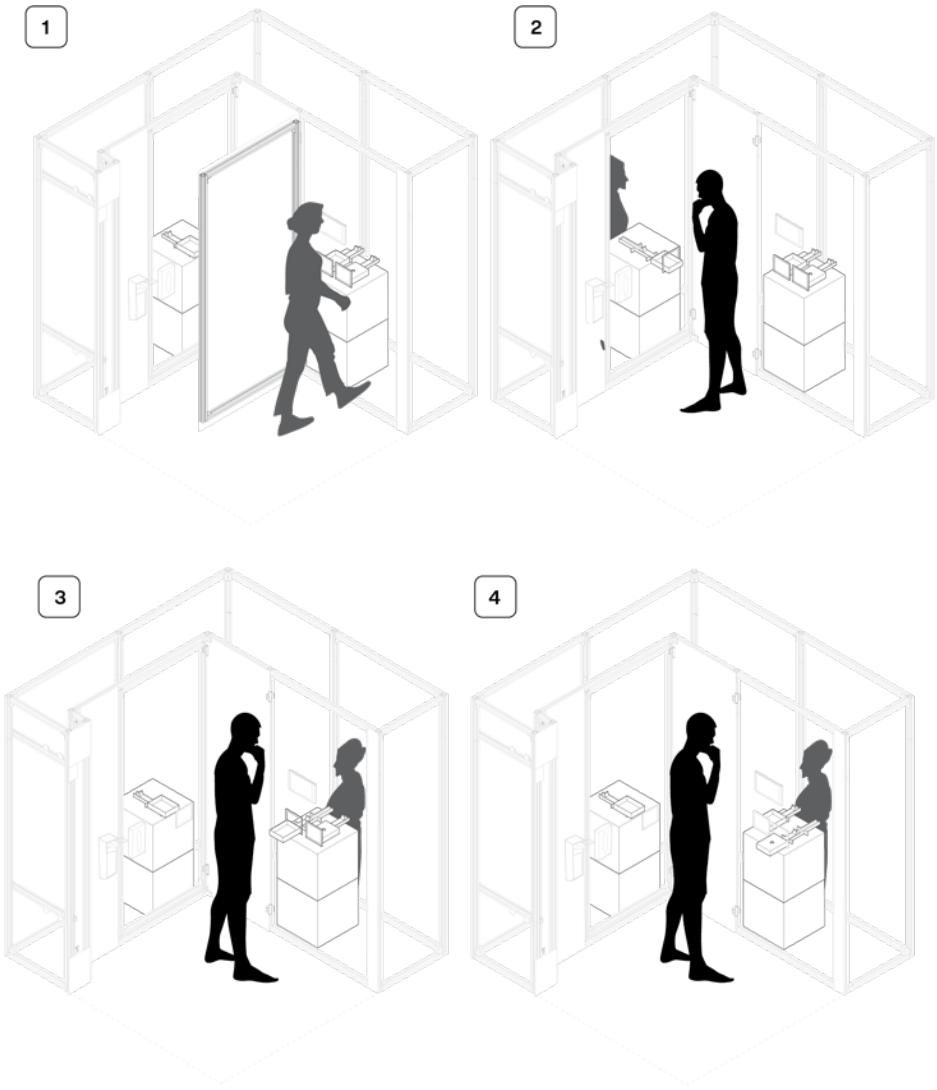

Figure 15: Axonometric view that shows the sample collection procedure moment and the relationship between author (gray), structure (prop) and user (black).

Fidelity-resolution

The prototype resolution was medium-high with the fidelity of distinct aspects mixed. We positioned at the medium-low level the look and feel of the technology and the realism of the experience. Medium-high fidelity was kept for the props functionality and look and feel, along with the technology's functionality and realism of the location. In the case of Checkd. The servicescape and its elements – ambient conditions, spatial layout and function, sign, symbols and artefacts (Bitner, 1992) – were extremely important, as they had a high degree of influence on the users, their feelings, their understanding of the service and their interaction with the touchpoints.

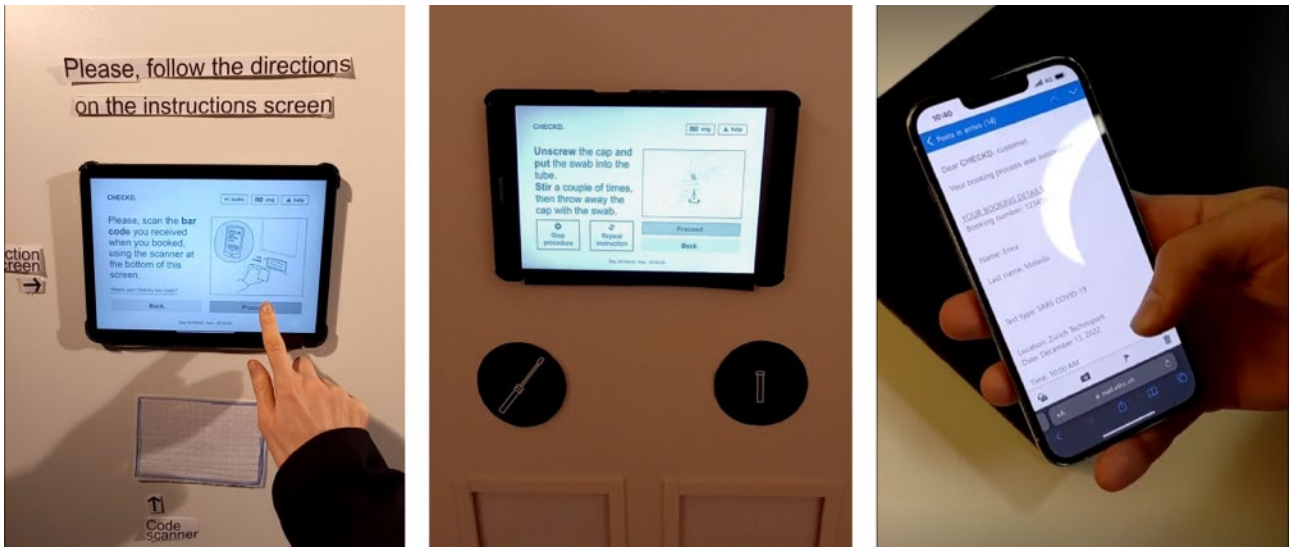

Figure 16: Some of the digital artefacts employed during the prototyping: look and feel were low fidelity, while depth and breadth of information and functionality were of higher fidelity.

Validity

Despite the larger context and location surrounding the prototype were similar to the implementation ones, aspects of the servicescape and other influencing factors could be replicated only in a limited manner. Moreover, it was taken into consideration that, although real potential customers were involved, they only represented a few user categories, and gave feedback only from their perspective.

Plausibility

Since the audience was kept into consideration while designing the prototype, as Blomkvist (2011) suggests, the participants all provided very detailed and extensive feedback and engaged organically in explaining their own point of view.

Results

Both quantitative and qualitative date were collected. On the quantitative side we collected information about time (browsing, registering, booking, check in, sample collection) and

errors (presence and number). Qualitative knowledge was gathered with open questions regarding the overall service-system, the single service moments and their experience (pre, during, post service) and single elements (digital interfaces, structure/architecture, wayfinding/signage and their dimensions – functionality, data/information, interactivity).

The data were analysed in the following way: for each participant a customer journey map of the prototyped experience was made. While reviewing each session (all of them were video recorded) we noted in the different service phases the following data: start and end of task (time), issues, comments (positive, negative, …), facial/physical reaction/behaviour (surprised, annoyed, confused, …). These points were integrated with the answers of the final interview. Recurring comments and points of criticality were finally outlined and discussed with the stakeholders. Finally, a list of future improvements was elaborated.

Reflections and conclusions: towards a culture of (service) prototyping

The employment of the experience prototyping and service walkthrough techniques and the application the Service Prototyping Practical Framework (Passera et al., 2012) for the prototyping of Checkd. Produced some reflections, that we present here summarized in in the form of three main takeaways.

One first takeaway relates to the relationship between purpose and fidelity level. In both prototyping phases the low resolution and their related mixed fidelity did not hinder the right execution of the procedures and their correct evaluation. The opposite: low fidelity elements helped in leaving space for user interpretation and exploration.

A missing physical element or functionality, in fact, sparked more comments than a working/existing one. Participants proactively engaged with the prototypes and their elements, ‘showing’ their perspective (eg. What they would do differently, new ideas) rather than only ‘telling’. They used props or role-played situations. Only occasionally participants were prompted, for example, with the question ‘what do you think it is supposed to happen when you (…)?’.

It is interesting to highlight that prototypes that were mainly thought with an ‘evaluation’ purpose naturally shifted towards being more ‘explorative’, due to the fidelity level of the prototypes themselves. This led to a more participatory design dimension, highlighting the need of carrying out additional co-design activities about some specific service moments and touchpoints. We may argue that in this case the boundaries between co-design and prototyping were blurred, as we continuously ‘moved’ between testing activities and re-designing them with the help of the users-participants.

Another aspect that supported this prototyping-purpose transformation was adopting a technique of usability testing, the ‘think aloud’ protocol, where the user voices what they are doing, thinking or feeling while solving a task or a problem (Someren et al., 1994). Applied to both experience prototyping and service walkthrough, it gave the ability to participants to be more comfortable and empowered in externalizing their own views.

A second takeaway concerns iterations of service walkthroughs and servicescapes. With Checkd. The test situation corresponded to the real implementation context only in certain aspects (mainly superficial and related to the ‘look and feel’). Many other different factors that usually shape the original servicescape (eg. Airport) were not implemented, despite being

highly influential on the service experience and the customer successfully reach their goal.

From this point emerges the necessity of iteration. Multiple progressive sessions would allow to increase each time the level of fidelity and validity.

For example, in the case of Checkd. It would be interesting to do more service walkthroughs, each time adding more variables (eg. Waiting time, random errors and failures, ambient sounds or more user categories do the walkthrough simultaneously, implementing the trays automation system) that raise the level of realism. In any case, despite the number of repetitions, we experienced (by ourselves) that it is vital to prototype as soon as possible to advance in the project (Blomkvist et al., 2012), even if the fidelity level is very low. It is better to test some crucial service moments and, if needed, come back and co/re-design them, to then test them again. The continuous flow between co-design and prototyping that we mentioned before should be adopted.

Finally, a third takeaway relates to the role of the Author. Passera et al. (2012) and Blomkvist (2011) provide similar descriptions about the Author and identify he/she as the person in charge of designing the service prototype and taking decisions regarding the alternatives.

During the prototyping phase of Checkd., the Author performed many roles: she was at times creator (session design/planning), at others facilitator (supporting/following users) or orchestrator (performing backstage actions). This metamorphic nature is essential in medium-low fidelity prototypes, where the Author intervention is required to make the service mechanisms work. We believe that here there is room for further research: it is important to educate and prepare the Author in playing different roles and jumping between them, seamlessly. The multiple role situation can, in fact, hinder the prototyping activities when sessions are long and services simulated have many different dimensions. Complications in recording, frequent interruptions of service flow and incorrect execution of actions can happen or user comments/behaviours can go unnoticed. In these cases, the presence of multiple ‘Authors’, taking up different roles could benefit the research, as each person can focus on one or a few roles, always though collaborating with the others. This means to educate and create a prototyping group of Authors, able to intervene at any stage, especially in complex and articulated projects as services are in most of the cases.

Such perspective is strictly connected to what McElroy (2017) suggests at the beginning of her book: it is fundamental not only to prototype and have a personal mindset toward prototyping, but above all to develop and spread an actual culture of prototyping. This is even more important in the service design discipline, in which the combination of tangible and intangible elements creates a great complexity and generates the need of setting a constant feedback and user testing loop. In this context, the Author is not only a facilitator and an orchestrator of the prototyping process, but he/she should also become advocate of a broader prototyping culture that allows to better advocate the user within its organisation, who should be always placed at the centre of any (service) design actions.

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