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Using Patient Experiences to Understand the (Missed) Digitalisation of the Public Health Services

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Using Patient Experiences to Understand the (Missed) Digitalisation of the Public Health Service

This paper explains how value co-creation is affected by the introduction of tools to digitalise healthcare. In particular, this study examines how pregnant women in France collect, utilise, and share their health records after the launch of a new Electronic Health Record (EHR). The paper combines methods from the design field (cultural probes) and micro-phenomenological interviews to capture value co-creation and value co-destruction dynamics. Through analysing nine cases, we highlight the role of patients' expectations in potential value co-destruction with an EHR. We describe why it is important to know by whom and how co-creation is carried out to improve the launch of digital health applications. Finally, the paper emphasises that value co-creation is a long-term process that needs to be studied longitudinally.

Keywords: Patient Experience; Healthcare; Value co-destruction; Value co-creation; Cultural Probes; Electronic Health Record; phenomenological research; Mixed method

Summary statement of contribution: An interdisciplinary method for exploring value co-creation and value co-destruction dynamics. A deeper comprehension of patients' expectations and value co-destruction when using electronic health records to store and share health documents.

Introduction

Until the 2000s, the digital transformation of healthcare services was seen as a means of increasing positive clinical outcomes and reducing costs. The COVID-19 pandemic has been a game-changer toward this transformation, highlighting the prominence of robust centres to manage big data on people's health and information systems to overcome and outpace the virus'

spread. With a new European policy[1], the development of new national healthcare information systems and advances in artificial intelligence, European states aim to both grow the amount of strategic health data as well as attract private platforms with high-speed development (e.g., Apple HealthKit, Doctolib, etc.). Countries, including the United Kingdom, Australia, and France, have implemented national, centralised, shared electronic health records (EHRs) (Essén et al., 2018). EHRs aim to allow different care providers to share patient information to optimise the quality of care by improving care relevance, reducing adverse drug reactions, and decreasing the duplication of diagnostic tests (and thereby health costs) (Antonio et al., 2020). EHRs also have the potential to support patients in self-managing their health (Otte-Trojel et al., 2015; Urowitz et al., 2012) and are a new way of sharing healthcare documents between patients and healthcare professionals. This is ideally envisioned to promote collaboration between patients and healthcare professionals and overall facilitate value co-creation (VCC). For the past 20 years, many European countries have faced numerous obstacles in deploying and adopting these tools (Essén et al., 2018; Lupton, 2019). To understand these challenges, many studies have explored the difficulties associated with integrating EHRs into primary healthcare services (as observed in Fichman et al., 2011). However, few studies have examined the dynamics of VCC as well as its negative counterpart (i.e. value co-destruction VCD) from the perspective of patients (Li & Tuunanen, 2022). This paper strives to fill this gap.

The case study for this investigation is a new EHR introduced in 2022 by the French government, name 'Mon Espace Santé' (MES)[2]. Our objective is to understand patients' appropriation of this new EHR and how it shapes patient expectations, fosters VCC, or potentially leads to VCD. In this paper, value co-creation is defined following Grönroos and Voima's definition (2013, p. 138) as 'the joint process whereby firms and customer together

[1] The European Health Data Space (EHDS) launched in March 2022

[2] 'My Digital Space' in English

[...], in interaction, create value'. Conversely, a value decrease can appear between a firm and a customer, known as VCD (Echeverri & Skålén, 2021). In addition, expectations have been recognised as a main factor in driving VCC/VCD (Lumivalo et al., 2024). This article aligns with Löbler's (2018) viewpoint: VCC and VCD need to be evaluated through individual experiences. This resonates with the phenomenological perspective of Grönroos and Voima (2013, p. 146) on value creation: 'value is always uniquely and phenomenologically determined by the customer (or other beneficiary)'. Therefore, we adopt a phenomenological approach, employing a combination of cultural probes (Crabtree et al., 2003; Gaver et al., 1999) and micro-phenomenological[3] interviews (Vermersch, 2006; Petitmengin et al., 2019) to delve into patients' perceptions and feelings, for understanding VCC processes. To capture specific moments of co-creation, the study draws on patients' personal health records (physical or digital) and how patients collect, store, utilise and share these records. We selected the pregnancy journey in collaboration with the health insurance fund as a case study object to examine the use of an EHR by patients[4] for several reasons. Firstly, pregnant women can be considered patients because they are undergoing medical treatment. Secondly, pregnancy evolves over a long period of time in which women are interacting with multiple healthcare practitioners. Thirdly, during their pregnancy women have to manage many digital and physical health documents, created by the healthcare system. Finally, the local health insurance fund identified pregnant women willing to participate in the study.

The paper is structured as follows. The literature review is presented first and focuses on VCC and VCD and patient experience. This first part underlines the unique aspects of

[3] This type of interview is also known as 'entretien d'explicitation' in French.

[4] Smajdor and Räsänen (2024) argued that there are pragmatic grounds for affording pregnant women a patient status on the basis that pregnancy shares important features with other diseases. To be pregnant is to experience symptoms and face significant risks to life and health, which does not prevent it from being valued as a life experience.

gathering patient experience descriptions over a long period of time using a phenomenological approach. This is followed by methods used to study how patients handle their health documents with a focus on lived experience. The findings are then presented and discussed in relation to existing literature. Finally, the paper outlines the theoretical, methodological, and managerial implications and acknowledges potential limitations to suggest directions for future research.

Research Approach and Related Work

This section, first, explores VCC and VCD as concepts for analysing collaboration between patient and healthcare professionals (Keeling et al., 2021) and then the role of EHRs in this collaboration. It then provides a comprehensive understanding of the relevance of focusing on lived patient experience to capture expectations and descriptions of VCC/VCD.

Definition of VCC and VCD

The seminal works of Vargo and Lusch (2004, 2008) defined VCC as a reciprocal and mutually beneficial relationship involving at least a customer and a provider. However, some authors have shown that VCC can be either positive or negative, depending on the actors' intentions, the resources used, and the actual interactions that take place (Storbacka et al., 2016; Echeverri & Skålén, 2021). In addition, not all actors necessarily play the role that was assigned to them by the service creators (e.g., Hassan Shah et al., 2021). In order to capture the specificities of this negative aspect of VCC, Plé et al. (2010) proposed the new concept of VCD, as 'an intentional or unintentional misuse of resources leading to decline customer and/or provider well-being' (Lumivalo et al., 2024, p. 159). After this first mention of VCD, multiple research definitions emerged, and two main research pathways diverged. On one side, a group led by Echeverri and Skålén (2011; 2021) opposed VCC and VCD as two different dynamics. On the other side, was the idea that co-destruction can be viewed as value co-creation with a

negative valence (see the seminal review of Lumivalo et al., 2024 for an overview). In this paper, we consider VCD following Echeverri and Skålén's (2021) view: if VCC denotes an increase in value, then VCD denotes a decrease in value. Thus, we consider VCC and VCD as two distinct concepts. Patients typically expect to experience improved well-being when interacting with healthcare professionals. However, EHRs can hinder this process, potentially leading to VCD scenarios (see for example Keeling et al., 2021 for VCC and parallel VCD during consultation). Finally, beyond these conceptual debates, Lumivalo et al. (2024) emphasise that an important avenue for future research lies in empirically understanding the mechanisms of VCC and VCD across various sectors and services, and particularly at the actor level (i.e., patients).

EHRs: enablers of VCC and VCD in Healthcare

In healthcare, VCD is likely to happen when patients or practitioners do not use the right resource, have a conflicting point of view, or are seeking different outcomes (Palumbo & Manna, 2018; Keeling et al., 2021). An EHR only mediates VCC and VCD dynamics that appear through human interactions. Indeed, an EHR is a bundle of resources that can be used to improve communication, coordination, and decision-making among all parties involved in patient care. Li and Tuunanen (2022) state that IT platforms can facilitate social interaction by increasing dialogues, communication, or synchronic interactions but, also, impede collaboration. Indeed, IT platforms can compromise privacy and security, force behaviours that are incongruent with patients' or professionals' routine and prevent resource integration by making resource access more complex and contributing to information overload. However, Li and Tuunanen (2022) do not emphasise the moment where VCC and VCD take place nor the longitudinal dynamic between patients, professionals and IT platforms. Studying patient experience in a longitudinal way enables a comprehensive understanding of dynamics with

multiple actors at various levels, embedded within contextual touchpoints (Kranzbühler et al., 2018), the locus of institutional arrangements (Verleye et al., 2017), and resource integration (Jacob et al., 2022).

We need, firstly, to deepen knowledge of mechanisms at play when patients interact with an EHR and the expectations that formed prior to patient-professional encounters. Secondly, it is essential to understand the role of EHRs during face-to-face interactions (i.e. consultation). Our objective aligns with that of Keeling et al., (2021): studying patient experience over a long period of time is a good way of understanding practice, social interaction, institutional arrangements and resource integration, and VCC and VCD in a healthcare service system. We focus on patients because numerous researchers have already highlighted the difficulties for frontline healthcare services: adverse influence of adopters on non-adopters of digital IT platforms (Venkatesh et al., 2011; Davidson et al., 2018), privacy concerns (Meskó et al., 2017), perceptions about how time-consuming they are to use, and the fear of missing patients' data from all the available information (Romanow et al., 2012). However, there are too few studies on the lived experience of EHRs from a patient perspective to understand the process of VCC/VCD (Keeling et al., 2021).

Defining Patient lived Experience

In healthcare research, the notion of patient experience (PX) is now widely accepted and diffused in healthcare institutions (Jenkinson et al., 2002; Jenkinson et al., 2003). However, patient experience is a concept with multiple definitions in different domains. The Beryl Institute (2014, p. 8) proposes the following definition of PX: 'Patient Experience is the sum of all interactions, shaped by an organisation's culture, that influence patient perceptions across the continuum of care.'. In marketing, patient experience is an extension of customer experience (Lemon & Verhoef, 2016). According to Gallan et al. (2019, p 378):

> Patient experience is a multidimensional construct focusing on a patient's cognitive, emotional, behavioural, sensorial, and social responses to a firm's offerings during the patient's entire healthcare journey.

Building on Gallan et al.'s (2019) vision, we adopt a phenomenological approach that considers PX as the lived experience of patients. The study of patient lived experience must also acknowledge that patients tend to develop habits and knowledge about themselves and the healthcare system in general (Borkman, 1976; Lim et al., 2016). These habits and knowledge are called experiential knowledge and are gained from personal experience with a disease, one's body, the health journey, and so on (Castro et al., 2019). For example, Lim et al. (2016) demonstrated that a patient who has had Crohn's disease for many years develops expertise in selecting which information is relevant for the medical staff and how to handle a surge in symptoms. For pregnancy, as the duration is around nine months, the knowledge accumulated by patients themselves must not be disregarded. This experiential knowledge can be categorised into three types (Caron-Flinterman et al., 2005): knowledge by acquaintance (e.g., being familiar with pregnancy-related symptoms), practical knowledge (e.g., knowing how to bend over as a pregnant woman), and propositional knowledge (e.g., not to drink alcohol when pregnant).

Lastly, different approaches exist to capture collaboration in healthcare. One approach involves exploring relationships between different actors through the lens of artefacts (Stahl, 2013). Artefacts encompass all the digital or material objects created during the healthcare journey (e.g., blood analysis, ultrasound, patients' notes, etc). They are lasting, durable, dynamic objects, usually used cooperatively, that remain long after the written or spoken word (Stahl, 2013). Health documents and the EHR interface are actors, therefore, that serve as an ideal means to investigate VCC/VCD over the long term (several months).

Based on these aspects of PX, we strive to provide a consistent picture of the co-creation and co-destruction of value from the perspective of patients' lived experience of a newly introduced EHR.

Method

An overarching aim of the study was to help improve the application of 'Mon Espace Santé' (MES) in collaboration with the local healthcare insurance fund of a French department (named CPAM44). We developed a research program focused on patient lived experience. It focuses on the patient perspective (micro level) to address a gap in the existing literature, which has predominantly focused on the macro level and meso level (e.g., Hermes et al., 2020).

However, to gain a thorough understanding of the micro level, it was essential to understand the context of the French EHR system 'Mon Espace Santé' (MES) (i.e., the meso and macro level). So, we performed a preliminary set of interviews with MES integrators (i.e., local health insurance fund), as well as a document analysis of the history and functionalities of MES. Then, we studied pregnant women interacting with MES. Each woman was considered as an individual case study to construct a longitudinal multiple-case explanatory study (Stake, 2006; Yin, 2018). The case study methodology is recommended to process an empirical inquiry that investigates a phenomenon in depth in its real-life context, especially when boundaries between phenomenon and context are unclear. This qualitative research design isolates causal relationships between pregnant women's behaviours and contexts, intertwined events, and ecosystem problems (Creswell & Poth, 2016). We studied pregnant women (at the micro level), longitudinally, in two steps to capture different sources of information: (1) cultural probes were sent to the participants by mail and retrieved after two months to observe lived experience and the sharing of artifacts and (2) first-person interviews were conducted to explore women's lived experience (micro-phenomenological interviews).

History and context of the study: the French EHR MES

To understand the background around MES and EHRs in general, we conducted interviews with MES project managers from the local health insurance fund, the patient experience manager within a hospital, and the local administrator (Healthcare service of Pays de la Loire). To understand the macro level, we studied French state official documentation, YouTube conferences, and websites.

The French EHR is considered an essential element in the digital transformation of France's national healthcare system. However, the French EHR has encountered many difficulties since its introduction and has struggled to be adopted by healthcare practitioners. After a somewhat rushed start in 2006, it was stopped six months later due to security concerns. It was re-launched in 2010 and again in 2016 due to poor EHR data creation and low user adoption (Séroussi & Bouaud, 2016). New features have been developed since 2017, including the ability for patients to create an EHR space by themselves and the implementation of financial incentives for healthcare providers. After a difficult starting period, the new EHR appeared to be successful in terms of growth in EHR use but was still considered a failure for the same reasons (Séroussi & Bouaud, 2020). In 2022, an enhanced version of the EHR, called MES, was launched within a new digital health platform. For health providers, the government proposes only a financial incentive, developed data operability, and data accessibility.

An EHR system such as MES can be examined at different levels: micro, meso, and macro. At the micro level, MES is a platform, utilised by both patients and practitioners. At the meso level, the French system comprises local and regional healthcare insurance services. At the macro level, healthcare authorities/ministries and CNAM[5] (national healthcare insurance

[5] Caisse Nationale de l'Assurance Maladie

funds) coordinate policies, organisations, and investments (Hermes et al., 2020). The healthcare service ecosystem around MES is schematised in Figure 1.

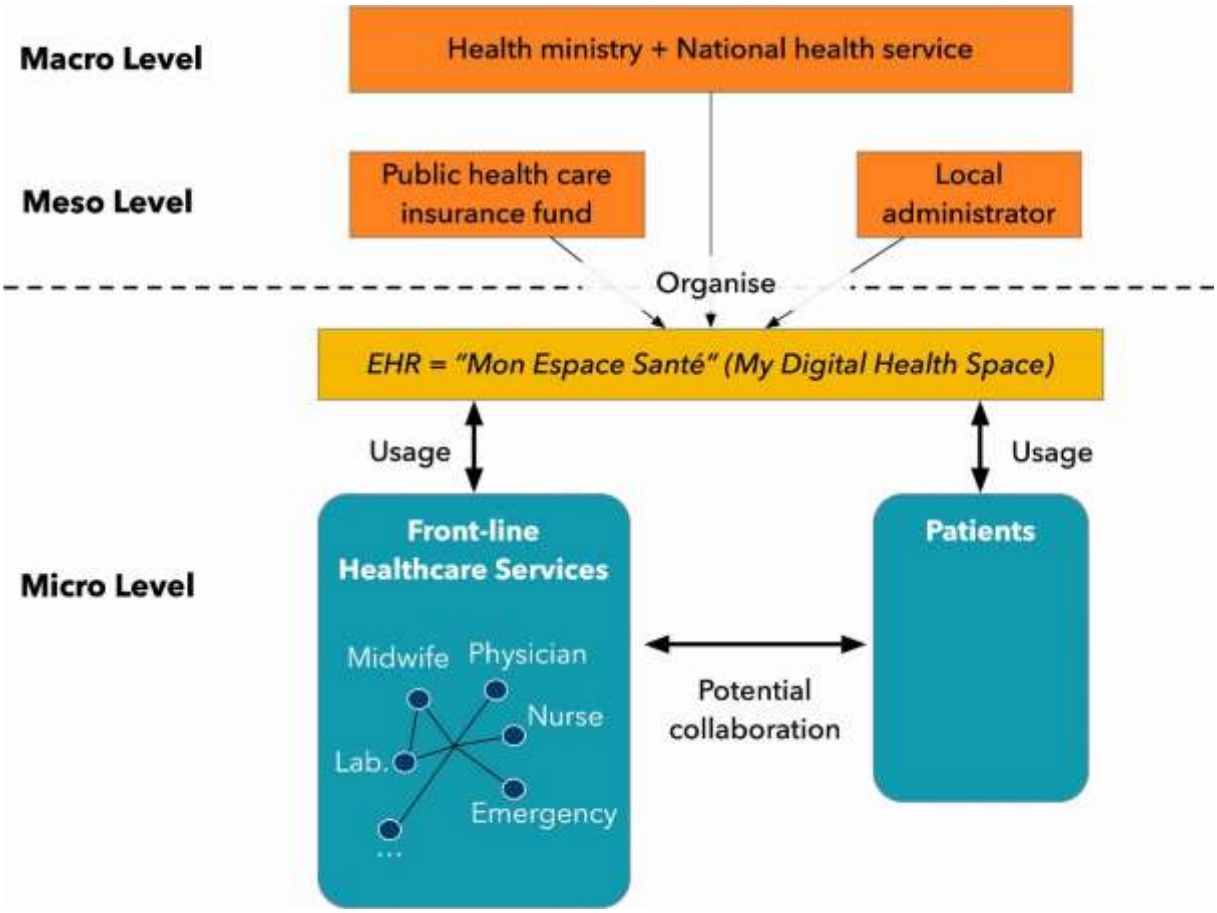

Figure 1 - The French healthcare ecosystem

The EHR MES features include (see also the website page in Appendix B):

- a digital safe to store and share all health documents and information such as medical profiles, prescriptions, medical test results, hospitalisation records, and vaccinations;
- a secure messaging system for patient-health practitioner exchanges;
- a health diary to centralise medical appointments and receive reminders (feature added in 2023); and
- a catalogue of mobile health apps selected and certified by the state and compatible with MES (e.g., connected watch app, meditation app) (feature added in 2023).

Collecting patients' lived experience of MES of 9 women cases

The local healthcare insurance fund (CPAM44) reached out to pregnant women by phone in December 2021, and 77 women expressed interest in participating in the research. Twelve women consented to their inclusion in the study following a video meeting, with nine women completing the study[6]. Each participant is described in Appendix A. Figure 2 illustrates the two steps for collecting patients' lived experience of MES: using cultural probes and conducting micro-phenomenological interviews. Overall, the triangulation of qualitative methods enabled us to explore the same subject from different angles, with each method compensating for the shortcomings of the other.

[6] Many of the 77 women who were contacted were in the very end stages of their pregnancy, so too late to participate in the research program. We also anticipated that some of the women contacted would be discouraged by the time-consuming nature of cultural probes.

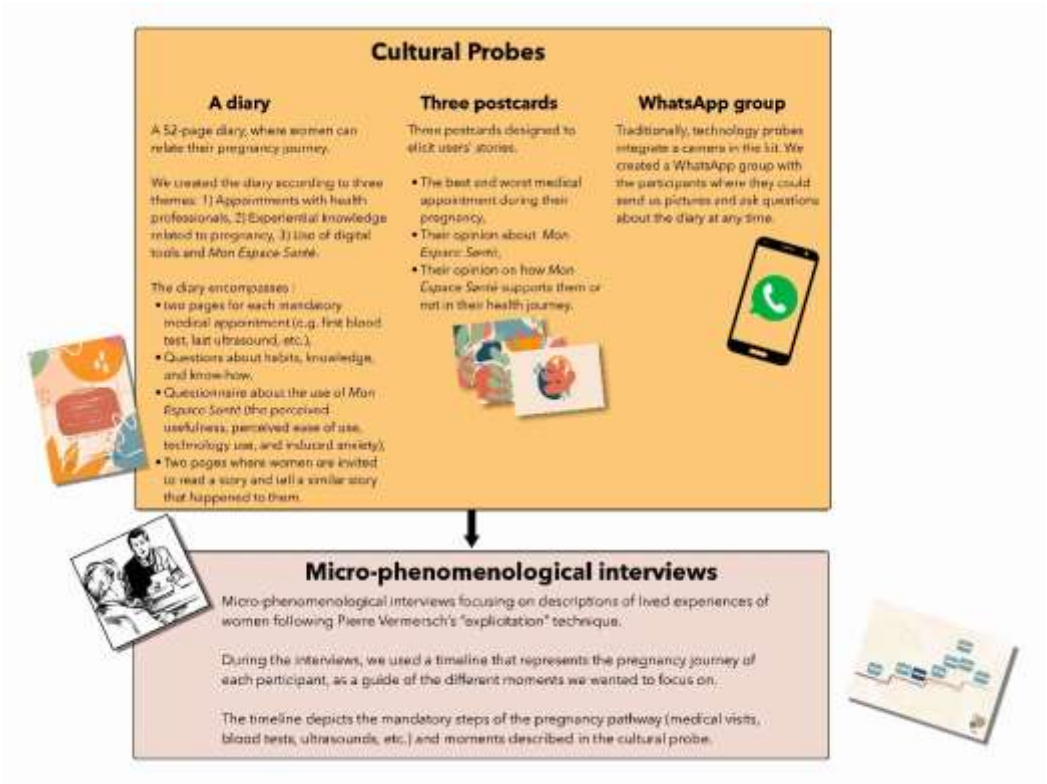

Figure 2 - A two-step methodology with cultural probes and interviews to trace the pregnancy journey.

Step 1: Cultural probes to capture patients' lived experience

To study patient experience over a long period, we selected the cultural probe method, which allows participants to describe their experience over time. Cultural probes are simple and appropriable objects (usually a diary maintained by a user over several days or weeks) that can be deployed in real-world situations to gain contextually sensitive materials about a particular situation (Gaver et al., 1999). They are particularly pertinent to collecting first-person data in the long term as they enable women to describe their lived experience during medical appointments after each consultation. Moreover, it also facilitates ongoing interdisciplinary research projects (Crabtree et al., 2003).

The cultural probes consisted of a 52-page diary, three postcards, coloured felt pens, and a WhatsApp group. Two professional designers created the graphic design to make the probes a joyful object and encourage women to keep them up to date. The different elements of the cultural probes are depicted in Figures 2 and 3. The probes were sent out in February 2022 to 12 participants with instructions to complete the postal cards and the diary for two months and send them back via post. Of the 12 diaries expected, nine were received. Three participants did not return their diary and were therefore not included in the results. The last nine participants received compensation of 50 euros for completing the diary for two months, in the form of a gift voucher. The nine pregnant women were between 23 and 38 years old (M = 30.11, SD = 5.06) living in Nantes, France. They were between seven and eight months pregnant at the start of the study and were undergoing either their first or second pregnancy (6/9 and 3/9, respectively).

Figure 3 - The cultural probes contained a colourful bag with a diary, coloured pens, and three postcards.

Step 2: micro-phenomenological interviews

Cultural probes are highly suitable for gathering experience over a long period of time, but a drawback is that participants generally provide short descriptions of their experience. After receiving and analysing participants' cultural probes, the study continued with the aim of gathering detailed descriptions of specific moments. It was decided to conduct classical semi-structured interviews with the nine women, using a specific technique: the micro-phenomenological interview (Vermersch, 2006).

A micro-phenomenological interview is a method to collect first-person accounts of lived experiences (Prpa et al., 2020; Høffding et al. 2023) during which the interviewer focuses on asking the participant to re-enact an experience; this means helping the participant to 're-live' a moment of their experience and to verbalise what happened at that moment. For example, what actions they took, their thoughts at a specific moment, their sensations, perceptions, etc. The interviewer refrains from asking questions likely to trigger judgements (questions generally beginning with 'why [...]') and instead focuses on the interviewees' course of action. For each moment selected by the interviewer, participants are asked to take their time, to go back to the particular moment and describe, step by step, what they saw, did, or felt. Examples of questions include 'What are you seeing now?' And 'What are you doing when you see that?'

As the interviewer had a limited amount of time to review moments of interest, it was important to preselect 'key' moments of the interview that should be elicited. These moments were identified using participants' diaries and can be considered as touchpoints (Neslin et al., 2006). Although all interviews started with the participants' first use of MES, the moments mentioned thereafter were generally different from one participant to another. The interviewer was free to explore interesting moments that were uncovered during the interview (touchpoints or other interesting episodes or phenomena outside of touchpoints). To assist the interviewer

during the interview, a graphical timeline was created that described the mandatory pregnancy-related medical appointments and the moments of interest. The timeline allowed the investigator to recall the chronology of the pregnancy journey and focus on the specific moments chosen (as listed in the diary or related to the research question).

All 9 participants agreed to take part in one interview in May 2022. Each interview lasted between 60 minutes and 90 minutes. All interviews were conducted via Zoom[7], recorded, and later transcribed (134 pages) for analysis. Two researchers were present for each interview: one conducted the interview while the other completed the timeline with the different moments evoked in the interview.

For the data analysis process, used pseudonyms to preserve the anonymity of participants. Then, we used an abductive analysis approach (a top-down analysis followed by a bottom-up analysis). Firstly, two researchers iteratively analysed the participants' diaries focusing on two theoretical concepts (top-down):

- Participants' lived experience, including thoughts, emotions, sensations, actions, social perceptions that were experienced before, during, or after a consultation.
- Patients' experiential knowledge, encompassing the habits and knowledge created to handle health documents (e.g., where documents are stored, how the participants choose which document to bring with them, etc.).

Secondly, we created a timeline to visualise each woman's overall health journey and replaced the description of lived experiences and experiential knowledge gathered with the probes in chronological order. This timeline highlights the key moments experienced by patients and served as a guide for interviews. Thirdly, we actively looked for themes representing patterns within the transcript of the interviews (Braun & Clarke, 2006) (bottom-up). We found four

[7] To avoid physical contact for the pregnant women during the COVID-19 pandemic.

themes: 1) patients' expectations with MES, 2) VCD generated by practitioner's misalignment with expectations, 3) VCD generated by the introduction of an EHR in patient and professional face-to-face interactions, 4) and VCC generated with platforms other than MES. In the following section, we delve into the first three themes. We have opted not to elaborate on the fourth theme (VCC with technological tools other than MES) as our focus lies primarily on MES. The cultural probes and the micro-phenomenological interviews allowed us to build up a picture of each woman as a case, construct a timeline of their pregnancy journey, and obtain information about how they managed their health documents and integrated the MES platform into their journey. This mixed-qualitative design produced an understanding of the lived experience of each woman.

Findings

We found that participants had four different expectations about future interactions with practitioners created when they first logged onto the platform before meeting them: (1) MES is a digital vault and a centraliser for my health documents; (2) MES is a communication facilitator with my health professionals; (3) MES usability is the promise of future frictionless interactions; and (4) MES is a digital applications centraliser. Then, we provide two cases of VCD with MES due to practitioner misalignment: (1) VCD generated by practitioners that did not adapt their practices to MES, and (2) VCD generated by the insufficient sharing of health records among professionals. Lastly, we show that VCD also occurs during face-to-face interactions because (3) MES security hinders interactions, and (4) MES integration in the health app ecosystem is limited. The findings are schematised in Figure 4.

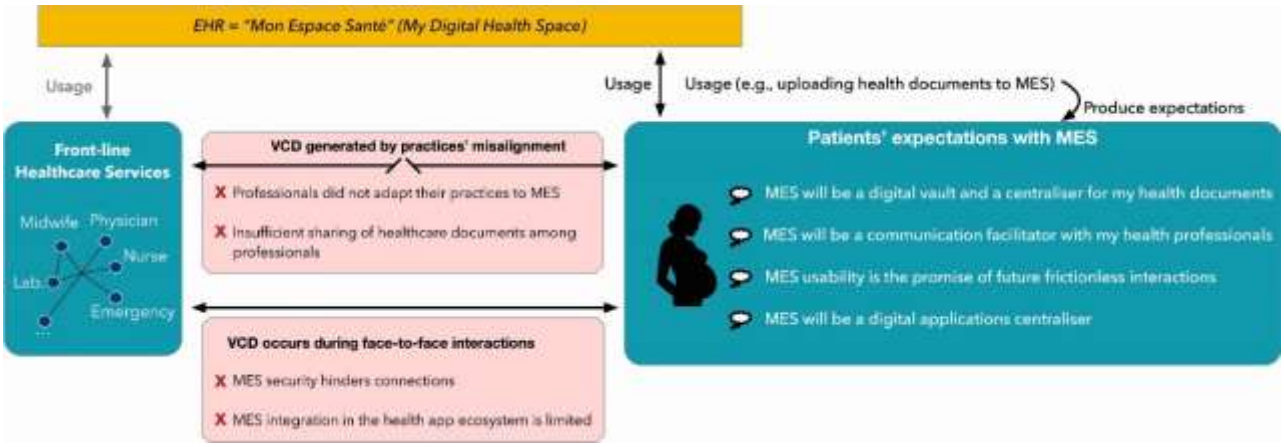

Figure 2 - Patient expectations and value co-destruction caused by MES

Patients' expectations created by MES

Patient expectation 1: MES is a digital vault and a centraliser for my health documents

Several participants (Élodie, Manon, Céline, Mélanie, and Camille[8]) indicated that they expected MES to be a digital vault (i.e., a place where their medical documents can be stored securely). As a digital vault, MES should also enable the centralisation of health-related information. For example, Céline explained how she expected MES to become a central point for all her documents and with this in mind, she took on the tedious task of gathering and uploading all her documents to MES:

> I first logged on to all [healthcare] platforms, downloaded everything, and then uploaded everything to MES. [...] I repeated this procedure maybe ... 10 times. [...] Uploading was more like a chore than a pleasure, but I had to do the job. [...] But I saw the benefit and I was satisfied with the idea of using this digital vault. I saw it as a central point for all my documents. (Céline)

In her diary, Camille explains having the same expectation:

[8] The first names of all participants have been anonymized.

> I was expecting a single digital space to host my healthcare documents, and for it to be able to replace the amount of paper documents for each check-up. (Camille)

Élodie likewise saw MES as a central place where health information (health documents as well as health information) is accessible:

> It's really a tool where information is centralised. I never had any visibility for all my health information, at least not in this way, centralised like this, and I told myself that ... 'Well, it's great to be able to access it like this.' [...] What I liked was that it was a potential tool for centralising information. It's digital, so it should be easy to access and accessible from my computer and my phone. (Élodie)

Based on her expectations, Céline decided to use MES as a counterpart to her paper folder. Indeed, all the participants used a physical tool (binder, folder) to store and save their health documents before MES. As Céline explains, this is due to the pervasive paper culture in France:

> When I was first shown MES, it looked like it would be useful to have a single point that brings together all health documents, that was the major point. Since each practitioner had their own platform during my journey, I wanted to centralise everything and lose nothing, knowing there was also the paper file. At each consultation, you must print almost all the results, so my goal was to download everything [into MES] and put everything together. I did it quite late in my journey to prepare for the last trimester of pregnancy when I had to change physician. (Céline)

Thus, Céline's story illustrates that women expect MES to facilitate their pregnancy journey by acting as a unique health documentation platform.

Patient expectation 2: MES is a communication facilitator with my health professionals

Another strong expectation of MES was that it would facilitate the sharing of health information between different public services (hospitals, physicians, nurses, etc.). As an example, Pauline wrote in her diary:

> When I activated my account, I expected to be able to exchange information with the healthcare professionals I met. I also expected that each healthcare professional I met would have access to my data and history to facilitate exchanges. (Pauline)

Similarly, Mélanie explained during the interview:

> Ideally, I would like the midwife to access it [MES] directly during my first appointment at the hospital. I don't know if she can do that, but I plan to tell her that she can connect directly to my MES, which would save me from having to print out all the results. (Mélanie)

Manon also faced a problem with document sharing when using an application other than MES. In her opinion, MES should be able to facilitate document sharing, especially as it is a public service application. She commented:

> At my hospital, you can make an appointment on Doctolib. Before the appointment you are told by the app [Doctolib] to put all your documents on the platform so that practitioners can access them [...]. Fortunately, I think ahead, and I also took my binder with me [...]. I'm glad I did, because at the hospital they told me that they don't have access to Doctolib documents. I hope that with MES we can do that. [...]. It's [MES] a government tool [...]. I think that public hospitals should have access to my documents through MES, right? Otherwise, I don't see the point either. (Manon)

Although the French national health care insurance fund currently seeks to promote the connection between patients, health services, and physicians (Séroussi & Bouaud, 2020)

compartmentalisation of information remains the norm (Lairet et al., 2024). However, the participants' stories indicate that users are not aware of these problems.

Patient expectation 3: MES usability is the promise of future frictionless interactions

The women expected MES to be easy to use and to run smoothly. With an average score of (4.16/5) on the usability survey printed in the diary, participants considered that MES does not require any particular knowledge and is relatively user-friendly (4.11/5). Women found that interacting with MES is neither frustrating nor requires much effort to master. From a technical and ergonomic point of view, MES kept its promises, as explained by Laura and Céline:

> It was really easy to do, I filled in my identity details and then my pathologies. During my first time logging in, I don't have to search all over the site. In fact, it is obvious: you see exactly which boxes you need to fill in. [...] It was really smooth, it didn't even take 10 minutes to find my identity and fill it in. (Laura)

> I found it [MES] really simple. It was a positive impression, so there you go, I really thought: 'Ok, it's easy, it's similar to digital services, which are very accessible, intuitive.' You can find information quickly, even if you are not very technically minded. (Céline)

Hence, uploading and sharing documents with MES was considered straightforward and user-friendly. Uploading documents, however, was considered as tedious by Céline, but she still uploaded most of her documents on the platform. According to the feedback, the platform functioned effectively in terms of usability, allowing for future VCC.

Patient expectation 4: MES is a digital applications centraliser

The final expectation of one participant (Manon) was that MES could replace, or at least interface, with their other health-related apps. Manon explained that she expected MES to replace other applications that she used:

> I make my appointments with the Doctolib platform or by telephone. MES would be useful if I could put my personal documents on it, make appointments with professionals, add my health profile, etc. [...]. For me, the aim of MES would be to replace Doctolib and Amelie [a health insurance platform]. (Manon)

While some of the perceived interest in MES seems to correspond to what was imagined by the local health insurance fund CPAM 44 (e.g., the idea of a digital vault that can centralise documents), other expectations seem beyond what MES can provide. However, MES had been designed to interface with other applications in the future.

One participant (Camille) noted that she did not have expectations about MES because she prefers to use paper for her health documents:

> I don’t see the long-term usefulness of storing documents produced during my pregnancy. I have my ultrasounds in paper format, which I keep. I prefer the paper format, so I don’t necessarily see the point of having them in digital format, too. (Camille)

However, this does not mean that Camille does not use digital applications. On the contrary, Camille used applications to book her appointments. It is interesting to note that only one participant addressed data confidentiality as an issue. For example, Manon (a Google Drive user) explained why a private platform is not necessarily worse than a public one:

> I don’t trust Google any less than I would trust something public. I know that Google is very good at security. I don’t know how, for example, a public tool would be more secure because Google, has got years of practice behind it. Of course, I have learned that when it’s free, you are the product, whether it’s a public tool or not. If it’s free, I don’t trust it. It’s all the same. (Camille)

In conclusion, by introducing new features and functionalities to patients, MES reshapes patients’ expectations and redefines possible interactions with healthcare providers. MES also

fosters the adoption of new practices, including improved procedures and practical knowledge, as defined by Echeverri and Skålén (2021).

VCD generated by misaligned practices

Despite the perceived usefulness of MES and the high expectations associated with it, MES falls short when it comes to VCC. Indeed, unlike its success as a digital vault, we found that MES does not facilitate collaboration between patients and healthcare professionals. Only two women reported regular usage of the app during their pregnancy. We observed that this phenomenon is a result of misalignment between patients' expectations and professionals' practices, especially during face-to-face interaction. Based on the previously described participant expectation, we provide examples of reasons why patients either did not use MES or discontinued its use. We emphasise the disappointments arising from legitimate expectations as well as those stemming from unfounded ones according to patients' stories. We begin with examples of VCD generated by healthcare professionals, followed by VCD generated by the lack of relational resource adaptation throughout the healthcare ecosystem.

VCD 1: professional did not adapt their practices to MES

Participants viewed MES as an interesting way of facilitating exchanges with their healthcare professionals. Based on this notion, five participants took the time to provide their personal information and also uploaded their pregnancy-related documents. However, in reality, none of the participants had the opportunity to collaborate or send their health documents to their practitioners through MES. Having tediously uploaded her document to MES, Céline tells a story that highlights the misalignment between her practices and the health practitioner's practices. The digital tool, which is meant to serve as the cornerstone of all healthcare documents, is not accessed by health professionals:

> I remember a consultation at the university hospital. One of the last examination reports was missing. I hadn't printed it out, but I had the digital version on MES! So, I naively thought that the practitioner would be able to access it with one click. But no. Not at all. He didn't log on to MES and asked me for the document, so I pulled out my iPhone. (Céline)

This misalignment was a source of disappointment and even anger, for the patient:

> Yes, honestly, I was disappointed and annoyed because I invested time beforehand looking for documents on the different platforms. Everything was uploaded, I thought this was going to be the central hub. And I was doubly disappointed because the first practitioner I had in front of me did not consult or use MES, even though everything is absolutely organised. The second reason for disappointment was that I definitely found this procedure secure, but it was too over-secure, too long, and too time-consuming, so I lost my patience. (Céline)

Through this story, Céline explains how she experienced what we can define as the non-integration of data resources in practitioners' practices. This led to a VCD of both the information that the patient provided, and the efforts made. It also induced strong emotions. Céline's story is not unique, as five other participants also stated that their health professionals never used MES. For example, Laura described spending 15 days in the hospital, repeating the same information, over and over again, even though she had completed her medical history on MES. Following this hospitalisation, and much disappointment later, she decided to stop using MES:

> The worst thing is that as I was hospitalised for 15 days, well this is a concrete example! Every day they came to my room, and it was a different doctor who repeatedly and asked me the same thing. EVERY DAY! And I told all of them, why don't you use MES, it's all documented on there. I was saying the same thing for 15 days! At some

> point, you run out of steam. It would have been very useful, because I was in the same place for 15 days, and they would have had the same information, so it's a real shame, and so I didn't go back to it [MES]. (Laura)

Laura's story reveals that collaboration is one-sided. Healthcare professionals do not upload new data to the platform, nor do they adapt their practices. Patients fill in their medical history in MES, professionals do not use it, patients request it, and professionals can still decide not to use it.

VCD 2: insufficient sharing of health records among professionals

Based on the above information, patients perceived MES to facilitate the exchange of information among various stakeholders, including patients themselves, laboratories, physicians, and hospitals. However, patient accounts reveal that this expectation did not materialise as intended. Despite the participants' belief that their healthcare documents would automatically be sent to MES, they discovered that only a few documents were actually shared around the health ecosystem. For example, Élodie pointed out that her laboratory test results are exclusively accessible on the laboratory website.

> I have no personal interest in going to the lab website, downloading all my tests results, and putting them back into MES, because I need to connect MES. It's time-consuming and I gain nothing overall. On the other hand, maybe one day it will become a storage space where it will be available automatically and then it will be great. (Élodie)

Documents were not consulted by professionals either (Céline):

> I can't remember where you click, but I remember the possibility of seeing which healthcare professional had consulted the documents submitted. I clicked on it, to see if what I was doing was useful or not. Nobody had consulted it… (Céline)

Similarly, Camille also explained that her documents are not shared between the different health institutions, forcing her to use the laboratory's website to retrieve the documents. Interestingly,

although her blood analysis results were sent to both the laboratory's website and MES, she used the laboratory's website to retrieve them:

> So, I had an appointment at the university hospital with a midwife I knew, but who wasn't my regular healthcare provider. This appointment was mandatory since I was giving birth at the hospital. This midwife had to reconstruct my medical file, so she needed access to a certain amount of information, including all of my laboratory test results, blood tests, and ultrasounds. I had all the ultrasounds with me in a folder because I always received them in paper format. However, I only had one or two laboratory test results because they were mostly sent by post. The midwife needed all of them, and I was a bit stuck because I didn't have all the results in paper format. I told her that they were available on the laboratory's website and that I had my login information. She could easily check my results there, so, she said, 'Well, let's take a look,' and she took my phone, connected to my laboratory's online platform, and clicked on the different results, viewing the documents from my phone. (Camille)

Élodie described how the various healthcare players did not communicate with each other, leaving her to fill in the gaps in the information:

> It was the first appointment in my pregnancy, the eight-month appointment, and the first appointment I had at the hospital ... I saw a midwife and a student midwife for the eight-month appointment. We talked about my blood tests, the 50th blood tests I had to do and the results … Well, I had part of my results in a binder and some of the results on my phone when I logged on to the laboratory space. And so there comes a time when they must enter the values, my values for certain blood parameters into their software, which took time. At some point, the software crashed, and they restarted the computer, and they had to go through all the data entry again! Then I think it's a shame, you know, we should be able to authorise my results to be sent directly to the hospital. (Élodie)

A wide variety of data resources are stored in the competing systems to MES and used by practitioners, co-creating values on other private platforms. Participants expected MES to replace other digital applications, or at least centralise them. However, MES was not intended to fulfil this role. Consequently, the majority of participants continued using the applications they were using before, as they did not find the expected added value. Manon stated:

> MES would be useful if you could put your personal documents on the space, make appointments with professionals, and complete your health profiles. In fact, I saw that you could add professionals related to our care, but it wasn't possible to contact them or make an appointment with them. [...] I said to myself that MES could probably be very useful when all these functions are added but for the moment it wasn't a very useful tool. I didn't see the value compared to Doctolib for example, or even my cloud platform. I have the cloud for my documents which is accessible everywhere, I even have an application on my phone, which isn't the case with MES. [...] If they add all these functions, then I would see the point because it will be just one site instead of many, but for now … (Manon)

Finally, Camille summarised the position that MES must find within the digital app ecosystem:

> I think that if professionals start using MES, then maybe MES could find its place. By professionals, I also mean laboratories that have their own platforms, which is becoming increasingly complex. I use Doctolib, I use the laboratory's platform, and MES is struggling to find its place. (Camille)

VCD occurs during face-to-face interactions

While misalignment between patients' expectations and healthcare professionals' practice is a significant contributor to VCD in the context of MES, it is not the sole factor. Poor communication among various healthcare practitioners also plays a crucial role in exacerbating

this issue, ultimately placing an additional burden on patients. Tracing the patient journey reveals another layer of complexity: misalignment during face-to-face interactions. Firstly, connecting to a secured platform can be time-consuming (due to double authentication) and is prone to failure (due to connection problems), which hampered the use of MES during consultations. Secondly, the lack of clear integration between MES, mainstream applications, and healthcare provider applications lead to user frustration. The following section address the use (and non-use) of MES during face-to-face interactions and how it produces VCD.

VCD 3: Security hinders interactions

In Céline's story, another barrier to the use of MES regards its security. By design, a digital vault must be secure, which hinders its accessibility. MES operates on a double authentication system in which users must provide two separate forms of identity verification (in this case, a password and confirmation via SMS or email). This double authentication is misaligned with the practices of other health applications. For example, Céline commented that during her last consultation, the MES login process was time-consuming, and she therefore preferred to use other, less secure tools:

> [The physician] didn't log in to MES, and he asked me for a document, so I used my iPhone and logged in, but I really found the procedure too laborious: login, password, then they sent a secure code by email. It took so much time! So, I abandoned MES and logged in to the analysis laboratory portal to retrieve the document and the information that the doctor was asking me for. This was my last use of MES, an aborted connection attempt (laughs). (Céline)

VCD 4: MES integration in the health app ecosystem is limited

Our interviews and documents regarding the meso level indicated that all healthcare facilities have modified their internal information system to create an internal electronic healthcare record for each patient. However, the relationship with MES and this internal

electronic healthcare record is unclear for patients. MES is not a priority for hospital practitioners and they do not want to share strategic or sensitive data during face-to-face meetings. This difficulty is contextualised by Laura as follow:

> I was hospitalised for 15 days, during which time they [the health professionals] did several tests on me, including a blood test because I have a rare disease in my family. When I left the hospital, I asked for my health file, and they said 'No, we are keeping it.' Even though I'm not giving birth in that hospital. So, I asked them if I could at least have the results of the blood test, which is very expensive and kind of a big deal, and I told them about MES. They told me: 'We know MES, but we aren't quite there yet'. I still don't have [the results]. (Laura)

The results show that only patients and the laboratories uploaded health documents to MES. Hospitals, on the contrary, did not change their practices and continued to use paper medical records or their internal records. A misalignment exists between patients' strong motivation to use MES (driven by their expectations) and healthcare professionals' reluctance to integrate MES into their practices. This likely contributes to the VCD observed during MES use by patients. In addition, at least four participants did not use MES nor wanted to digitise their documents, resulting in an undigitised pregnancy journey. For these four participants, there were no particular expectations related to MES and subsequently no MES-related VCD. In addition, the interviews with the local health administrator (CPAM44) at the meso level and the national documentation revealed that the design process of MES was only focused on patients' and healthcare professionals' needs, MES ergonomics and general storytelling (named patient MES-use cases). However, it did not delve into patients' and professionals' consultations, nor into patient-professional face-to-face interactions and collaboration.

The findings also suggest that healthcare providers play a pivotal role in determining whether patients will adopt a specific platform or not. After all, it is the healthcare ecosystem that generates crucial documents such as ultrasound reports, medical analysis, and more. It therefore seems vital to boost the practitioner's side in order to co-create value for the patients.

Contributions and Discussion

Despite the French government's focus on implementing EHRs, every attempt thus far has been met with disappointing results. As argued by Xie et al. (2020), making sense of value co-creation could be one solution to the crises faced by governments and healthcare systems. In this study, we explored, from a patient lived experience perspective, VCD dynamics to understand why patients do not use MES. We assessed how patients gather, store and share many health-related documents during their healthcare journey. We showed that patients understood the usefulness of the MES platform and had high expectations for future interactions with health professionals. However, these expectations were generally not met when interacting with their professionals. An alignment of practices and expectations is essential to develop VCC and avoid VCD. This work contributes to existing knowledge on the effect of using IT platforms in healthcare services by providing, in the first part, theoretical contributions to explain why VCD dynamics appeared and, in the second part, how to observe VCD with phenomenological methods in a longitudinal way to help managers.

Theoretical contributions

Our results contribute to the literature on value-co-destruction by filling two knowledge gaps. The first, identified by Azzari et al. (2021), is that there is still work to be done in understanding the transformation and digitalisation of services: how value is formed collaboratively and what actions are needed to improve patient well-being. The second gap is

understanding deeply how value is co-created through the intermediation of a digital platform (Echeverri & Skålén, 2021). We now present two points to enhance our understanding of these results. First, EHRs can be considered as two-sided platforms that enable both physical and digital interactions. Second, we propose a focus on VCD dynamics with EHR.

EHR, as a two-sided platform, enables phygital experience

Phygital experience is experience lived in the physical world (e.g., in this case, the hospital) and the digital world (e.g., screens and the Internet) 'at the same time and in the same place' (Belghiti et al., 2017, p.61). In healthcare, phygital experience can occur when patients interact with healthcare providers using both physical and digital tools (e.g., health documents). The digital interaction can be supplemented by in-person visits with healthcare providers. While phygital approaches offer new avenues for information exchange, they introduce challenges that need to be addressed. EHR affects patients by allowing them to become actively involved in the VCC and VCD within the ecosystem (Hein et al., 2019). Our study showed that this was a high expectation for patients which resulted in a VCD, when healthcare professionals did not change their practices (continued reliance on paper records and restricted access to internal networks).

To unpack this negative value created by phygital experience, we introduce the concept of a 'mobile-to-healthcare' to better understand patient behaviour. The 'mobile-to-healthcare' concept integrates two theoretical concepts: mobile-to-store and control-by-platform. The mobile-to-store literature is based on studies that explore how starting a service journey with a mobile device can change in-store relationships (for example, Rodriguez-Torrico et al., 2020). Similarly, using an EHR mobile app facilitates the initial steps of a health service journey before an in-person meeting. This literature confirms that expectations generated in the early stages of the service journey, through an app, influence real-world relationships, fostering closer, more

horizontal, assertive, and collaborative dynamics. We examine MES using the mobile-to-store concept to explain how patient expectations of more egalitarian and distributed practices advancing collaboration takes place in patients' minds. Empowering patients and fostering collaboration in healthcare is a well-established strategy for improving healthcare quality (Bombard et al., 2018). Although the MES platform effectively motivated some patients to take a more active role in their own healthcare journeys, patients' efforts resulted in VCD through misalignment with actual professionals' practices, and finally to a failed initiative. To explain the resistance of some practitioners to adopting new digital tools, we draw upon the literature on two-sided platforms. Indeed, an EHR is more than just a communication platform or a repository for health data; it is a two-sided platform, as defined by Rochet and Tirole (2003): a platform that produces value for both of the users who are interconnected through it. The EHR platform is a governance tool for the macro level, facilitating state control. It also distributes roles and proposes resource alignment. In our case, patients and health professionals are the two providers of health information resources. However, according to patient stories, practitioners could refuse to enter into these new roles and the resources alignment dictated by the platform. Indeed, such new practices would be time-consuming to implement and require additional resources to consult documents, social resources of other professionals, and technological resources to be coordinated with other platforms (Fichman et al., 2011). For healthcare practitioners, the focus of VCC during consultations is to achieve therapeutic outcomes, whether curing a disease or maintaining health. VCDs arise through excessive resource consumption posited by using this EHR, without introducing any new routes to VCC for health professionals that involve practice change for improved outcomes.

From the patient stories, VCD primarily stemmed from the reluctance of healthcare professionals and patients to embrace the new roles envisioned by the platform. Indeed, health documents (i.e., information resources) are produced by professionals (ultrasound reports,

medical analysis, etc.), who choose the platform for this information to be shared (e.g., MES, Doctolib, a private website, etc.). If healthcare professionals, and producers of health information resources, do not change their practices, patients have little reason to change theirs. Drawing from the literature on digitalised two-sided platforms, inducing behavioural changes among users may require the implementation of stricter regulatory measures by the state. These controls could include mandating EHR usage, establishing EHRs as the sole source of information, or incentivising healthcare professionals for adopting best practices (Thomas et al., 2014). However, the French state has not implemented such control mechanisms within the EHR system to compel two-sided users to modify their practices, which explains part of the failure.

MES is part of a movement for more democracy in health, where patients take a more active role and collaborate with their doctors. As Pomey et al. (2015) explained, European health systems currently tend to move from a paternalistic model of medicine (where the doctor makes the decisions, and the patient acquiesces) to a more patient-centred model. However, this new model may be unpopular among health professionals as change requires more resources from them. Further work is therefore needed to study how EHR and digital collaboration with patients can be integrated seamlessly into medical practices.

Focus on a VCD dynamic with EHR document storage

Our second contribution lies in highlighting the need for further research to fully comprehend the transformation and digitisation of services at the micro level induced by EHR. We showed that although MES increases the privacy and security of health documents, patients experienced it as VCD. This finding complements our understanding of patient non-compliance with healthcare digital platforms: lack of confidence in data management and data storage (Li et al., 2016), data protection (Kellermann & Jones, 2013), data access (Sunyaev et al., 2015),

or data control by the patient themselves (Li et al., 2016). Patient non-compliance with healthcare digital platforms could also stem from both the platform's stringent security measures and its use (or not) by healthcare professionals. Conversely, storing health documents in MES alleviates patients' fears of data loss by ensuring secured and centralised storage.

Managerial and methodological contributions

Lumivalo et al. (2024, p. 169) ask for 'a lens through which managers can view the emergence of negative or insufficient value across dyads, triads, and networked relationships. We argue that design tools (e.g. cultural probes and classical design methods) are suitable methods for eliciting accounts of VCD. Below we explain them in more detail.

Cultural probes to track VCD

Traditionally, studying patient experience and value creation is done through surveys (Ahmed et al., 2014), design tools (Simonse et al., 2019), and service design tools (Philpot et al., 2019), on specific touchpoints. These touchpoints are usually chosen by healthcare professionals or researchers (Schiavone et al., 2020) and studied over a short period of time. However, some important episodes happen outside the contacts between patients and the healthcare professionals, as shown by Baxendale et al. (2015). A phenomenological qualitative design such as cultural probes is a solution for exploring patients' lived experiences in relation to touchpoints. Cultural probes enable patients to describe situations outside of their patient journey that allow researchers to explore the diversity of experiences. For example, patients can describe problems encountered with MES during moments when they interact with other healthcare applications. Moreover, we found that patients' expectations are not linked to a single use of the MES application but are rather shaped by multiple interactions outside the app or with other apps. To study such episodes, it is essential to acknowledge patients' knowledge

and let participants describe moments that they find interesting, and not only the moments that researchers consider to be interesting (i.e., traditional touchpoints).

Collecting patient experience through design methods

Studying the patient journey with cultural probes enables a focus on VCC/VCD longitudinally. Firstly, cultural probes enabled us to reduce the complexity of the patient journey by relying on known scenarios and ideal patient journeys, as recommended by Kimbell (2009). With the richness of cultural probes, it is easy to deliver scenarios that contribute significantly to the management of patient experience (Jacob et al., 2021). The patient experience blueprint calls for the short steps strategy in experience management (Maklan et al., 2017) to change and strengthen relations between patients and practitioners with EHRs, as advised in experience management. Secondly, using the patient journey allowed us to describe the dynamics of VCD between practitioners and patients. The qualitative approach made it possible to determine the different steps in VCD, as well as the logic of collaboration and interaction, which is essential when dealing with long-term care experiences. To design patient experience in digital context, co-design with patients and health professionals seems necessary. Such practice should permit the description of all patient resources involved, their representations and evolutions at each step of the patient journey.

Structuring cultural probes to support the launch of digital health applications

Cultural probes are relevant tools for project managers to improve the launch of digital health applications. This methodology is particularly relevant in the healthcare sector, as collecting experiential knowledge and lived experience 'in the wild' has proven to be challenging (Wherton et al., 2012; Oertzen, 2022). In this context, we propose several elements to develop complete and relevant cultural probes in management research.

First, we found that the design of the probes (form and content) is important to motivate the participants to complete the diary integrate it into their daily lives and make it their own

over time. It is essential to adapt the diary according to the patient's typical health journey, key stages, and mandatory appointments and focus on specific moments of the patient's journey. This requires a thorough understanding of the patient's health journey by relying on medical recommendations (in our case, mandatory pre-pregnancy appointments). Second, a balance must be found between offering a specific framework by developing factual questions, multiple-choice questions, and cards to complete, and offering free spaces to allow patients to share all their experiential knowledge. We recommend also letting participants tell similar stories, based on anecdotes from other patients. Furthermore, creating a WhatsApp group proved necessary to guide the participants and maintain their engagement throughout the data collection. The WhatsApp group allowed us to provide additional details, reassure the participants that they understood the instructions correctly, and maintain a certain proximity with the participants. Finally, it is also possible to create technology probes, which are cultural probes that incorporate interactive elements. According to Hutchinson et al. (2003), such technology can support a better understanding of the needs and desires of users in a real context.

Limitations and future work

These research findings must be interpreted with caution because the initial sample of 77 pregnant women was reduced to nine. Nine cases may seem low, but in the cultural probe's methodology, a sample of 6 to 12 participants is common. Each woman is considered as a case study. The qualitative data covers a long period of time (2 months) and includes retrospective knowledge spanning the beginning of the pregnancy to the first weeks after birth. Although the collection method provides a good understanding of participants' lived experience, it is difficult to deploy and it requires time to produce the probe, and also to collect and analyse the data. The study was undertaken during the COVID-19 pandemic, which prevented us from meeting our participants in person. This deviates from micro-phenomenological interviews which are

designed to be face-to-face, and interviewing women to 'relive' their experience by videoconference does not allow the same closeness between the researcher and the participants. Nevertheless, the cultural probes were a good way to gather data despite the pandemic context and the fragility of pregnant women.

Applying the VCD concept to conceptualise the problem of missed digitalisation requires caution due to theoretical fragmentation. It is an ongoing academic debate with multiple attempts to reconcile the VCD point of view with a Service-dominant logic (SDL) (see the recent critique of VCD by Alexander & Vallstrom, 2023). We consider VCD and VCC as two distinct concepts, following the perspective of Keeling et al. (2021). As theorised by Lumivalo et al. (2024) both VCC and VCD dynamics are at play during patients' journeys. To understand these intricacies in even greater detail, we would need to conduct interviews with patient-caregiver dyads.

Finally, Mustak and Plé (2020) recommend integrating three levels of study (micro, meso, and macro) to understand a service ecosystem and its transformation. In this research, only one side of the micro level was studied, with the meso and macro levels studied through light interviews and documentary analysis, to better understand the context. We detected VCD dynamics mainly at the micro level in the patient-healthcare professional relationship, but the role of platform creation at the macrolevel was not sufficiently explained to understand the institutional arrangements. Future work should conduct investigations at all three levels and in other countries. In addition, as the digitisation of a service arises, new types of data can be collected; for example, the number of patient and professional connections, the number of documents sent to the platform, and its use. Performing a quantitative study on the use of MES could be used to validate the patterns we identified and point to a general trend. Experiential data, on the other hand, can be used to explain some of these trends.

Conclusion

This study examines how patients use and adapt an electronic health record (EHR) during their pregnancy journey. We contribute to the field of marketing in three ways: empirically, theoretically and methodologically. Empirically, we provide grounded examples of patients having high expectations that leads to value co-destruction. Theoretically, we explain the emergence of VCD dynamics and contribute to knowledge about the impact of IT platforms in healthcare. Methodologically, we applied a phenomenological approach over two months to study VCD. While further research is needed to explore the seamless integration of EHRs and digital patient collaboration into medical practices, our study sheds light on the proximity between patients' high expectations of an EHR and the resulting value co-destruction. Finally, this study opens new avenues for using cultural probes and phenomenological methods to better understand the transformation and digitization of services driven by EHRs.

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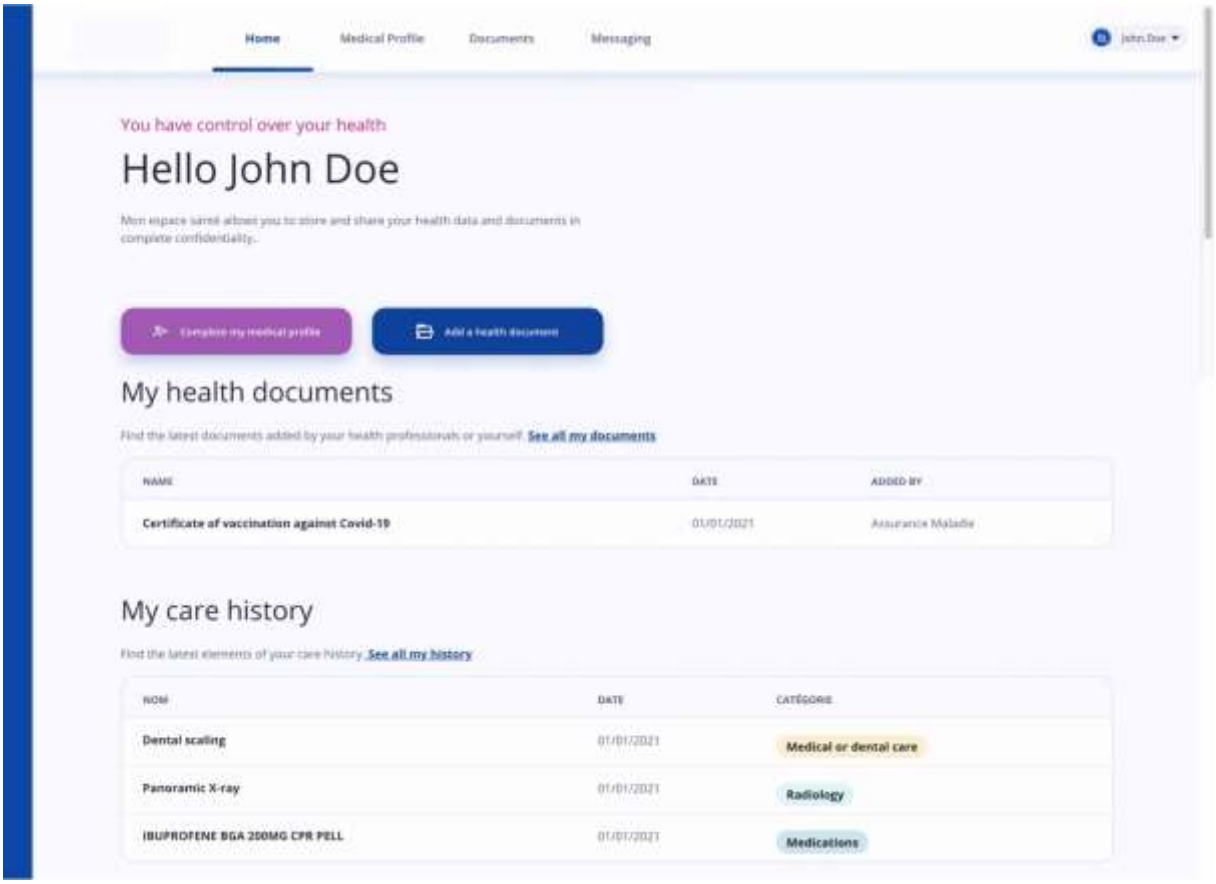
Appendices

Anonymous ID	Job Title	Age	Tool mainly used to be connected to health platforms	Type of Monitoring: Classic (low-risk pregnancy) or Specific (high-risk pregnancy)	Number of months of pregnancy at diary registration	Pregnancy
Élodie	Quality manager in industry	35	Smartphone	Classic	7.5	2nd
Laura	Home care manager	26	Smartphone	Specific	8	1st
Marie	*Not disclosed*	27	Smartphone	Classic	8	1st
Manon	Web developer / UX designer	26	Smartphone, Laptop	Classic	8	1st
Céline	Project manager	38	Smartphone	Classic	8	2nd
Léa	Pharmacy assistant	23	Smartphone, Laptop	Specific	8	1st
Camille	Pension technician	29	Smartphone	Classic	8	2nd
Pauline	Communication consultant	34	Smartphone, Laptop	Classic	7	1st
Mélanie	Assistant nurse	33	Smartphone	Specific	8	3rd or more

Appendix A. Profile of the respondents for the cultural probes and interviews.

At the beginning of the study and due to the recruitment delay, 8/9 women were in their eighth month of pregnancy. Thus, for 8 women, the study continued for almost one month after childbirth. This was not an issue as the month following childbirth involves a considerable amount of health documents and visits to healthcare professionals, both of which are central elements of the study.



Appendix B. *Mon Espace Santé* is a secure space to store and share health documents and health information, a health diary, a catalogue of health applications, and a secure messaging system [ed: Web page anonymised, translation authors' own].