Introduction

This study investigates how people naturally use digital tools to plan travel. I conducted three remote naturalistic observations of three individual participants as they planned real trips. Applying two theoretical frameworks, Information Foraging Theory (IFT) and External Cognition, I explored how people navigate complex information environments, offload cognitive burden, and make planning decisions in real time. Digital travel planning involves a combination of goal setting, search behavior, information evaluation, and cognitive coordination across various tools and devices. Whether searching for a hotel or filtering for the best flight, people rely on multiple cues such as visual layout, price, reputation, and interface fluency to inform their choices. The frameworks selected for this study allow for an in-depth understanding of both the internal cognitive strategies (IFT) and the external supports (External Cognition) that enable these complex behaviors.

Explanation and justification of data collection approach

I observed three participants as they each planned real upcoming trips using their own devices and preferred websites. The observations were conducted remotely using Microsoft Teams, and each participant shared their screen while thinking aloud. This method captured authentic behavior in their natural digital environments. The decision to observe digital, screen-based travel planning remotely rather than in-person reflected both convenience and alignment with real user behavior. Participants often plan trips from home, using personal devices in digital environments that are inherently remote and asynchronous. Therefore, a video conference based setup replicated natural use more accurately than an in-person observation might. Ali was planning a multi-city road trip in the Pacific Northwest with her fiancé (Observation 1); Christa was planning a work trip to Los Angeles with a leisure extension in Paris (Observation 2); Sharon was preparing for a family wedding in the South of France, including flights, accommodation, and rail transport (Observation 3).

I prepared a script and read the same aloud to each participant prior to each session. To maintain a naturalistic setup, I gave no direction about which websites to use or which order to perform tasks and noted that each participant could pause, text, or multitask as they would normally. Applying the observational approach of Contextual Inquiry, the only time I prompted them was if they went silent for long periods so that I could understand what they were thinking or why they behaved a certain way, probing “the user in discussion and reflection on their own actions, intents, and values” (Holtzblatt and Beyer, 2010). My goal was to remain unobtrusive while encouraging participants to verbalize their decision-making processes as clearly as possible with “situated interview questions concerning the work at hand” (Blandford et al., 2016). Prior to beginning each session, I shared a participant information sheet outlining details of the study and included an informed consent form. I ensured that these were signed and then verbally walked through with each participant before beginning the observation, with each participant giving informed consent to be recorded with audio and video.

Before conducting the first official observation, I carried out a pilot observation with my first participant to test the functionality of the technology used (Microsoft Teams recording and transcription features), the script and instructions within the script, as well as the theoretical frameworks I planned to apply (IFT and External Cognition). The first 15 minutes validated my desired approaches as I noticed clear information foraging behaviors (such as patch

leaving and information scent evaluation) in addition to use of external tools (like the calendar app and notes app) as reliance for memory saving and calculation. By the end of the pilot, I decided to include questions around why a user would use a certain website, whether because they were already familiar with it, or because they believed it to be the best option even if they never used it before. This would help inform me of the user's experience levels and intentions as I observe them within my selected theoretical frameworks.

Explanation and justification of data analysis approach

My analytical approach was a deductive, theory informed thematic analysis. I transcribed each session in full, capturing not only user speech but also the sequence of interactions with digital interfaces. I then combined the transcripts with my observation notes and video review. From these, I coded the transcripts and created a structured list of significant or interesting events and occurrences for each participant (SIEO), linking behavioral moments and theoretical constructs, as advocated for in theory-informed qualitative analysis (Rogers, 2019). I reviewed each participant's data set two separate times (once through the lens of each theoretical framework) identifying where concepts from Information Foraging Theory and External Cognition occurred and recording those instances for later analysis.

IFT focuses on how people seek, identify, and extract valuable information, analogous to foraging animals (Budiu, 2019). In my coding of the transcripts, I highlighted behaviors grounded in the constructs related to IFT: patch leaving (moments when participants exited one digital tool or site to explore another), information scent (cues that guided their decisions such as ratings, pricing, platform familiarity), satisficing (choosing "good enough" options without exhaustive searching), and diet selection (specific types of information participants considered in totality to satisfy an information need such as budget flights and scenic routes). These instances were recorded and then tallied as one "point" per instance, and displayed in the figure below (Figure 1):

	Patch Leaving	Information Scent	Satisficing	Diet Selection
Ali	3	4	1	4
Christa	2	3	3	1
Sharon	3	3	5	1
Totals	**8**	**10**	**9**	**9**

Figure 1

In parallel with IFT, I analyzed the transcripts through the lens of External Cognition, drawing on the theoretical account presented by Rogers (2021) in her discussion of how cognitive processes are distributed across internal and external representations. This approach was well-suited to understanding digital travel planning, where users frequently rely on artefacts such as notes, calendars, or visual interfaces to support memory, reasoning, and coordination. Rogers highlights how external representations serve to offload cognitive load, anchor actions, support computation, and enable new operations that would require effort or are impossible using mental representations alone.

Guided by this framing, I reviewed each transcript to identify behaviors aligned with key categories such as cognitive offloading (recording reminders, costs, or links in sticky notes), new operations (using screenshots or repurposing interfaces), and

re-representation (transforming complex digital input into simplified, actionable formats), then tallied these into a table displayed below (Figure 2). I also recorded the persistence and stability of external representations, and their use in shared contexts. This allowed me to apply a structured and repeatable coding process across all three participants. By anchoring the analysis in this well-established theoretical framework, I was able to systematically track how cognition extended beyond the individual and into the digital tools and artefacts participants engaged with.

	Cognitive Offloading	Shared Objects	New Operations	Persistence and Stability	Re-representation
Ali	4	2	2	2	6
Christa	2	1	1	0	6
Sharon	4	1	1	2	1
Totals	**10**	**4**	**4**	**4**	**13**

Figure 2

Explanation and interpretation of findings

My findings are grounded in qualitative coding of transcripts and observation notes, supported by frequency counts and charts produced through systematic review of participant behavior across three naturalistic remote sessions. Figures 3 and 4 of this section are visual summaries of behavioral trends based on the coded data reported in the analysis section.

Participants demonstrated a variety of external cognition strategies that supported memory, planning, and decision-making. Across the three observations, instances of re-representations were the most prevalent strategy (13 coded instances), followed by cognitive offloading (10 instances) and persistence and stability (4 instances). These behaviors were closely aligned with Rogers' (2021) description of how external representations reduce internal cognitive effort by distributing memory, computation, and perception across tools and artefacts.

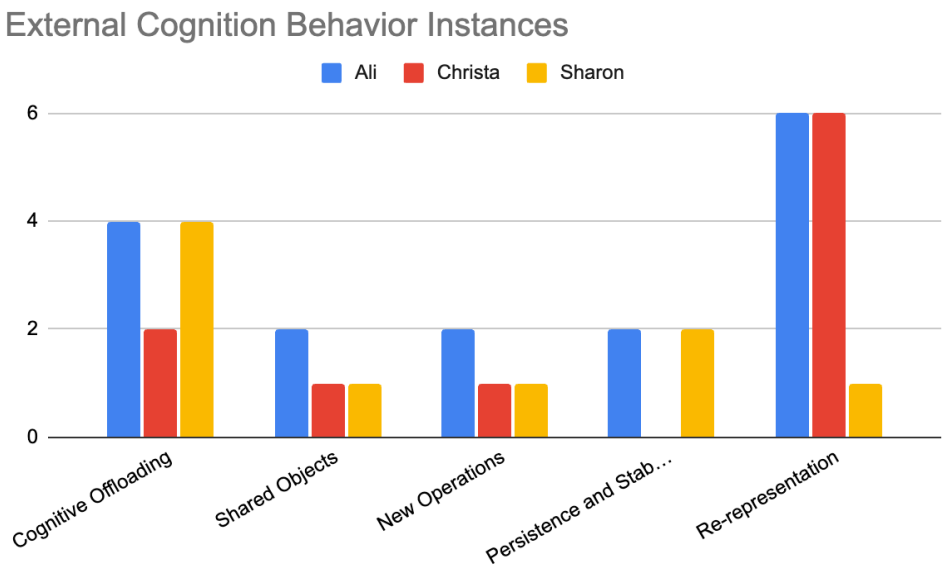

Figure 3

Ali relied on her Notes app as a persistent workspace, copying in flight costs, TikTok travel ideas, and rental car screenshots to help structure the trip. Her frequent use of hyperlinks and annotations exemplifies offloading (4 instances) and re-representation (6 instances), turning scattered platform content into cohesive plans. Christa's use of a shared Google Doc with her boss reflected both persistence and collaboration. She used it to manage travel policy compliance and personal planning, including budget breakdowns, hotel quotes, and per diem tracking. Sharon offloaded simpler details to sticky notes but demonstrated less integration or layering of multiple artefacts in her travel planning compared to the other participants.

Shared objects and new operations were less common but meaningful: Christa's shared spreadsheet became a collaborative reference when communicating with her boss, while Ali's live partner discussions led to decisions based on social confirmation. New operations occurred when participants used tools beyond their designed scope. For instance, screenshotting content from TikTok to extract travel plans, or reverse image searching listings from Airbnb. In line with Rogers (2021), these strategies reduced the cost of recalling information and helped participants plan seamlessly across platforms and devices.

The application of IFT revealed how participants selectively navigated through online platforms in search of high-value information, guided by scent cues, perceived cost, and content relevance. Each participant's behavior was coded and tallied against four core IFT categories: patch leaving, information scent, satisficing, and diet selection. Figure 4 (below) illustrates the frequency of these behaviors, confirming that scent-following and satisficing were the most common strategies. This highlights IFT's relevance in understanding digital travel planning, where interface friction, time pressure, and trust shape rapid decision-making.

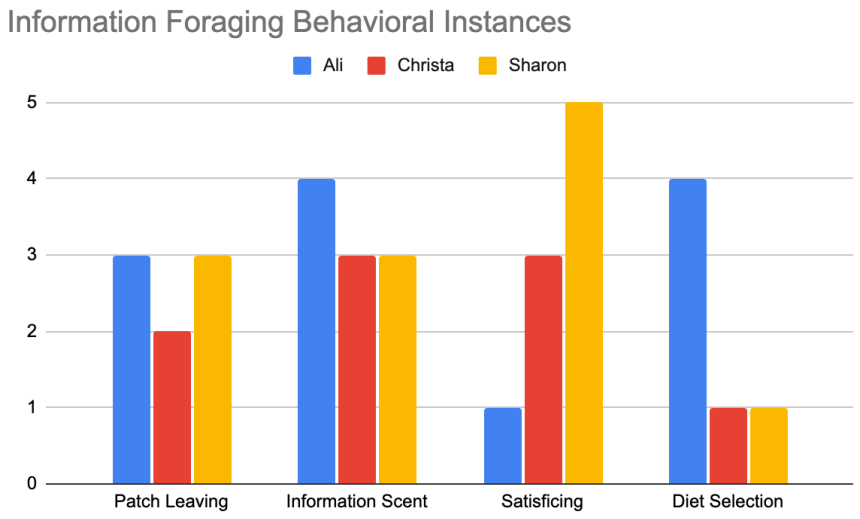

Figure 4

Information scent (10 instances) and satisficing (9 instances) were the most frequently observed behaviors, while patch leaving occurred 8 times, and diet selection 9 times. All three participants frequently moved between sites (patch leaving) and relied on familiar visual or textual cues (information scent) to determine value. Satisficing was a common pattern: users often chose workable rather than optimal solutions, such as accepting mid-tier hotels with strong reviews, or airlines that offered points despite higher cost.

Ali's planning involved dynamic patch leaving between Google Flights, TikTok, and her Notes app. Her behavior demonstrated a strong reliance on information scent. She consistently responded to cues like loyalty perks, visual content from TikTok, and airline brand familiarity to guide her next action. Sharon also exhibited scent-following through her use of Airbnb reviews, superhost indicators, and Trainline filters to reduce uncertainty and cognitive load when searching for ideal departure times. Christa switched patches more reactively in response to technical friction, such as abandoning HotelTonight after a login failure. Her decision-making process revealed ongoing cost/benefit assessments, a central theme of IFT (Pirolli & Card, 1999), as she navigated platform reliability and effort trade-offs.

These visual tools offer a comparative view of how each participant offloaded cognitive load and navigated information environments in alignment with the two theoretical frameworks.

Guidelines for the design of future digital technologies

1. Minimize interaction cost through persistent, multi-option layouts

Design systems that reduce the need for repeated patch leaving or redundant navigation. This can be done through auto-saving viewed items to a persistence comparison tray, for example. Christa's abandonment of HotelTonight following a login failure highlights how high foraging cost leads to disengagement (Pirolli & Card, 1999). Travel sites should reduce effort by enabling side-by-side comparisons, visible history, and fewer reloads, aligning with Card's (1983) focus on minimizing cognitive effort in interface navigation.

2. Surface strong information scent cues to reduce uncertainty

Participants relied on ratings, reviews, cancellation policies and loyalty programs as decision factors. Sharon, for example, relied heavily on refundability because she was uncertain if her friends would agree to the booking, but had to open each listing to verify. Interfaces should display these cues early to support scent-following and reduce search effort. One way this can be implemented is by visually highlighting flexible or refundable options using badges and filters. This supports the principles of perceptual attention, which emphasize that users allocate visual and cognitive resources to information that is prominent, distinct, and perceived as relevant to their task (Card, 1983).

3. Enable flexible re-representation of evolving plans

Ali planned travel across multiple locations by consulting TikTok for inspiration, then mapping routes in Google Maps and manually tracking stops in her Notes app. One way to make this more efficient for the user would be to enable multi-stop itinerary sketching directly on maps then exporting to Notes app. The user can drop map pins, reorder stops, annotate locations and then auto calculate drive or train segments. Allowing users to sort, annotate, and visually arrange their options mirrors Norman's (1993) argument that external representations enable deeper reflection and action. Interfaces should encourage dynamic restructuring of content to support evolving thoughts and plans.

4. Support cross-device cognitive offloading

Participants split tasks across phones and laptops based on ease and habit. Ali was switching between her phone and her laptop, taking screenshots on mobile then taking notes on her laptop, expressing frustration with TikTok's interface on non-mobile devices. It would be helpful if there were an interface such as a trip journal where screenshots and text notes from both devices sync and display in chronological order. Syncing notes, screenshots, and filters across desktop and mobile devices supports cognitive continuity,

reflecting Rogers' (2021) and Blandford's (2006) framing of cognition as inherently distributed and context-dependent.

5. Provide shared and collaborative planning spaces
This can be implemented by integrating collaborative itinerary editing directly within the platform. Christa used an external Google Doc to track travel plans, approvals, and budget breakdowns, revealing the absence of in-app coordination tools. Travel platforms for work trip planning could offer editable itinerary templates with embedded commenting, budget tracking, and role-based permissions ("suggest-only" for a manager, "edit" for a co-traveller). Pre-defined sections for flights, hotels, and expenses reduce setup time, while built-in collaboration avoids reliance on disconnected third-party tools.

Critical Evaluation of Theoretical Approaches

The combined use of Information Foraging Theory (IFT) and External Cognition provided valuable insights into how users approach digital travel planning, but these also introduced unique limitations when applied to the context of real-world observational data.
IFT was particularly effective in identifying user behaviors related to search strategies, decision-making, and interface switching. These constructs helped explain why participants moved between tools or stopped searching when the cognitive effort outweighed the perceived reward.

However, IFT was less effective in capturing the underlying beliefs, expectations, or prior experiences that informed participants' behavior, especially when those behaviors deviated from purely rational, effort-driven models. This limitation became evident in Sharon's belief that repeated searching for flights would increase the price, a decision rooted not in objective information value, but in a prior personal experience. IFT does not account for such internalized assumptions, even though they directly influenced how Sharon approached her search strategy. A complementary theoretical lens, such as Mental Models, could have addressed this gap. Mental models, as described by Norman (1983), refer to the internal representations users develop based on past experiences, which shape their expectations and interactions with systems. They are often incomplete, inconsistent, or based on superstition, but nonetheless strongly guide user behavior.

Ali also demonstrated behavior aligned with mental models. For instance, her strong preference for American Airlines despite slightly cheaper alternatives. While IFT would classify this as satisficing based on time efficiency and brand familiarity, a mental model framework would highlight how her trust in the airline and previous positive experiences influenced her judgement more than price or convenience. Mental models also help explain why users may favour certain tools, not due to rational cost/benefit foraging value, but because those tools align with their expectations of how a travel platform should behave, based on prior experience or familiarity. IFT overlooks this aspect of design and user interpretation.

External Cognition, on the other hand, was a more flexible and descriptive framework that helped surface the value of tools like the Notes app, shared Google Docs, calendars, calculators and map filters as support for distributed thinking. It was particularly helpful in identifying design opportunities related to cognitive offloading, re-representation, and cross-device interaction. External Cognition allowed for a more nuanced understanding of how users reduced mental load by externalizing information across multiple artefacts and devices. This framework was especially useful in identifying how planning was sustained across artefacts and platforms, and how tools were repurposed to support evolving decisions, such as when Ali used TikTok for route inspiration and then embedded screenshots into her Notes app as visual anchors. It also helped interpret Christa's use of

a shared Google Doc as more than just a note-taking tool: it was a collaborative artefact that distributed memory, planning, and policy compliance across stakeholders.

Unlike IFT, which focused primarily on users' information-seeking strategies, External Cognition provided insight into the cognitive scaffolding users build for themselves while working across multiple interfaces. Rather than simply tracking where users searched and when they switched, this framework illuminated how and why they managed information in the way they did.

Ultimately, while IFT offered a structured way to analyse information navigation, it lacked clarity to the intentionality behind personal, contextual, and collaborative elements of planning behavior. External Cognition complemented this by highlighting the external structures that support user thinking. Still, together, the two frameworks enabled a holistic view of digital travel planning: one focused on navigation strategy, and the other on cognitive support strategies. Their combination was particularly valuable for generating design recommendations that address both search optimization and the external organization of cognitive work. Including a third, more belief-oriented framework like Mental Models would likely have enriched the observation analyses by addressing the motivations behind tool selection, brand trust, and interface interpretations and misinterpretations that fall outside cost-benefit analysis. This triangulation of perspectives would support the development of more nuanced, human-centered design guidelines.

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Appendix A

Research Ethics Review Form for MSc Projects

Computer Science Research Ethics Committee (CSREC)

https://www.city.ac.uk/about/governance/committees/cs-research-ethics

Postgraduate students undertaking their final project in the Department of Computer Science must consider the ethics of their project work and ensure that it complies with research ethics guidelines and the law for data protection. In some cases, a project will need approval from an ethics committee before it can proceed. Usually, but not always, this will be because the student is involving other people ("participants") in the project.

To ensure that they give appropriate consideration to ethical issues, all students must complete this form and attach it to their project proposal document. There are two parts:

PART A: Ethics Checklist. All students must complete this part. The checklist identifies whether the project requires ethical approval and, if so, where to apply for approval.

PART B: Ethics Proportionate Review Form. Students who have answered "no" to all questions in A1, A2 and A3 and "yes" to question 4 in A4 in the ethics checklist must complete part B as well. The project supervisor has delegated authority to provide approval in such cases that are considered to involve MINIMAL risk. The approval may be ***provisional*** – *identifying the planned work with human end user participants as likely* to involve MINIMAL RISK. In such cases you must additionally seek ***full approval*** from the supervisor as the project progresses and details are established. ***Full approval*** must be acquired in writing, before recruiting and engaging with human end users participants for your project.

A.1 If you answer YES to any of the questions in this block, you must apply to an appropriate external ethics committee for approval and log this approval as an External Application through Research Ethics Online - https://researchmanager.city.ac.uk/. This type of research is not covered by City's process, and external approval from an appropriate institution is required.		*Delete as appropriate*
1.1	Does your research require approval from the National Research Ethics Service (NRES)? *e.g. because you are recruiting current NHS patients or staff?* *If you are unsure try -* https://www.hra.nhs.uk/approvals-amendments/what-approvals-do-i-need/	**NO**
1.2	Will you recruit participants who are covered by the Mental Capacity Act 2005? *Such research needs to be approved by an external ethics committee such as NRES or the Social Care Research Ethics Committee -* http://www.scie.org.uk/research/ethics-committee/	**NO**
1.3	Will you recruit any participants who are covered by the Criminal Justice System, for example, people on remand, prisoners and those on probation? *Such research needs to be authorised by the ethics approval system of the National Offender Management Service.*	**NO**
A.2 If you answer YES to any of the questions in this block, then unless you are applying to an external ethics committee, you must apply for approval from the Senate Research Ethics Committee (SREC) through Research Ethics Online - https://researchmanager.city.ac.uk/		*Delete as appropriate*
2.1	Does your research involve participants who are unable to give informed consent? *For example, people who may have a degree of learning disability or mental health*	**NO**
2.2	Is there a risk that your research might lead to disclosures from participants concerning their involvement in illegal activities?	**NO**
2.3	Is there a risk that obscene and or illegal material may need to be accessed for your research study (including online content and other material)?	**NO**

2.4	Does your project involve participants disclosing information about protected characteristics (as identified by the Equality Act 2010)? *For example, to: racial or ethnic origin; political opinions; religious beliefs; trade union membership; physical or mental health; sexual life; criminal offences and proceedings*	**NO**
2.5	Does your research involve you travelling to another country outside of the UK, where the Foreign & Commonwealth Office has issued a travel warning that affects the area in which you will study? *Please check the latest guidance from the FCO - http://www.fco.gov.uk/en/*	**NO**
2.6	Does your research involve invasive or intrusive procedures? *These may include, but are not limited to, electrical stimulation, heat, cold or bruising.*	**NO**
2.7	Does your research involve animals?	**NO**
2.8	Does your research involve the administration of drugs, placebos or other substances to study participants?	**NO**
A.3 If you answer YES to any of the questions in this block, then unless you are applying to an external ethics committee or the Senate Research Ethics Committee (SREC), you must apply for approval from the Computer Science Research Ethics Committee (CSREC) through Research Ethics Online - https://researchmanager.city.ac.uk/. Depending on the level of risk associated with your application, it may be referred to the Senate Research Ethics Committee.		*Delete as appropriate*
3.1	Does your research involve participants who are under the age of 18?	**NO**
3.2	Does your research involve adults who are vulnerable because of their social, psychological or medical circumstances (vulnerable adults)? *This includes adults with cognitive and / or learning disabilities, adults with physical disabilities and older people.*	**NO**
3.3	Are participants recruited because they are staff or students of City, University of London? *For example, students studying on a particular course or module.* *If yes, then approval is also required from the Head of Department or Programme Director*	**NO**
3.4	Does your research involve intentional deception of participants?	**NO**
3.5	Does your research involve participants taking part without their informed consent?	**NO**
3.5	Is the risk posed to participants greater than that in normal working life?	**NO**
3.7	Is the risk posed to you, the researcher(s), greater than that in normal working life?	**NO**

A.4 If you answer YES to the following question and your answers to all other questions in sections A1, A2 and A3 are NO, then your project is deemed to be of MINIMAL RISK. **If this is the case, then you can apply for approval through your supervisor under PROPORTIONATE REVIEW. You do so by completing PART B of this form.** **If you have answered NO to all questions on this form, then your project does not require ethical approval. You should submit and retain this form as evidence of this.**		*Delete as appropriate*
4	Does your project involve human participants or their identifiable personal data? *For example, as interviewees, respondents to a survey or participants in testing.*	**YES**

PART B: Ethics Proportionate Review Form

If you answered YES to question 4 and NO to all other questions in sections A1, A2 and A3 in PART A of this form, then you may use PART B of this form to submit an application for a proportionate ethics review of your project. Your project supervisor has delegated authority to review and approve this application under proportionate review. You must receive final approval from your supervisor in writing before beginning the planned research.

However, if you cannot provide all the required attachments (see B.3) with your project proposal (e.g. because you have not yet written the consent forms, interview schedules etc), the approval from your supervisor will be ***provisional***. You **must** submit the missing items to your supervisor for approval prior to commencing these parts of your project. Once again, you must receive written confirmation from your supervisor that any provisional approval has been superseded by with ***full approval*** of the planned activity as detailed in the full documents. **Failure to follow this procedure and demonstrate that final approval has been achieved may result in you failing the project module and/or result in an academic misconduct investigation.**

Your supervisor may ask you to submit a full ethics application through Research Ethics Online, for instance if they are unable to approve your application, if the level of risks associated with your project change, or if you need an approval letter from the CSREC for an external organisation.

B.1 The following questions must be answered fully. All grey instructions must be removed.		*Delete as appropriate*
1.1.	Will you ensure that participants taking part in your project are fully informed about the purpose of the research?	**YES**
1.2	Will you ensure that participants taking part in your project are fully informed about the procedures affecting them or affecting any information collected about them, including information about how the data will be used, to whom it will be disclosed, and how long it will be kept?	**YES**
1.3	When people agree to participate in your project, will it be made clear to them that they may withdraw (i.e. not participate) at any time without any penalty?	**YES**
1.4	Will consent be obtained from the participants in your project? Consent from participants **MUST** be obtained if you plan to involve them in your project or if you plan to use identifiable personal data from existing records. "Identifiable personal data" means data relating to a living person who might be identifiable if the record includes their name, username, student id, DNA, fingerprint, address, etc. *If YES, you must attach drafts of the participant information sheet(s) and consent form(s) that you will use in section B.3 or, in the case of an existing dataset, provide details of how consent has been obtained.* *You must also retain the completed forms for subsequent inspection. Failure to provide the completed consent request forms will result in withdrawal of any earlier ethical approval of your project.*	**YES**
1.5	Have you made arrangements to ensure that material and/or private information obtained from or about the participating individuals will remain confidential?	**YES**

B.2 If the answer to the following question (B2) is YES, you must provide details		*Delete as appropriate*
2	Will the research be conducted in the participant's home or other non-University location? *If **YES**, you must provide details of how your safety will be ensured.*	**YES**

B.3 Attachments **ALL of the following documents MUST be provided to supervisors if applicable.** **All must be considered prior to final approval by supervisors.** **A written record of final approval must be provided and retained.**	***YES***	***NO***	***Not Applicable***
Details on how safety will be assured in any non-University location, including risk assessment if required (see B2)	**X**		
Details of arrangements to ensure that material and/or private information obtained from or about the participating individuals will remain confidential (see B1.5) *Any personal data must be acquired, stored and made accessible in ways that are GDPR compliant.*	**X**		
Full protocol for any workshops or interviews**	**X**		
Participant information sheet(s)**	**X**		
Consent form(s)**	**X**		
Questionnaire(s)** *sharing a Qualtrics survey with your supervisor is recommended.*	**X**		
Topic guide(s) for interviews and focus groups**	**X**		
Permission from external organisations or Head of Department** *e.g. for recruitment of participants*	**X**		

***If these items are not available at the time of submitting your project proposal, then **provisional approval** can still be given, under the condition that you must submit the final versions of all items to your supervisor for approval at a later date. **All** such items **must** be seen and approved by your supervisor before the activity for which they are needed begins. Written evidence of **final approval** of your planned activity must be acquired from your supervisor before you commence.*

Changes

If your plans change and any aspects of your research that are documented in the approval process change as a consequence, then any approval acquired is invalid. If issues addressed in Part A (the checklist) are affected, then you must complete the approval process again and establish the kind of approval that is required. If issues addressed in Part B are affected, then you must forward updated documentation to your supervisor and have received written confirmation of approval of the revised activity before proceeding.

Templates for Consent and Information

You must use the templates provided by the University as the basis for your participant information sheets and consent forms. You **must** adapt them according to the needs of your project before you submit them for consideration.

Participant Information Sheets, Consent Forms and Protocols must be consistent. Please ensure that this is the case prior to seeking approval. Failure to do so will slow down the approval process.

We strongly recommend using Qualtrics to produce digital information sheets and consent forms.

Further Information

https://www.city.ac.uk/about/governance/committees/cs-research-ethics

https://www.city.ac.uk/research/ethics/how-to-apply/participant-recruitment

https://www.city.ac.uk/research/ethics

Appendix B

City St George's, University of London
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Participant Informed Consent Form

Title of Study: INM314 Understanding User Interactions Coursework 2025: Observing Travel Planning Behavior

		Please tick or initial box
1	I confirm that I have read the *Participant Information Sheet*, for this student coursework project, and can keep a copy of that information for my records. The project has been explained to me, and I had opportunity to ask questions, which were answered satisfactorily.	
2	I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage, without penalty or disadvantage	
3	I understand that I will be able to withdraw my data up to 3 days after the session has taken place (inclusive of the date of the session).	
4	I agree to be interviewed (asked verbal questions).	
5	I agree to undertake given tasks on a computer while being observed.	
6	I agree to 'think aloud' while undertaking tasks.	
7	I agree to screen-recording of tasks I undertake.	
8	I agree to the session being audio recorded.	
9	I agree to the session being video recorded.	
10	I understand that anonymised direct quotes from me, de-identified results and screen images, may be reused in future teaching.	
11	I understand that anonymised direct quotes from me, de-identified results and screen images, may be used in publications, reports, presentations, posters, and portfolios of the researcher's work.	
12	I understand that no information that could lead to the identification of any individual will be shared with any other party other than the researcher and those involved in assessing the coursework.	
13	I agree to City St George's recording and processing this information about me. I understand that this information will be used only for the purpose(s) explained in the *Participant Information Sheet*, and my consent is conditional on City St George's complying with its duties and obligations under the General Data Protection Regulation (GDPR).	
14	I understand that data from this study will be stored securely, on a password-protected and encrypted device, and/or in locked storage, and deleted/destroyed after the marks for the coursework have been approved by the examinations board.	
15	I agree to take part in this study.	

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Name of Participant	Signature	Date

Name of Researcher	Signature	Date

Appendix C

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Participant Information Sheet

Title of Study: INM314 Understanding User Interactions Coursework 2025: Observing Travel Planning Behavior
Name of researcher: Rafaela Rossi (Supervised by Sylwia Frankowska-Takhari)

Invitation

I would like to invite you to take part in a research study. Before you decide whether you would like to take part, it is important that you understand why the research is being done and what it would involve for you. Please take time to read the following information carefully and discuss it with others if you wish. Please ask if there is anything that is not clear or if you would like more information. You will be given a copy of this information sheet to keep.

What is the purpose of the study?

The study is for a coursework project that I am carrying out as part of a taught module, *INM314 Understanding User Interactions*, on the MSc in Human-Computer Interaction Design programme, at City St George's, University of London.

The purpose of this study is to gather information that will be used to inform the development of design principles or guidelines for future digital technologies in the context of digitally-enabled travel. To this end, I will be undertaking user observations with people who carry out real-world travel-related tasks supported by digital technologies. This user research is a crucial part of my project for this module.

The findings and any output derived from them will be written up in an individual report that I will submit to City St George's, University of London, for marking, to determine my final grade for the module.

Why have I been invited?

You have been invited to take part in this study because

- you are an adult, aged at least 18 years old.
- you do not consider yourself to be vulnerable.
- you intend to plan a trip using a digital interface

Do I have to take part?

Participation in the project is voluntary. It is up to you to decide whether or not to take part, and you can choose not to participate in part or all of the project; this includes choosing not to answer any questions which you feel are too personal or intrusive, or undertake specific tasks. If you do decide to take part, you will be asked to sign an Informed Consent form. If you decide to take part, you are still free to withdraw at any time and without giving a reason, and without being penalised or disadvantaged in any way.
You will be able to withdraw your data up to **3 days** after the session has taken place (inclusive of the date of the session).

What will happen if I take part? What will I have to do?

- You will take part in a naturalistic observation session, during which you will perform real or realistic travel-related tasks that involve digital technologies (e.g., planning a journey, checking public transport routes, or using a travel app to decide on a place to visit).
- The session will last approximately **30 to 45 minutes**.
- This session will take place remotely, over a video conferencing application
- We will only meet once
- You will be asked to "think aloud" while you perform the task. I will take observational notes and audio/screen recordings, with your consent.
- No preparation is required in advance, and you are encouraged to carry out your task as naturally as possible.

What are the possible disadvantages and risks of taking part?

There are no foreseeable risks or harms or possible side effects for participating in this study.

What are the possible benefits of taking part?

While there are no specific benefits of taking part, I hope you enjoy the experience of participating in the study.

Expenses and Payments

You will not be paid or have any expenses compensated for taking part in this study, but I am very grateful for your help.

What should I do if I want to take part?

Once you have read this participant information sheet in full and are confident that you understand what participating in the study would involve, please contact me by email at Rafaela.rossi@citystgeorges.ac.uk to confirm your interest. I will reply with a proposed time and location for the observation and send you a consent form to review and sign before we begin.

Data privacy statement

(note: this is mandatory for all studies collecting personal data)

City St George's, University of London is the sponsor and the data controller of this study based in the United Kingdom. This means that we are responsible for looking after your information and using it properly. The legal basis under which your data will be processed is City St George's public task.

Your rights to access, change or move your information are limited, as we need to manage your information in a specific way in order for the research to be reliable and accurate. To safeguard your rights, we will use the minimum personally identifiable information possible (for further

information please see https://ico.org.uk/for-organisations/guide-to-data-protection/guide-to-the-general-data-protection-regulation-gdpr/lawful-basis-for-processing/public-task/).

City St George's will use your name and contact details to contact you about the research study as necessary. The only people at City St George's who will have access to your identifiable information will be the researcher (student), staff responsible for assessing the coursework, and, if appropriate, individuals with responsibility for monitoring and auditing at City St George's. There may be occasions when regulatory authorities may access research data in accordance with their statutory powers. City St George's will keep identifiable information about you from this study until the coursework mark has been approved by the Examinations Board, after which, it will be destroyed.

You can find out more about how City St George's handles personal data by visiting https://www.city.ac.uk/about/governance/policies/data-protection-policy. You can also read City St George's general privacy notice by visiting https://www.city.ac.uk/about/governance/policies/general-privacy-notice . If you are concerned about how we have processed your personal data, you can contact the Information Commissioner's Office (ICO) directly https://ico.org.uk/.

Will my taking part in the study be kept confidential?

Only the researcher (me), and any staff responsible for assessing the coursework will have access to your data at any point. The data gathered in this study, including your identity and personal information, will be kept confidential. Data will be anonymised or de-identified where possible, and stored securely in a password protected location, in accordance with the University's data protection regulations. No personally identifiable data will be published; any quotes will be anonymised.

The raw data, including any recordings, will be destroyed once the marks for the coursework have been approved by the University's Examinations Board.

What will happen to the results?

The anonymised results of the study will be included in a coursework report for the module INM314 Understanding User Interactions 2025 which will be submitted to the University for marking (assessment). They may also be used in a future portfolio of my work.

Who has reviewed the study?

This coursework project has been approved by a representative of City St George's, University of London Computer Science Research Ethics Committee.

What if there is a problem?

If you have any problems, concerns or questions about this study, you should ask to speak to a member of the research team (see contact details at the bottom of this document).

If you remain unhappy and wish to complain formally, you can do this through City St George's complaints procedure. To complain about the study, you need to phone 020 7040 3040. You can then ask to speak to the Secretary to Senate Research Ethics Committee and inform them that the name of the project is INM314 Understanding User Interactions 2025 **coursework project**

You can also write to the Secretary at:

Annah Whyton
Research & Enterprise Office
City St George's, University of London
Northampton Square
London, EC1V 0HB

Email: senaterec@city.ac.uk

Insurance

City St George's, University of London holds insurance policies which apply to this study, subject to the terms and conditions of the policy. If you feel you have been harmed or injured by taking part in this study, you may be eligible to claim compensation. This does not affect your legal rights to seek compensation. If you are harmed due to someone's negligence, then you may have grounds for legal action.

Further information and contact details

For further information about this study, please contact one of the following people, as appropriate:

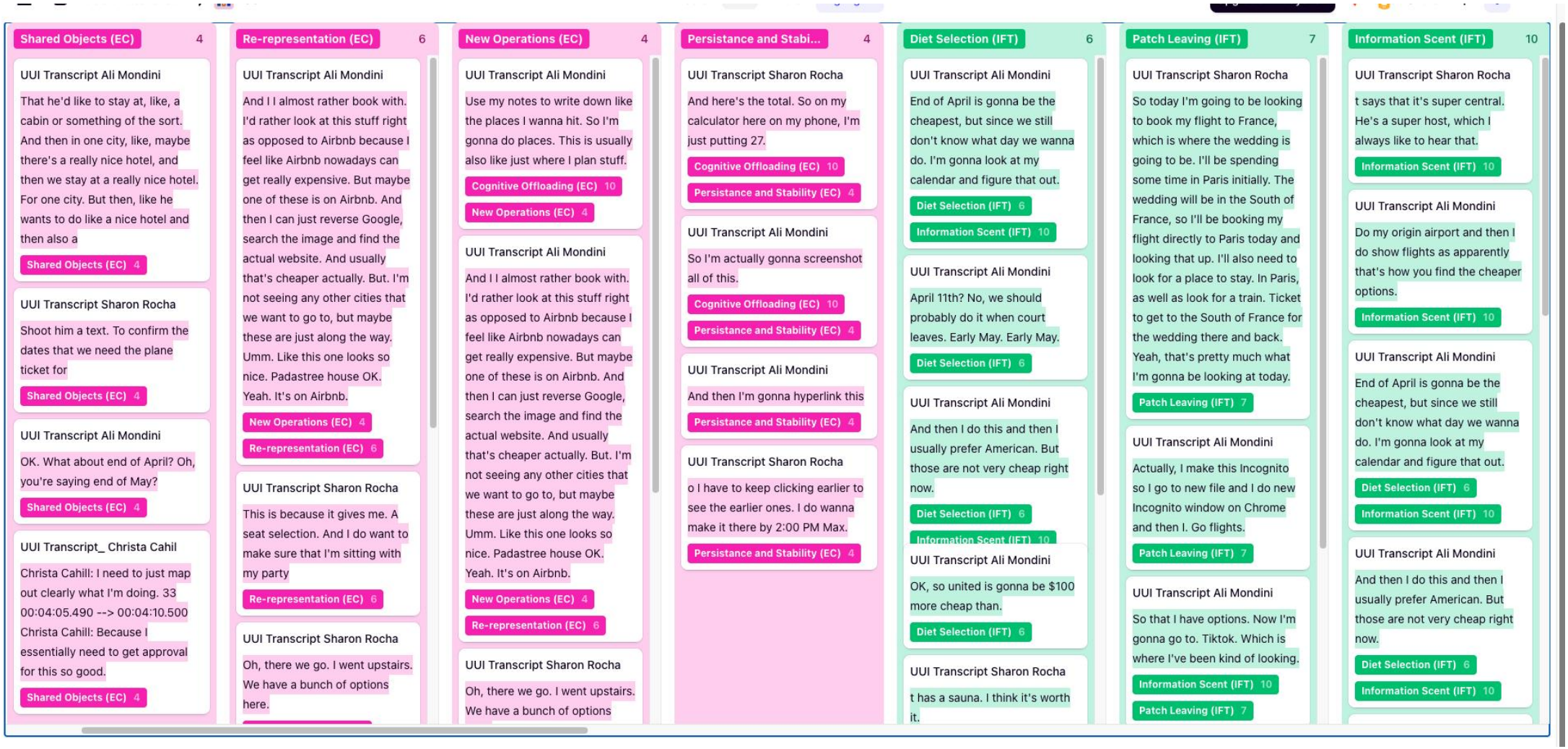
Researcher (student):	Rafaela Rossi	rafaela.rossi@citystgeorges.ac.uk
Module Leader / Lecturer:	Sylwia Frankowska-Takhari	sylwia.frankowska-takhari@city.ac.uk

Thank you for taking the time to read this information sheet.

Link to One Drive (in case needed)

INM314 Understanding User Interactions Coursework

Appendix E


Shared Objects (EC) 4
UUI Transcript Ali Mondini
That he'd like to stay at, like, a cabin or something of the sort. And then in one city, like, maybe there's a really nice hotel, and then we stay at a really nice hotel. For one city. But then, like he wants to do like a nice hotel and then also a
Shared Objects (EC) 4
UUI Transcript Sharon Rocha
Shoot him a text. To confirm the dates that we need the plane ticket for
Shared Objects (EC) 4
UUI Transcript Ali Mondini
OK. What about end of April? Oh, you're saying end of May?
Shared Objects (EC) 4
UUI Transcript_ Christa Cahil
Christa Cahill: I need to just map out clearly what I'm doing. 33 00:04:05.490 --> 00:04:10.500 Christa Cahill: Because I essentially need to get approval for this so good.
Shared Objects (EC) 4
Re-representation (EC) 6
UUI Transcript Ali Mondini
And I I almost rather book with. I'd rather look at this stuff right as opposed to Airbnb because I feel like Airbnb nowadays can get really expensive. But maybe one of these is on Airbnb. And then I can just reverse Google, search the image and find the actual website. And usually that's cheaper actually. But. I'm not seeing any other cities that we want to go to, but maybe these are just along the way. Umm. Like this one looks so nice. Padastree house OK. Yeah. It's on Airbnb.
New Operations (EC) 4
Re-representation (EC) 6
UUI Transcript Sharon Rocha
This is because it gives me. A seat selection. And I do want to make sure that I'm sitting with my party
Re-representation (EC) 6
UUI Transcript Sharon Rocha
Oh, there we go. I went upstairs. We have a bunch of options here.
New Operations (EC) 4
UUI Transcript Ali Mondini
Use my notes to write down like the places I wanna hit. So I'm gonna do places. This is usually also like just where I plan stuff.
Cognitive Offloading (EC) 10
New Operations (EC) 4
UUI Transcript Ali Mondini
And I I almost rather book with. I'd rather look at this stuff right as opposed to Airbnb because I feel like Airbnb nowadays can get really expensive. But maybe one of these is on Airbnb. And then I can just reverse Google, search the image and find the actual website. And usually that's cheaper actually. But. I'm not seeing any other cities that we want to go to, but maybe these are just along the way. Umm. Like this one looks so nice. Padastree house OK. Yeah. It's on Airbnb.
New Operations (EC) 4
Re-representation (EC) 6
UUI Transcript Sharon Rocha
Oh, there we go. I went upstairs. We have a bunch of options
Persistance and Stabi... 4
UUI Transcript Sharon Rocha
And here's the total. So on my calculator here on my phone, I'm just putting 27.
Cognitive Offloading (EC) 10
Persistance and Stability (EC) 4
UUI Transcript Ali Mondini
So I'm actually gonna screenshot all of this.
Cognitive Offloading (EC) 10
Persistance and Stability (EC) 4
UUI Transcript Ali Mondini
And then I'm gonna hyperlink this
Persistance and Stability (EC) 4
UUI Transcript Sharon Rocha
o I have to keep clicking earlier to see the earlier ones. I do wanna make it there by 2:00 PM Max.
Persistance and Stability (EC) 4
Diet Selection (IFT) 6
UUI Transcript Ali Mondini
End of April is gonna be the cheapest, but since we still don't know what day we wanna do. I'm gonna look at my calendar and figure that out.
Diet Selection (IFT) 6
Information Scent (IFT) 10
UUI Transcript Ali Mondini
April 11th? No, we should probably do it when court leaves. Early May. Early May.
Diet Selection (IFT) 6
UUI Transcript Ali Mondini
And then I do this and then I usually prefer American. But those are not very cheap right now.
Diet Selection (IFT) 6
Information Scent (IFT) 10
UUI Transcript Ali Mondini
OK, so united is gonna be $100 more cheap than.
Diet Selection (IFT) 6
UUI Transcript Sharon Rocha
t has a sauna. I think it's worth it.
Patch Leaving (IFT) 7
UUI Transcript Sharon Rocha
So today I'm going to be looking to book my flight to France, which is where the wedding is going to be. I'll be spending some time in Paris initially. The wedding will be in the South of France, so I'll be booking my flight directly to Paris today and looking that up. I'll also need to look for a place to stay. In Paris, as well as look for a train. Ticket to get to the South of France for the wedding there and back. Yeah, that's pretty much what I'm gonna be looking at today.
Patch Leaving (IFT) 7
UUI Transcript Ali Mondini
Actually, I make this Incognito so I go to new file and I do new Incognito window on Chrome and then I. Go flights.
Patch Leaving (IFT) 7
UUI Transcript Ali Mondini
So that I have options. Now I'm gonna go to. Tiktok. Which is where I've been kind of looking.
Information Scent (IFT) 10
Patch Leaving (IFT) 7
Information Scent (IFT) 10
UUI Transcript Sharon Rocha
t says that it's super central. He's a super host, which I always like to hear that.
Information Scent (IFT) 10
UUI Transcript Ali Mondini
Do my origin airport and then I do show flights as apparently that's how you find the cheaper options.
Information Scent (IFT) 10
UUI Transcript Ali Mondini
End of April is gonna be the cheapest, but since we still don't know what day we wanna do. I'm gonna look at my calendar and figure that out.
Diet Selection (IFT) 6
Information Scent (IFT) 10
UUI Transcript Ali Mondini
And then I do this and then I usually prefer American. But those are not very cheap right now.
Diet Selection (IFT) 6
Information Scent (IFT) 10

Satisficing (IFT) 9

UUI Transcript Sharon Rocha

But it is nice. I'm gonna just keep it open, just in case.

Satisficing (IFT) 9

UUI Transcript Sharon Rocha

So I'm gonna go ahead and book this one and share what I booked with. The team so just fill this out. PG-Rossi, Rafaela 20:25 So the budget you mentioned was a little bit higher, right than what you guys wanted? So how come you sort of? Decided anyways to go with this. Alexandre Rebiere 20:38 It has a sauna. I think it's worth it

Satisficing (IFT) 9

UUI Transcript Ali Mondini

iny place. And then we splurge on the cooler.

Satisficing (IFT) 9

UUI Transcript Sharon Rocha

t has a sauna. I think it's worth it.

Diet Selection (IFT) 6

Satisficing (IFT) 9

UUI Transcript Sharon Rocha

Cognitive Offloading ...

UUI Transcript Sharon Rocha

Cancel if needed because my friends can be a little bit flaky.

Cognitive Offloading (EC) 10

UUI Transcript Sharon Rocha

Absolutely. So first I just opened my sticky notes here on my computer so I can put in a couple of the pieces of information that I need to confirm while I'm looking to book things for this trip. So let me just put in France trip here.

Cognitive Offloading (EC) 10

UUI Transcript Sharon Rocha

And here's the total. So on my calculator here on my phone, I'm just putting 27.

Cognitive Offloading (EC) 10

Persistance and Stability (... 4

UUI Transcript Sharon Rocha

And I'm just gonna put that here in my sticky note. So I don't forget while I'm looking.

Cognitive Offloading (EC) 10

UUI Transcript Ali Mondini