Contextual Research

Why We Need to Research in Context to Deliver Great Products

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Abstract. This paper is part of a panel about user research methods and how they are applied to the benefit of products. The method of contextual research is discussed, and three case studies from the public sector are illustrating how contextual research has been driving product development. Contextual research is part of field study methods and used when exploring the context of usage of a product or service, or the cultural context. It is applied when users' tasks are involving other people or processes which need to be observed to fully understand users' needs and goals. The concept of contextual research has been developed by Holtzblatt and Beyer and for the first time completely described in 1995. The case studies from the Ministry of Justice, from Greater Manchester Transport, and the Blue Badge project are showing why this method is so important for successful product development. Especially when designing services which are involving various user groups interacting with each other, combining offline and online tasks, or when developing B2B tools embedded in processes in the office, research in context is necessary.

Keywords: Contextual inquiry · Contextual research · Contextual design · User research · User experience

1 What is Contextual Research?

Susan Farrell [2] describes several examples of field studies: user tests in the field, customer visits, direct observation, ethnographic research, and contextual inquiry which is a combination of several field-study activities. All these approaches differ in how much the researcher interacts with the participant; it can range from just observing the user to a co-discovery session when researcher and user are both sharing ideas.

Contextual research is a combination of observation and conversation with the user while the user is performing tasks at work or at home. Users are not interrupted during their tasks, but still insights are derived by asking additional questions.

The Book of Knowledge from UPA, 2010 defines it as following: "Contextual inquiry is a semi-structured interview method to obtain information about the context of use, where users are first asked a set of standard questions and then observed and questioned while they work in their own environments" [1].

Contextual research is uncovering latent needs and desires and core values. Usually it is analyzed with affinity sorting.

Contextual inquiry is part of the contextual design process, developed by Karen Holtzblatt and Hugh Beyer [4]. This approach is so much more than just a method; it is a certain view of the world about how to treat each other and how to work together.

Teamwork & immersion: The core of Holtzblatt and Beyer's contextual design approach is effective teamwork: "Contextual design creates a new team culture and way of working – committed to using data about people's real lives to drive requirements and design" [4]. "No one person is enough to make a great product – but a well-functioning team can be."

The team should be immersed in the world of the user and needs to internalize the user in order to design user centered. That is why the team is involved in the research, either by taking directly part or via interpretation sessions where the interviews are analyzed as a team to achieve a shared understanding of the user. "Hearing about the user is one thing; understanding and embodying knowledge about the user at a gut level is another. Because people are people, just telling them information about the user doesn't really communicate – not at the level necessary for design" [4].

2 How to Conduct Contextual Inquiry

The contextual interview is a one-on-one interview which lasts about 1.5 – 2h with a user in context.

The basic concept of contextual inquiry is quite simple: "[…] go to the user, watch them to do activities you care about, and talk with them about what they're doing right then" [4]. However, it is a sophisticated technique which requires an experienced interviewer and is embedded in a cross-functional team.

Contextual inquiry is based on a relationship and partnership with the user, respect for the user and the team members. It is a shared inquiry and discovery of interviewer and user. Therefore, it is by nature subjective; it is influenced by the interviewer's point of view, his experiences, and personality. But only in that way the best possible insights can be achieved, including uncovering users' emotions and needs: the interviewer should "probe emotional energy and find its origins and motivations" [4]. Since the whole team is involved in the research and roles can be shared, either for the research itself, or at least for the interpretation of the interviews, the team members will contribute with different point of views and perspectives, and thus arrive at well-rounded conclusions regarding the design. "Some data gathering methods ask for total objectivity from the interviewer; we don't think that's possible and use the interviewer's subjectivity instead" [4].

The interviewer has an "[…] attitude of inquiry, attention to detail, and humility" [4] and the "[…] user is the only true expert on their own activities" [4]. "[…] Interviewers can learn by immersion in the world of the user, discovering what's important from the people who know best" [4]. It is much more than empathizing with the user; it is putting yourself into users' shoes and experiencing their emotions. This is only possible by being subjective and establishing a real relationship with the user. "So where the target activity is happening, observe it, sense the user's feeling, and talk about it, all while it happens" [4].

A guideline for all contextual inquiries is: Be concrete, focus on describing a specific task or event, and avoid all generalizations and summaries: "Don't allow the user to summarize, abstract, or report […]" [4]. Sticking to a concrete task makes it easier for the user to describe it and also to memorize past events; the current task will trigger past experiences (retrospective accounts). It is important that the user talks through all steps, and the interviewer pays attention to emotions and motivations when the user performs the task.

The interviewer and the user should try to find the right interpretations for the facts that were discovered. The interviewer is creating hypotheses about the user's motives and is sharing them with the user to validate them. "When we go out into the field, we are not first collecting the facts of what people are doing – we must come back with an accurate interpretation of those facts. We must collect meaning" [4]. "It's the interpretation which drives the design decision" [4].

The interviewer should take notes himself. "Take notes by hand the whole time. Don't depend on a recording or a second person to catch everything." [4]. The interviewer is in close contact with the user and therefore catches emotional responses and tiny reactions better than a second person taking notes or a recording of the session.

The four principles of contextual inquiry:

- **Focus:** You need to discuss with your team which parts of a process or which tasks are most relevant, so that you know on what to focus in the research.
- **Context:** You are visiting the user at the place where he performs a certain task (office, at home, on the move).
- **Partnership:** The interviewer and the user are in a partnership - like master and apprentice: the user is the expert and has the leading role because he shows the interviewer his tasks and explains them, the interviewer is learning about the task and context, observing and probing.
- **Interpretation:** Both interviewer and user are developing a shared understanding about the user's tasks, the interviewer is sharing his interpretations and the user confirms or corrects them. Having the correct interpretation of observed facts is important for making the right product decision.

The structure of the contextual inquiry:

- **Introduction:** Welcome and explanation, getting to know the user and getting an overview about his (work) day & life.
- **Transition:** Explaining how the contextual interview will work.
- **Contextual interview:** Observing & asking questions & suggesting interpretations. Eliciting retrospective accounts. Looking for emotional energy.
- **The wrap up:** Interviewer shares with the user final summary and interpretation of what he has learned for validation.

3 How to Analyze Contextual Inquiries

In qualitative research, especially contextual research, vast amounts of data are collected. Analyzing them time efficient and making sure the team gets actionable insights from the research fast is a challenge. "Capturing the data is not the major problem for product teams – having a shared understanding of the world of the user is" [4].

Holtzblatt & Beyer have a very good solution for that, the team analysis: "Together, the team generates a richer understanding of the user than one person alone would have been able to provide" [4]. They are suggesting interpretation sessions with the interviewer and between 2 and 5 team members. The interviewer talks through the events of a single interview, using his handwritten notes and memory. The team interviews the interviewer about the user session. One team member writes down the issues, the interpretations, and any design ideas. Thus, the team is actively involved in creating the insights and feeling ownership. In that way the problem of lacking buy-in for research results is avoided. The interpretation session should take place within 24 – 48h after the interview, so that the memory is still fresh, and it is lasting about 2h, the same length as the interview session. Interviews and interpretation sessions are taking turns, so each new interview can be adapted, if necessary.

A quick overview of how to conduct contextual research gives 'Contextual Interviews and How to Handle Them' from the Interaction Design Foundation (2019) [5] and an article from the UK government 'Contextual research and observation' (2017) [3].

In order to learn in detail how to apply contextual inquiry 'Principles of Contextual Inquiry' in Holtzblatt & Beyer Contextual Design [4] is highly recommended.

4 Benefits of Contextual Research

We need context to test our assumptions about how valuable a product or concept is for the user. Observing users in context gives more reliable and valid information about what they are doing, how they are doing it, and why they are doing it (use cases and scenarios).

A lab situation is artificial and often misses out on relevant aspects of using a product. Regarding services, it is often inevitable to research in context to explore all different steps and touch points of a service. Just asking users about how they use a product or what they did in the past or plan to do in the future won't give reliable results. Even

making users perform certain tasks in a lab usability test is already a limitation which could result in missing crucial aspects of product usage.

Context knowledge is also needed to create personas and user journeys. Impediments are in most cases not permanent, but dependent on the situation (see fig. 1) and therefore temporary. With contextual research we can discover all relevant situational information.

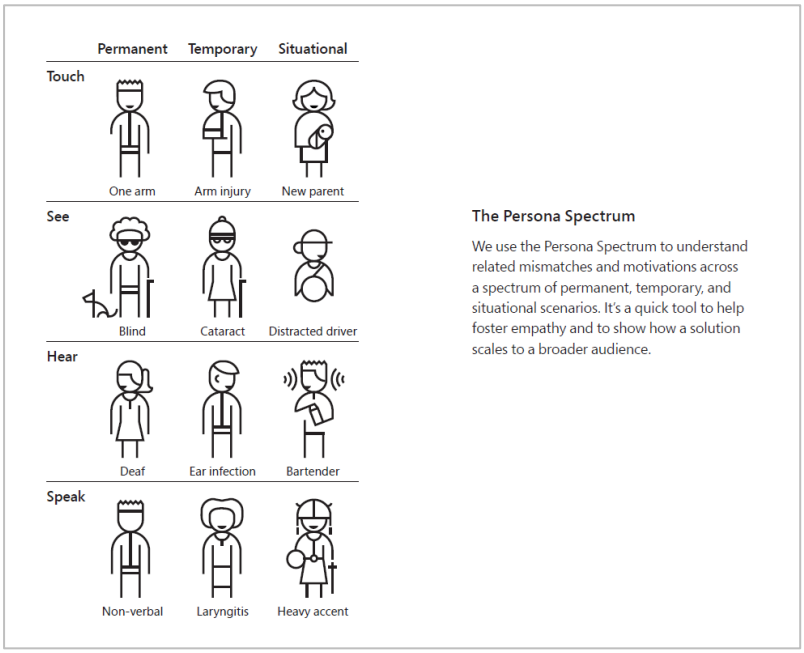

Fig. 1. Microsoft Inclusive Design Toolkit.

5 When to Conduct Contextual Research

Contextual research is most useful during discovery phase, at the beginning of product development when you need to understand the potential customers and the market to find business opportunities.

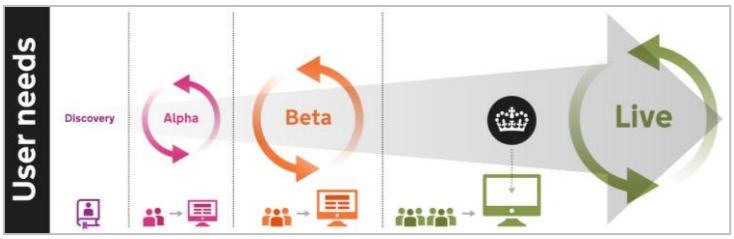

Fig. 2. Government Digital Service (GDS) phases of development.

Discovery projects are often starting without any product or service at all; it is necessary to go to workplaces or homes of users to gather information about context and needs. Based on this initial exploratory research, user needs and pain points are extracted, and assumptions and hypotheses are created about how the user needs can be met. Research in discovery starts very broad; later this converges, and the focus is defined. In alpha phase prototypes are created and iteratively tested with users. In beta phase, the product or service will be rolled out with a small segment of users to collect more quantitative feedback. Fig. 2 shows an overview of the different phases in digital service development for the UK Government.

Contextual research helps to find the right problems to solve. A well-known cartoon by Randy Glasbergen from 2006 says "My team has created a very innovative solution, but we're still looking for a problem to go with it."

Skipping the discovery phase with contextual research and jumping right into the beta phase optimizing a product with iterative usability testing could result in a very usable product with no value for anyone. Many products are based on untested assumptions because nobody has ever conducted the appropriate research, which is a serious business risk. In 'The Lean Startup' (2011) [7] Eric Ries describes how to validate assumptions about users in a build-measure-learn feedback loop process, creating a Minimum Viable Product (MVP) to test these assumptions with users. This approach is called 'validated learning'. The term 'Minimum Valuable Product' would be even more appropriate; emphasizing that it is about the value a product has for the user. A short overview about this approach is on the lean startup website [9]. Fig. 3 shows the different phases of software development and what questions to ask about your users.

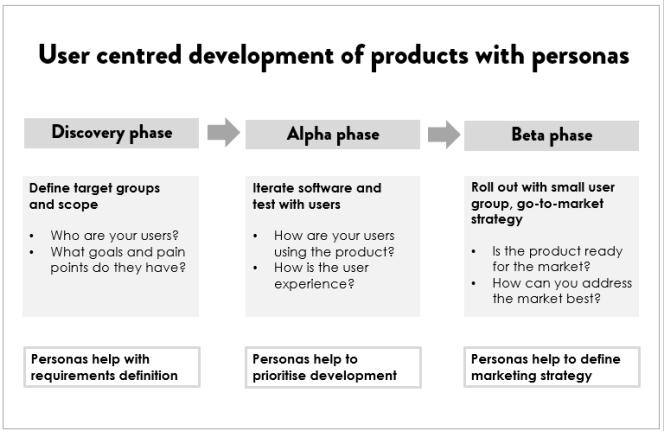

Fig. 3. User centered development

6 Challenges of Contextual Research

Despite all the benefits, there are challenges of conducting contextual research. In many cases it means more effort for recruiting, and higher incentives, to find people willing

to let you observe their activities. Sometimes there are legal issues, because especially in B2B it is not always allowed to observe at the workplace (for confidentiality reasons, or because it would be too disruptive). Another example is election time in the UK when research activities with the public are restricted, in order not to influence any election outcomes. Sometimes home visits are not feasible. When working for the Ministry of Justice (MOJ), we were advised not to do home visits, because some of the appellants could be potentially violent.
Ross, J. (2012) is writing in his blog 'Why Are Contextual Inquiries So Difficult?' about the difficulties with this method and how to overcome them, based on his own experiences with clients, which is worth reading [8].

7 Examples of User Research with Contextual Research

7.1 HM Courts & Tribunal Service (HMCTS) Project

We were part of the Ministry of Justice (MOJ) reform program and were working on improving the appeals process for the Social Security and Child Support Tribunal (SSCS). People are appealing to HMCTS when their benefits are cut.

One of the challenges of the project were the many different user groups - appellants (citizens), judiciary, representatives, appointees, family and friends, admin staff (DWP and HMCTS) - and the fact that the main user group, the appellants, were vulnerable. Another challenge was the long and complicated appeals process (see fig. 4).

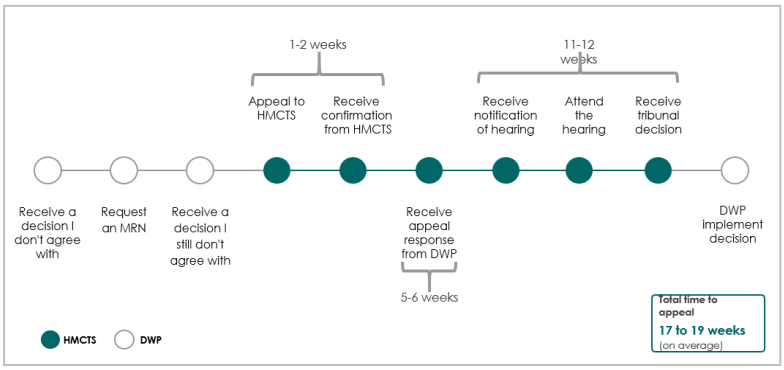

Fig. 4. Appeals process.

In discovery phase we did interviews with all user groups: appellants, representatives, judges, DWP, HMRC. We did contextual research in tribunals and call center listening. We visited two tribunals and attended hearings in London Fox Court and Liverpool. We spoke to judges, medical experts, disability experts. Observing staff at a tribunal revealed that the work is mainly paper based; all appellant files, some are hundreds of pages long, are in paper format (see fig. 5 and fig. 6).

Fig. 5. Admin at work in tribunal.

Fig. 6. Appellant files.

At the end of discovery, we focused on the main user group - the appellants - and prioritized user needs. In a team workshop we mapped the user needs and pain points we had discovered to the existing user journey (see fig. 7).

Fig. 7. User journey mapping with pain points.

We focused on the main pain points of our appellants and defined our alpha goal: “Remove confusion by making the appellant (and/or representant) understand the process and where they are in it.”

We created a prototype giving status updates (see fig. 8) about the appeals process in various formats (online, email, text) to address the most pressing user need we had identified in discovery: “I need to understand the process and where I am within it, so that I am not confused and know what to do next.”

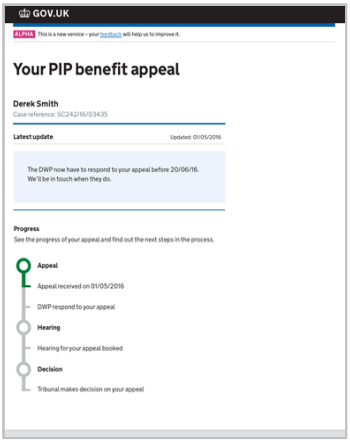

Fig. 8. Status information system.

Another major pain point we had identified in discovery was that appellants are very anxious about the hearing. They don’t know who will be in the hearing, what will be happening in the hearing, how the room looks like. We created a page in our prototype (see fig. 9) describing what to expect at the hearing to reduce anxiety to address the user need: “As an appellant, I want to know what the hearing involves, so that I am less anxious.”

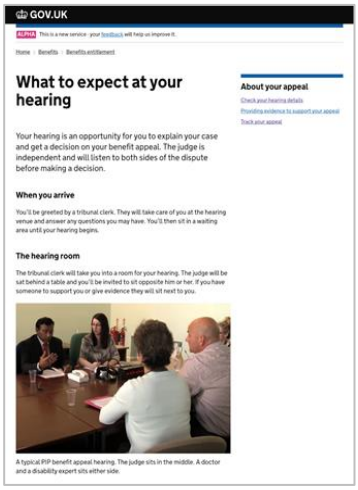

Fig. 9. What to expect at the hearing.

In alpha, we iterated on the prototype in 2-weekly sprints. User testing took place in different places in the UK every other week (London, Birmingham, Glasgow, Norwich). In addition, we continued with discovery and visited judges, representatives of welfare organizations, and Citizens Advice Bureaus to speak to people in their work environment.

Results. We successfully passed GDS alpha assessment for the service. User testing showed great appreciation of the status information system and the information on the web pages helped ease the stress of the appellants.

Without contextual research, we would not have been able to explore the whole user journey with all involved user groups including their challenges and emotions.

7.2 Public transportation project

Transport for Greater Manchester (TfGM) is coordinating transport services in Greater Manchester in North West England. In this project Valtech was researching how users are using public transport in order to make the website more inclusive [12].

Fig. 10. Manchester trams.

Method. Contextual enquiry was conducted with the general public as they travel on public transport throughout the city of Manchester (see fig. 10). Researchers went out in pairs, with one prompting with a few questions, while the other researcher made notes on what participants said and did. We then brought the results back to the team for affinity sorting (see fig. 12 and fig. 13).

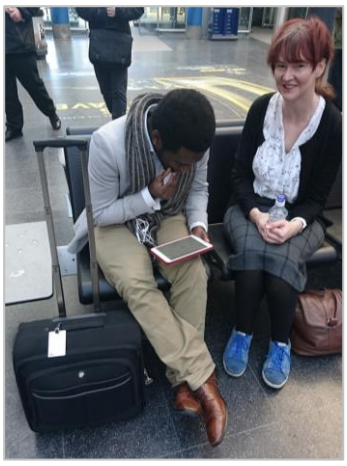

Fig. 11. Interviewing user in context.

We talked with people on buses and trams, at stops and railway stations (see fig. 11). People often don't want to engage, and so we approached them with a bright smile and the promise they'd be helping other local people, and most were willing to chat for a short time, around 10 minutes on average. We spoke with 130 people, selecting people with different age profiles, ethnicity and physical ability, to ensure we reached a cross section of the population.

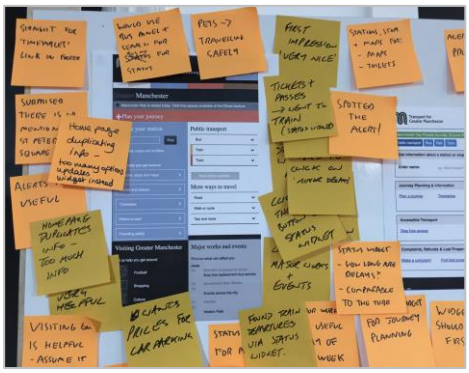

Fig. 12. Findings from user research.

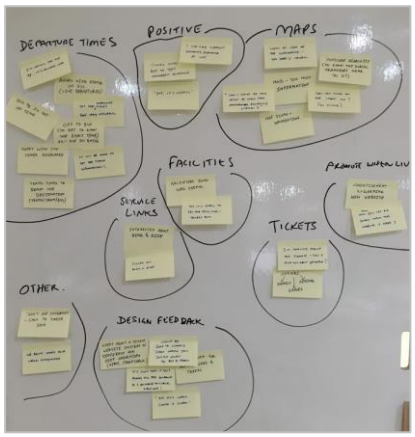

Fig. 13. Affinity sorting.

Results. We observed people on the move to find out what they were travelling for and see which devices and information they use to decide how best to travel. By focusing on people while they were on the move, we were able to find out how they accessed information, where things were going wrong, and learned how they respond to frustrations they were experiencing.

Contextual research taught us about problems they encounter, such as avoiding getting wet when it's bad weather, avoiding steps, and knowing about available facilities. We found that travelers with disabilities needed to know the layout of the station before they got there, an insight that could have been lost in the noise with other methods.

We were able to discover what people do if their travel is disrupted, while real disruptions were going on. We also saw some of the limitations of commonly used apps. The findings from this research proved most effective in helping us to design a better transport website for Greater Manchester that is inclusive for all (see fig. 14).

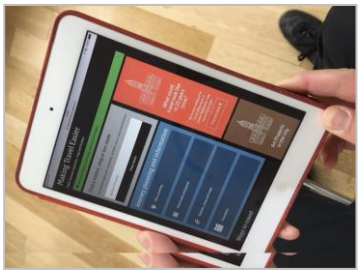

Fig. 14. Website.

7.3 Blue Badge Digital Transformation Project

Blue Badge is a disabled parking permit. The Blue Badge is displayed when parking and is permitting the owner to park in a special reserved area. Valtech has won several awards for this project, three awards at the UK Digital Experience Awards 2019 [10], and the Managed Services & Hosting Award [11].

Method. We used contextual enquiry to help us make more informed design decisions. The Blue Badge service has many audiences to consider. The users include:

- Applicants who have difficulty moving around and need to park closer to where they need to go.
- Organizations such as charities that help disabled people lead a better life.
- Local Authorities (LAs) are administration teams that manage and administer applications.
- Enforcement Officers (part of LAs) inspecting badges on the streets.

We visited all user groups at their place of work or homes, so that we could gain a richer understanding of these users. We wanted to see how their environments affected their experience whilst interacting with the service. In this paper, the method for applicants and Enforcement Officers will be outlined.

Applicants. It is obvious that the main user group who requires the service has difficulty moving around. More so than ever, getting out of the building was an important decision we made as a team to ensure that we were meeting the user's accessibility needs. It also ensured a more realistic setting for them to apply with all the artefacts required and their own devices (see fig. 15).

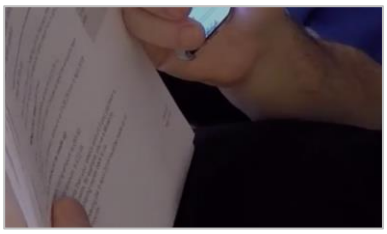

Fig. 15. Applicant at home.

Enforcement Officers. A few user interviews had taken place prior to the contextual enquiry. Assumptions surfaced from this research that needed backing up e.g. Enforcement Officers need a QR code to check badge details (see fig. 16). It became clear that the team needed to get a feel for their day to day work on the streets. A very small camera (GoPro) was strapped to the researcher's body to maximize evidence capture for team playbacks (see fig. 17).

Fig. 16. Enforcement Officer at work.

Fig. 17. User researcher with GoPro camera.

Results

Applicants. There are many insights to cover, however here we will focus on one.

We discovered users who are automatically eligible for a Blue Badge had problems with their DWP letters. These particular users are in receipt of certain DWP benefits and score a specific number of points for various measures of mobility one can be assessed on, such as "moving around". They need to be able to share this letter with the Local Authority to show they are eligible for a badge.

The majority of users found it difficult to find the correct letter and page. By visiting users in their homes and seeing how they interact with DWP correspondence, we discovered a few things that users were having problems with:

- DWP letters and benefits change format quite regularly, so users struggle to keep up with these changes.
- The letters are double sided and in thick wads. Users spend a lot of time sifting through the pages to try and find the information LAs need to make a decision.
- There's different scoring for different parts of certain benefits, so trying to differentiate these can be difficult.
- Users receive these letters once a year, and many users don't know where their letters are.

- Users expect government services to be unified. They expect the system to access the information from DWP and thus share with the LA to avoid the need to share the letter altogether.
- Users we visited with low digital skills struggle with uploading these letters.

Visiting the users in their homes meant we had increased empathy as we observed the problems they were facing in real time. The rich evidence we were able to gather took us to DWP to see how we could improve the user journey. Not only were users having issues with the actual letters, but we knew from quantitative feedback and analytics that uploading is difficult for a high proportion of users, so removing this action altogether would improve the journey significantly.

Here is one of the design improvements we made to the user journey to help solve the problems the users were facing regarding their DWP letters. The latest iteration is demonstrated in the image below (see fig. 18). During the eligibility check, the user is prompted to get their letter before starting their application. This is to ensure they are prepared before starting the application process, as it may take them some time to find their letter. By using illustrations, we point out which part of their DWP letter they need to check to see if they are eligible.

Fig. 18. Blue Badge service design – gov.uk website.

Enforcement Officers. There were many findings from doing a contextual enquiry with Enforcement Officers. We will take you through one of them.

As mentioned previously, there was a team held assumption that Enforcement Officers would find a QR code useful to check badge details. Enforcement Officers use mobile phone devices to check badge details on the street. Therefore, we believed a QR code would reduce the time and effort needed to bring up badge details when on the move. We visited Enforcement Officers around the country and observed this solution wasn't appropriate. This was because:

- Blue Badges aren't always displayed on the dashboard in clear view. Sometimes they're placed quite far away from the dashboard. The type of vehicle

can affect this placement, and other items may block parts of the badge. A badge number doesn't take up a lot of space on the badge, so it is less likely to get covered.

- They were worried about damaging windscreens and scratching cars with their devices or coats when leaning over the bonnet.
- There are different types of Enforcement Officers. Some are undercover and check badges away from the vehicle. They memorize the badge number and search for the owner on the system inconspicuously. They demonstrated that having a QR code to scan badges would make their job more obvious, and this may deter people from coming back to their car.

Based on these facts we agreed as a team that Enforcement Officers didn't need a QR code to do their job effectively. Contextual enquiry ensured that as a design team we were being outcome focused rather than solution focused.

Fig. 19. Enforcement Officer checking Blue Badge details from his car.

8 Summary & Conclusions

Contextual research methods are a crucial part of successful product development. They will probably become even more relevant in the future as methods for product development are evolving and users are much more online and on the move which requires appropriate research methods.

We observe more and more specialization regarding research methods. Online remote methods have been improving a lot over the past few years, and are offering surveys, click tests, AB testing, unmoderated remote testing. On the other hand, qualitative methods are as popular as ever and their value is appreciated which is reflected in a surge in positions for qualitative user researchers. There is a need for experienced people with good interviewing and observation skills; especially for contextual research.

User research is much more common practice now than it was 20 years ago. Nonetheless, in many cases user needs are not shaping the company strategy. For becoming a truly user centered company, the whole organization needs to change its processes, ways of working, and its vision and values. Holtzblatt and Beyer are convinced: “But a truly user-centered organization is still a rare thing” [4]. “So we have come a long way, but the organizational change mission of our work […] is not over” [4].

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