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Effect of Intentionally Designed Waiting Screens on UX

An exploratory study of artificial waiting screens in digital interactions and their effect on user perception and trust

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Abstract

Speed is treated as a virtue in user experience design, yet a delay is not experienced only as elapsed time. This study explores how short, intentionally designed waiting screens are perceived, and whether the visual form of a waiting screen shapes how users interpret a pause.

A prototype shoe e-commerce website was built with three response conditions: an instant response, a three-second static message reading "Checking availability...", and a three-second animated waiting screen using a themed spinner. Five participants aged 22 to 26, all regular users of digital services, completed the same availability-checking task in each condition and answered the same set of questions afterward. Conditions were presented in the same order to every participant. The interviews were analyzed thematically.

Four of the five participants ranked the instant condition first. The fixed order and a briefing that named the waiting screens in advance both limit what that count can support, and the more informative result concerns variation between participants. One participant ranked the instant condition last, describing an immediate answer as robotic and less credible than a visible check. The static condition was least preferred overall, chiefly because it gave no indication of activity. Animation was read as evidence that the system was working, and four participants preferred it to the static message.

Animation did not shorten the perceived wait. Both delayed conditions lasted three seconds, yet no participant judged them equal to that value, and two judged the animated screen longer than the static one. No participant reported that a delay reduced trust. The study does not show that users prefer delay. It shows that a pause acquires its meaning from what the interface displays during it, and that this meaning is not the same for every user.

Keywords: *human-computer interaction, user experience, perceived waiting time, feedback design, waiting screens, intentional delay, trust*

Table of Contents

Abstract **2**
1 Introduction 2
1.1 Problem statement 3
1.2 Purpose and research questions 3
1.3 Scope and limitations 4
1.4 Disposition 4
2 Theoretical framework **6**
2.1 Waiting and Perceived Time in HCI 6
2.2 Perceived Waiting Time versus Actual Waiting Time 6
2.3 Perceived Responsiveness and User Expectations 7
2.4 Feedback Design, Animation, and Waiting Screens 8
2.5 Trust, Credibility, and the Meaning of Waiting 8
2.6 Balancing Benefits and Risks of Artificial Delay 9
3 Method and implementation **11**
3.1 Data collection 11
3.1.1 Study Design 12
3.1.1.1 Interview Prototype design 13
3.1.1.2 Interview Questions Design 14
3.2 Data analysis 15
3.3 Validity and reliability 17
3.3.1 Research Question support 18
3.4 Considerations 19
4 Results **20**
4.1 Presentation of collected data 20
4.2 Thematic analysis 24
5 Discussion **28**
5.1 Result discussion 28
5.2 Method discussion 32
6 Conclusions and further research **34**
6.1 Conclusions 34
6.2 Limitations 36
6.3 Further research 37
7 References **39**
8 Appendixes **42**

1 Introduction

Waiting is a routine part of using any digital system, and every interface has to decide what to display while it happens. Hohenstein et al. (2016) found that the visual configuration of a waiting screen affects how users judge the performance of a system. Duration is measured by the clock and experienced through the interface, and those two readings rarely coincide. A system can be quick and still feel slow. Micro-interactions operate in much the same way. They are brief interface moments that users barely register at the time, yet Ingemarsson et al. (2023) report that suitable feedback during such moments shapes the impression an interface leaves as a whole.

Development teams continue to cut load times, and some waits remain structural regardless. A form submission or a payment confirmation requires the system to perform work before it can answer, and a check of live stock levels behaves the same way. Willermark et al. (2021) tested progress indicator design in a mobile application and found effects on both subjectively experienced time and user satisfaction. That study concerned mobile interfaces, so the transfer to desktop is an inference rather than a finding. The general point still holds: the psychological effect of a wait is only loosely tied to its measured length. A wait state can therefore be treated as a design decision that communicates something to the user.

Deliberate waits may do useful work inside a digital workflow. A visible processing state can confirm to the user that an action registered, and it can make back-end activity apparent while that activity is still underway. Whether it achieves either depends on the person waiting. Bystam and Moliteus (2022) used eye tracking to record where users directed their attention during interface feedback, and found individual differences in what people noticed and prioritized. The effect of a processing state therefore rests on how it is presented and on how a particular user reads that presentation. Designed waiting periods sit between interaction design and individual perception, which is what makes them worth examining (Bystam & Moliteus, 2022; Ingemarsson et al., 2023).

1.1 Problem statement

In user experience design, speed is commonly treated as an indicator of quality. Industry practice and academic work both emphasize shorter loading times and reduced friction, on the assumption that an immediate result is always preferable.

Perception does not always follow technical reality, however. Users read visual and interactive cues in order to make sense of a process, and small design elements, such as a waiting screen introduced on purpose, can shape that reading. Most existing research concerns the removal of waiting. The inverse case has received considerably less attention: a short delay inserted deliberately, and whether users experience it differently from a delay they assume to be accidental. The question is therefore one of perception rather than performance. How do users experience short, intentionally designed waiting screens in digital systems?

1.2 Purpose and research questions

The purpose of this study is to explore how intentionally designed waiting screens influence user experience. Two research questions guide the work.

RQ1: How do users perceive digital interactions that respond instantly compared to interactions that include a short, intentionally designed waiting screen?

This question examines how users experience and interpret an immediate response alongside a short deliberate delay. One possibility is that instant feedback reads as more efficient, more natural, or more satisfying. Another is that a brief waiting screen leaves a different impression, because the interaction then feels more deliberate, easier to understand, or more trustworthy. The aim is to capture the subjective side of responsiveness and interaction quality.

RQ2: How do different types of waiting screens, such as a static message or an animated waiting screen, influence user experience?

Here the concern is whether the design of the screen changes how the delay itself is experienced. A static message and an animated screen may produce different impressions of clarity, comfort, engagement, or trust during the waiting period (Dorati

& Vásárhelyi-Nagy, 2025). The aim is to establish whether the visual form of the waiting screen affects the overall user experience.

1.3 Scope and limitations

The study covers short, intentionally designed waiting screens in digital interactions, and how users perceive them during one simple, controlled task. Three conditions are compared: an instant response, a three-second static waiting message, and a three-second animated waiting screen. All three were presented in a desktop environment, with a small sample of participants and a qualitative, interview-based approach. The findings are exploratory and descriptive. They should not be treated as statistically generalizable.

Long waiting times fall outside the study, as do system performance issues and the technical infrastructure that produces a delay in practice. The study also leaves aside other waiting-screen variants and devices other than desktop computers. What remains is narrower: perception and interpretation of artificial waiting in a controlled setting. The results apply to this design situation and this research approach, and not to user experience design in general.

1.4 Disposition

The report moves from theory to method, then to findings and their interpretation. Each chapter is outlined below.

Chapter 2 presents the theoretical framework. It covers perceived waiting time, perceived responsiveness, feedback design, and the relationship between waiting and credibility, drawing on research in human-computer interaction to treat a delay as something users interpret rather than merely endure. A final section weighs the benefits of intentional delay against its risks. This literature supports the two research questions and informed the three conditions built into the prototype.

Chapter 3 describes the method and its implementation. It sets out the qualitative approach, the design of the prototype and the three waiting conditions, the selection of participants, and the interview procedure, together with the thematic analysis applied to the material. The chapter also records the features of the design that limit what the findings can support, among them the fixed order of conditions, the information given to participants before they began, and a defect in the prototype. Validity, reliability, and ethical considerations are addressed in the closing sections.

Chapter 4 reports the results. The first section describes each participant's responses to the three conditions in turn, including their rankings and their estimates of how long each delay lasted. The second section presents six themes identified across the interviews. These cover how instant feedback was received, how the two waiting screens differed in effect, and how participants related waiting to trust and to their expectations of the task. One theme concerns a difference between the programmed duration of the delays and the duration participants perceived.

Chapter 5 discusses these results in relation to the theoretical framework. Each research question is addressed separately, and the discussion considers what the material can support as well as where the design of the study limits interpretation. A method discussion follows, examining the strengths and constraints of the qualitative approach and the prototype setup.

Chapter 6 presents the conclusions of the study and returns them to the problem stated in Section 1.1. It sets out the limitations of the work and identifies directions for further research, including the perceived-duration result, which the present design was not built to test.

2 Theoretical framework

Waiting in digital systems has mostly been studied as a performance problem. This chapter approaches it differently, treating a delay as something users interpret while it happens. The research reviewed below indicates that a pause in system response is a subjective event, and that graphical design choices carry much of the weight in how it is read. The literature serves as the lens for the present study, and it informed the three conditions built into the prototype.

2.1 Waiting and Perceived Time in HCI

Users are not accurate timekeepers. Their sense of how long something took depends heavily on what they were looking at while it happened, rather than on the clock. Willermark et al. (2021) tested progress indicator design in a mobile application and found effects on subjectively experienced time and on user satisfaction. Their study concerned mobile interfaces, so any transfer to desktop conditions is an inference.

An interaction that receives no acknowledgment leaves the user without information about what the system is doing. Doherty and Sorenson (2015) argue that system responsiveness is closely tied to user flow and to the perceived quality of an interface. Their framework places delays of one to five seconds in a category where users perceive some processing and remain engaged, provided the interface supplies appropriate feedback. They also argue that tolerance for a delay depends on what the user expects of the interaction rather than on the objective complexity of the task. Hohenstein et al. (2016) compared several loading screen types and found that the visual treatment of a pause affected perceived performance, which suggests that measured duration accounts for only part of a user's evaluation.

One consequence follows, although the literature reviewed here does not test it directly. When a processing state offers no clear sign of activity, attention may move away from the task and toward the question of whether the system has failed.

2.2 Perceived Waiting Time versus Actual Waiting Time

Designers use visual feedback to shape how long a wait feels. The underlying reasoning is that moving elements occupy attention, and that attention directed elsewhere is unavailable for tracking time. Söderström et al. (2018) compared passive

loading screens rotating at three different speeds and found that faster animation produced shorter perceived wait times and greater satisfaction. Their participants also tended to judge whichever application they encountered last as the slowest, an order effect the authors observed despite shuffling the sequence.

Static or uninformative screens work in the opposite direction. With nothing to attend to, the delay itself becomes the object of attention, and the wait is likely to feel longer than it was.

Evidence for the value of active visual elements comes from several directions. Heidrich et al. (2020) compared an interactive loading screen against a passive animated one in virtual reality, and found higher perceived speed, greater enjoyment, and lower frustration in the interactive condition. The passive condition was itself animated, so their result favors interactivity rather than movement as such. Their study is set in virtual reality, which differs considerably from a desktop browser. Wang et al. (2021) examined initial loading pages in mobile applications and found effects on user mental state and on subsequent behavior. Dorati and Vásárhelyi-Nagy (2025) compared static, animated, and interactive loading screens, and reported that moving feedback reduced hesitation among their participants. That study is a bachelor thesis rather than a peer-reviewed publication, and it is the source most directly comparable to the present work.

2.3 Perceived Responsiveness and User Expectations

Perceived responsiveness rests on habit. Frequent users of digital services acquire a fairly firm sense of how quickly a given action ought to resolve, and an unexplained departure from that expectation tends to be read as a fault in the system. Tahir et al. (2022) studied response delays in crowd-powered conversational systems and found that unsignaled delays reduced user tolerance. Their context is conversational rather than transactional, which limits how far the finding travels.

Tolerance for a delay is bounded, and the bound shifts with context. Peng et al. (2020) studied conversational delay in a service robot and found that user satisfaction held at delays up to four seconds before dropping at eight. The acceptable delay differed by context, with satisfaction highest at four seconds during information retrieval and at two seconds during casual conversation. Asked what would help during a long delay, participants proposed on-screen indicators such as progress bars and thinking icons, though the study did not test whether such indicators work.

Taken together, these results suggest that a brief pause becomes acceptable when it fits what the user believes the task requires. Reactions are not uniform, however.

Bystam and Moliteus (2022) used eye tracking to record where users directed attention during interface feedback, and found individual differences in which cues were noticed and prioritized.

2.4 Feedback Design, Animation, and Waiting Screens

What a loading screen looks like changes what a loading screen means. Feedback during a pause serves as evidence that the system is working rather than broken, and this is the function that a blank screen cannot perform. Ingemarsson et al. (2023) studied feedback during micro-interactions and argue that small adjustments carry substantial weight in how an interface is perceived. Their study is a Swedish bachelor thesis using qualitative methods, so the claim rests on interpretation of interview material rather than on measurement.

Visual treatment also shapes the emotional character of a wait. Wang et al. (2021) report that richer loading pages produced better emotional responses and greater tolerance of delay than simple or empty ones.

Additional visual material does not help automatically. Chen and Li (2020) examined types of visual feedback on the wait indicator of a mobile application and found that different types produced different interpretations. Their results caution against treating animation as a general remedy, since visual enhancement does not repair an interaction whose feedback lacks clarity or context in the first place. The implication for design is that a moving indicator must suit the task it accompanies. A generic spinner communicates very little about what is being processed, whereas an indicator matched to the content of the action gives the user something specific to read.

2.5 Trust, Credibility, and the Meaning of Waiting

Speed and perceived value are not the same property. Buell and Norton (2011) ran five experiments using simulated travel and dating search services, comparing a transparent condition, which displayed the sites or profiles being searched, against a blind condition showing only a progress bar. Transparency raised perceived value even though it lengthened the wait, and in one experiment participants preferred waiting with transparency to receiving results instantly. The authors term this the labor illusion.

The mechanism they identify is not the one an interface designer might assume. Transparency increased perceived effort, which induced feelings of reciprocity, and reciprocity in turn raised perceived value. Perceptions of how much work had actually been done did not predict value, and reducing the real quantity of labor did not weaken the effect. Uncertainty was ruled out as an explanation, since both conditions included a progress bar and reported uncertainty did not differ between them.

Three qualifications apply here. Their outcome measures concern perceived value, satisfaction, and repurchase intention rather than trust, so treating the result as evidence about credibility is an inference. The work belongs to an operations and marketing tradition rather than to human-computer interaction. The tasks were open-ended searches through many options, which differs from a discrete check of stock availability.

The mechanism the study suggests is nonetheless relevant. An operation that resolves faster than a user expects supplies no evidence that the work was carried out, and a short pause accompanied by clear feedback supplies exactly that evidence. Delay of this kind operates as communication.

The condition attached to it carries more weight than the effect itself. A pause supports credibility only when the interface accounts for it, since feedback that identifies what the system is doing makes technical malfunction a less available interpretation. Tahir et al. (2022) found that unsignaled delays reduced user tolerance, and Peng et al. (2020) found that users tolerated conversational delays up to four seconds, with the threshold varying by context. Neither study tested intentional delay as a credibility mechanism, so the argument advanced here extends their findings rather than reporting them. Where feedback is absent, the delay carries no meaning, and the user supplies one.

2.6 Balancing Benefits and Risks of Artificial Delay

Intentional delay carries obvious risk, and Buell and Norton (2011) identify where the effect stops. Their fifth experiment varied the quality of the outcome participants received. When the result was poor, transparency made perceptions of value worse than an instant response, since participants blamed the service for trying hard and still failing. The benefit also declined as waits lengthened, falling away after 30 seconds in one simulation and after 15 in the other. The authors attribute that difference to expectation: users assume a flight search takes longer than a match search. A pause added to a trivial action removes time from the user and returns nothing.

The distinction that matters is between operations a user expects to take time and operations a user expects to resolve immediately. A security check or a complex search supports a visible processing state. A button press does not.

There is also a limit on visual feedback itself, and it is easily missed. Branaghan and Sanchez (2009) tested four displays across three experiments: a static wait message, sequentially filling dots, a constant-rate progress bar, and a progress bar that paused unpredictably. Their study sets an intuitive model, in which more information produces better outcomes, against attentional gate theory, which holds that displays with many discrete changes raise arousal or direct attention toward time and should therefore lengthen perceived duration.

Their results divided. Display type had no measurable effect on duration estimates in either experiment where estimates were collected. It did affect how reasonable the wait was judged to be, and the same pattern appeared in ratings of the overall experience and of whether the wait had been worth it. Sequential dots and the variable-rate bar scored below the constant-rate bar and the static message on all three. Preference ran the other way, favoring the more informative displays. The authors read this as evidence that users prioritize being informed over how long a wait appears to take, and they describe the resulting choice as a trade-off for designers. The constant-rate progress bar was the single display that scored well on both counts, since it informs the user without increasing arousal or inviting attention to temporal stimuli.

More visible feedback is therefore not straightforwardly better. The form of an indicator determines whether a user attends to the system or to the passing of time, and preference is not a reliable guide to how the wait itself is experienced.

Three conditions therefore apply to any deliberate delay. The pause must be short, and it must be justified by what the user believes the task involves. It must also be accompanied by feedback that explains the pause without inviting the user to measure it.

3 Method and implementation

This study takes a qualitative approach. The goal was to understand how people experienced the waiting conditions, not to measure response times or generate statistics. A qualitative design was considered appropriate because the purpose was to examine how intentionally designed waiting screens are perceived and how these perceptions shape the overall user experience. As Bryda and Costa (2023) note, qualitative research is particularly useful when the aim is to explore how individuals interpret and make sense of specific experiences.

3.1 Data collection

Data were collected through a controlled experimental setup combined with in-person semi-structured interviews. Holding the setup constant meant that differences between participant responses could be related to the waiting screens rather than to variation in the task or the surrounding interface. Each participant used three versions of the same system: one with an instant response, one with a static waiting message, and one with an animated waiting screen. Task and system functionality remained unchanged across versions, so the visual representation of waiting was the one element intended to vary. With five participants and a single task, this supports interpretation rather than attribution.

Five participants took part. The study was exploratory and concerned with patterns of perception rather than with statistically generalizable findings, so a small sample was appropriate. Malterud et al. (2016) propose that sample size in qualitative interview studies should be guided by information power rather than by fixed numerical rules, and that the number of participants needed depends on the aim of the study, the specificity of the sample, the use of established theory, the quality of the dialogue, and the analysis strategy. A narrow aim, a specific sample, and an analysis conducted case by case all reduce the number of participants required. The sample here was selected to allow detailed examination of participant experience under controlled conditions.

Participants were between 22 and 26 years of age and were selected for their familiarity with digital environments, including regular use of websites, applications, and online services. Experienced users have formed expectations about responsiveness and interaction behavior, which is what the study asked them to report on. Doherty and Sorenson (2015) argue that system responsiveness is closely connected to user experience; the inference that experienced users therefore make suitable participants is one drawn here rather than one they make.

All sessions were held in person under similar conditions. Participants completed the study individually, using the same device and the same prototype throughout. The procedure had three stages. Participants first received a short introduction and answered two general questions about their experience with digital systems. They then completed the interaction tasks across the three conditions, answering the same set of questions after each one. Each session closed with a question asking participants to place the three interactions in order of preference.

The data consisted mainly of participant descriptions of their perceptions and emotional responses to each condition. The interview guide covered first impressions, perceived response time, emotional reaction, confidence in the system, the effect of waiting on trust, and whether the interaction felt natural. Follow-up questions carried a substantial part of the interpretive work, since several questions in the guide could be answered in a single word, and participants frequently did so. Combining direct interaction with reflective questioning produced both immediate reactions and more considered accounts.

Interviews were screen-recorded and transcribed using an automated transcription tool. Transcripts were checked against the recordings by the author before analysis.

3.1.1 Study Design

The study used a task-based qualitative design built around a prototype website and semi-structured interviews. This allowed capture of immediate reactions during the interaction as well as reflection afterward. Because the research examines how intentionally designed waiting screens influence user experience, the focus remained on perception, interpretation, and emotional response rather than on measurable performance.

The design combined controlled interaction with open questions. Every participant completed the same task on the same prototype and encountered all three waiting conditions. This structure allowed direct comparison between instant feedback, static messages, and animated waiting screens while the rest of the interface stayed consistent. Variation in the waiting screen was therefore the intended difference between conditions, although a study of this size cannot rule out the influence of factors outside the design.

Conditions were presented in the same order to every participant. Each product on the prototype homepage corresponded to one condition, and participants were directed to work through the products from left to right, beginning with the instant condition and ending with the animated one. A fixed order kept the procedure identical across

sessions. It also means that position in the sequence and condition cannot be separated, so any effect of order forms part of the results rather than something the design controlled for.

3.1.1.1 Interview Prototype design

The prototype was a simplified shoe e-commerce website, built to provide a familiar setting under controlled conditions. Participants could interact with a recognizable type of system while meeting waiting states at points where feedback would normally be expected. The interface included a homepage with three products, individual product pages, and a basic cart and checkout process. Appendix C contains the full set of prototype pages and the interaction flow.

Each product corresponded to one experimental condition. The first was the instant-response condition, which served as the control. The system responded immediately with no artificial delay, and the interaction continued without interruption, giving participants a baseline of direct feedback. One element of this condition did not behave as intended. The availability status did not visibly refresh when a participant changed size selection, which required repeated presses before the response appeared. Two participants commented on this, and their evaluations of the instant condition were shaped partly by that behavior rather than by the absence of delay alone.

The second condition used a static waiting message. The system paused and displayed a short line of text reading "Checking availability...". The delay was visible, but the feedback stayed minimal and did not move. This condition tested whether a plain message was enough to communicate that the system was processing the request.

The third condition used an animated waiting screen. The system paused again, this time accompanied by a spinner together with a short message. The animation was themed to the shoe context rather than generic. Compared with the static message, this condition added visual movement, which made the waiting state more noticeable. The aim was to examine whether animated feedback made the delay easier to understand, more engaging, or more reassuring than the static message.

Both delayed conditions used a delay of three seconds. The two waiting screens therefore differed only in visual form, and differences in how participants experienced them can be related to that form rather than to the length of the wait.

Waiting screens appeared at the same interaction points in every condition, including quantity selection, stock verification, and adding items to the cart. The comparison

therefore concerned how waiting was represented and not when it occurred. System functionality was otherwise identical across versions.

The three conditions represented different levels of feedback. The instant condition provided no delay and no waiting screen. The static condition provided textual confirmation with little visual engagement, while the animated condition combined text with motion. Comparing them made it possible to examine whether the waiting period was experienced differently depending on whether feedback was absent, minimal, or visually active.

The prototype was kept simple and familiar in order to reduce distraction and keep attention on the waiting screens. A recognizable e-commerce structure and a consistent interface flow limited the influence of unrelated factors such as navigation complexity or visual inconsistency.

3.1.1.2 Interview Questions Design

The interview questions were written to match the purpose of the study and to capture how participants perceived each waiting condition. The study was exploratory, so the interviews were semi-structured and built on open questions. Participants could describe their experience in their own words while the discussion stayed on the themes relevant to the research questions. Appendix B contains the full guide.

The guide followed a set progression. It opened with two general questions about expectations of online shopping websites and about what participants think when a page takes time to respond. The same block of questions followed each of the three interactions, which captured immediate impressions while the experience was recent. These covered first impressions, perceived response time, emotional reaction, confidence in the system, the effect of waiting on trust, and whether the interaction felt natural. In the two delayed conditions, participants were also asked to estimate how long the delay had lasted. Each session closed with a question asking participants to place the three interactions in order.

Estimates of duration were collected before participants were told the actual value. Where a participant offered an estimate, the interviewer repeated it back without correction, and the true duration was disclosed only after the session had finished. Figures spoken by the interviewer during a session therefore reflect what the participant had just said rather than the delay programmed into the prototype.

These themes were chosen because they reflect central aspects of how users interpret waiting periods in digital systems. The guide asked participants not only which condition they preferred but why a particular condition felt appropriate, natural, or

trustworthy, which made it possible to examine the reasoning behind an evaluation rather than the evaluation alone.

Questions were phrased in neutral and descriptive terms, and no condition was presented as preferable. Two departures from that principle should be recorded. Where participants did not respond to the question about emotional reaction, or asked for clarification, a set of response options was offered verbally, namely calm, impatient, uncertain, and confident. Emotional vocabulary in the material therefore originates partly with the interviewer. The final ranking question was also worded variably across sessions, sometimes as a question about preference and sometimes about which interaction was best or most comfortable, so the dimension along which participants ranked the conditions was not identical in every case.

3.2 Data analysis

The data were analyzed using thematic analysis, which suited material consisting of participant descriptions of experience, interpretation, and emotional response. The analysis followed the six-phase approach set out by Braun and Clarke (2006), and aimed to identify recurring patterns in the interview material and relate them to the research questions. Because the study concerns how intentionally designed waiting screens influence user experience, thematic analysis offered a structured route from individual statements to broader interpretation.

The analysis began with repeated reading of the transcripts, before any coding. The aim was to become familiar with how each participant talked about the experience prior to imposing structure on it. Reading several times made it possible to notice recurring expressions, comparisons, and differences in how participants described the instant, static, and animated conditions. This close reading also kept the analysis grounded in the complete material rather than in isolated quotations.

Relevant sections of the transcripts were then highlighted and coded according to their meaning in relation to the research questions. Coding focused on statements describing how participants experienced the waiting conditions, including comments on trust, reassurance, realism, comfort, frustration, perceived responsiveness, and overall interpretation. These codes were treated as parts of a broader pattern rather than as separate pieces of information.

Once initial coding was complete, similar codes were compared across participants and gathered into broader categories. Statements about trust and reassurance sat together. Comments about frustration or uncertainty formed a separate cluster.

Grouping the material in this way made it easier to see which aspects of the waiting conditions recurred and which responses tended to appear together.

Themes were developed from those categories, as patterns holding across several interviews and conditions. The aim was to interpret what the responses revealed about how waiting screens are understood, rather than to describe what participants said. That interpretive step is where the analysis moves beyond surface description, and it is also where the analyst has most influence over the result.

The first research question guided the comparison between the instant condition and the two delayed conditions. This comparison examined whether artificial waiting was perceived positively or negatively, and how participants described the difference between immediate and delayed feedback. Attention was paid to whether a short waiting screen influenced perceptions of responsiveness, trust, reassurance, or system reliability.

The second research question guided the comparison between the static waiting message and the animated waiting screen. This part of the analysis examined whether the two designs created different impressions of system behavior, emotional response, and overall experience. Statements describing one condition as clearer, calmer, more engaging, more natural, or more reassuring received particular attention, since these descriptions indicate how the visual form of a waiting screen shapes interpretation. Separating the two delayed conditions mattered because it distinguishes the effect of waiting from the effect of how waiting is presented.

Participant estimates of delay duration were treated as part of the material rather than as measurements. Since both delayed conditions lasted three seconds, differences between a participant's two estimates indicate how the visual form of the screen affected their sense of elapsed time.

Throughout the analysis, attention was paid to how participants explained their reactions, and not only to whether those reactions were positive or negative. By examining recurring meanings across the interviews, the analysis identified patterns relating to trust, clarity, emotional response, and perceived system behavior. These patterns were then used to address the research questions in a way that reflects both the similarities and the differences between participant experiences.

Generative artificial intelligence tools were used in parts of this thesis for paraphrasing and language support, and for transcribing the recorded interviews. All research design decisions, data collection, coding, thematic analysis, interpretation, and conclusions were carried out by the author, who takes full responsibility for the content of this thesis.

3.3 Validity and reliability

The interaction conditions were identical apart from the type of waiting screen, which allows differences between participant responses to be related to the visual representation of waiting. The interview questions addressed feelings, trust in the process, and interpretation of the interaction, all of which connect directly to the aim of the study. Data collected therefore align closely with the research questions.

Construct validity was supported by having participants experience and compare all three conditions within a single session, which gave them a basis for reflecting on the differences. A pilot test of the website was carried out before the main study to confirm that the interaction flow worked as intended and that the waiting conditions were presented clearly. The study was also informed by Dorati and Vásárhelyi-Nagy (2025), who compared static, animated, and interactive waiting screens and reported that the design of a waiting interface shapes how users perceive and respond to delay. Their work supported the decision to treat waiting as several distinct conditions rather than as one uniform experience.

Three features of the procedure limit these claims, and they are recorded here rather than in the discussion because they concern the design itself.

Participants were told before beginning that the three products used different system responses, and that the study concerned how natural, clear, or trustworthy the interaction felt. Informing participants supported informed consent and made comparison across conditions possible. It also directed attention toward the waiting screens before participants had encountered them, and supplied part of the vocabulary in which they later described their experience. Responses should therefore be read as reactions from participants who knew what varied, and not as reactions from users meeting the delays unawares.

The order of conditions was fixed rather than varied, as described in Section 3.1.1. Position in the sequence and condition are consequently confounded, and the instant condition was in every case the first one encountered.

The instant condition contained a defect in which availability status did not refresh visibly after a change of size. Evaluations of that condition are therefore not evaluations of instant feedback alone.

Reliability was addressed through consistency and dependability. All participants completed the same tasks, used the same system, and received the same instructions

under similar conditions. The interviews followed the same structure across sessions, which supports comparability. The procedure was documented in detail, including the design of the conditions, the pilot test, the interview process, and the analysis. This aligns with Nowell et al. (2017), who argue that credible thematic analysis depends on a precise and well-documented analytical process.

3.3.1 Research Question support

The design supports the research questions by allowing controlled comparison between waiting conditions. The first research question concerns how users perceive instant feedback compared with a short delayed response, and the study included both an immediate condition and two delayed conditions within the same interaction flow. This allows examination of whether users experience a difference when waiting is made visible, rather than assuming that an immediate response is always preferred. Earlier research indicates that loading and waiting states affect how users perceive speed, frustration, and overall experience, which makes the comparison relevant here (Dorati & Vásárhelyi-Nagy, 2025; Hohenstein et al., 2016).

The second research question concerns whether the design of the waiting screen influences user experience. Two delayed conditions differing in presentation, one static and one animated, allow examination of whether the visual form of a waiting screen shapes how participants interpret a delay. Because both lasted three seconds, the comparison holds duration constant. Loading-screen design has been shown to affect judgments of waiting time and the degree to which an experience feels enjoyable or frustrating, which supports comparing waiting-screen types rather than treating waiting as a single condition (Dorati & Vásárhelyi-Nagy, 2025; Hohenstein et al., 2016).

The interview guide supports both questions by asking participants to reflect on trust, clarity, comfort, and overall impression. These topics connect directly to the purpose of the study, and they made it possible to relate participant responses to the research questions. The design was intended to establish not only whether the waiting conditions were noticed, but how they were experienced and interpreted.

3.4 Considerations

Ethical, scientific, and societal considerations shaped the design and purpose of this research.

Participants were informed about what the study involved, how long it would take, and that they could withdraw at any time without consequence. Consent was obtained before participation. Interview recordings were used only for transcription and analysis, no personal or sensitive data were reported, and all responses were treated anonymously. Artificial waiting was approached with care, since a delay added on purpose may be experienced as misleading. The study therefore examined how users experience such designs in practice, and under what conditions they find them acceptable or problematic, rather than promoting the technique.
Buell and Norton (2011) draw the same distinction, separating operational transparency, where a service honestly displays the work it performs, from inducing an illusion of labor where little work occurs. They note that the second approach approaches an ethical boundary, and that customers who detect it may read it as manipulation. The prototype used here belongs to the second category, since no availability check took place behind the delay.

Participants were not told the true duration of the delays until after their session had ended. Withholding that information during the interview prevented the figure from shaping later answers, and disclosing it afterward meant no participant left the study with a false impression of what they had experienced.

From a scientific perspective, the design holds all aspects of the interaction constant apart from the waiting screen. The small number of participants means that the findings are exploratory and should not be treated as statistically generalizable, which is consistent with methodological guidance on qualitative research in digital contexts (Bryda & Costa, 2023).

From a societal perspective, the research concerns how small design choices influence user trust and sense of control. Examining how artificial waiting is perceived may support design decisions that treat transparency toward users as a requirement rather than an option.

4 Results

This chapter presents results from five semi-structured interviews. Each participant used three prototype conditions: an instant response, a static waiting message, and an animated waiting screen. The first section describes each participant's responses in turn. The second presents a thematic analysis of patterns across the interviews.

4.1 Presentation of collected data

Table 1

Participant Rankings and Estimated Delay Duration by Condition

Participant	ranking (most to least preferred)	Static estimate	Animated estimate
1	Instant, static, animated	1–2 s	About 2 s; described as longer
2	Animated, static, instant	About 1 s	0.5 s
3	Instant, animated, static	3 s	Same as static
4	Instant, animated, static	0.5–1.5 s	1.5–2 s
5	Instant, animated, static	Several seconds	Same as static

Note. Both delayed conditions lasted three seconds. Estimates are participants' own, given before the actual duration was disclosed.

Participant 1

This participant described price as the first consideration when shopping online, followed by quality, and named affordability as the reason for using particular sites as a student. Slow pages were described as bothersome, on the grounds that immediacy is the purpose of ordering online.

The instant condition was described as clear. The participant said the interface was "just obvious and everything's clear," listing the sizes, the availability information, the product image, and the price as visible at once. Nothing stood out. The response was called quick and the emotional reaction was calm. Confidence was unqualified. Asked whether waiting had affected trust, the participant answered by pointing out that no waiting had occurred.

In the static condition the participant reported a delay of one to two seconds. Asked what stood out, the answer was the delay itself: noticeable, not annoying, and yet "not

as fast as it should be." The participant added a general observation that an instant response inspires more confidence than a delayed one. The wait was characterized as casual and normal rather than as a failure. Trust was unaffected and the interaction was described as natural.

The animated condition produced the most negative response from this participant. The delay was reported as longer than in the static condition, estimated at around two seconds, and the feature that stood out was the additional length. The participant said the wait was bearable but raised a suspicion in passing, expressed as wondering whether something might be wrong with a site that responds slowly. Confidence was qualified: not complete, though not uncertain either. Trust was again unaffected and the interaction was still called natural. The ranking placed the animated version last.

One qualification applies throughout this interview. Several of the participant's comments concerned the products rather than the interface, including remarks about sizing, price, and brand information. The judgment that the static condition was "not as clear as the first one" referred to product information on the page and not to the waiting screen.

Participant 2

This participant named the search bar as the most important element of an online shopping site. When a page responds slowly, this participant reported checking the internet connection and regional availability before attributing the problem to the site.

The instant condition was described as very comfortable, with extended praise for the simplicity of the layout and the product description. The response was called fast and smooth, with no perceived delay at all, and the emotional reaction was calm. Confidence in correct operation was affirmed. The interaction was nonetheless judged slightly unnatural for a specific reason: the availability text did not update when the participant changed size, and the participant suggested it should have reverted to prompting a fresh check.

The static condition was preferred to the instant one. The participant said it "feels more alive" and explained the difference through a comparison: where the first condition returned an answer immediately, this one behaved as though someone had paused to look something up. What stood out was the sense that the site was checking on the participant's behalf. The delay was estimated at about one second and was not experienced as a delay at all. The participant volunteered that a wait of up to ten seconds would not have been troubling, reasoning that a site holding many products and serving many visitors needs time to search. Asked about confidence, the participant returned to the instant condition and described its immediate answer as somewhat robotic, adding that an instant answer raises the possibility that something

is wrong. The emotional reaction was confidence, and the interaction was called more natural than the previous one.

The animated condition drew the strongest positive response in the study. The participant described it as customized and noted approvingly that the loading screen showed walking shoes rather than generic dots. The screen was described as holding attention without becoming boring. The delay was estimated at half a second, the shortest estimate given by any participant for either delayed condition, and the condition was described as feeling instant. The emotional reaction combined calm with interest. The interaction was judged fully natural, more so than either earlier condition. The ranking placed the animated version first and the instant version last.

Participant 3

This participant expected online shopping to be simple and fast, and described slow responses as annoying.

The instant condition produced confusion. The participant did not realize that the size option required a further press after each change, and described the interaction as strange for that reason. Once the mechanism was understood, the response was called fast and the interaction natural. Confidence was affirmed and trust was unaffected. The confusion was caused by the defect described in Section 3.1.1.1 rather than by the absence of a waiting screen.

The static condition was described as very slow, and the participant reported mild annoyance. The delay was estimated at three seconds, which was the only accurate estimate in the study. The wait produced impatience. On the question of confidence the participant gave a qualified answer, describing it as an unsure yes and then explaining the reasoning: having to wait does not indicate that a system has stopped working. Trust was unaffected. The interaction was called natural on the grounds that such delays occur anywhere.

The animated condition required a second look. The participant had moved past it and asked to return before answering, having not registered the difference on first encounter. Once the screens were compared, the participant preferred the moving one, and the moving quality was what stood out. The delay was judged identical to the static condition. The emotional reaction was reported reluctantly, the participant first saying the condition produced no particular feeling before settling on surprise, prompted by the change in the screen. The interaction was called natural because loading screens are familiar and this one resembled them. In placing the conditions in order, the participant put the animated version second because waiting had at least been entertaining.

Participant 4

This participant expected clear navigation, a search function, and accessible price and product information. Slow pages were described as frustrating, and continuous loading was called a reason to leave a site.

The instant condition was described as very good and easy to navigate, with the availability option visible immediately. What stood out was the visual layout rather than the response speed. Nothing felt delayed, the emotional reaction was satisfaction, and both confidence and trust were unaffected.

In the static condition the participant noticed a slight difference and estimated the delay at half a second to one and a half seconds. The wait was described as short enough to escape notice without deliberate attention. Satisfaction was unchanged, though the participant registered the change and added a qualification worth noting: without the previous condition available for comparison, the delay would not have been apparent at all. Confidence was affirmed on the basis of repeated successful checks. Trust was unaffected, since the wait fell within normal expectations.

The animated condition was noticed distinctly. The participant estimated one and a half to two seconds and said the difference registered very significantly, in direct contrast to the static condition. The animation was nonetheless credited with improving the experience, described as making the situation better and as somewhat fun. The participant also reasoned about the counterfactual, observing that a wait with nothing happening would have produced more frustration. The emotional response was mixed: satisfaction at the outcome, together with a brief interruption during which the participant registered that waiting was necessary. Confidence was affirmed, and the participant noted that the animation itself demonstrated that loading was underway. On trust the participant gave the most detailed answer in the study, concluding that trust remained intact given the short duration and the evident absence of a fault, while acknowledging mild frustration at the wait that the animation had offset. The ranking placed the instant version first, and the participant introduced it as a departure from the tenor of the preceding answers.

Participant 5

This participant expected online shopping to be fast and to make items easy to find. Slow pages were described as strange.

The instant condition was described as good, and the participant attributed the resulting confidence directly to the speed of the response. Nothing stood out. Trust was unaffected, and the interaction was called natural because everything was found at once.

The static condition produced the strongest negative response in the study. The participant described the interaction as confusing. Asked what stood out, the answer was the wait, and the participant's estimate wandered between seconds and minutes before settling on several seconds. The emotional reaction was uncertainty, which the participant contrasted explicitly with confidence. On whether the system was working correctly, the answer was negative, and the reason given was simply that waiting had occurred. The interaction was called somewhat unnatural, because the absence of feedback left the participant unable to tell whether the system was functioning.

The animated condition reversed this. The participant described it as good, named the animation as the feature that stood out, and judged the delay to be the same length as before. Preference was stated with the reason attached: the participant preferred this version because the movement showed the system was working. The emotional reaction was confidence, and confidence in correct operation was affirmed. This was the only case in the study of a participant answering that waiting had affected trust, and the effect was positive, attributed to the motion of the screen. The interaction was called natural, and the participant articulated the underlying reasoning: the wait was the same length as before, but the movement indicated that a process was taking place.

4.2 Thematic analysis

Theme 1: Instant Feedback Was Associated With Efficiency and Clarity

Participants described the instant condition in terms of speed and ease. Four of the five ranked it first, which indicates that immediate feedback matched what they expected from an online shopping interaction. Descriptions included clear, smooth, and satisfying. The interaction did not interrupt them, and for most that was sufficient.

Speed was not always read as the most natural form of response. Participant 2 described an immediate answer as somewhat robotic and said it raised the possibility that something had gone wrong. Participant 3 was confused by the way the interface behaved after a size change. The two reactions differ in origin but converge on the same expectation, namely that an interface should visibly confirm that an action has registered.

Both cases require qualification. Participant 3's confusion followed from the prototype defect and not from instant feedback as such. Participant 2's unnaturalness rating also referred initially to the same defect, and the robotic

quality was mentioned only later, while reflecting back from the static condition.

Theme 2: Static Waiting Produced the Weakest Experience

The static condition was the least preferred overall. Three participants ranked it last. Participants associated it with delay and with an absence of information about what the system was doing.

Participant 5 showed the effect most clearly, describing the condition as confusing, reporting uncertainty, and answering negatively when asked whether the system was working correctly. The stated reason was the absence of any indication of activity. Participant 3 called the condition very slow and reported impatience. For Participant 4 the condition was acceptable, though acceptable because the wait was brief rather than because the message conveyed anything.

One case runs against the pattern. Participant 2 preferred the static condition to the instant one, describing it as more alive and comparing it to a person pausing to check something. The same brief message that left other participants uninformed was read by this participant as evidence of work in progress. The static screen therefore did communicate activity to at least one participant, which limits how far the general finding extends.

Theme 3: Animation Made the Delay Interpretable and Changed How It Felt

Movement was read as evidence that work was taking place. Participants reported that the animation showed the system to be active, which reduced ambiguity and made the delay easier to accept. In this respect the animation functioned as an account of system status rather than as ornament.

Participant 5 stated the mechanism most directly, explaining a preference for the animated version by the fact that the movement showed the system to be loading, and later describing the reasoning as a thought during the wait itself: the same duration, but with visible evidence that a process was running. Participant 4 made the same point from the opposite direction, observing that a wait with nothing happening would have produced more frustration. Participant 3 found the animated screen natural because loading screens are familiar and this one resembled them.

Alongside this, animation changed the character of the wait. Participants described the animated version as interesting, entertaining, or surprising. Participant 2 said the screen could be watched for a minute without becoming

boring, and reported interest as the emotional response. Participant 4 described the animation as fun and as improving the situation. Participant 3, who reported no particular feeling in response to the other conditions, settled on surprise.

The two effects were not separable in participants' own accounts. Participant 4 described the animation as making the situation better without distinguishing whether this was because it explained the wait or because it filled it, and the same holds for Participant 3, who preferred the moving screen and ranked it above the static one because waiting had been entertaining.

The effect was not uniform. Participant 1 ranked the animated version last of the three. For this participant the feature that stood out was the length of the wait rather than the animation occupying it.

Theme 4: Perceived Duration Did Not Match Actual Duration

Both delayed conditions lasted three seconds. No participant identified this. Estimates ranged from half a second to several seconds, and only one estimate, given by Participant 3 for the static condition, matched the programmed value. Every other estimate fell below it.

The direction of error differed between the two conditions. Participants 1 and 4 judged the animated screen longer than the static one, and both named that extra length as what stood out. Participants 3 and 5 judged the two equal. Participant 2 judged the animated screen substantially shorter, estimating half a second and describing it as effectively instant.

A relationship appears between these estimates and the rankings, although five cases cannot establish one. The participant who judged the animated version shortest ranked it first. The participant who judged it longest ranked it last. Participant 4, who noticed the additional length very distinctly, still placed the animated version above the static one, but below the instant condition.

This complicates the preceding theme. Animation made the wait interpretable and, for most participants, more agreeable. It did not make the wait feel shorter. For two participants it had the opposite effect, which suggests that a screen engaging enough to hold attention may hold attention on the waiting itself.

Theme 5: Naturalness Depended on Whether the Delay Matched Expectations

Participants did not judge waiting by duration alone. They also interpreted it against what they believed the task required.

Participant 2 provides the clearest case. An immediate answer seemed less believable than a visible check, and this participant stated that a delay of up to ten seconds would have been acceptable given the number of products a site holds and the number of visitors it serves. That tolerance far exceeds anything else expressed in the study, and it followed from a belief about what the system was doing rather than from the wait itself.

Participant 3 arrived at naturalness by a different route, judging both delayed conditions natural on the grounds that such delays occur everywhere. The expectation here concerned web behavior in general rather than the specific task. Participant 1 held the opposite expectation, treating any delay as a departure from how a site ought to perform, and reported a passing suspicion that something might be wrong.

Theme 6: Trust Was Shaped by Explanation Rather Than by Delay

No participant reported that a delay reduced trust, including those who found the wait annoying. Participant 3 stated the reasoning explicitly, observing that having to wait does not mean a system has stopped working, and repeated the point when the question was pressed.

One participant reported an effect in the other direction. Participant 5 answered that waiting had affected trust in the animated condition, and attributed this to the movement as evidence of loading. That is the only instance in the material of waiting influencing trust positively, and it concerned the animated condition specifically.

Confidence and trust separated in two cases. Participant 5 reported low confidence that the system was working correctly during the static condition while still answering that trust was unaffected. Participant 3 gave a qualified answer on confidence in the same condition, describing it as an unsure yes, and answered the trust question negatively. The interview guide treated these as separate questions, and two participants answered them differently within the same condition.

5 Discussion

5.1 Result discussion

The results complicate a straightforward preference for speed. Participants responded to what the interface did during a wait as much as to the wait itself, which indicates that a delay was read as part of the interaction rather than as an empty interval before it resumed.

Research Question 1: Instant Response Compared With Delayed Response

Four of the five participants ranked the instant condition first, and it was described as efficient, clear, and satisfying. Read alone, that count suggests immediate feedback is preferred. Several features of the study limit what the count can support, however, and the research question asks how users perceive the two forms of response rather than which they prefer.

The order of conditions was fixed, with the instant condition always encountered first. It therefore functioned as a baseline against which the two delays were judged. Participant 4 identified this without prompting, observing that without the previous condition available for comparison, the static delay would not have been noticeable and satisfaction would have been unchanged. Outside a study, users do not encounter three versions of the same interaction in sequence. They encounter one. A ranking produced by direct comparison does not describe that situation.

Participants were also told before beginning that the three products used different system responses, and that the study concerned how natural, clear, and trustworthy each interaction felt. Attention was therefore directed toward the waiting screens before participants met them. All five stated in the opening questions that they expected online shopping to be fast, and three described slow pages as annoying, frustrating, or strange. The preference for the instant condition was expressed before any participant touched the prototype.

What the material shows more reliably is variation in how the conditions were interpreted. Participant 2 ranked the instant condition last of the three, described its immediate answer as somewhat robotic, and said that receiving an answer at once raised the possibility that something was wrong. The static condition was preferred to it, described as more alive and compared to a person pausing to look something up. This participant also volunteered that a wait of up to ten seconds would have been acceptable, reasoning that a site holding many products and serving many visitors needs time to search.

This is the pattern Buell and Norton (2011) describe as the labor illusion, where visible effort raises the perceived value of a service and participants sometimes prefer a slower version returning identical results. One case out of five does not demonstrate the effect. It does show that an instant response is not universally read as the best outcome, and the reasoning behind the preference was articulated clearly enough to be examined rather than merely counted.

Participant 5 provides a second instance of the same principle from a different direction. This participant ranked the instant condition first, yet reported that the static condition left them unable to tell whether the system was working, and that the animated condition restored confidence because the movement showed a process underway. Speed was preferred, but the evaluation turned on whether the system communicated, not on how long it took.

Delay was therefore evaluated against what participants believed the task required. Participant 2 assumed an availability check involves real work and tolerated a wait accordingly. Participant 1 assumed the opposite and treated any delay as a departure from how a site should behave, reporting a passing suspicion that something might be wrong. Both encountered the same three-second wait. The difference lay in what they thought the system was doing, which supports the position taken in Section 2.5 that a pause carries whatever meaning the interface allows the user to assign it.

Ingemarsson et al. (2023) argue that small feedback elements shape how an interaction is experienced, and the present material is consistent with that: evaluations of three functionally identical conditions differed according to what appeared during the pause. Bystam and Moliteus (2022) found individual differences in what users attend to during interface feedback, which offers a partial account of why these five participants did not converge. Their study used eye tracking and concerned visual attention, so applying it to interpretive priority extends the finding beyond what the method measured.

One qualification applies across this section. Two participants had their evaluation of the instant condition shaped by a defect in the prototype, in which availability status did not refresh after a size change. Participant 3's confusion in that condition came from the defect. Participant 2's initial judgment of unnaturalness did too, and the remark about robotic immediacy was made later, in retrospect. The instant condition was therefore not evaluated purely as instant feedback, which weakens the four first-place rankings further.

Research Question 2: Static Compared With Animated Waiting Screens

The static condition was least preferred, ranked last by three participants and described as unclear or unreassuring. The animated condition was more often understood as evidence that the system was processing the request. Participant 5 stated the mechanism plainly, explaining a preference for the animated version by the fact that the movement showed the system to be loading. Participant 4 reasoned from the opposite direction, observing that a wait with nothing happening would have been more frustrating.

Since both conditions lasted three seconds, these differences can be attributed to visual form. That is the cleanest comparison the study offers.

Dorati and Vásárhelyi-Nagy (2025) compared static, animated, and interactive loading screens and reported that the design of a waiting interface shapes how users respond to a delay. The present results are consistent with theirs. Their study is a bachelor thesis rather than a peer-reviewed publication, which limits the weight it can carry, and it is also the source closest in design to this study.

A more complicated result sits alongside this one. Both delayed conditions ran for three seconds, and no participant identified them as equal in a way that matched the prototype. Participants 1 and 4 judged the animated screen longer than the static one, and both named that additional length as the feature that stood out. Participants 3 and 5 judged the two equal. Participant 2 judged the animated screen substantially shorter, estimating half a second against about one second for the static condition.

Animation therefore did not compress perceived duration in any consistent way, and for two of five participants it appears to have extended it.

Branaghan and Sanchez (2009) provide a partial account, though their own results complicate it. Attentional gate theory, which they test, holds that a display with many discrete changes draws attention toward time and should lengthen perceived duration. Across three experiments they found no effect of display type on duration estimates. What they did find was that displays presenting many discrete changes were judged less reasonable and produced worse experience ratings, while preference ran in the opposite direction and favored the more informative displays. Their waits lasted between 15 and 60 seconds, so the comparison with a three-second delay is indirect.

Their central observation is that preference and the perceived quality of a wait can come apart. Participant 4 illustrates this directly, having judged the animated wait distinctly longer than the static one and still ranked it above the static condition because the animation improved the experience. The animation used here was themed and deliberately noticeable, and one participant described it as engaging enough to watch for a minute without becoming bored. On the account Branaghan and Sanchez advance, a screen that holds attention that effectively is also a screen that holds attention on the waiting.

The two effects run in opposite directions, and the ranking data suggests they compete. The participant who judged the animated screen shortest ranked it first. The participant who judged it longest ranked it last.

The answer to RQ2 is therefore split. Animated feedback improved interpretation and, for most participants, preference. It did not reliably improve the sense of how long the wait lasted, and it may have worsened it for some. A study of five participants cannot establish which effect dominates, or under what conditions.

Broader Interpretation

Two findings run through the material. The presence of a delay affected how responsive the system felt. The design of that delay affected whether the wait was read as meaningful or as a fault. Artificial waiting therefore functions as part of interaction design rather than as an interruption to it.

The question this study set out to explore was whether a deliberately designed waiting screen has a place in digital interaction. The material does not answer that with a preference count, and a count of five would not settle it in any case. What it shows is that the answer is not uniform. One participant preferred a visible check to an immediate answer and found the immediate answer less credible. Four preferred the animated screen to the static one and gave reasons concerning what the movement told them. Every participant judged the delayed conditions natural, including those who found them slow.

The stronger reading is that a delay is neither good nor bad in itself. It acquires a value from what the interface does with it. A pause that communicates nothing was experienced as a fault by one participant and tolerated by others only because it was brief. A pause that showed activity was read as the system doing its work, and by one participant as a reason for increased trust.

Trust behaved differently from preference throughout. No participant reported that a delay reduced trust, including those who found the wait annoying. Participant 3 stated the reasoning directly, observing that having to wait does not mean a system has stopped working. Participant 5 reported an effect in the other direction, answering that waiting had affected trust in the animated condition, positively, and attributing this to the movement as evidence of loading. That is the only such case in the material, and it concerned the animated condition specifically.

Confidence and trust also separated. Two participants reported low or qualified confidence that the system was working correctly during the static condition while still answering that trust was unaffected. Momentary uncertainty about whether a system is functioning appears not to be the same as a judgment about whether it can be relied upon, though five interviews cannot establish where the boundary falls.

5.2 Method discussion

A strength of the design was that all three conditions could be compared within one session, which kept attention on the waiting screens rather than on unrelated variation. Holding both delays at three seconds meant that the comparison central to RQ2 varied only in visual form.

The method also suited the subject. Waiting feedback concerns communication as much as duration, and a design built around participant reflection captured clarity, trust, comfort, and frustration in participants' own terms rather than reducing them to measurements. Participant 4's account of the animated condition illustrates the value of this: satisfaction at the outcome, mild frustration at the wait, and the observation that the animation offset the frustration, all within a single answer. A rating scale would have recorded one of those three things.

Five constraints qualify the findings, and they are of different kinds.

The context was singular. A shoe e-commerce prototype carries expectations that differ from those a person brings to a medical booking system or a bank transfer, and the results should be read as belonging to this setting.

The conditions were presented in the same order to every participant, beginning with the instant condition and ending with the animated one. Position and condition are therefore confounded throughout. The instant condition was encountered before participants had any basis for comparison, which may have favored it, and Participant 4 observed directly that the static delay would not have been noticeable without that comparison available. The animated condition was encountered last, by which point participants had completed the same task twice, which may have worked against it through fatigue or in its favor through novelty. Participant 3 reported surprise at the change in the screen, which is consistent with the second possibility. The direction of the effect cannot be determined from this material.

Participants were told in advance that the three products used different system responses and that the study concerned how natural, clear, and trustworthy the interaction felt. This supported informed consent and made comparison possible. It also directed attention toward the waiting screens before participants encountered them, and supplied vocabulary they later used. The word natural appears in participants' answers throughout, and it appeared first in the briefing.

The interviewer supplied emotional vocabulary where participants hesitated, offering calm, impatient, uncertain, and confident as options. Several participants selected from that list rather than generating their own terms. Participant 3 stated the difficulty

explicitly, saying the condition produced no particular feeling before settling on surprise. Emotional descriptions in the material are therefore partly the interviewer's.

The prototype defect in the instant condition affected two participants' evaluations of that condition, as described in Section 5.1.

These constraints define the boundaries of the study rather than undermining it. For a question about how people interpret waiting, rather than how long a wait objectively lasts, a qualitative design centered on reflection was the appropriate choice. A study designed to test the perceived-duration finding in Theme 4 would need a different method: more participants, randomized order, and duration estimates collected without the interviewer present.

6 Conclusions and further research

This chapter presents the conclusions of the study and outlines directions for further research. It returns the findings to the problem stated in the Introduction chapter and identifies where the topic could be developed.

6.1 Conclusions

What appears on screen during a wait changes how that wait is experienced. Participants in this study encountered three functionally identical interactions and evaluated them differently, and the differences followed from what the interface displayed while the system was working. A pause is therefore an interval in which an interface either accounts for itself or does not.

Participants interpreted the waiting states in relation to clarity, trust, and naturalness. Ingemarsson et al. (2023) argue that small feedback elements shape how an interaction is perceived, and the present material is consistent with that, though it rests on five interviews and their study is a bachelor thesis using qualitative methods.

Research question 1: Instant response versus delayed response

The instant condition was ranked first by four of five participants and was described as efficient and clear. That count is weaker evidence than it appears. Conditions were presented in a fixed order with the instant version first, so it served as the baseline against which the delays were judged, and participants were told in advance that the study concerned the waiting screens. All five stated a preference for speed before touching the prototype.

The finding that survives those qualifications concerns variation rather than preference. Participants did not converge. One ranked the instant condition last of the three, described an immediate answer as somewhat robotic, and said that receiving a result at once raised the possibility that something had gone wrong. This participant preferred a visible check to an instant response and stated that a wait of up to ten seconds would have been acceptable, on the reasoning that a site holding many products needs time to search. Buell and Norton (2011) report the same pattern in five experiments, where visible effort raised the perceived value of a service. One case does not demonstrate the effect, and it is a case in which the reasoning was articulated clearly enough to examine.

Delay was evaluated against what participants believed the task required. Two participants met the same three-second wait and read it differently, one treating an availability check as work that takes time and the other treating any delay as a departure from how a site should behave. Doherty and Sorenson (2015) and Tahir et al. (2022) both indicate that responsiveness is judged by more than speed, though Tahir's study concerned conversational systems rather than transactional ones.

The answer to the first research question is that users do not simply prefer the fastest response. They evaluate a response against what they expect the system to be doing, and those expectations differ between individuals.

Research question 2: Static versus animated waiting screens

The static condition was ranked last by three participants and was described as giving few cues about system activity. The animated condition was more often read as evidence that the system was processing the request. One participant explained a preference for it by saying the movement showed the system to be loading; another observed that a wait with nothing happening would have been more frustrating. Because both delayed conditions lasted three seconds, these differences can be attributed to visual form rather than to duration. Dorati and Vásárhelyi-Nagy (2025) reported a comparable result, and their study is the source closest in design to this one.

The animated screen did not, however, make the wait feel shorter. No participant judged the two delayed conditions to be equal in a way matching the prototype, and estimates ranged from half a second to several seconds. Two participants judged the animated screen longer than the static one, and both named that additional length as the feature that stood out. Two judged them equal. One judged the animated screen substantially shorter.

Branaghan and Sanchez (2009) offer a partial account, though their own results complicate it. Attentional gate theory, which they test, holds that a display presenting many discrete changes draws attention toward time and should lengthen perceived duration. Across three experiments they found no effect of display type on duration estimates. What they did find was a division between preference and the perceived quality of a wait: displays with many discrete changes were judged less reasonable and produced worse experience ratings, while preference favored the more informative displays. Their waits ran between 15 and 60 seconds, so the comparison with a three-second delay is indirect.

The conclusion for the second research question is therefore divided. Animated feedback improved how the delay was interpreted and, for most participants, how it was preferred. It did not reliably improve the sense of how long the delay lasted. Form is not cosmetic, and neither is more visible feedback straightforwardly better.

Overall contribution

Waiting feedback is part of the experience rather than a residue left over once the substantive design work is finished. The same three-second pause was experienced as a fault, as ordinary, and as evidence of the system working, depending on what filled it and on what participants believed the system was doing. Söderström et al. (2018) and Willermark et al. (2021) both found that waiting experience depends on the design of feedback as well as on timing, and both studies concerned mobile interfaces.

Responses were not uniform, and that non-uniformity is the finding rather than noise around one. Bystam and Moliteus (2022) found individual differences in what users attend to during interface feedback, which offers a partial account. Their study used eye tracking and measured visual attention, so applying it to interpretive priority extends the result somewhat.

The practical implication is narrow but usable. A deliberately designed wait is neither an improvement nor a cost in itself. It becomes one or the other according to whether the interface explains the pause, and whether the pause matches what the user believes the task involves. Neither condition is satisfied by adding motion to a screen.

6.2 Limitations

The study was conducted within one digital shopping interaction. Findings describe how waiting feedback was experienced in that setting, and expectations differ across contexts. A person waiting on a bank transfer or a medical booking brings assumptions this study did not examine.

Five participants is a small number. The design favored depth over breadth, which is defensible for qualitative work, and it means the findings describe a particular set of experiences rather than a pattern that holds generally.

Conditions were presented in the same order to every participant, so position and condition are confounded. The instant condition was always encountered first, before participants had any basis for comparison, and one participant noted directly that the static delay would not have been noticeable without that comparison available. The animated condition was always encountered last, which may have worked against it through fatigue or in its favor through novelty. One participant reported surprise at the change of screen, which is consistent with the second possibility. The direction of the effect cannot be established from this material. Söderström et al. (2018) reported a comparable pattern in a study of loading screens, where participants tended to prefer whichever application they encountered first and to judge the last as slowest, even though the order was shuffled.

Participants were told before beginning that the three products used different system responses and that the study concerned how natural, clear, and trustworthy the interaction felt. This supported informed consent and made comparison across conditions possible. It also directed attention toward the waiting screens in advance and supplied vocabulary participants later used, including the word natural, which recurs throughout their answers and appeared first in the briefing.

Emotional vocabulary was partly supplied by the interviewer. Where a participant hesitated, a set of options was offered verbally, and several participants selected from that list rather than generating their own terms.

The instant condition contained a defect in which availability status did not refresh after a size change. Two participants commented on it, and their evaluations of that condition reflect the defect as well as the absence of delay.

The study examined short delays and three forms of feedback. This kept the comparison tight and narrowed what could be observed. Longer delays, or other indicator designs, may produce different results.

6.3 Further research

The perceived-duration result reported here is the most direct opening for further work. Two participants judged an animated three-second wait longer than an identical static one, which attentional gate theory predicts, though Branaghan and Sanchez (2009) found no such effect on duration estimates in their own experiments. Testing it would require a design this study did not use: a larger sample, randomized condition order, and duration estimates collected without an interviewer present. The relationship between how engaging a waiting screen is and how long it feels appears to be worth examining directly.

The same conditions could be examined in other settings, such as booking systems, health applications, or educational platforms. Users approach different systems with different expectations, and the finding that a pause is read against an assumed task suggests that context does much of the work. Testing outside online shopping would show whether these results belong to this setting or point to something broader.

A larger and more varied group of participants would also help. The five here differed considerably in how they read the same conditions, which suggests that habit, experience, and expectation matter. A broader sample could establish whether those differences track identifiable user characteristics.

Longer delays and other forms of feedback remain unexamined. Three seconds is short. Waiting may work quite differently once a pause becomes unmistakable, and a comparison across progress indicators, textual messages, and more interactive designs would show which forms leave users informed rather than merely occupied.

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8 Appendixes

Appendix A: Participant Demographics

Participant	gender	age
Participant 1	female	22
Participant 2	male	26
Participant 3	male	23
Participant 4	male	23
Participant 5	female	22

Appendix B: Interview Guide

Participant introduction

Participants received a verbal introduction explaining that they would use a prototype website simulating an online shopping experience, and that the task involved checking product availability across three products. They were told that the three products used different system responses: an instant response, a static waiting message, and an animated loading screen. The introduction stated that the study concerned how different forms of system feedback affect the experience, including how natural, clear, and trustworthy an interaction feels, that there were no correct answers, that responses would remain anonymous, and that they could stop at any time.

A. Questions before interaction

1. How would you normally describe your expectations when using online shopping websites?
2. What do you usually think about when a page takes time to respond?

B. Questions asked after each of the three conditions

First impression

3. How did this interaction feel overall?
4. Did anything stand out to you?

Perception of response

5. How would you describe the system's response time?
6. How long do you think the delay was? *(delayed conditions only)*
7. Did it feel instant, delayed, or something else?

Emotional reaction

8. How did this experience make you feel?

Trust and interpretation

9. Did you feel confident that the system was working correctly?
10. Did the waiting, or lack of waiting, affect your trust in the system?

Naturalness

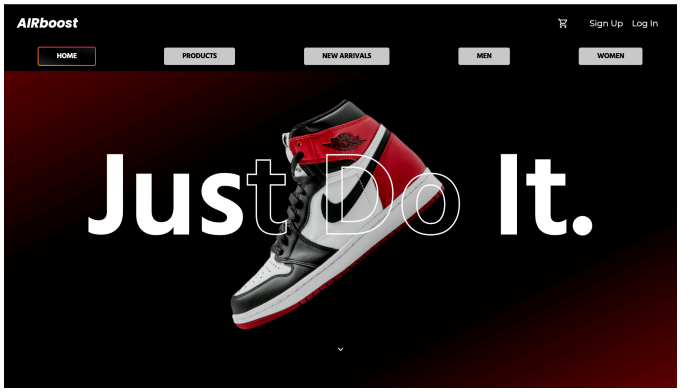
11. Did the interaction feel natural or unnatural? Why?

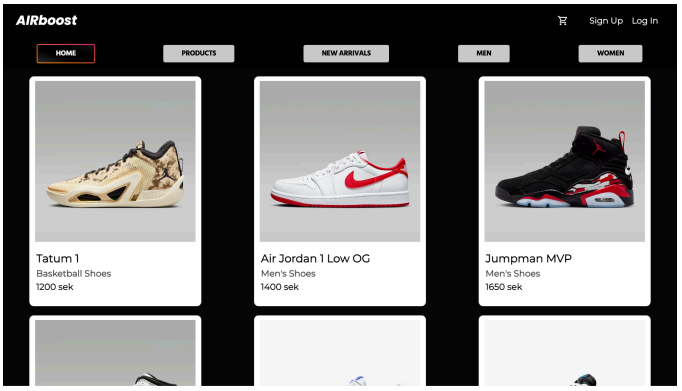
C. Final comparative question

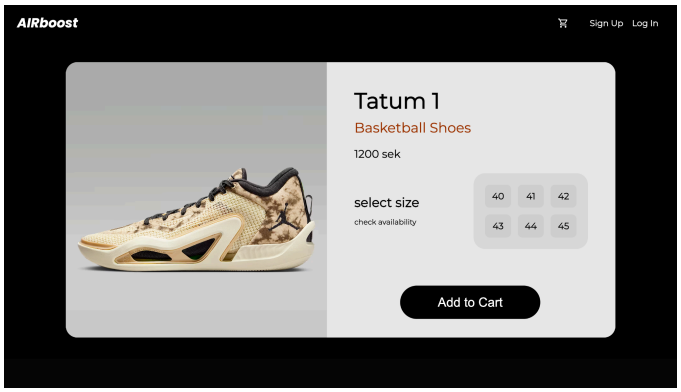
12. Considering all three interactions, how would you place them in order from most to least preferred?

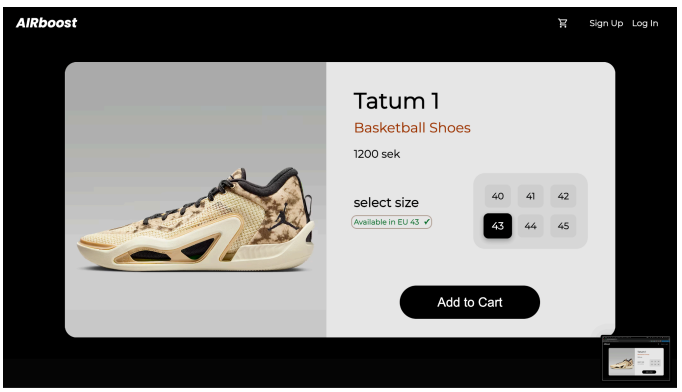
Note. Where participants did not respond to Question 8 or asked for clarification, the response options calm, impatient, uncertain, and confident were offered verbally. Question 12 was phrased variably across sessions, including as a question about which interaction was best and worst, and which felt most comfortable. Follow-up questions were used throughout to clarify brief or ambiguous responses.

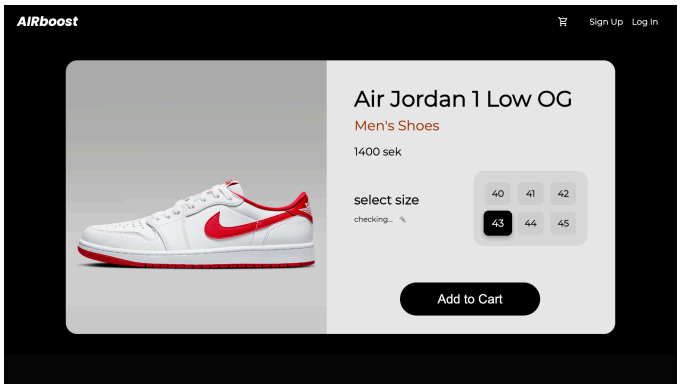
Appendix C: Prototype User Interface and Interaction Flow Chart

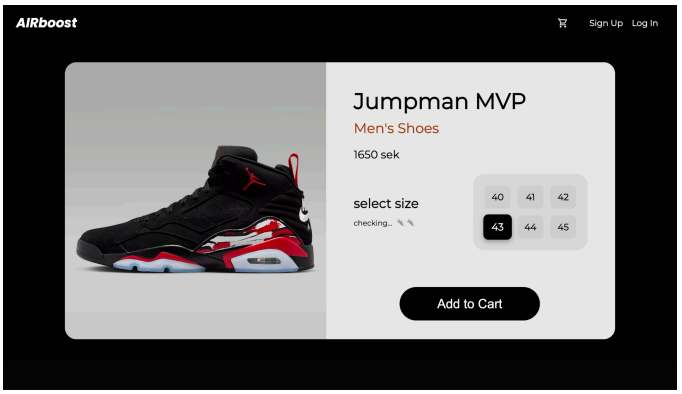












Appendix D: Interview Transcripts

Participant 1

+ Interviewer: First, I have two main questions for you. The first one is: how would you normally describe your expectation when using online shopping websites?

- Participant 1: My expectation towards, well, like the quality or just the product?

+ Interviewer: Like, you want to order something from a website, like, it can be anything.

- Participant 1: First of all, for me, it's the price. Of course, I don't want to just pay for something very high. And also quality as well. But I think the priority is the price for me.

+ Interviewer: And more about the, like, website application, whatever. Like, for example, how often do you buy stuff online, do shopping online, and like, where do you do your shopping? Not specifically the names, but like, how would you, like, check if, like, you want to shop, like, here or there?

- Participant 1: I usually order online, especially recently, 'cause I think it's more convenient. Like websites like Shein, Temu, because, I mean, the qualities aren't high, but I mean, it's affordable. As a student, I don't want to pay that much. Of course, I want to have brands, but like, I usually prefer to have something pretty rather than just be a brand or specific.

+ Interviewer: Amazing. What do you usually think about when a page takes time to respond?

- Participant 1: I get bothered. Like, you mean if it's glitching or something like that?

+ Interviewer: When it's like long. It can be loading, it can be waiting.

- Participant 1: Of course, it's not like I don't want to waste my time. Like, I want something to be quick and just at the moment. That's the point of online orders.

+ Interviewer: Amazing. So, we have three prototypes down there. Scroll please. The first three prototypes, you can check them. I want you to start from the left one. Check that one, check the availability of, like, different sizes. You can even add them to the basket.

- Participant 1: This is not my size, I think. How can I go back?

+ Interviewer: No, but only these three prototypes now, so you have to check, like, if one size that you want, like, you just imagine your size.

- Participant 1: I have to just choose?

+ Interviewer: Yeah, you can just choose, you can check the availability. I want you to check the availability.

- Participant 1: Oh, here. I did. Oh, it's like available in EU size 44.

+ Interviewer: Yes. Okay. That's good. How did this interaction feel overall?

- Participant 1: Like about this one, this shoe, or the whole thing?

+ Interviewer: The task was to check if it's available, like the size that you want, if it's available or not.

- Participant 1: Yeah, I think the size is just like for men. They don't have the available size for me. And also the price is too high. And I also don't like the way the sneakers look.

+ Interviewer: It's more about the website, not the product.

- Participant 1: But like, okay, I said about the website. Wait, what am I gonna say?

+ Interviewer: The whole interview is about the website.

- Participant 1: Okay, but like, what am I gonna say?

+ Interviewer: Like, let's say you want to buy a gift for someone. So you know their size is maybe 44. Or like, you want to check to see if it's available and then you can add it to the basket, I don't know, you want to purchase from this website. So, you want to see if, like, do you like this website, and like, there are three different kinds of interactions that we're gonna test. So this one was the first one. And it's more oriented around the availability. So you can, for example, check another size.

- Participant 1: Available in EU size 44. Okay.

+ Interviewer: And then I'm gonna ask you about, like, your experience with, like, checking if it's available or not. That's the main thing. So how did this interaction feel overall?

- Participant 1: I think it's clear, like, what you're, like, looking for. You can see the sizes, availability. You can also see the clear vision of the sneakers as well, also the name of it, and also at the end, the price. So I think it's just obvious and everything's clear.

+ Interviewer: Amazing. And did anything stand out to you?

- Participant 1: No.

+ Interviewer: How would you describe the system's response time?

- Participant 1: I think it was quick. Like you just have to click on any of the sizes and you will just check the availability and it's done.

+ Interviewer: Done, amazing. Did it feel instant, delayed, or something else?

- Participant 1: Not yet, let's see. I didn't have, like...

+ Interviewer: No, like for example, you choose this one, then you check. Does this one feel, like, instant, delayed, or something else? Did it give you what you wanted?

- Participant 1: Aha, like, okay... yeah, it was instant. Like, it was just formal and the information that you need for purchasing the thing.

+ Interviewer: Amazing. And how did this experience make you feel? For example: calm, patient, uncertain, or confident?

- Participant 1: Yeah, like, they make you assure of everything you need, like, as I said, the size, the price, and I feel like calm and it feels very easy to work with.

+ Interviewer: Amazing. And did you feel confident that the system was working correctly?

- Participant 1: Mhm, yeah, of course.

+ Interviewer: Did the waiting, or lack of it, affect your trust in the system?

- Participant 1: The what? The lack of waiting?

+ Interviewer: Did the waiting, or lack of waiting, affect your trust in the system?

- Participant 1: I mean, was there any waiting? No. So no, I don't think so.

+ Interviewer: You said instant. Yes, amazing. So, we can move to the next product. Go to the next one. Just go and press on the logo. All right, you have to do the same task with this.

- Participant 1: Let's try with 40.

+ Interviewer: Amazing. And how did this interaction feel overall?

- Participant 1: So here, there are some things that are not as clear as the first one. It's the thing that first of all... sorry... it's like men's shoes. It doesn't say, like, even though if you can see the brand, like of course it's Nike, but still, like, we need more information about it. And also here, I just realized it like had kind of like a two-second or one-second delay. And let me check another one. For example... it's fine I think, but still, if I want to compare it with the first one, obviously the first one is my choice because of the whole information and the basically everything.

+ Interviewer: Did anything stand out to you in the waiting process?

- Participant 1: Like in compared to the first one?

+ Interviewer: Like for this page.

- Participant 1: Standing out... I mean, maybe the branding here?

+ Interviewer: 'Cause the only difference on all the different is, like, here, that's the main focus of the whole.

- Participant 1: As I mentioned, it's like the delay that it has. Like as you can see, if you like click on another one and it's like, you can see a bit of delay. Even if it's not that much and it doesn't annoy me, but still, it's not as fast as it should be.

+ Interviewer: Okay, amazing. How would you describe the system's response time?

- Participant 1: Like the kind of same question, but I think it's... it has delay, obviously not that much to bother anyone. Of course, you can wait, but if it's just instant, you feel more confident with it.

+ Interviewer: How much do you think the delay was?

- Participant 1: Should I test again? No. Oh, one or two seconds maximum.

+ Interviewer: Two seconds. Okay. Did it feel instant, delayed, or something else?

- Participant 1: Casual. It was normal. Not something like just delayed to be like, "Oh man, what is not loading?"

+ Interviewer: How did this experience make you feel? For example, like calm, impatient, uncertain, confident.

- Participant 1: It was fine. I don't think it was something that would like make me just move on and go find it on another website. I'll wait for like a second.

+ Interviewer: All right, great. Did you feel confident that the system was working correctly?

- Participant 1: Yeah, because a lot of websites have this problem. I think it's just not the only one that should be, like, a bit of delay, doesn't matter that much. So I think it was fine.

+ Interviewer: Did the waiting, or lack of it, affect your trust in the system?

- Participant 1: No, not at all. At least not for this one. It was all, like, completely fine.

+ Interviewer: Did the interaction feel natural or unnatural?

- Participant 1: With this one? Natural. It was completely normal.

+ Interviewer: Okay, we can move to the third product. This one? Yes, same task again. Check if the size that you want is available.

- Participant 1: So... okay... mhm... it's the same.

+ Interviewer: How did this interaction feel overall?

- Participant 1: This one had more delay. I think I counted maybe around two seconds. But still, I would say I can bear it. Maybe for two seconds, it's not that much. But still, when you see a website that it has delays, you be like, "Maybe something is off. Why are they, like, not just quick?" So, I don't know, like, I'm still not that picky when it comes to just delays. But of course, if it gets more, like, if it gets longer, I'm not gonna waste my time just for waiting for the product.

+ Interviewer: Did anything stand out to you about the timing again?

- Participant 1: It took longer.

+ Interviewer: And how would you describe the system's response time compared to the other two, or just in general?

- Participant 1: As I said, it was just like a bit not that much different from the second one. But still, I think if it keeps going, I'm gonna be like, "Okay, maybe something is off," because delays are normal, of course. Sometimes there are problems with network, but still, it's not acceptable all the times.

+ Interviewer: Did it feel instant, delayed, or something else?

- Participant 1: A bit delayed.

+ Interviewer: And how did this experience make you feel? Like calm, impatient, uncertain, confident.

- Participant 1: I cannot say completely confident, but like, it's fine, not uncertain. It's okay.

+ Interviewer: And did you feel confident that the system was working correctly?

- Participant 1: As I said, like, I worked with a lot of websites and I've seen even worse than this, so I think it's totally fine.

+ Interviewer: Did the waiting, or lack of it, affect your trust in the system?

- Participant 1: No, not yet. It's fine. Not at all.

+ Interviewer: Did the interaction feel natural or unnatural?

- Participant 1: It was natural.

+ Interviewer: Amazing. And if you want to order them, put them in order, like which one did you like the most, which one felt more natural, how do you put them in order?

- Participant 1: Of course, like, the way the order is now: first, second, and third.

+ Interviewer: So instant, static loading, and then animated loading?

- Participant 1: Yes.

+ Interviewer: Amazing. Thank you so much.

- Participant 1: Thank you.

Participant 2

+ Researcher: Choose your size, check the availability.

- Participant 2: Mm-hmm. Yes, amazing.

+ Researcher: So, I forgot to ask you a few questions before that. Sorry. How would you normally describe your expectations when using online shopping websites?

- Participant 2: Hmm... I really like—when I'm in the site—the main thing I look into, and it's really important for me, is the search bar. Because whenever I know the name of the thing I'm looking for—whether it is a bicycle or it's shoes—I know the name, I instantly search for the search bar. It is really important for me. So, yeah, that's the main thing in my experience I'm looking for.

+ Researcher: Yes. And then what do you usually think about when a page takes time to respond?

- Participant 2: First of all, I always check my internet connection first, so I don't usually think that it is the problem with the website itself. I always check first of all my internet, my location, if this site is available in my region or not. And only then I look at the site after these two options. So yeah, it is not the very high expectation for me.

+ Researcher: Yes, thank you. And then we can go with the first one again and then check the availability.

- Participant 2: Okay. I will go with this. And it says the available in the EU 45, 44, 43. Yes.

+ Researcher: Amazing. So how did this interaction feel overall?

- Participant 2: Very, very comfortable. Why? Because I have used a lot of sites—also the site of the Nike—and it feels very overwhelmed. There is a lot of information there, there are a lot of sizes which I don't understand. Of course, we are in EU, maybe for someone from the US these will be comfortable. I don't understand the US sizes. And—but it looks very small and I like that when I'm scrolling the mouse here, it shows the shoes themselves in the different—from different angles. And also this description is really nice. In most of the sites they don't write about the description of the what kind of shoes these is, why—for what you can use them. There are a lot of types and I like the minimalism a lot, and very smooth.

+ Researcher: Yes, thank you. And then did anything stand out to you?

- Participant 2: Stand out? I'll be honest, not so much, but the simplicity of this—ah, no, I would say like that: the simplicity of the site itself and the how the description of the photo of the shoe, it really stands out. I like the simplicity a lot. As I said before, when I went to the other sites, I'm looking for one shoe, the—before seeing the other shoes they are recommending me other shoes before seeing the actual shoe, and I like this minimalism and concrete.

+ Researcher: Yeah, straightforward. How would you describe the system's response time?

- Participant 2: It's very fast, actually. In this case, I'm checking the availability for example in here and then 45 EU, and when I'm pressing on the add to cart, it's very fast, it's very responsive and it's very smooth, actually.

+ Researcher: And then did it feel instant, delayed, or something else?

- Participant 2: I don't feel any delay at all. Again, it is very smooth, very comfortable, and very easy. I think with this thing—how can I say—with this site, with this design, even my grandparents can choose a shoes for themselves.

+ Researcher: And the next question is: how did this experience make you feel? Like calm, impatient, uncertain, confident?

- Participant 2: Not confident. What were the choices again?

+ Researcher: Calm, impatient, uncertain, and confident.

- Participant 2: Very calm. Very nice and calming experience. I really like it.

+ Researcher: And did you feel confident that the system was working correctly?

- Participant 2: Currently yes, like a lot. I feel like I can do—I can choose anything I want, check the availability, add to cart and purchase.

+ Researcher: No, no, sorry my bad, correctly—like if it's actually like working.

- Participant 2: Ah, like that. Yes, it seems very correct. So, I see the shoe, I choose the size, I check the availability, it's available, and that's it. Simple as that.

+ Researcher: Amazing. And did the waiting, or lack of it, affect your trust in the system?

- Participant 2: No, it doesn't affect me at all because I can see that currently in the site there is no any issues with the waiting time and response time. I really like it.

+ Researcher: And did the interaction feel natural or unnatural?

- Participant 2: A little bit unnatural. Why? One issue—it is not—I would not say that it is an issue. For—let's say that I'm changing from 45 or 43. It would be good that if

"available in EU 45" would change to—wait, I will—can I? Yeah. It would be good for example if it would change to "check availability again" rather than staying like this.

+ Researcher: Yeah, change the size.

- Participant 2: Only this caught my attention.

+ Researcher: Amazing. Then we can move to the second product. Go to the second one.

- Participant 2: This one?

+ Researcher: Yes, and same task again.

- Participant 2: Oh, okay. Amazing.

+ Researcher: How did this interaction feel overall?

- Participant 2: It feels more alive. It's like in the first one, it's like checking the database and giving the answer right away, but here is like "hmm, let me see," like you're talking to a human, said "let me see" and yes, it is available. It feels more natural.

+ Researcher: Natural. And did anything stand out to you?

- Participant 2: The thing that the site is—is checking for me, and I really like that interaction actually. Yes, this stood out rather than the first product.

+ Researcher: And how would you describe the system's response time?

- Participant 2: System's response time is actually very quick. So, it's—it's checking the, let's say, the database of the shoes available currently in the warehouse or somewhere else and it's giving me answer the right away. So yeah, it's pretty fast.

+ Researcher: How long do you think it was? But don't check right now.

- Participant 2: How long? It's like one second.

+ Researcher: One second. Okay. And did it feel instant, delayed, or something else?

- Participant 2: It didn't feel delayed, but even let's say that it would be maximum of 10 seconds, I wouldn't even be bothered because I would understand that there are a lot of shoes and the site has to check and it's overwhelmed with people who are entering the site. If it is the popular, I would be calm. And also I like this interaction like I'm pressing it, it's checking the availability and then give me the answer.

+ Researcher: Nice. And then how did this experience make you feel? Calm, impatient, uncertain, or confident?

- Participant 2: I would say that in this experience it would be more confident.

+ Researcher: Confident, amazing. Did you feel confident that the system was working correctly?

- Participant 2: I was—I am confident about that, that it's working correctly. In the first one it's giving the answer right away, which feels a little bit robotic and—in that case I would feel like that maybe there is some issue, why it's giving me the answer the right away? But here I can feel that it's searching, it's searching, and then giving me the answer. I liked it much better.

+ Researcher: And did the waiting or lack of it affect your trust in the system?

- Participant 2: Not at all. In this case no, it didn't affect me at all.

+ Researcher: And did the interaction feel natural or unnatural?

- Participant 2: Much more natural than the previous one.

+ Researcher: Okay. Then we can move to the third product.

- Participant 2: Okay. Same task again. Hmm, okay. That's interesting.

+ Researcher: How did this interaction feel overall?

- Participant 2: Very customized, very—I like that it is much more focused on the design of the site itself, like it is shoes and the load screen instead of like dots, it's walking shoes. It's really nice.

+ Researcher: Did anything stand out to you?

- Participant 2: Yeah, stood out thing that the load screen is not as the same as previous other products. It is actually more interactive and more interesting to watch at. I can look at it for one minute and will not get bored.

+ Researcher: And how would you describe the system's response time?

- Participant 2: System's response time—again, it was fast, it was also interesting.

+ Researcher: How long do you think it was?

- Participant 2: 0.5 seconds.

+ Researcher: So compared to the previous one? Actually, the first one was a little bit faster than this—1.2 seconds. Okay. Then did it feel instant, delayed, or something else?

- Participant 2: It felt instant actually. I chose my size and I pressed again and the available and almost instant.

+ Researcher: And how did this experience make you feel? Calm, impatient, uncertain, confident?

- Participant 2: Almost calm and really interested. Like, I liked looking at it.

+ Researcher: Yes. Did you feel confident that the system was working correctly?

- Participant 2: Yes, I had confidence in it. For example, let's say if one shoe will be—maybe there will be a bug, I'm pressing it, one shoe goes up here and down here—yeah, it will be feeling not good.

+ Researcher: And did the waiting or lack of it affect your trust in the system?

- Participant 2: Again, not at all, it didn't affect me. I really like the speed of it.

+ Researcher: And did the interaction feel natural or unnatural?

- Participant 2: 100% natural than the first two products.

+ Researcher: Okay. And the last one is like, how would you order these three different—how would you order them, these three interactions that you saw?

- Participant 2: What do you mean by order? Like I have made my—

+ Researcher: The first one was instant, second one was a static loading screen, and third one was animated loading screen.

- Participant 2: Oh, which one I would order?

+ Researcher: Yes. How would you order them? Which one was the best, which one was the worst?

- Participant 2: I would choose the third, second, and then first.

+ Researcher: So animation, static, and then—

- Participant 2: Yes, animation, static, and the first product.

+ Researcher: Yes, thank you so much.

- Participant 2: That's it?

+ Researcher: Yes.

Participant 3

+ Interviewer: So first, I have a few questions for you. How would you normally describe your expectations when using online shopping websites?

- Participant 3: Uh...

+ Interviewer: How would you normally describe your expectations when using online shopping websites?

- Participant 3: I expect it to be simple, easy to handle, fast.

+ Interviewer: Nice. What do you usually think about when a page takes time to respond?

- Participant 3: It's annoying.

+ Interviewer: Annoying. Okay. So, we have three prototypes if you scroll down. The three top ones work, but I want you to start with that one, check that one, check the availability.

- Participant 3: Oh... what do I have to check? Ah, okay. It just pressed it once and then it goes back, why?

+ Interviewer: It actually changes every time that you press.

- Participant 3: Oh... 45 there again... 44.

+ Interviewer: Okay, amazing. How did this interaction feel overall?

- Participant 3: It's weird that I have to press it again and again and again.

+ Interviewer: Did anything stand out to you?

- Participant 3: Stand out?

+ Interviewer: Yes.

- Participant 3: Uh... not really.

+ Interviewer: How would you describe the system's response time?

- Participant 3: Like response time in what?

+ Interviewer: In like whatever you do, like how fast does it give you the response, like when you check the availability, for example?

- Participant 3: It's pretty fast.

+ Interviewer: It's pretty fast. And did it feel instant, delayed, or something else?

- Participant 3: In what? Instant? Yes, it felt instant.

+ Interviewer: How did this experience make you feel? For example, like calm, impatient, uncertain, confident?

- Participant 3: Confused in the beginning. That I didn't have to... didn't know I have to press that again.

+ Interviewer: Yeah, it didn't bring back the... that's the bug that the system still had. And did you feel confident that the system was working correctly?

- Participant 3: Confident?

+ Interviewer: Yes. Like imagine you're ordering the shoe, you want to check and order. Did you feel confident that the system was working correctly?

- Participant 3: Yeah.

+ Interviewer: And did the waiting, or lack of it, affect your trust in the system?

- Participant 3: Not really.

+ Interviewer: Did the interaction feel natural or unnatural?

- Participant 3: Natural.

+ Interviewer: Okay, amazing. Now we can go to the other prototype.

- Participant 3: This... what just with this? No...

+ Interviewer: Every... if you press on the Airboost logo, it will go back to the top.

- Participant 3: Oh, never mind.

+ Interviewer: Now this one, check the availability. Same questions again. How did this interaction feel overall?

- Participant 3: Very slow.

+ Interviewer: Very slow. What do you usually think about when a page takes time to respond?

- Participant 3: I get a little annoyed.

+ Interviewer: A little annoyed. Okay. How would you describe the system's response time?

- Participant 3: Fairly slow.

+ Interviewer: Fairly... how long do you think it was?

- Participant 3: Three seconds.

+ Interviewer: Three seconds. Okay. Did it feel instant, delayed, or something else?

- Participant 3: It felt delayed.

+ Interviewer: Delayed. How did this experience make you feel? Calm, impatient, uncertain, confident?

- Participant 3: A little impatient.

+ Interviewer: Impatient. Did you feel confident that the system was working correctly?

- Participant 3: Yeah, but it’s an unsure yes. I mean just because I have to wait it doesn't mean it doesn't work.

+ Interviewer: No, it’s about your feeling. How do you feel?

- Participant 3: I mean, that’s what I’m saying. Like it doesn’t... it doesn't make me feel like I cannot trust the page just because I have to wait.

+ Interviewer: Yes. And did the waiting, or lack of it, affect your trust in the system?

- Participant 3: No, not really.

+ Interviewer: Did the interaction feel natural or unnatural?

- Participant 3: Natural. I mean, it can happen anywhere.

+ Interviewer: Yes. And then we can go to the third one.

- Participant 3: Wait, I forgot what the other one did, can I check?

+ Interviewer: Yeah.

- Participant 3: Ah, okay.

+ Interviewer: How did this interaction feel overall?

- Participant 3: Wait...

+ Interviewer: Do you want to check it again? 'Cause like it should be the last one that you see.

- Participant 3: Last one that I... oh yeah, I mean I know it’s moving and static. Yeah, I like that more that it was moving.

+ Interviewer: You liked it more. Why? Did anything stand out to you?

- Participant 3: Yeah, that it wasn’t static, it was moving.

+ Interviewer: How would you describe the system’s response time?

- Participant 3: Uh... same as the last one.

+ Interviewer: And did it feel instant, delayed, or something else?

- Participant 3: A little delayed.

+ Interviewer: Last one was fairly delayed, right?

- Participant 3: I mean fairly delayed also, same thing.

+ Interviewer: How did this experience make you feel? Like calm, impatient, uncertain, confident?

- Participant 3: You have to think because it doesn't really make me feel anything. Um... surprised, let's say.

+ Interviewer: Surprised.

- Participant 3: Yeah, kind of, because it... it changed, so I was like, "Oh, what's that?" you know.

+ Interviewer: Oh, that's why you went back and then back again. Yes. Did you feel confident that the system was working correctly?

- Participant 3: Yes.

+ Interviewer: And did the waiting, or lack of it, affect your trust in the system?

- Participant 3: No.

+ Interviewer: Did the interaction feel natural or unnatural? And why?

- Participant 3: It felt natural because, well, you see loading screens all the time and this was closer to that.

+ Interviewer: Yes. And if you want to order them, like which one do you like the most? Like order them from like the first one to the third one. Which one was the best, which one was the worst?

- Participant 3: I mean, the first one there was no delay, so that one on top. And then the third one because it was at least entertaining to wait. And then the second one is the third on the bottom.

+ Interviewer: Okay, amazing. Thank you so much.

- Participant 3: You're welcome.

Participant 4

+ Interviewer: So, first two questions. How would you normally describe your expectations when using online shopping websites?

- Participant 4: Oh, okay. Expectations for online shopping website... I would expect it to be easy to navigate, have a search engine—like search bar—and but also the

top bar, like menu or options, so I can see... If it's on the computer, I would expect it to have exactly this, so it's visible. I know what options I have. If it's on the phone, maybe a hamburger menu, yeah. But other than that, I would expect it to provide the necessary information, which is price about the product and... yeah, I think easy access to buy stuff. Not complicated ways, yeah.

+ Interviewer: Amazing. What do you usually think about when a page takes time to respond?

- Participant 4: What I think about it? Well, it's frustrating, I would say. If I'm trying to do something and it just keeps loading and loading and loading, yeah, I think it's a no-go for me.

+ Interviewer: Amazing. So there are three products that I want you to check. You can scroll down, and the top three products are the ones that we're going to test today. So we're going to start from the left one to the right; we're going to do them one by one, and then I will ask you questions.

- Participant 4: Okay.

+ Interviewer: And the task was to check the availability of the size that you want.

- Participant 4: Oh, all right, all the sizes I want. I need 45. Available. Okay. So I basically can go back. I checked the first one, yeah.

+ Interviewer: Yeah, do... we can do them one by one. No, no, not the second one, go back. Yes, that one you can check it again, like add something to the card.

- Participant 4: Okay, it's available. I added it.

+ Interviewer: Okay. So how did this interaction feel overall?

- Participant 4: It... this was very, very good. Very easy to navigate. I could see the availability option right away. Yeah, I happened to click first, and it warned me to first choose a size, so I know which one I'm checking, but it makes sense. So yeah, I would say it's really nice.

+ Interviewer: Yes. Did anything stand out to you?

- Participant 4: Um, stand out... I would say the sort of minimalistic part here where the add-to-cart button is really huge, also with the select size options. But also, I like the spaces between the title, the description, and the price is pretty visible, so everything sort of pops out.

+ Interviewer: Amazing. How would you describe the system's response time?

- Participant 4: System response—very easy, very quick, smooth. So I like it, even the picture animation.

+ Interviewer: And did it feel instant, delayed, or something else?

- Participant 4: Nothing really that would feel delayed or anything like that, so yes, I think it's really nice.

+ Interviewer: How did this experience make you feel—like calm, impatient, uncertain, confident?

- Participant 4: Satisfied.

+ Interviewer: Satisfied. Amazing. Did you feel confident that the system was working correctly?

- Participant 4: Yes, yes, I really don't have anything bad about this one. Yeah, I don't really.

+ Interviewer: Did the waiting, or lack of it, affect your trust in the system?

- Participant 4: Not at all. Everything was smooth.

+ Interviewer: Did the interaction feel natural or unnatural?

- Participant 4: I would say it was natural.

+ Interviewer: Amazing. So we can move to the second one now.

- Participant 4: Okay, second product. We're going to check availability. Yeah.

+ Interviewer: Yes. How did this interaction feel overall?

- Participant 4: Maybe I noticed a little slight difference of the loading part of availability and also a little shoe popping up, but still it was pretty, pretty fast enough to not notice if I'm not thinking about it.

+ Interviewer: Yes. And did anything stand out to you?

- Participant 4: Exactly what I said.

+ Interviewer: How would you describe the system's response time?

- Participant 4: It was still quick enough to not make me think about it that much, so really, really smooth still, I would say.

+ Interviewer: And how long do you think the delay was—the loading?

- Participant 4: Like maybe half a second up to one and a half, not more.

+ Interviewer: Half a second up to one... and did it feel instant, delayed, or something else?

- Participant 4: Just like slightly... I noticed a slight difference, but not really like didn't give me any anxiety or like frustration, no.

+ Interviewer: And how did this experience make you feel—calm, impatient, uncertain, confident?

- Participant 4: I would say still satisfied, but like I did notice a little change. But like if I would have just this option and not the previous one, then I wouldn't have anything to compare it with, and I would still be satisfied, so I think it's really, really okay.

+ Interviewer: Yes. And did you feel confident that the system was working correctly?

- Participant 4: Yeah, I would say yes. I checked multiple sizes and everything works.

+ Interviewer: Did the waiting, or lack of it, affect your trust in the system?

- Participant 4: Not really. It wasn't too long. It was still within the norms of... yeah, of my expectations.

+ Interviewer: And did the interaction feel natural or unnatural?

- Participant 4: Natural.

+ Interviewer: Yes. Okay, amazing. We can move to the third one now.

- Participant 4: Yeah. All right. Ha! All right.

+ Interviewer: Yes. How did this interaction feel overall?

- Participant 4: I mean, I got the result what I wanted. It's still there. It was just a little delayed. Personally, I think, okay, that one was kind of like—yeah, made me wait a little bit. It was an animation there, like yeah, maybe that one made it a bit like more okay, because if it was just like loading and nothing happening, then maybe I would be more frustrated. I don't think it's still that long time to wait, but I think I did notice this very significantly.

+ Interviewer: How long did you feel like it took—the animation?

- Participant 4: Maybe like a second and a half, two.

+ Interviewer: A second and a half, two. So like one and a half, one, one and a half more seconds than the other one.

- Participant 4: Yeah.

+ Interviewer: Yes. And did anything stand out to you?

- Participant 4: Yeah, the animation. The animation was actually... it was sort of like, yeah, like made it easier, like better, the situation. Yeah, it was... it was sort of fun as well, like the shoes.

+ Interviewer: And how would you describe the system's response time?

- Participant 4: Still smooth. Everything works. I can see everything, even like add... yeah, when it comes to availability, still, yeah, pretty smooth.

+ Interviewer: And did it feel instant, delayed, or something else?

- Participant 4: Um, yeah, a little bit, the loading.

+ Interviewer: The loading, a little bit of delay. How did this experience make you feel—calm, impatient, uncertain, confident, satisfied, not satisfied?

- Participant 4: I mean, I got the result, so I would say satisfaction is on point, but... yeah, a little bit... a little bit out of track for like a few split of a seconds, I had to think about like, okay, now I have to wait.

+ Interviewer: Amazing. And did you feel confident that the system was working correctly?

- Participant 4: Yeah, overall, the system works correctly, and it did show me with the animation that it's loading, actually, so I understood it. Yes.

+ Interviewer: And did the waiting, or lack of it, affect your trust in the system?

- Participant 4: I don't think that it would affect the trust in the system when it comes to like this amount of time, and it's obviously not a bug in the system or anything like that, so... um, yeah, I think I'm still... I still have the trust in the system, yeah, just with a little bit of frustration for the animation loading. But the animation made it better.

+ Interviewer: The loading was too much. Yes. And did the interaction feel natural or unnatural?

- Participant 4: Natural, yeah. It was all natural.

+ Interviewer: Amazing. And the last question is if you want to order them, put them in the order—which one did you like the most and like you felt better with? How would you order them?

- Participant 4: I think I would prefer... and this one is going to be a shift in the whole answering, but I think I prefer the first one, the quick right away, straight up to the point. But then, when I would choose between the second and the third, maybe the animation made it... yeah, like with the boat shoes, a bit more appealing. And then the second one.

+ Interviewer: Okay.

- Participant 4: But yeah, I think...

+ Interviewer: Okay. Thank you.

- Participant 4: Yeah, I hope it helped.

Participant 5

+ Interviewer: Okay, so I will start with the questions since I already explained it to you. How would you normally describe your expectations when using online shopping websites?

- Participant 5: Uh, something faster. Something fast and I can, like, buy it like easily. Find everything I want.

+ Interviewer: Yes, and what do you usually think about when a page takes time to respond?

- Participant 5: It's weird. Weird.

+ Interviewer: Yeah, I imagine. We can go to the first product. Yes, how did this interaction feel overall?

- Participant 5: It's good. Yeah, it was instant. So yeah.

+ Interviewer: Instant. Did anything stand out to you?

- Participant 5: No.

+ Interviewer: Okay. How would you describe the system's response time?

- Participant 5: Instant, like...

+ Interviewer: Did you like it or...?

- Participant 5: Yeah.

+ Interviewer: Okay. Did it feel instant, delayed, or something else? Which you already said instant. How did this experience make you feel? Good, for example, like calm, impatient, uncertain, confident?

- Participant 5: Uh, confident because it was instant.

+ Interviewer: Yes, amazing. Did you feel confident that the system was working correctly?

- Participant 5: Yep.

+ Interviewer: Yes. Did the waiting or lack of it affect your trust in the system?

- Participant 5: Everything was okay, no.

+ Interviewer: Everything was okay. Did the interaction feel natural or unnatural?

- Participant 5: It was natural, yeah. Natural. Yeah, it was natural, yeah.

+ Interviewer: And why?

- Participant 5: Because I just find everything like instantly.

+ Interviewer: Instantly. Okay. Amazing. Now we can go to the next product. Okay, I can start with the questions. How did this interaction feel overall?

- Participant 5: Confusing. Yeah.

+ Interviewer: Confusing. And did anything stand out to you?

- Participant 5: Yeah, I just wait like few minutes, few seconds, maybe few minutes...

+ Interviewer: How would you describe the system's response time?

- Participant 5: Long. Yeah, I waited a few seconds, yeah.

+ Interviewer: Did it feel instant, delayed, or something else?

- Participant 5: Like delayed, yeah.

+ Interviewer: Delayed. How did this experience make you feel? Like calm, patient, uncertain, confident?

- Participant 5: Uncertain, yeah. Not confident, yeah.

+ Interviewer: Uncertain. And did you feel confident that the system was working correctly?

- Participant 5: Not really because I just waited.

+ Interviewer: Did the waiting or lack of it affect your trust in the system?

- Participant 5: No.

+ Interviewer: No. And did the interaction feel natural or unnatural and why?

- Participant 5: A bit unnatural because I didn't know if it works or not. Because of the waiting.

+ Interviewer: Yeah, exactly. Amazing. Then we can move to the third one. And how would you... sorry, how did this interaction feel overall?

- Participant 5: Good.

+ Interviewer: Did anything stand out to you?

- Participant 5: The animation. The loading animation, yeah.

+ Interviewer: The animation. How was that? How...

- Participant 5: Yeah, I liked it. That was good, yeah.

+ Interviewer: Okay. How would you describe the system's response time?

- Participant 5: Delayed, like the second one. I think it's the same time, but I prefer this one because I know it works. I know it's loading.

+ Interviewer: Yeah, so which one do you like... can you order?

- Participant 5: I prefer when it's instantly, instant, the first one. Then when you need the loading or something like that, I prefer the third one. And finally the second one was not really good.

+ Interviewer: Did it feel instant, delayed, or something else?

- Participant 5: Delayed, yeah.

+ Interviewer: Delayed, yeah. How did this experience make you feel? Calm, impatient, uncertain, confident?

- Participant 5: Confident, yeah.

+ Interviewer: Confident. Did you feel confident that the system was working correctly?

- Participant 5: Yes, yeah.

+ Interviewer: And did the waiting affect your trust in the system?

- Participant 5: Yeah. Yes. Because it's moving and I know it's loading because it's moving.

+ Interviewer: Yes, amazing. Did the interaction feel natural or unnatural and why?

- Participant 5: Natural, yeah. Because I... like I told you, like, I know it's loading and in my head it was like "Oh, I'm waiting like the same time, but I know it's loading." Some processes are happening.

+ Interviewer: Yeah, exactly. Amazing. So you would like... what was the order overall? Which one did you like the most?

- Participant 5: The first one. The first one, then the third one, and finally the second one was the... not really good.

+ Interviewer: Thank you so much.

- Participant 5: You're welcome.