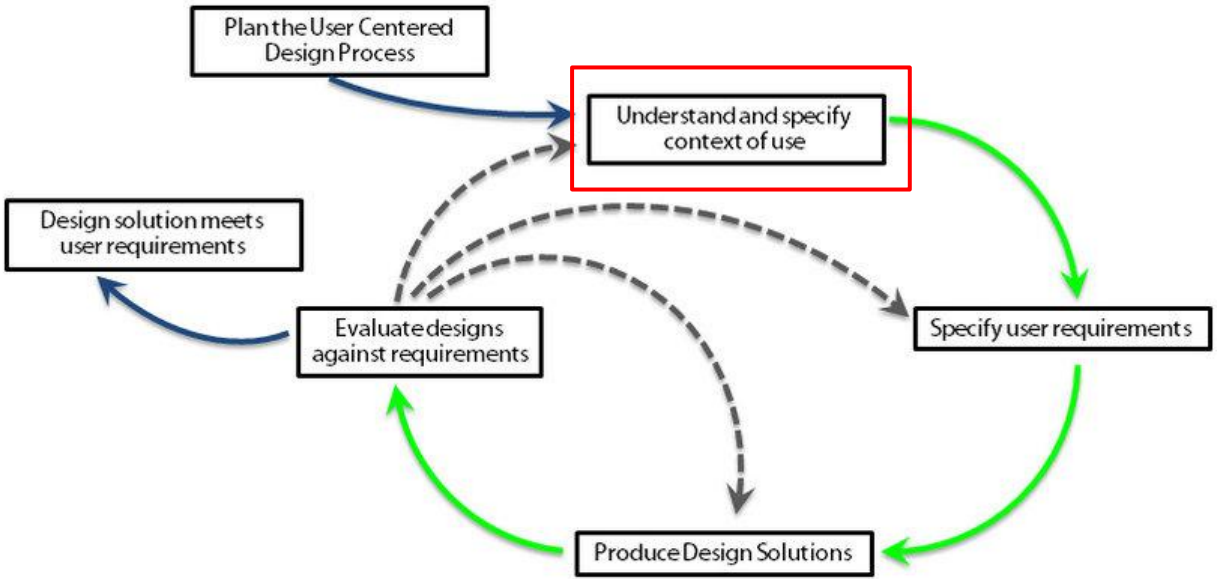
SENG 310
Lecture 6 - May 25th, 2023

Slide credits: Prof. Sowmya Somanath and Prof. Charles Perin

RECAP

Understanding and Specifying Context of Use

PHASE 2: UNDERSTAND AND SPECIFY CONTEXT OF USE



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HCD PHASE 2 - METHODS

- Interviews
- Ethnography
- Diary Studies
- Surveys
- Inclusive Design

INTERVIEWS

It is a qualitative method where researchers engage in a conversation with people to learn about their motivations and experiences.

https://www.nngroup.com/articles/interviewing-users/

INTERVIEWS - TYPES

- Structured – a fixed predetermined list of questions
- Semi-Structured – has predetermined questions and additional questions can be added for further clarification
- Unstructured – informal conversation with no prepared questions.

INTERVIEWS – SOME TIPS

Avoid leading questions. E.g. we have a first class tool we put a lot of effort building. What are your thoughts about our first class tool?

Write down (or audio record) what the person is saying and not what you think they are saying

You can’t take everything people say as explicit implications for what you should do in your designs. Observe, read, and listen!

Pilot everything!

ETHNOGRAPHY

Researchers observe or interact with people in their real-life environment for gaining a deeper understanding of people, their context, actions, process etc.

https://sightandlife.org/blog/why-ethnographic-research/

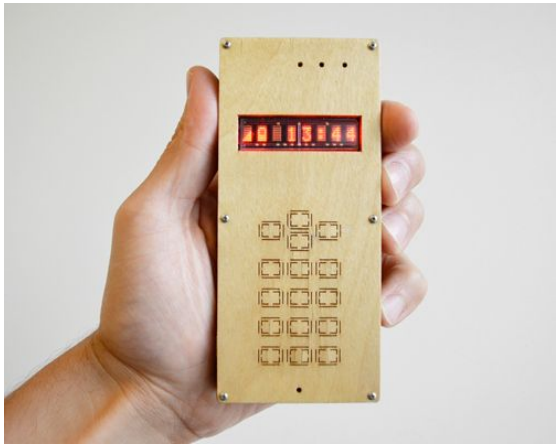
https://www.spotless.co.uk/insights/ethnography-when-and-how/

ETHNOGRAPHIC RESEARCH - TYPES

Field

Virtual/Online

Auto/Self



https://alumni.media.mit.edu/~mellis/cellphone/

ETHNOGRAPHIC RESEARCH – FIELD NOTES

Taking Field Notes – Example

Observation Protocol Example (Creswell, 2007, p. 137)

Length of Activity: 90 Minutes	
Descriptive Notes	*Reflective*
General: What are the experiences of graduate students as they learn qualitative research in the classroom?	
See classroom layout and comments about physical setting at the bottom of this page.	*Overhead the room*
Approximately 5:17 p.m., Dr. Creswell enters the filled room, introduces Dr. Wolcott. Class members seem relieved.	*Overhead projector not plugged in at the beginning of the class: I wonder if this was a distraction (when it took extra time to plug it in).*
Dr. Creswell gives brief background of guest, concentrating on his international experiences; features a comment about the educational ethnography "The Man in the Principal's Office."	*Lateness of the arrival of Drs. Creswell and Wolcott: Students seemed a bit anxious. Maybe it had to do with the change in starting time to 5 p.m. (some may have had 6:30 classes or appointments to get to).*
Dr. Wolcott begins by telling the class he now writes out educational ethnography and highlights this primary occupation by mentioning two books: *Transferring Qualitative Data* and *The Art of Fieldwork.*	*Drs. Creswell and Wolcott seem to have a good rapport between them, judging from many short exchanges that they had.*

Distinguish facts
versus
subjective interpretation

ETHNOGRAPHIC RESEARCH

- Helps identify and analyze unexpected situations
- Typically provides rich descriptions of how people act in their “natural” environment
- Researchers bring with them certain biases in observation.
  - Initially it’s better to note everything without any filtering of data
- Rapid ethnography is what we often end up doing: goal oriented

DIARY STUDIES

It is a method that asks people to take charge of recording their activities and reflections over a certain period of time but with the aim of answering a research question.

Lazar, J., Feng, J. H., & Hochheiser, H. (2017). *Research methods in human-computer interaction*. Morgan Kaufmann. Chapter 6

DIARY STUDIES

Good for gathering fluid and changing perspectives e.g., emotions and use over time.

Also, helpful to study people's use patterns across multiple technologies and multiple locations.

TYPES OF DIARY

Feedback Diary

As the name suggests it is the diary that collects feedback that researchers will then analyze.

e.g., Test a phone app for 1 week and record feedback regarding usability problems

Elicitation Diary

Are open ended diaries that enable people to record more self-directed reflections

e.g., record your interactions and reflections with your phone over 1 week.

DIARY STUDIES - CHALLENGES

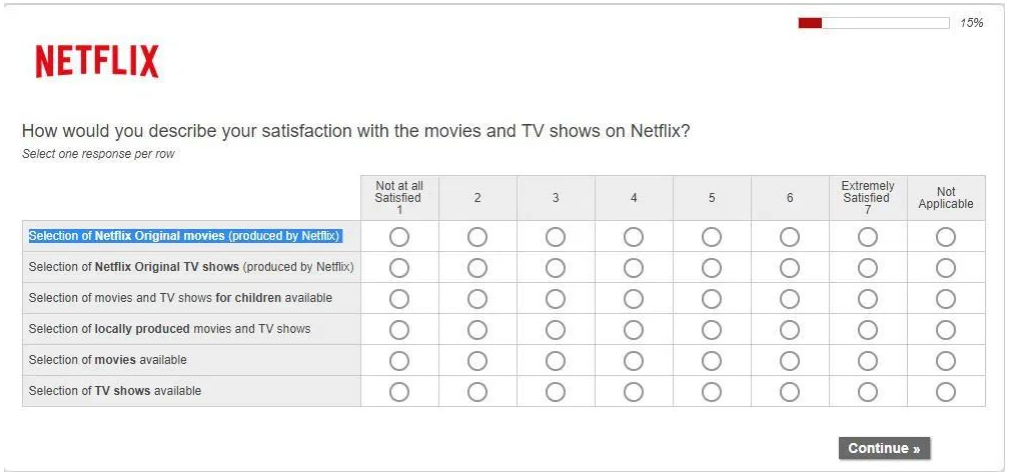
- People not always introspective
- May not follow through and therefore you do not get much feedback
- Can be difficult to find participants who are willing to take part in somewhat long term research and data collection processes
- Difficult to strike a balance between frequent entries and infrequent entries

DIARY STUDIES – SOME TIPS

- Think about who is the audience and what medium would work best for them to collect data.
- Some structured data entry activity is generally helpful as it ensures you will have at least some responses to work with
- Give participants clear guidance and check in to make sure the activity is making sense to the participant in practice

SURVEY

It is a mixed method research technique used to gather information about people's preferences, demographics, and reactions to interactions.



13. Tell us about the first time you drank coffee.

https://help.surveymonkey.com/categories/Design_Manage

PARTICIPATORY DESIGN

It is a collection of methods wherein the participant is positioned as a co-researcher and has an active role in data collection, analysis, synthesis, prototype generation, and final action.

https://cities.inclusivedesign.ca/ideas/co-design-session-2/

http://interactions.acm.org/archive/view/january-february-2019/reimagining-participatory-design

PERSONA SPECTRUM

Frame | Create a Persona Spectrum

Purpose

To map human abilities on a spectrum to inform solutions that benefit everyone.

Instructions

1. Interview a person(s) with a permanent limit to at least one ability.
2. Ask them about what they like to do and how they go about it.
3. Note those situations in which they experience friction, or limited accessibility.
4. Create a spectrum that illustrates how a similar limitation extends to temporary and situational scenarios.

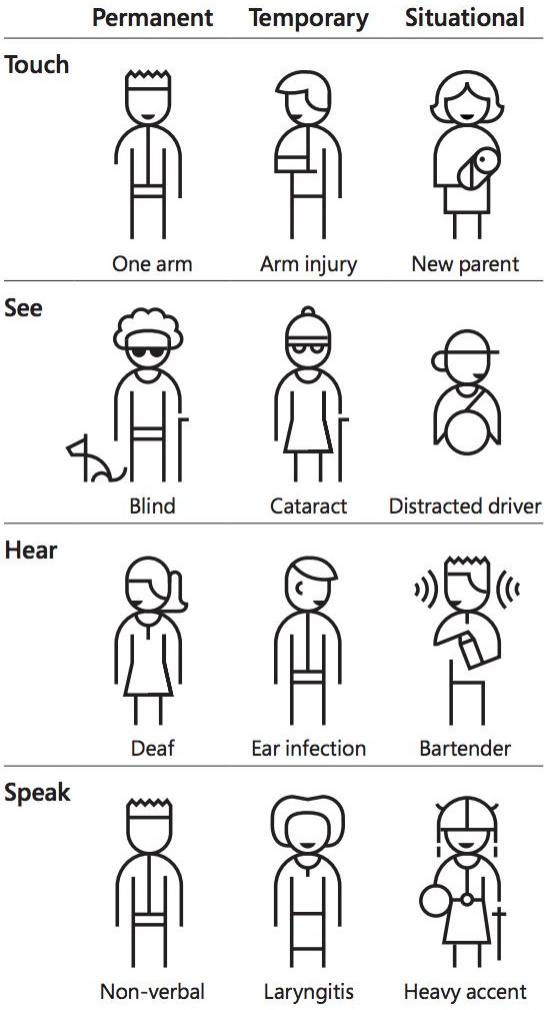
Materials

The Persona Spectrum support card

Tips

Bear in mind that an accomplishment for this person can be a simple task, or a larger concern.
This is a great introductory exercise to understand inclusive design broadly, and also acts as a good check-in exercise during a more granular design process.

Inclusive
A Microsoft Design Toolkit



TAKEAWAYS

Interview - when you primarily want to **ask** questions

Ethnography – when you want to primarily **observe** and not disturb the people

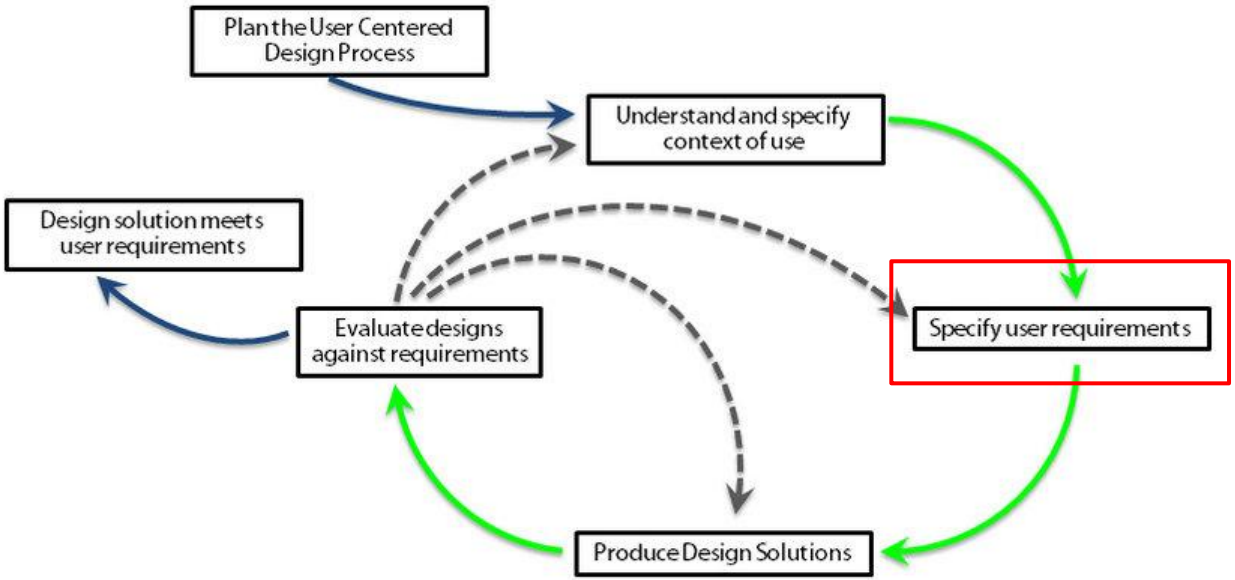
Diary Studies – when you want to gain deeper insights into **mental models and fluid experiences**

Survey – collect data from **many** people

Inclusive design – include multiple perspectives and **design with** rather than for

SPECIFYING USER REQUIREMENTS

HUMAN-CENTERED DESIGN PROCESS



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WHAT IS A REQUIREMENT?

A statement about an intended product that specifies what it is expected to do or how it will perform it.

Examples:

For a map application, the requirement could be that the time to load the map *must be less than half a second*. [*Very precise*]

For a smartwatch, the requirement could be that the *interface should be made attractive for college students*. *[Vague. What attractive means is subjective]*

DISCOVERING AND COMMUNICATING REQUIREMENTS

Helps us tell the developers what to build

Allows users to verify and contribute towards the development

Overall advancing our goal to build usable systems and one that meets the needs of people.

REQUIREMENTS GATHERING AND COMMUNICATION

Happens iteratively and could be gathered from different stages of HCD process

Over a period of time, requirements could change completely. For example, our requirements from our smartphone today are very different from early phones such as landline phone and early cell phones

TYPES OF REQUIREMENTS

Functional

Describe what the product will do

E.g., new video game

- The game must have varying levels of difficulty to match player's expertise level (number of tasks, hidden options etc.)
- Has to capture player data continuously

Non-Functional

Describe the constraints (physical, logical, semantic, cultural, technical)

E.g., new video game

- Works only on Xbox
- Needs two players

THINK ABOUT:

- Where will the interface be deployed – physical, digital, hybrid, home, office, school, hospital, etc.
- How many people will use it – single, two, multiple
- Use how? – synchronously, asynchronously
- User characteristics – skill levels, abilities
- User needs – types of tasks they perform using the system
- Security – what type of data does the system capture, store and how is it handled?

HOW DO WE CAPTURE REQUIREMENTS?

Directly interacting with potential end-users using methods such as interviews, surveys, diary studies, ethnography, rapid testing etc.

Secondary research – reading patents and research articles that typically explain in detail how systems have been developed and also do a good job outlining the rationale.

TASK CENTERED SYSTEM DESIGN?

A method to identify meaningful tasks that people want to or have to accomplish using a system, and

Using those tasks to propose new ideas or improvements for UI design

Reading for Monday:
http://grouplab.cpsc.ucalgary.ca/grouplab/uploads/Publications/Publications/2004-TaskAnalysis.LEAChapter.pdf

DEVELOPING TASKS

1. Says what the user wants to do but does not say how they would do it
   - No assumptions made about the interface
   - Can be used to compare design alternatives in a fair way

Requirement:

The interface must help people search for items

* How such a search may take place (e.g., by strolling through a store, looking at a catalog, based on crowd-sourced ratings or reviews, by recommendations) is something to ideate about

Fred **wants to purchase** a good quality umbrella stroller (red is preferred, but blue is acceptable).

Jamie **wants to learn** how to build bookends for her bookshelf at home

DEVELOPING TASKS

2. Are very specific

Requirement:

The interface must help people input data of different types to facilitate searching of information

* How such a search may take place (e.g., via search, image search, scanning of barcodes, speech input etc) is something to ideate about

Fred Johnson browses the catalog and chooses the JPG stroller and **makes note of the item code 323 066 697**.

Jamie Black wants the bookends to be **50 x 80 inches**

DEVELOPING TASKS

3. Describes a complete job/action being performed by the user from start to end

Requirement:

The interface must help people navigate 3 core steps: search, compare and contrast items and then purchase

* How the workflow is supported (e.g., wizard style system, by placing arrows in the store) is open to discussion

Fred wants a good quality umbrella stroller (red is preferred, but blue is acceptable). [where the user begins]

He browses the paper catalog and chooses the JPG stroller and notes the item code 323 066 697). [intermediate steps]

He pays for it in cash, and uses it immediately. [where the user ends]

DEVELOPING TASKS

4. Says who the user is

Requirement:

The interface must support first time users

The interface must support expert users

* How the expertise of the user is accounted for open to discussion e.g., novices may need a lot more help whereas experts may need advanced features such as shortcuts

Fred is a first-time customer to this store. He has little computer experience. He types very slowly with one finger.

Jamie is a 30-year DIY enthusiast. She is a long time member of the Victoria makerspace and builds things there often. She is an expert of fabrication machines. She is an expert technology user.

DEVELOPING TASKS

5. As a set the tasks cover a range of possibilities

- Typical ‘expected’ user; typical routine tasks
- Occasional but important user; infrequent but important tasks
- Unusual user; unexpected or odd tasks

From looking through your full task set, you can expand your requirements lists

System/ UI	Task	User
Restaurant menu system	Browse menu (routine task) Select items (routine task) Pay bill (routine task) Look up ingredients on the web (important but infrequent) Copy menu (odd or unexpected task)	Adults (primary users) An entire summer camp group (occasional users) 10 days old baby (least likely to use the system) Person who is unable to read (this person would be least likely to interact with the system)

WHAT IS THE SCOPE OF A TASK?

- Can be seen as each main thing people can do with the interface e.g., for an ATM, withdrawing cash. For restaurant context, tasks can be ordering food, paying the bill
- A cluster of tasks can be viewed as an activity e.g., banking-related activities involve depositing and withdrawing cash. The activity of going to restaurant involves tasks such as booking table, ordering food, paying bills

TASKS TO REQUIREMENTS

Which user groups will be addressed by the interface?

- Designs can rarely handle everyone! We typically need feature-level customization to reach a broad audience

Which tasks will be addressed by the interface?

- Designs can rarely handle all tasks. It costs money and time to implement features
- Requirements listed in terms of how they address tasks
  - Absolutely must include
  - Should include
  - Could include
  - Exclude

VISUAL METHODS

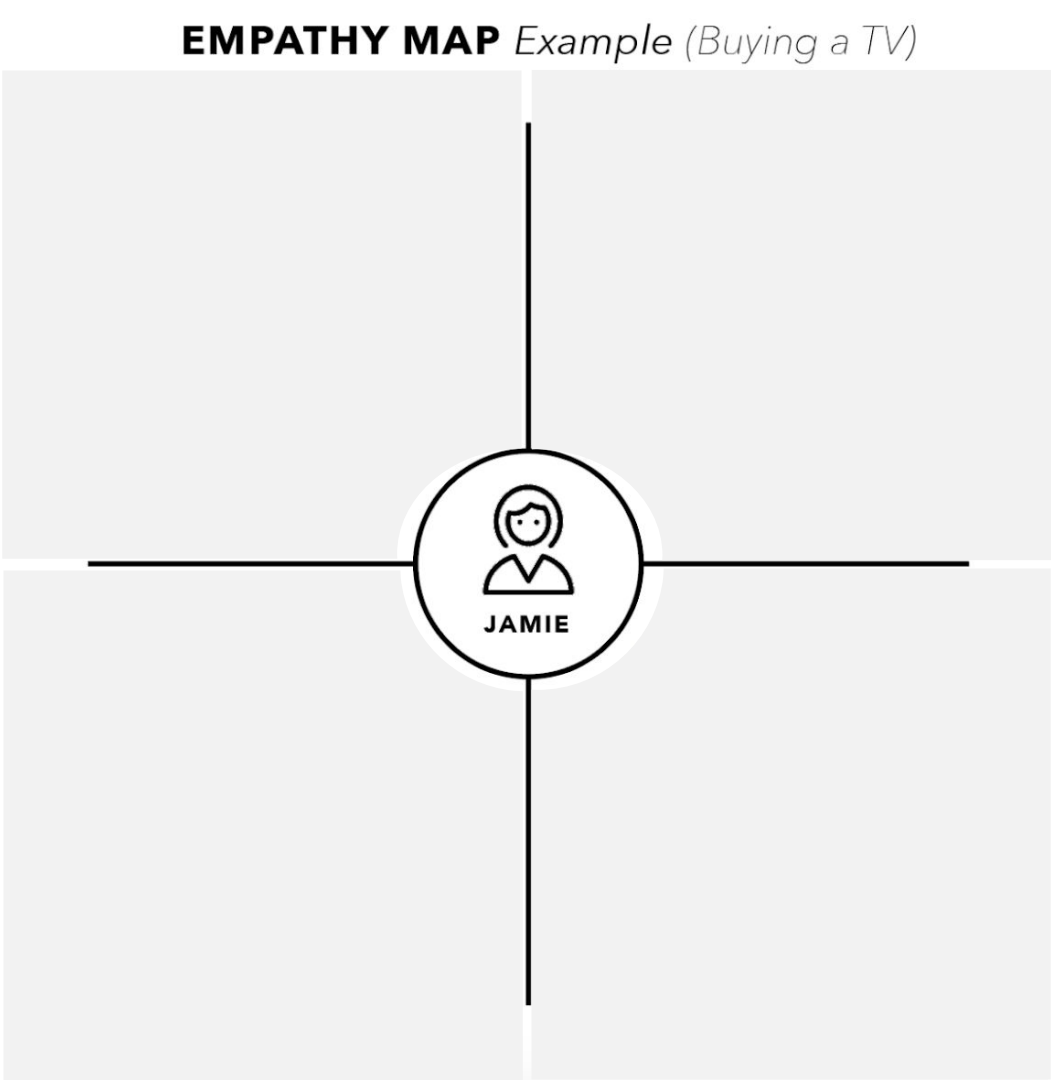
Projects are typically executed as a team and it's important for everyone involved to be on the same page

UX methods such as **empathy mapping, journey mapping, experience mapping** and **service blueprints** can help to visualize the information being synthesized and analysed. These visualizations can be shared with everyone for discussion and feedback

READ: https://www.nngroup.com/articles/ux-mapping-cheat-sheet/

EMPATHY MAP

- Empathy Map is used to distill and categorize your knowledge of the user



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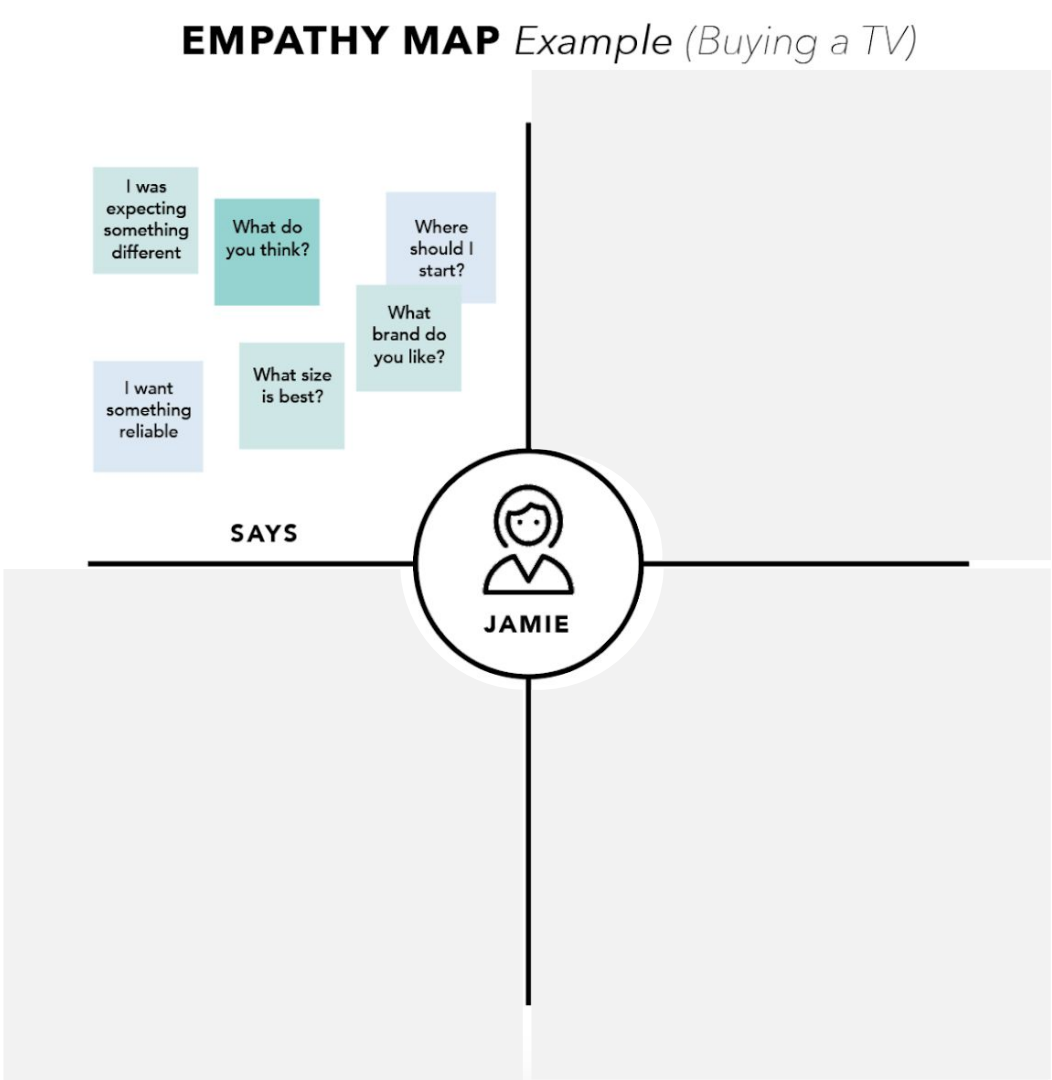

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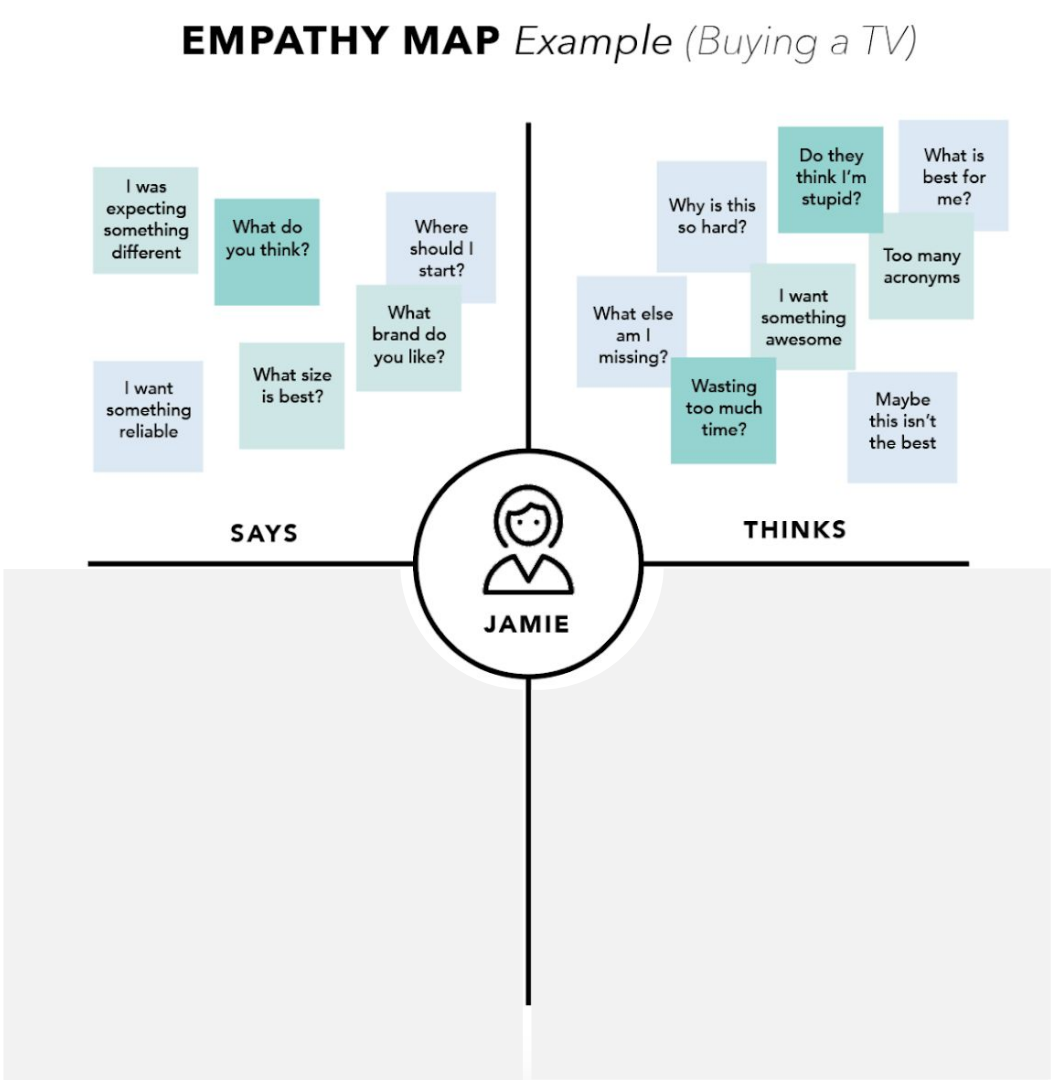

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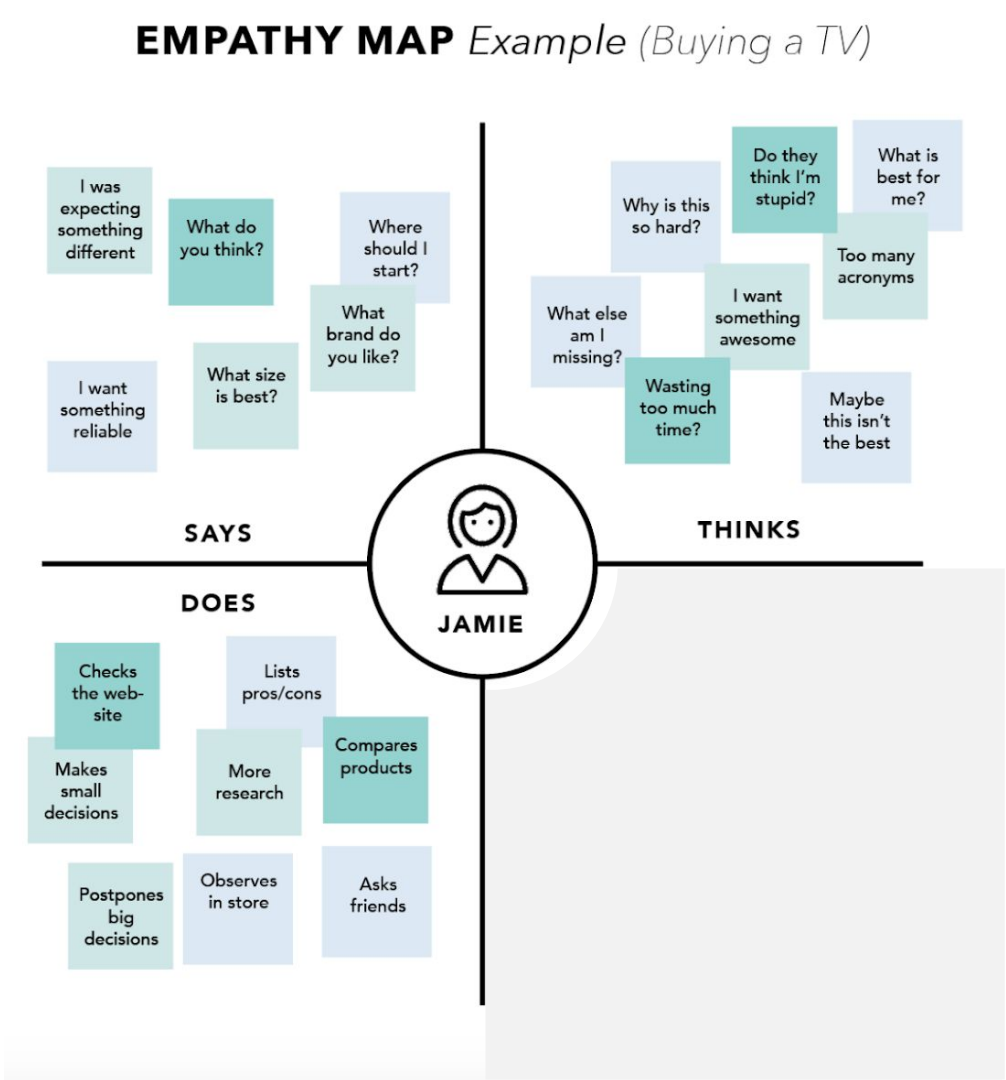

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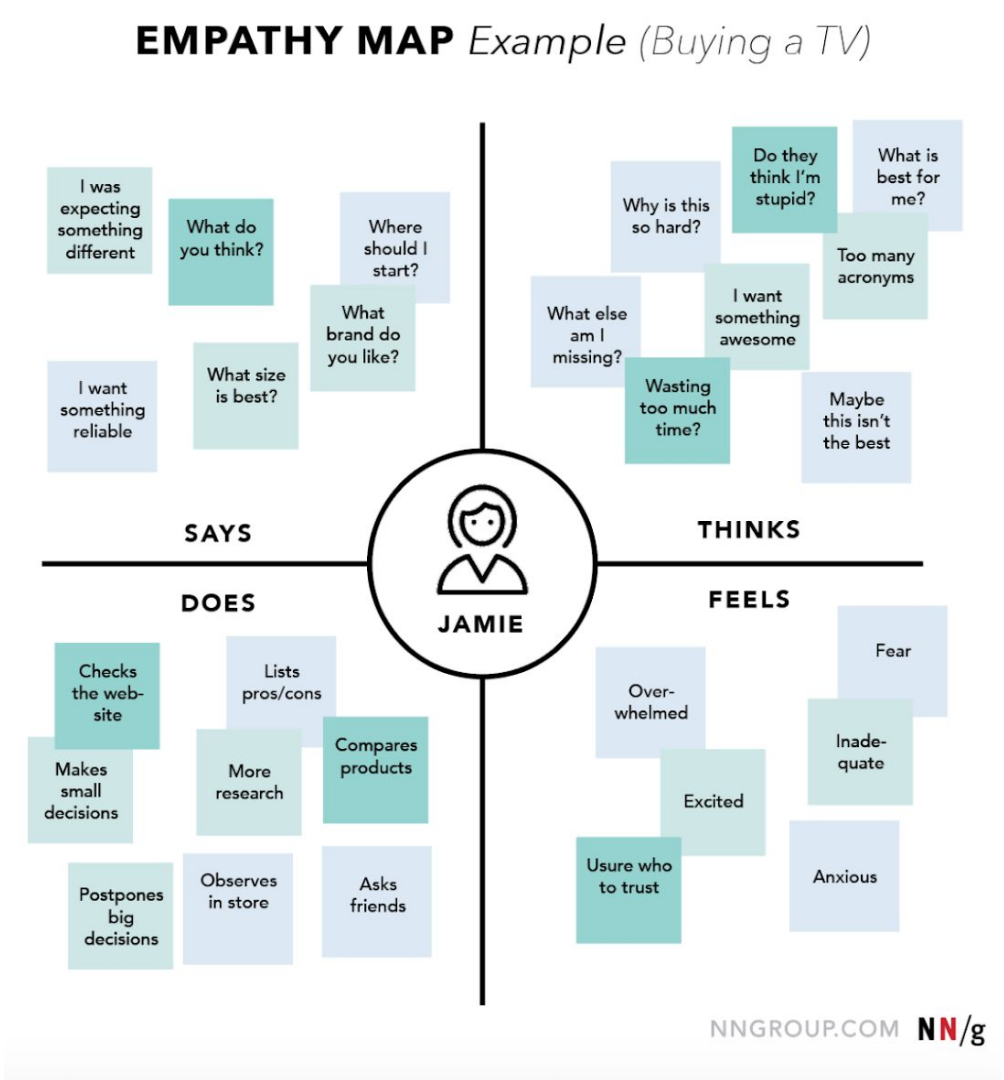
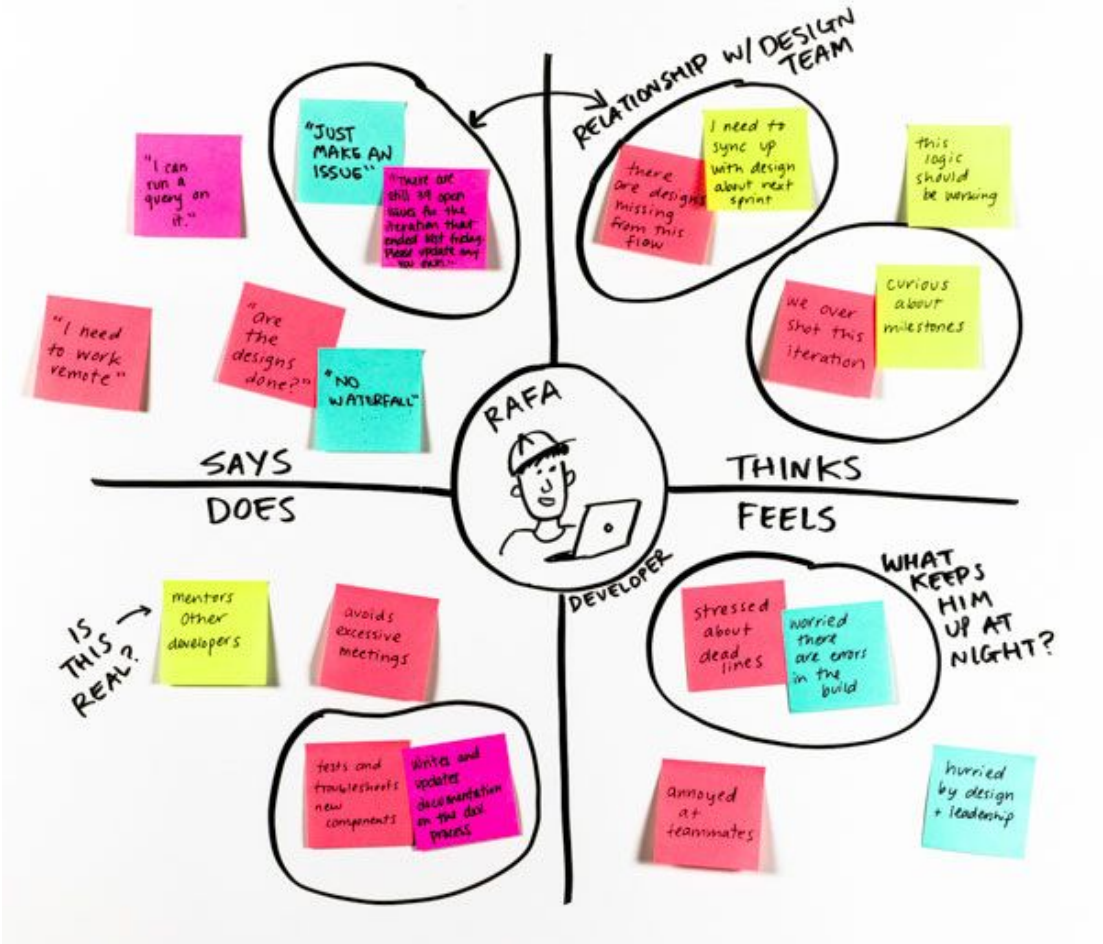


EMPATHY MAP

- Empathy maps can also be constructed for multiple users. Wherein the aggregated map represents a user segment instead of an individual.

- Once the map is filled out, as a team you can begin clustering data into categories and identify themes and relationships between quadrants.



EMPATHY MAP

When to use:

- At the beginning of the design process
- Categorizing research notes after understanding the user

https://www.nngroup.com/articles/ux-mapping-cheat-sheet/

JOURNEY MAPS

- **Journey maps** visualize a end-user's journey over a period of time

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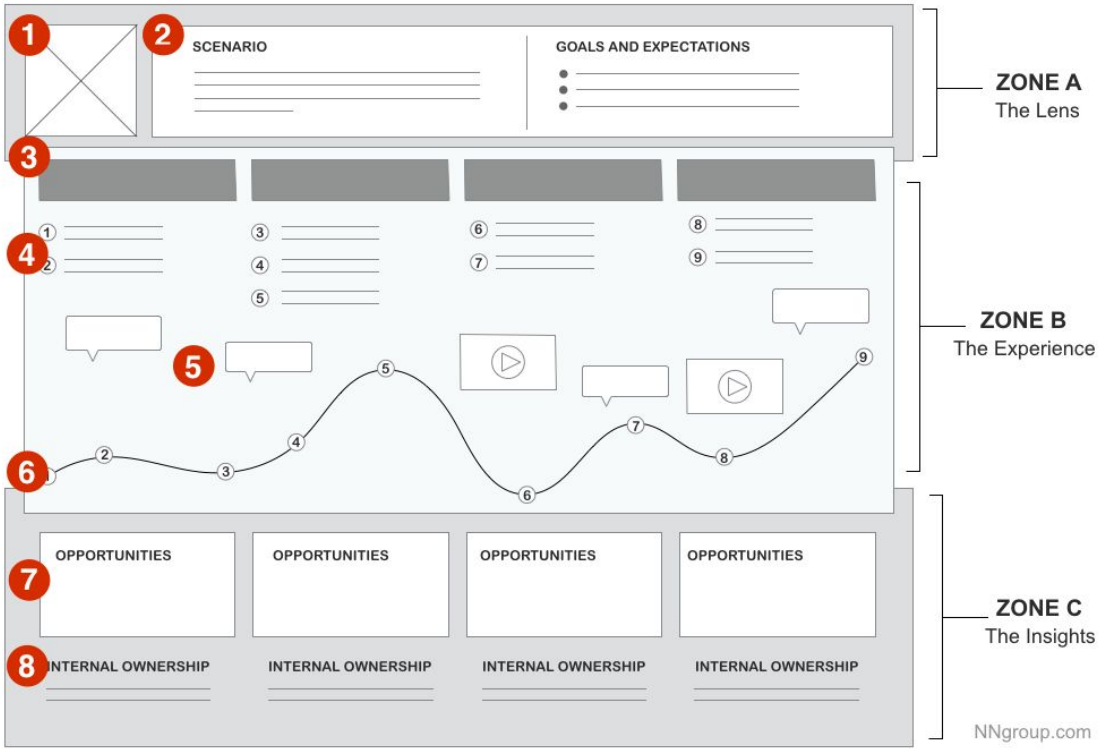
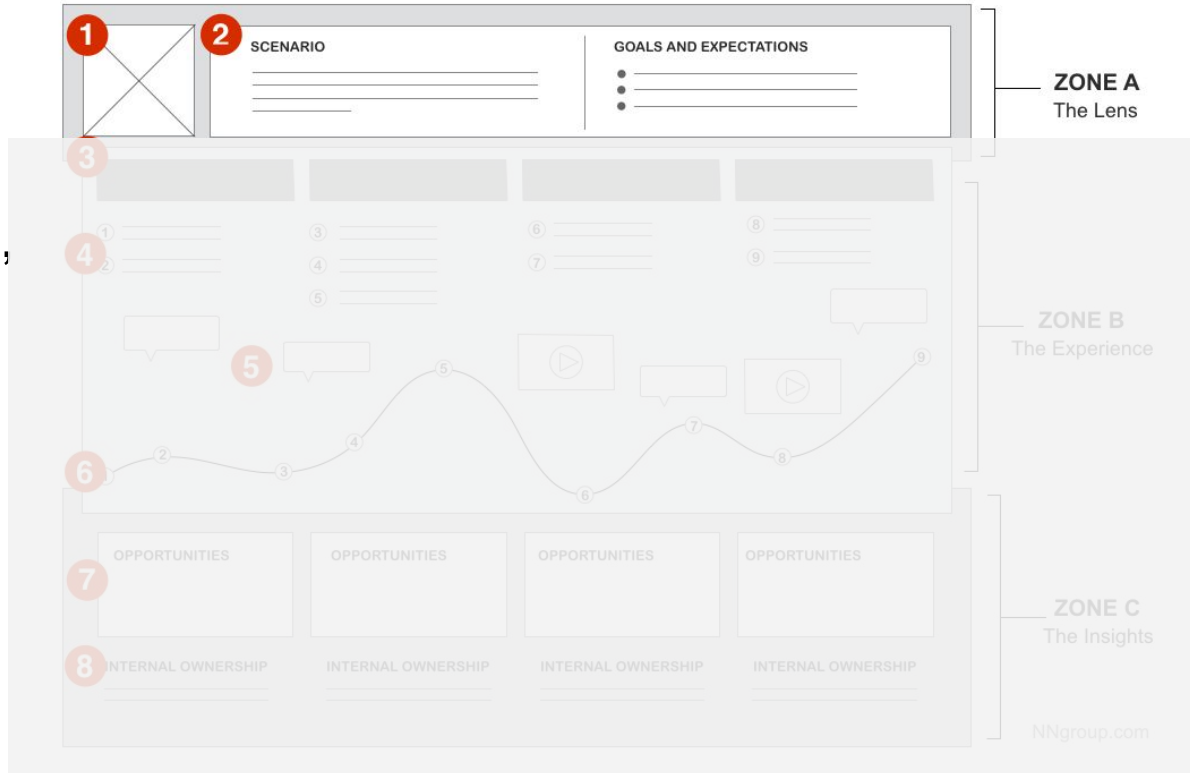


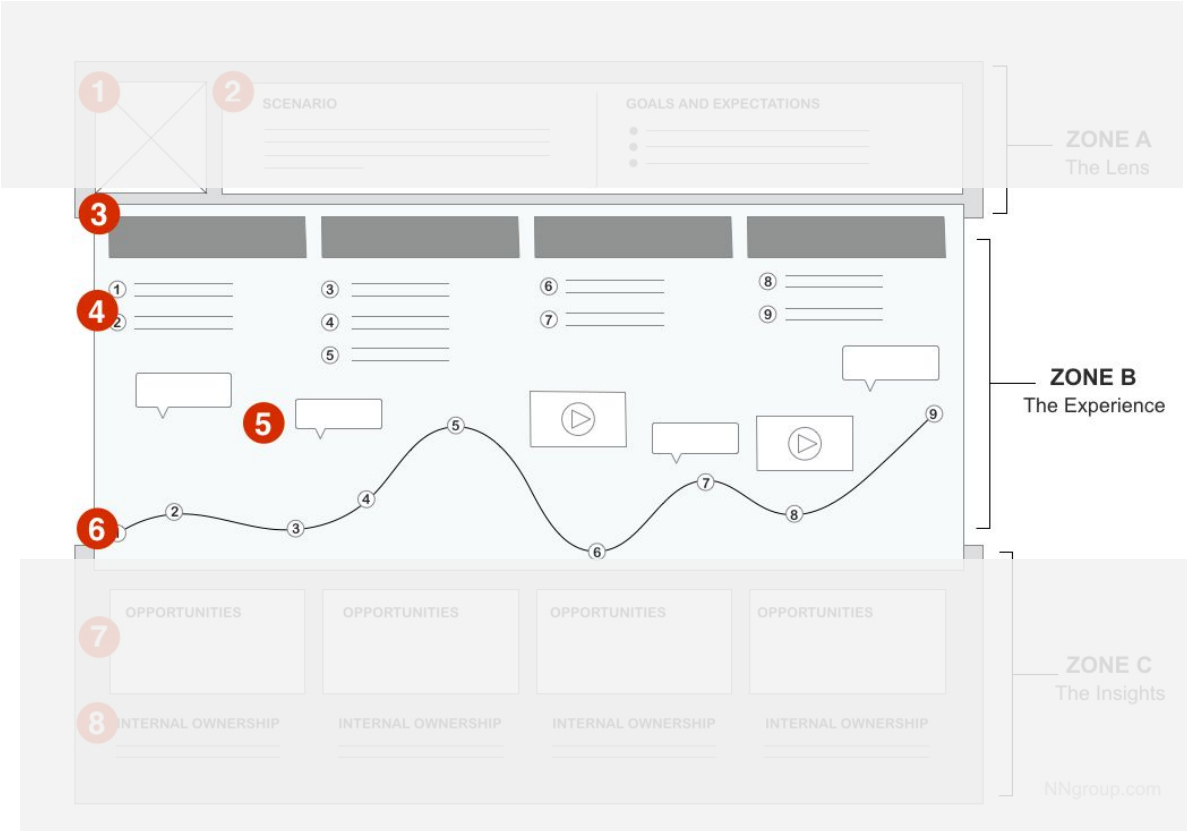
JOURNEY MAPS

- **Zone A:** The lens provides constraints for the map by assigning
  - **(1)** a persona (“who”),
  - **(2)** the task to be examined (“what”).



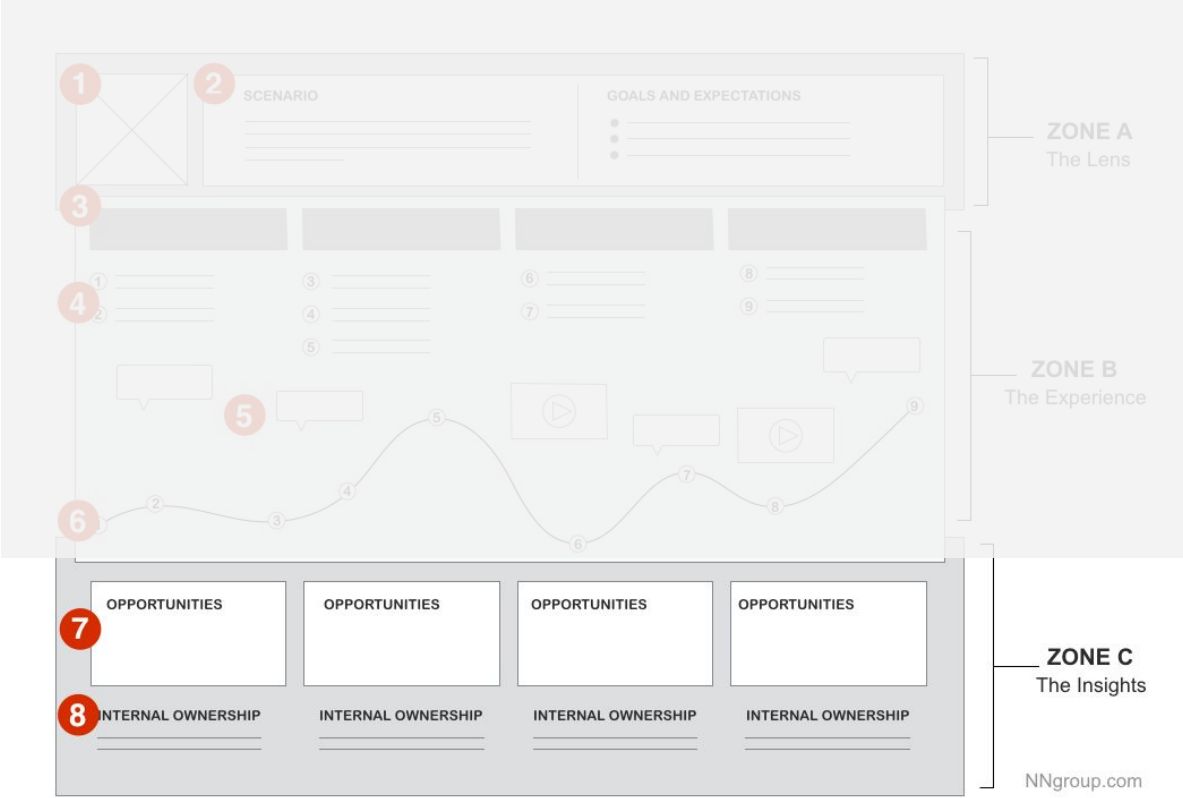
JOURNEY MAPS

- **Zone B:** The heart of the map is the visualized experience, usually aligned across
  - **(3)** steps or the end-to-end actions included in the task description,
  - **(4)** elaboration for the actions,
  - **(5)** thoughts
  - **(6)** emotional experience of the user has throughout the journey can be supplemented with quotes or videos from research



JOURNEY MAPS

- **Zone C:** describe the positive and pain points discovered, and the
  - **(7)** opportunities to focus on going forward
  - **(8)** internal ownership



The Food Boy - Customer Journey Map

PHASES	AWARENESS	WEBSITE SEARCH	ORDERING AND WAITING	RECEIVING	CONSUMING	SHARING AND REVIEWS
ACTIONS	Plans to order out for weekend breakfast	Browses the entire menu and places the order from the breakfast section	Searches for the website that promises delivery under 30 minutes	Goes to collect the ordered food	Unpacks the items and enjoys the breakfast	Leaves a review and shares about 'The Food Boy' with his friends
THOUGHTS	Consider breakfast as an important meal and does not want to skip it, due to any unnecessary circumstances	Food will be delivered at home, while I sip coffee and run the top priority errands	Considers it a good start to the weekend as customer got his favorite food item. Does not want to wait for more than expected time	Hopes that the food has an excellent quality and works for his taste	Loves the amount, taste, and condiments	Quite happy on the type of services delivered. Thinks of using the service on every alternative weekend, but if only, the stores add more options
CHANNELS	Mobile (Smartphone)	Mobile app	Computer as payment was not successful via phone	No channel used	No channel used	Used app and chat messenger
FEELINGS	Made the decision, while being uncertain	Interested in exploring a wide array of food items for breakfast	Anticipatory rush Loves the idea of ordering food online. But wants the process to be a bit faster. Disappointed due to the availability of less payment options	Excited and hungry. Not happy with the overall packaging of the food	Energized, relaxed, satisfied, and enriched	After leaving a review on the app, the customer feels connected to the business owner
OPPORTUNITIES	Plans to order out for weekend breakfast options on the weekends	Show them the options that are best for breakfast, according to their taste and preferences	Enable one-click purchase. Allow the website to remember information to save from the hassle of signing up again and again	Use clean and recyclable packaging	Encourage them to leave a review on the mobile app	Make use of proper packaging and branding so that more people become aware of the business Give the existing customer a free meal for each customer that comes through them

https://venngage.com/templates/mind-maps/food-service-customer-journey-map-b6ce887d-29aa-492d-ac36-b63967cbf54e

JOURNEY MAPS

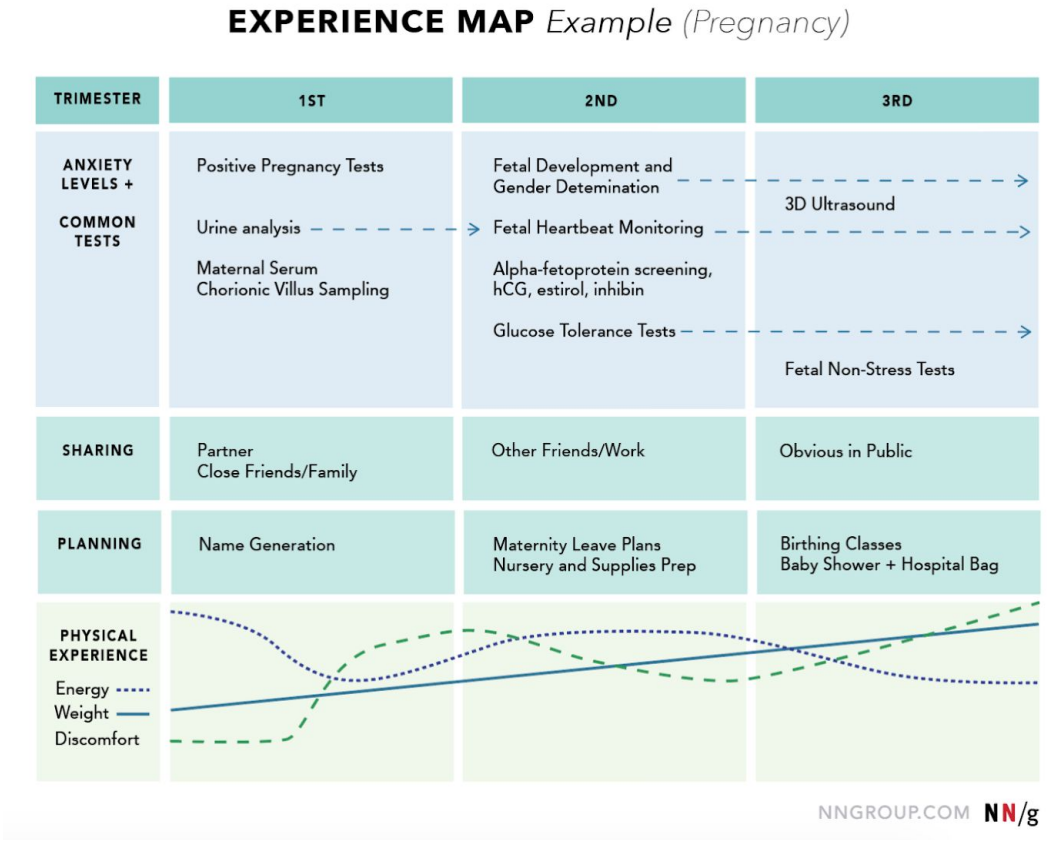
When to use:

- Typically, at any point as a reference point amongst a team

https://www.nngroup.com/articles/ux-mapping-cheat-sheet/

EXPERIENCE MAP

- **Experience maps** are typically used to generalize the experience of multiple users
- You can think of it as an aggregated journey map



EXPERIENCE MAPS

When to use:

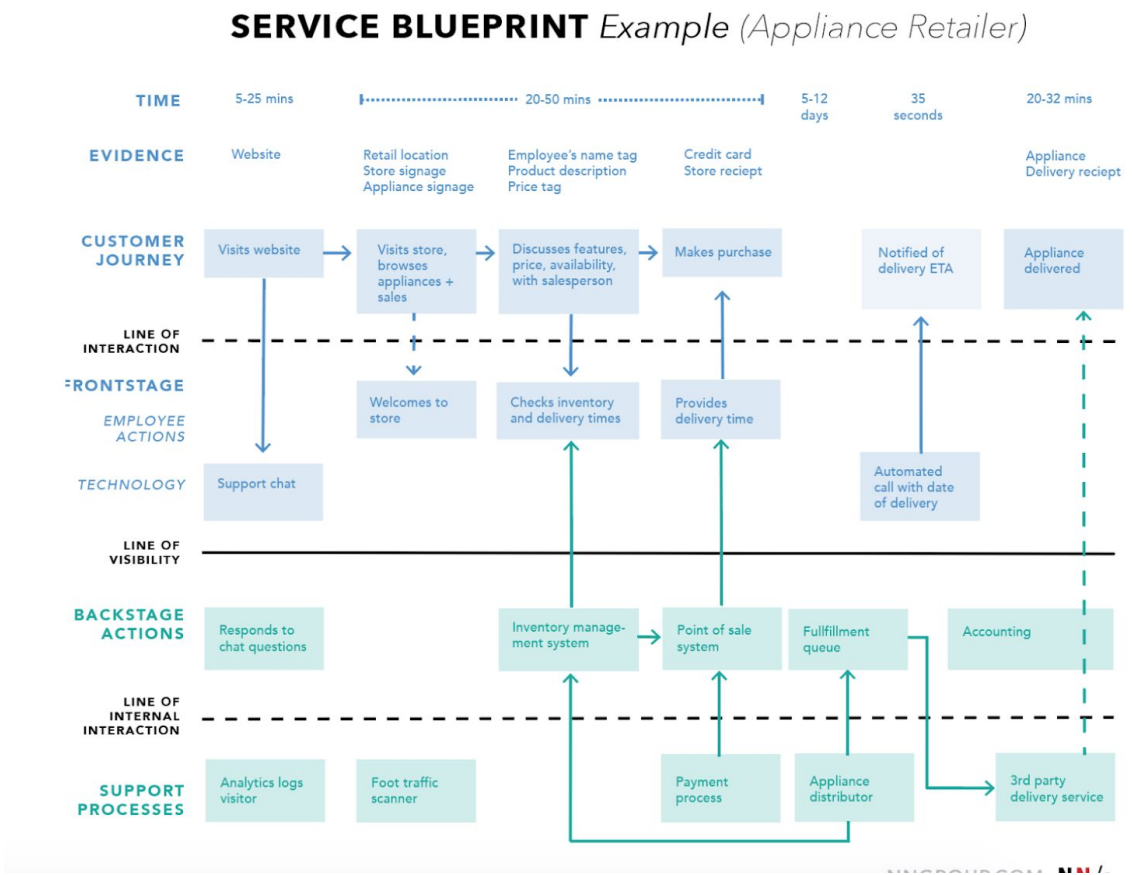
- Typically, before a journey map to gain a **general** understanding of human behavior in the targeted domain
- When converging multiple experiences

https://www.nngroup.com/articles/ux-mapping-cheat-sheet/

SERVICE BLUEPRINT

- **Service blueprints** visualize the relationship between people (customer & organization), props (physical and digital) and processes

*Essentially lays out a picture of how an entire system will work (front and back-end)



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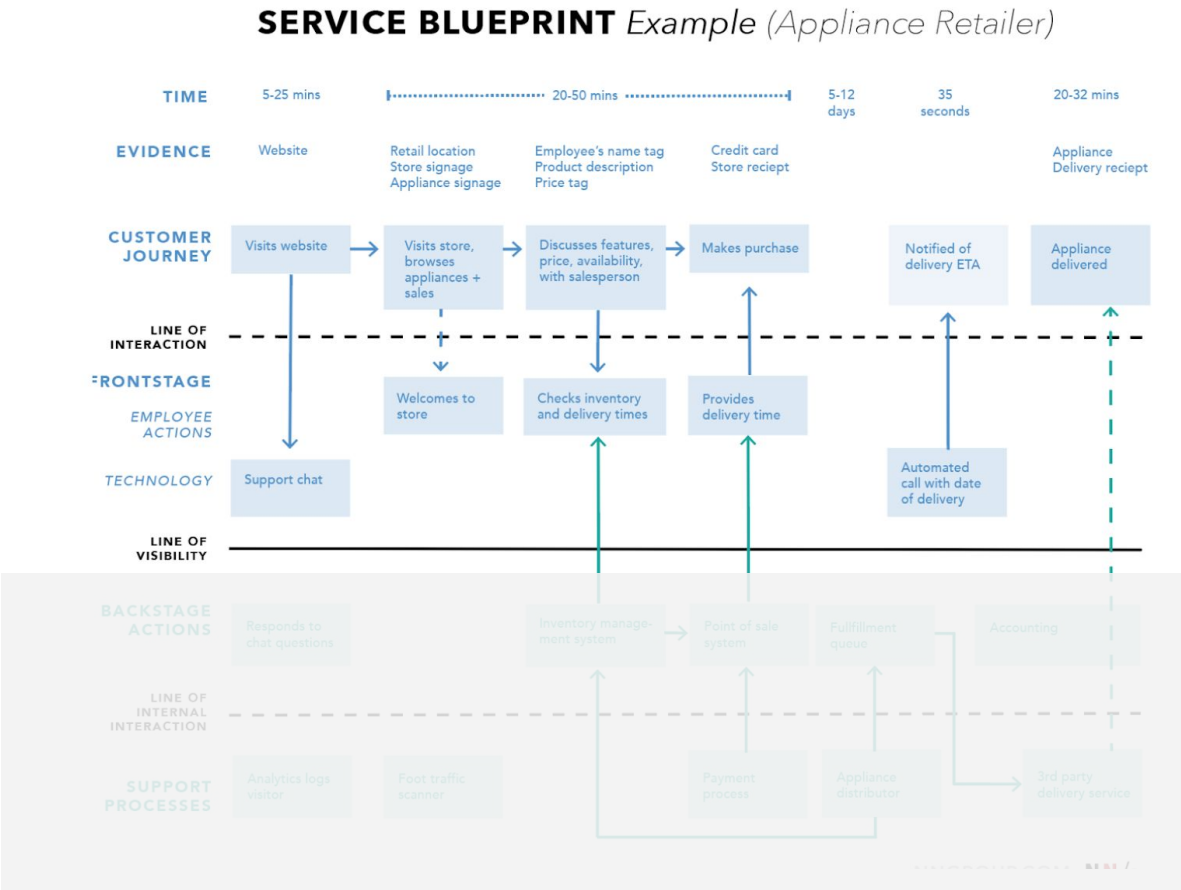

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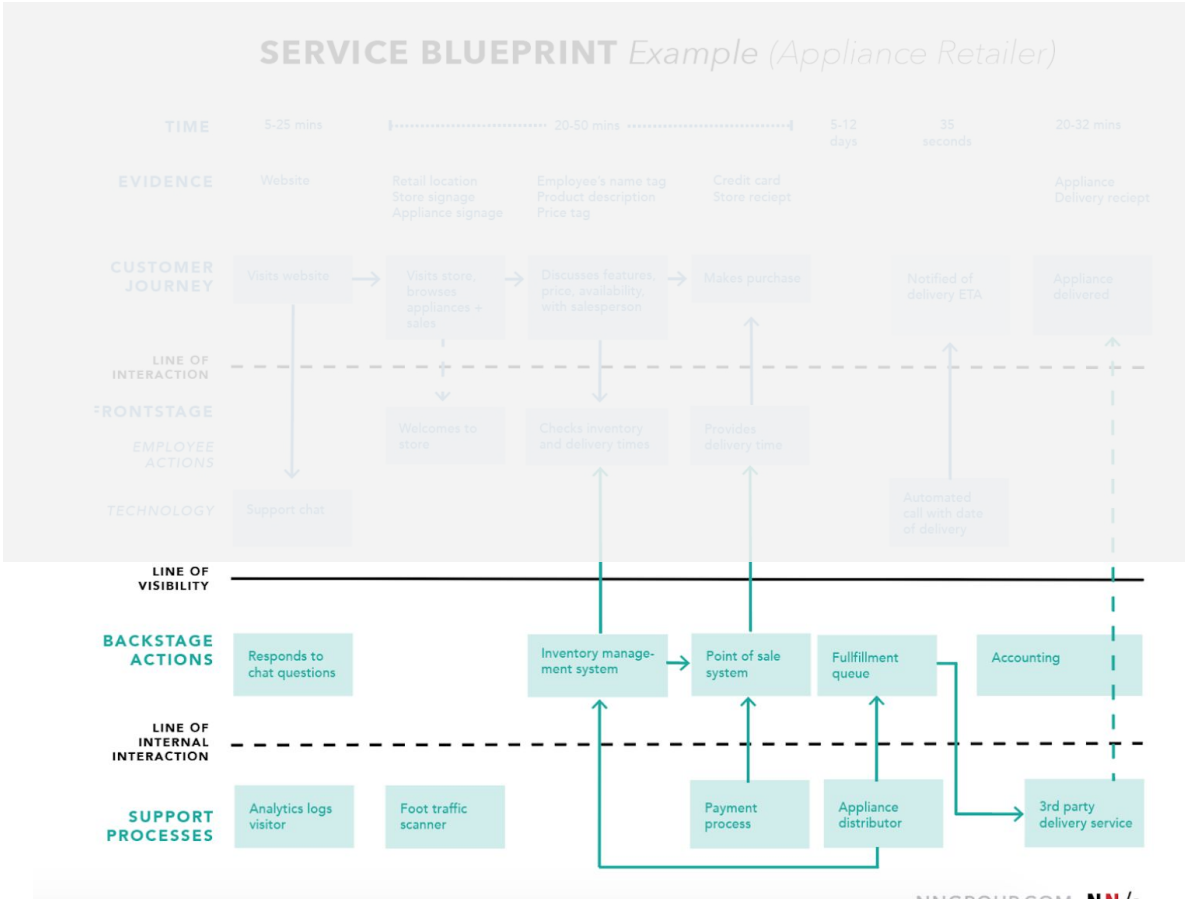

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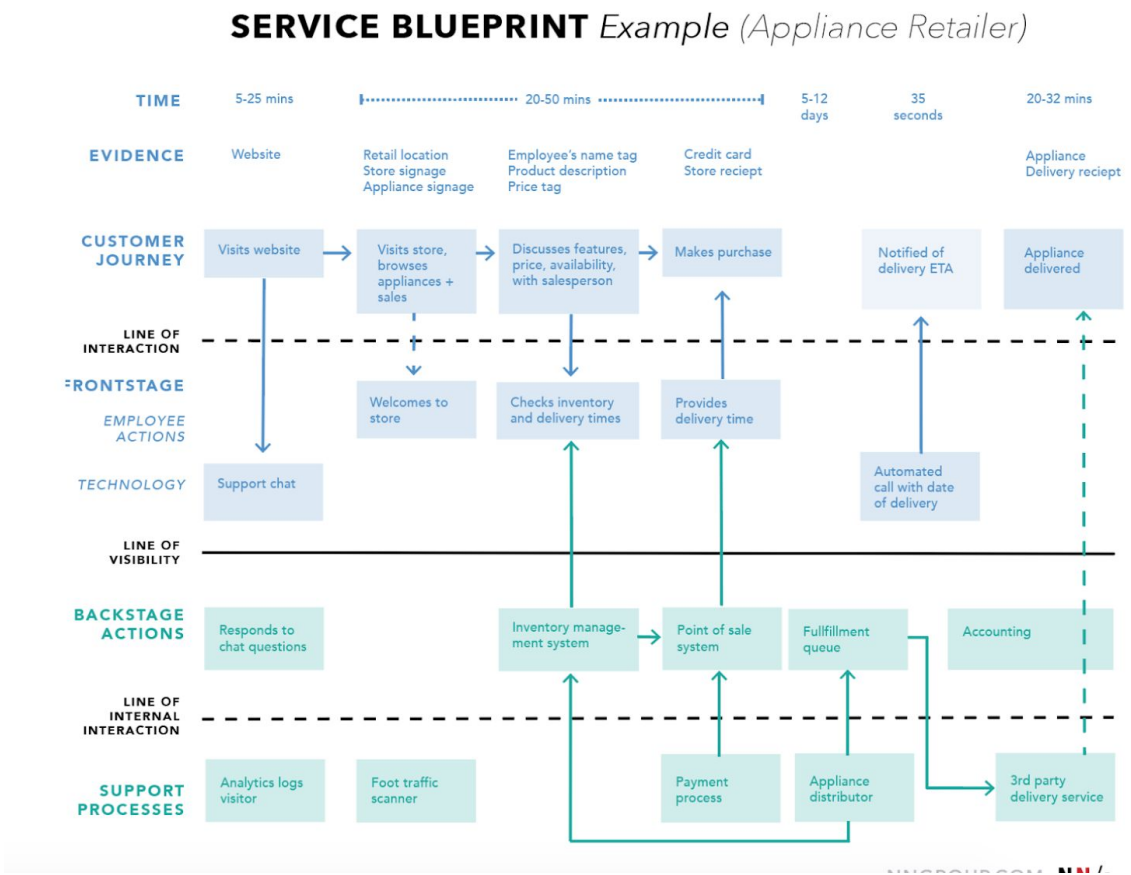

SERVICE BLUEPRINT

When to use:

- After journey mapping
- Before making organizational or process changes
- When pinpointing a breakpoint

https://www.nngroup.com/articles/ux-mapping-cheat-sheet/

SOME THINGS TO CONSIDER

Current (as-is) vs future (to-be): You can map the experiences of people using certain products/services/spaces as of today or you can imagine an “ideal” future and describe that. Maps that plot the current are useful to find pain points and opportunities whereas the future maps are helpful to evaluate your ideas.

Lo-Fi vs High-Fi maps: At the start of the process typically you want to start with creating low-fidelity maps using sticky notes or drawing on a white board. When the research is complete and the details have all been discussed then create well designed finished maps.

TASK CENTERED SYSTEM DESIGN?

Reading for Monday:
http://grouplab.cpsc.ucalgary.ca/grouplab/uploads/Publications/Publications/2004-TaskAnalysis.LEAChapter.pdf

Also in Week 4 module on Brightspace