CS3213: Foundations of Software Engineering

Requirements Engineering Elicitation and Analysis

Key Activities

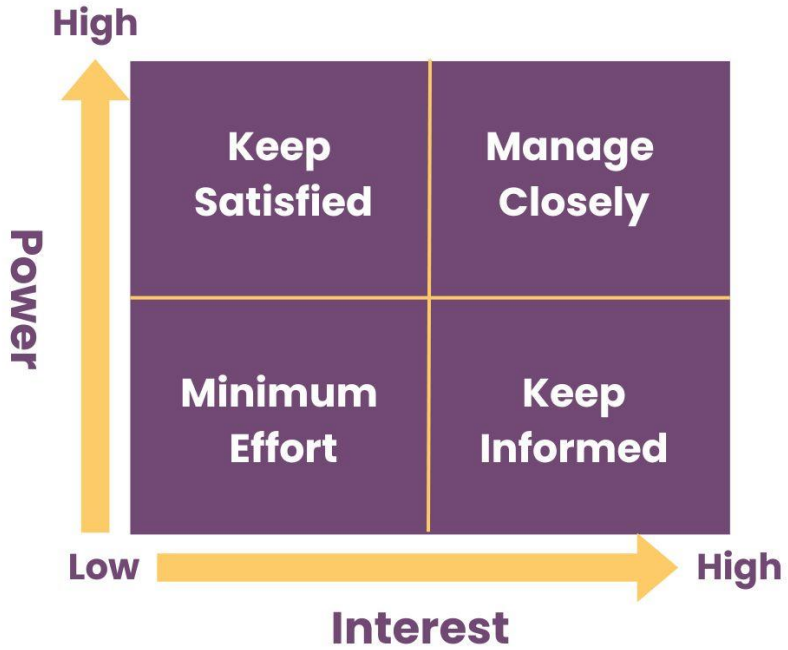
Discovering requirements by interacting with the stakeholders

Identifying Stakeholders

- Identify “baseline” stakeholders
  - Users, decision-makers, …
- Explore their network

https://discovery.ucl.ac.uk/id/eprint/744/1/1.7_stake.pdf

Mendelow’s Matrix



https://www.oxfordcollegeofprocurementandsupply.com/wp-content/uploads/2024/03/Interest-vs-Power-Stakeholders.jpg

Role in the System

- Primary stakeholders (e.g., users)
- Secondary stakeholders (e.g., supervisors)
- Tertiary stakeholders (e.g., regulatory agencies)

Requirements Elicitation Techniques

Interviews

Document Analysis

Workshops

Personas

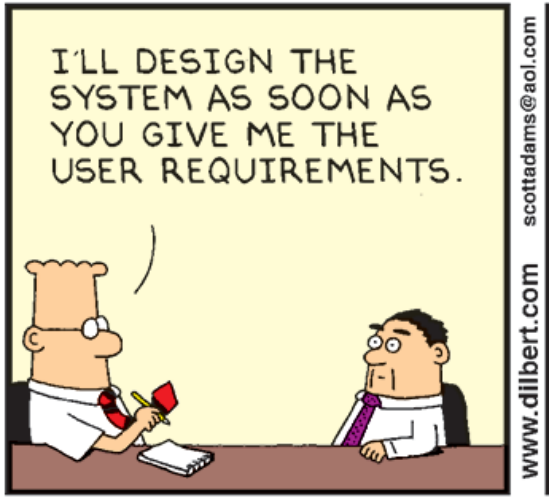
Prototyping

Focus Groups

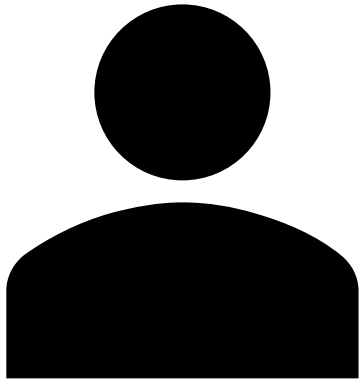
Questionnaires/Surveys

Observation/Ethnography

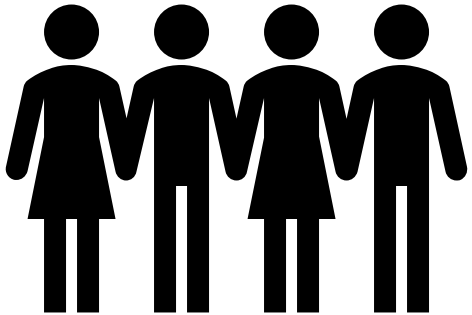
Interviewing



Interviewing



Individual



Small groups

Interviewing

- **Closed/structured interview**: stakeholder answers a predefined set of questions
  - Interview guides
- **Open/unstructured interviews**: no predefined agenda
- Semi-structured interviews: combination
  - Most common case

Suggestions for User Interviews

- Establish rapport
- Stay in scope
- Prepare questions and (pen-and-paper) prototypes ahead of time
- Suggest ideas
- Listen actively

Questions and Bias

“Would you like our new application in a browser?”

Questions and Bias

“You wouldn’t be willing to trade performance and a rich user experience just for having the software in a browser, would you?”

Questions and Bias

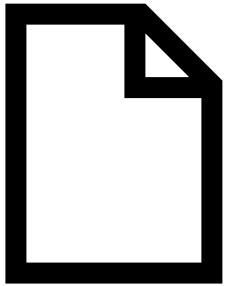
“Would you like our new application in a browser rather than as a native Windows application even if it means reduced performance, a poorer overall user experience, and less interactivity?”

Questions and Bias

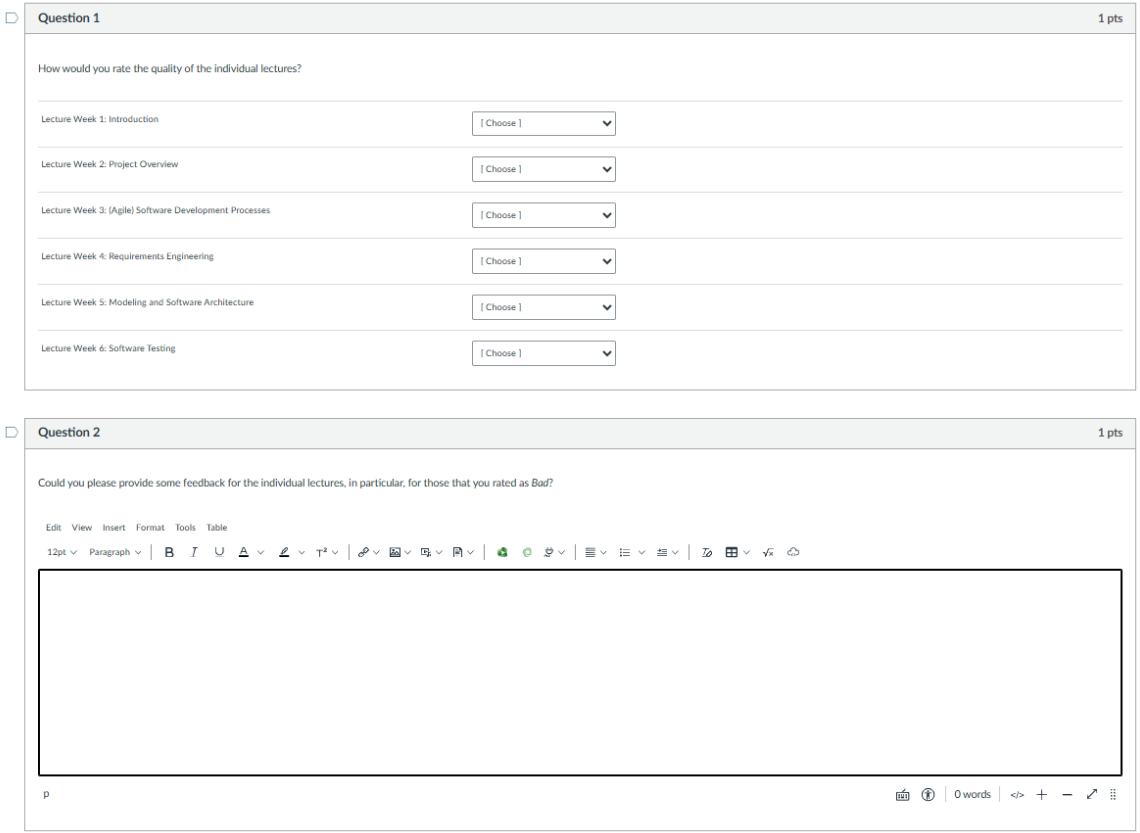
“What would you be willing to give up in order to have our next generation product run within a browser?”

Document Analysis

Document analysis: examine any existing documentation or resources available



Questionnaires



Question 1 — 1 pts

How would you rate the quality of the individual lectures?

Lecture Week 1: Introduction	[Choose]
Lecture Week 2: Project Overview	[Choose]
Lecture Week 3: (Agile) Software Development Processes	[Choose]
Lecture Week 4: Requirements Engineering	[Choose]
Lecture Week 5: Modeling and Software Architecture	[Choose]
Lecture Week 6: Software Testing	[Choose]

Question 2 — 1 pts

Could you please provide some feedback for the individual lectures, in particular, for those that you rated as *Bad*?

Edit View Insert Format Tools Table

12pt Paragraph

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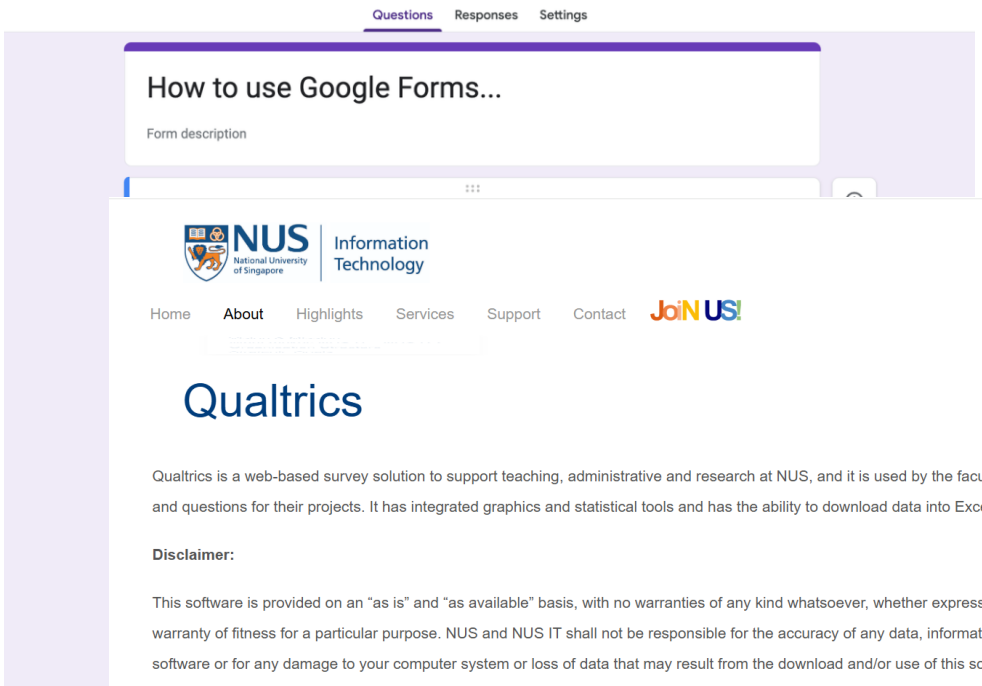
0 words

Examples for Tools

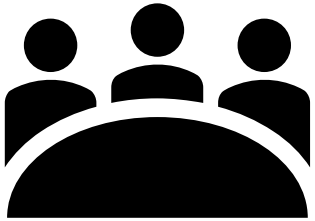


https://nusit.nus.edu.sg/services/digital-enablement/qualtrics/

Workshops

Workshops: facilitated sessions with **multiple stakeholders** from users to developers to testers

Scribe



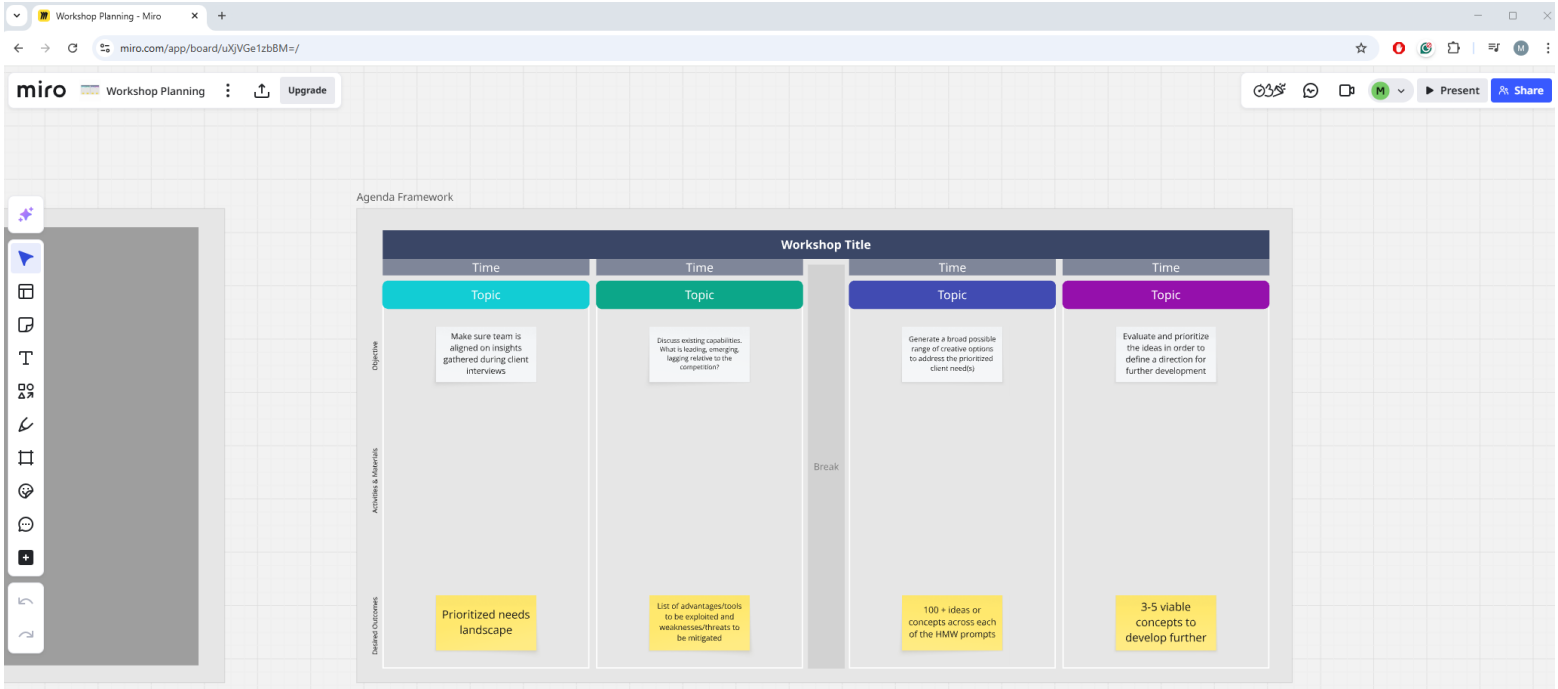
Stakeholders

Facilitator

Suggestions for Workshops

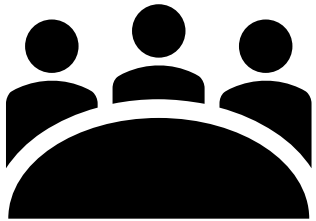
- Establish and enforce ground rules
- Fill all of the team roles
- Plan an agenda
- Stay in scope
- Use “parking lots” to capture items for later consideration
- Keep the team small but include the right stakeholders
- Keep everyone engaged

Tools: Miro


Workshop Planning - Miro
miro.com/app/board/uXjVGe1zbBM=/
miro
Workshop Planning
Upgrade
Present
Share
Agenda Framework
Workshop Title
Time
Time
Time
Time
Topic
Topic
Topic
Topic
Objective
Activities & Materials
Desired Outcomes
Make sure team is aligned on insights gathered during client interviews
Discuss existing capabilities. What is leading, emerging, lagging relative to the competition?
Generate a broad possible range of creative options to address the prioritized client need(s)
Evaluate and prioritize the ideas in order to define a direction for further development
Break
Prioritized needs landscape
List of advantages/tools to be exploited and weaknesses/threats to be mitigated
100 + ideas or concepts across each of the HMW prompts
3-5 viable concepts to develop further

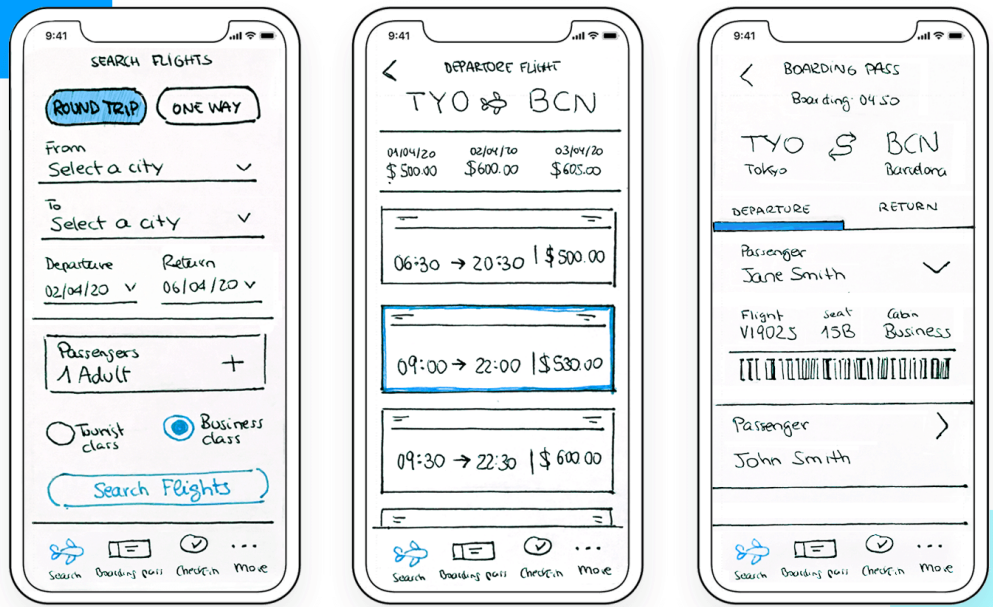
Focus Groups

Focus Groups: facilitated sessions with a group of **users**



Users

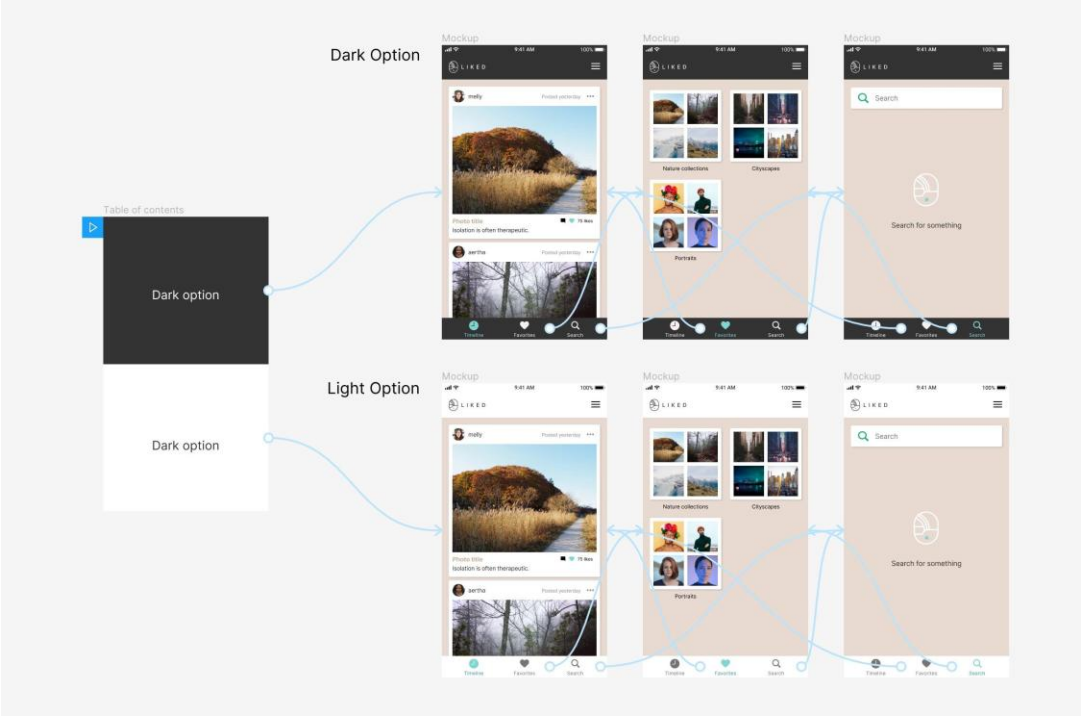
Prototyping



Low-fidelity prototype

https://www.justinmind.com/prototyping/paper-prototype

Prototyping: Figma



High-fidelity prototype

https://www.figma.com/best-practices/five-ways-to-improve-your-prototyping-workflow/

Ethnography/Observation

Image generated by ChatGPT

Personas

- **Persona**: an archetype of a user group
- **Hypothetical** names, goals, frustrations, photo, …
- Can be used to used in meetings
  - “Would Dave use this feature?”
- Can be based on research, or based on assumptions (“*ad-hoc personas*”)

Personas: Moving Beyond Role-Based Requirements Engineering

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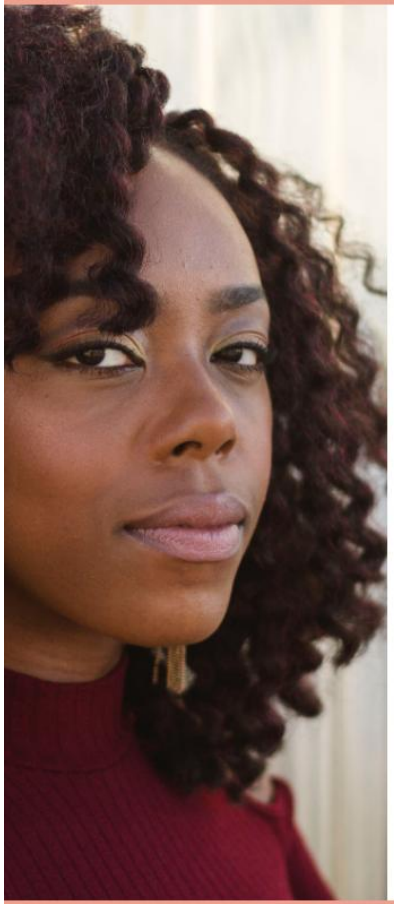
Abstract

A primary vehicle for understanding the user in the context of the requirements for a system has been the role. For example, the role is captured through the use of actors in the use case diagram and use case descriptions. Recently, personas have been used in conjunction with scenarios in participatory design to go deeper into examining the different types of people who could play a role. A persona is an archetype of a fictional user representing a specific group of typical users. This paper expands the use of personas to scenario-based requirements engineering. Personas and scenarios are being used together for specifying requirements at Microsoft. The result of this combination has been a more comprehensive understanding of the target customers' behaviors to drive and refine our scenarios and subsequently our product development.

The lack of understanding of the user community has lead to the suggestion that we bring some subset of our users onsite [3]. Certainly, user involvement is an important element in the success of a project [22] and may be the best option for many projects. However, very few projects find themselves able to get dedicated users available for the duration of the project. Additionally, requirements analysts of mass-market, commercial software can have trouble finding representative users [9].

Recently, Grudin and Pruitt [9, 16] have suggested using *personas* in conjunction with scenarios as a participatory design technique and as a compromise between the actor and the on-site customer. In the context of product development, a *persona* is an *archetype of* a *fictional user representing a specific group of typical users*. Personas have hypothetical names, likenesses, occupations, friends, and other specific personal data. Posters with photographs of the personas and their information can be hung in places



Julia's Cafe / Ideal User Persona

Janelle Robinson

Age: 26
Status: Undergraduate

Customer Profile: A busy PhD Student who needs a quiet place to study and read without distractions. She spends a lot of time on campus, refuels often and is a major coffee lover. She is the ideal customer for Julia's Cafe. She wants to receive quick and professional service; order online from her smartphone to avoid lineups, and not deal with over-conversational staff members.

Motivations

- High quality, strong coffee.
- Quiet atmosphere for studying.
- On or close to the college campus.

Frustrations

- Hates waiting too long for her coffee.
- Doesn't want to be bothered by the staff while studying.
- Actually relies on strong coffee to help her concentrate later in the day.

Goals

- She needs information on the type of coffee a cafe serves, in order to determine the quality.
- She wants to find the menu and the daily specials as quickly and easily as possible.
- She wants to order with her smartphone, avoid the usual line-up, and experience minimal distractions.

Favorite Coffee Beans

- Ethiopian Yirgacheffe Coffee
- Sumatra Mandheling Coffee
- Ethiopia Charbanta Natural

https://venngage.com/templates/reports/ideal-user-persona-guide-a34a0088-ccbb-40c4-b44c-3457e99191d9

Personas (UX perspective)

https://www.youtube.com/watch?v=PYv46j02zvY

Summary and Key Points

- Stakeholder analysis and categorization
- Requirements elicitation techniques
  - Interviewing
  - Document Analysis
  - Questionnaires
  - Workshops
  - Focus Groups
  - Prototyping
  - Ethnography/observation
  - Personas