

Applied Data Science Project

HUMAN CENTRED DESIGN [L13]

Focus on the users:
the User Personas

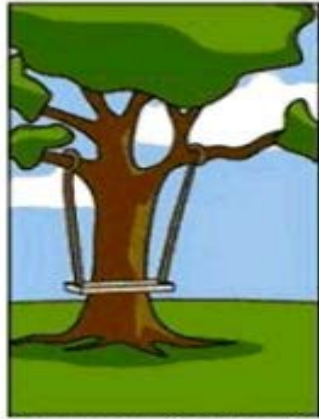
Antonella Frisiello



All we call it “wheel”, but...



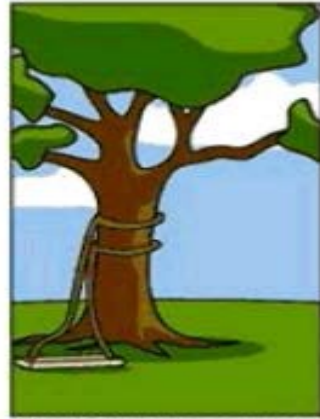
How the customer explained it



How the project leader understood it



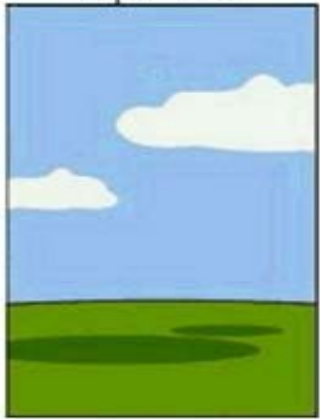
How the engineer designed it



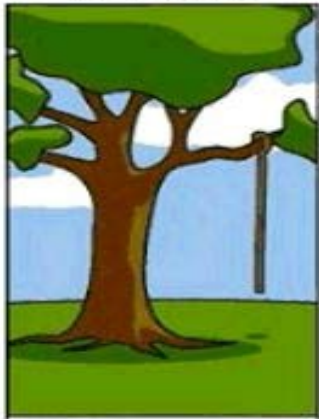
How the programmer wrote it



How the sales executive described it



How the project was documented



What operations installed



How the customer was billed



How the helpdesk supported it



What the customer really needed

“ No consumer ever buys a product.
Consumers buy what products provide.”

Moritz (2005).

Biases

In the data cycle, the main vulnerability is algorithmic bias.

“Bias in algorithms can emanate from unrepresentative or incomplete training data or the reliance on flawed information that reflects **historical inequalities**. If left unchecked, biased algorithms can lead to decisions which can have a **collective, disparate impact on certain groups** of people even **without the programmer’s intention** to discriminate.”

Lee, Resnick and Barton

There is a power and **informational asymmetry** between developers and users, which end up deploying algorithms that function in a “black box” style and whose criteria and methods are unknown to users.



A matter of mental models.



A mental model is an **internal mental representation** of the **perceived real world** and the **relationships between its various parts**.

It is the person's intuitive **perception of their actions and consequences**

A mental model is **the set of knowledge, beliefs, expectations and habits** deriving from our perceptions, direct and indirect experiences.

We develop mental models on any aspect of the experience, including the digital systems we use.

Mental models **drive our decision and behaviours**.

1 project/system, many mental models

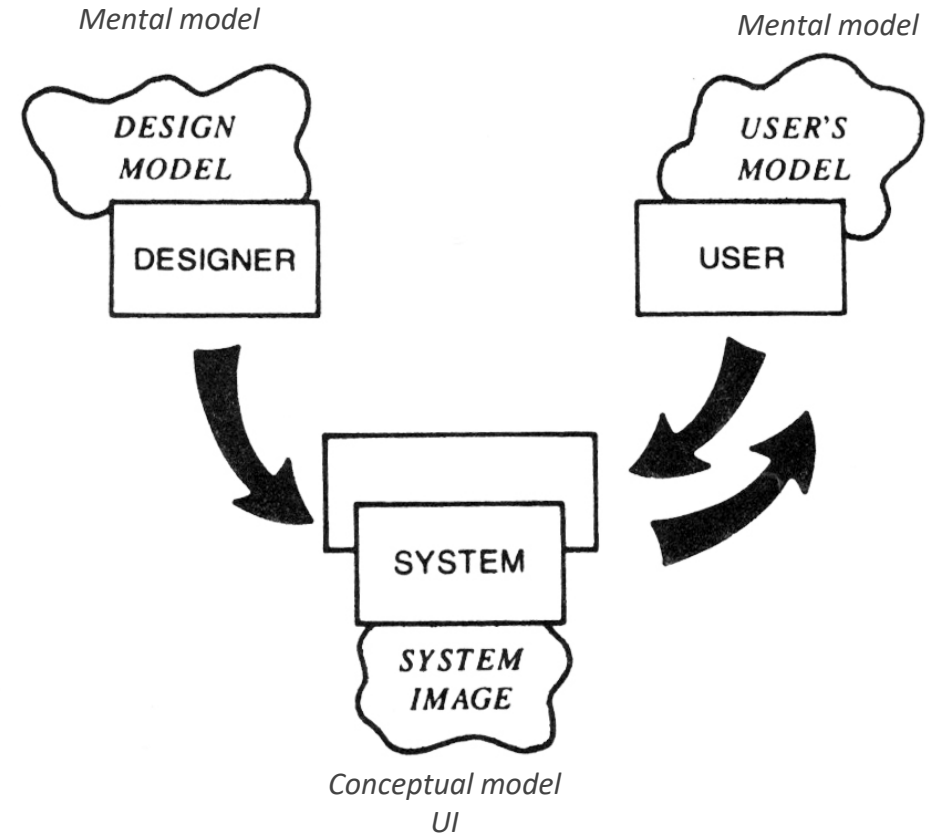
Each of us **creates mental models** that explain and organize our actions and interaction with the world.

The mental models we create derive from **what we perceive** and understand/learn about the objects.

The user's **behaviours are guided by the mental models created interacting with the** image of the system (UI).

If the system image (UI) is incomplete, inadequate or inconsistent, we'll build a weak mental model and have a difficult user experience.

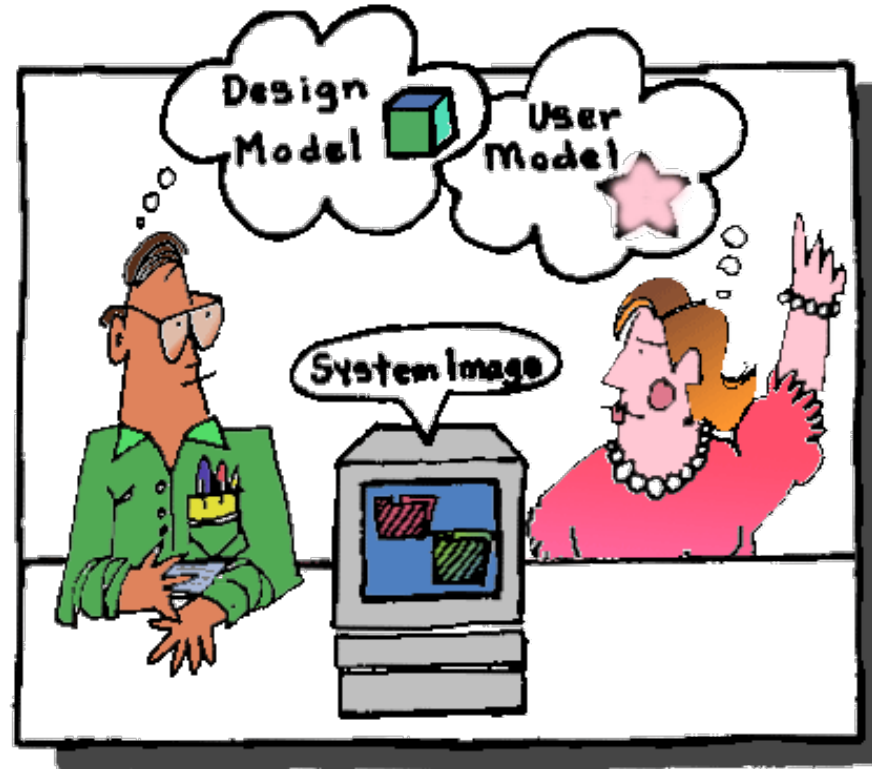
It results from all the elements of the system the user can access and interact with: physical interface, style of interaction, form and content of information.



“The system image reflects the designers’/developers’ mental model and works as a text open to interpretation .“

Mental models are:

- **Incomplete (i.e., essential)**
as they better focus on some aspects to the detriments of others
- **Unstable (i.e., flexible)**
as they change over time, with experience and time, highlighting some details and forgetting others.
- **Thrifty (i.e., efficient)**
since they aim to reduce the mental workload



To know the users' mental model, allow us to design better systems.

**We are not the user
The user is not the boss...
And not even a colleague, a friend,
the desk mate...**

We need to access to the **users' knowledge**
(both **explicit** and **implicit**)

In many situations, observers, listeners,
researchers are not allowed, so we need for
indirect knowledge.

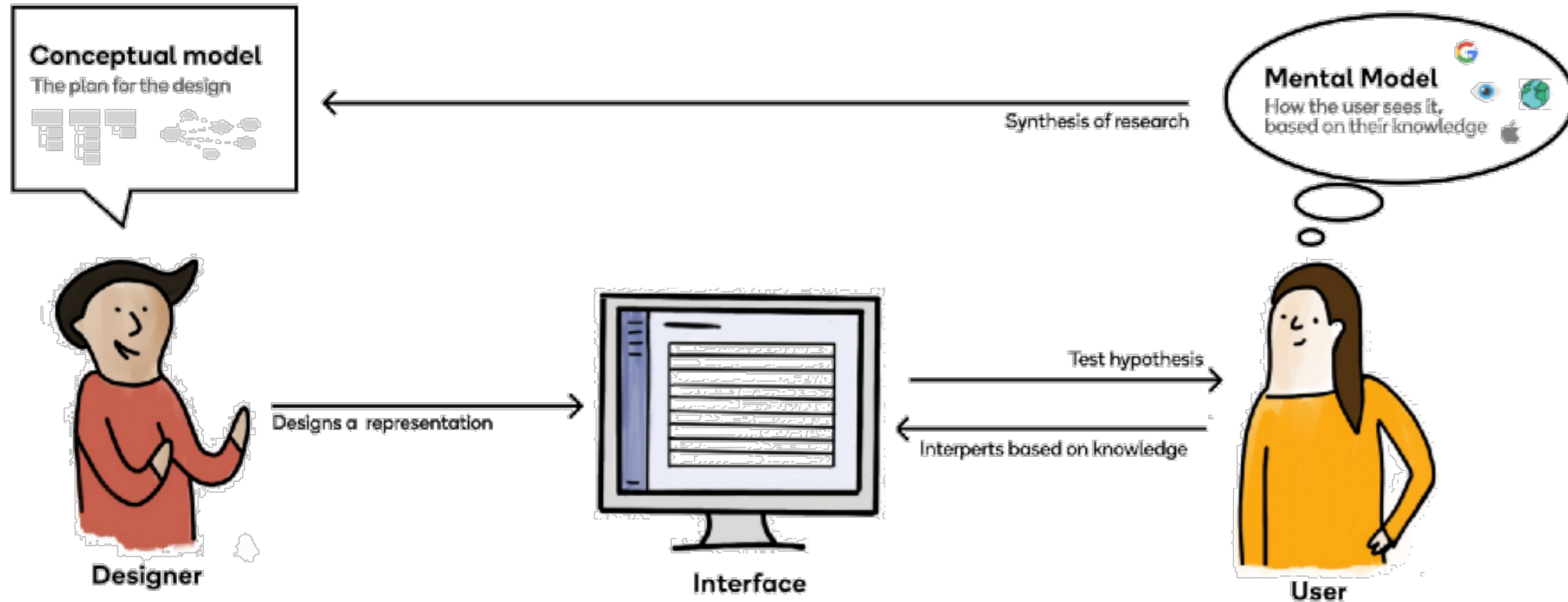
Gathering information to know and map the mental models
of users allows us to **get out of our perspectives** and biases
and design solutions widely usable and accepted.



From the mental model to the conceptual model and back

We as designers/developers often make too complex and detailed conceptual models, that do not respond the real needs and opportunities of the context and user

If the users get a mental model not corresponding to the system, they will likely do errors and get a bad experience (frustrating, difficult, boring, ...)



Mental models



Booking a flight

We have our **habits** when searching for a flight and the information we will need along the way



Drive a car

We expect what are the **main commands** to interact with, what the car can do and **how to drive it appropriately in our country.**



Use IM apps

We expect **messages** to come back in real-time and to send attachments like photos and GIFs.

We expect **to be notified** as soon as someone has responded.



The conceptual model

The conceptual model is a high-level description of the system operation and behaviour as we want to design.

It is the logical scheme that organizes functions and contents of the System, and specifies how to integrate the available data with users' goals and characteristics.

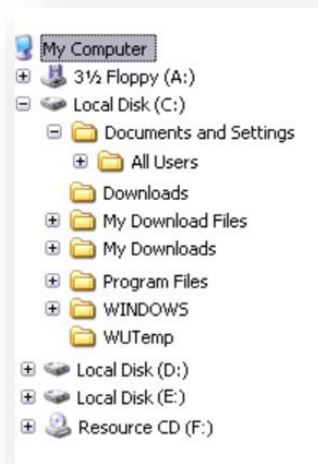
- It allows to express, analyze, define and decide explicit the implicit **objectives** (usability and user experience goals)
- Identifies the **human activities** to enable **through the interactions**
- **Specifies** the modes of **interaction** and the difficulties that may arise
- Respects and implements

It depicts and specifies the user interaction paradigm



Conceptual models

Directory



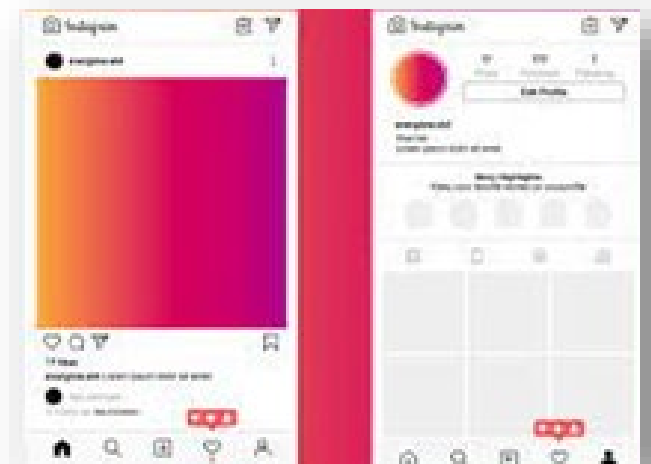
vs

Folders

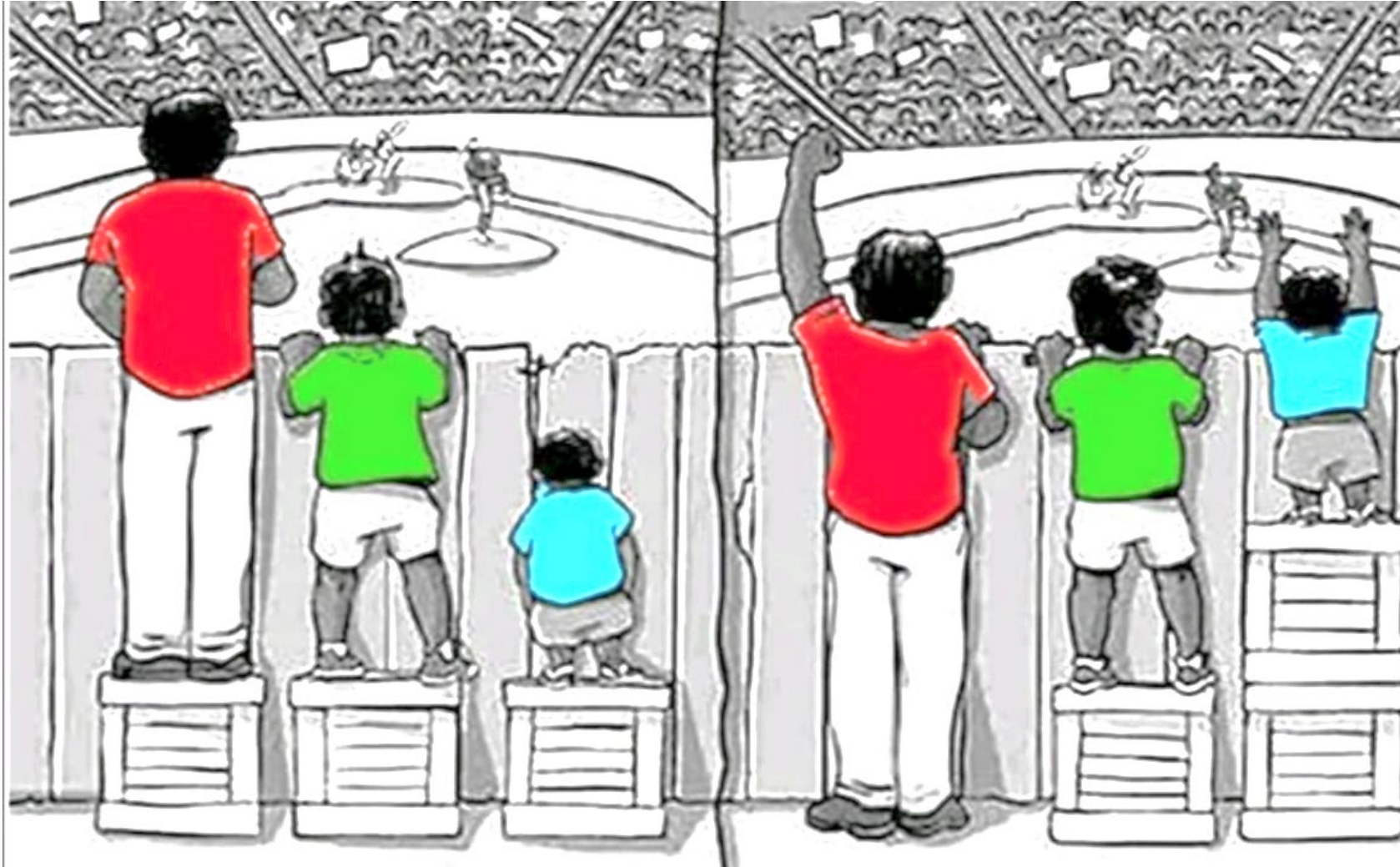


vs

Feed



One size does not fit for all

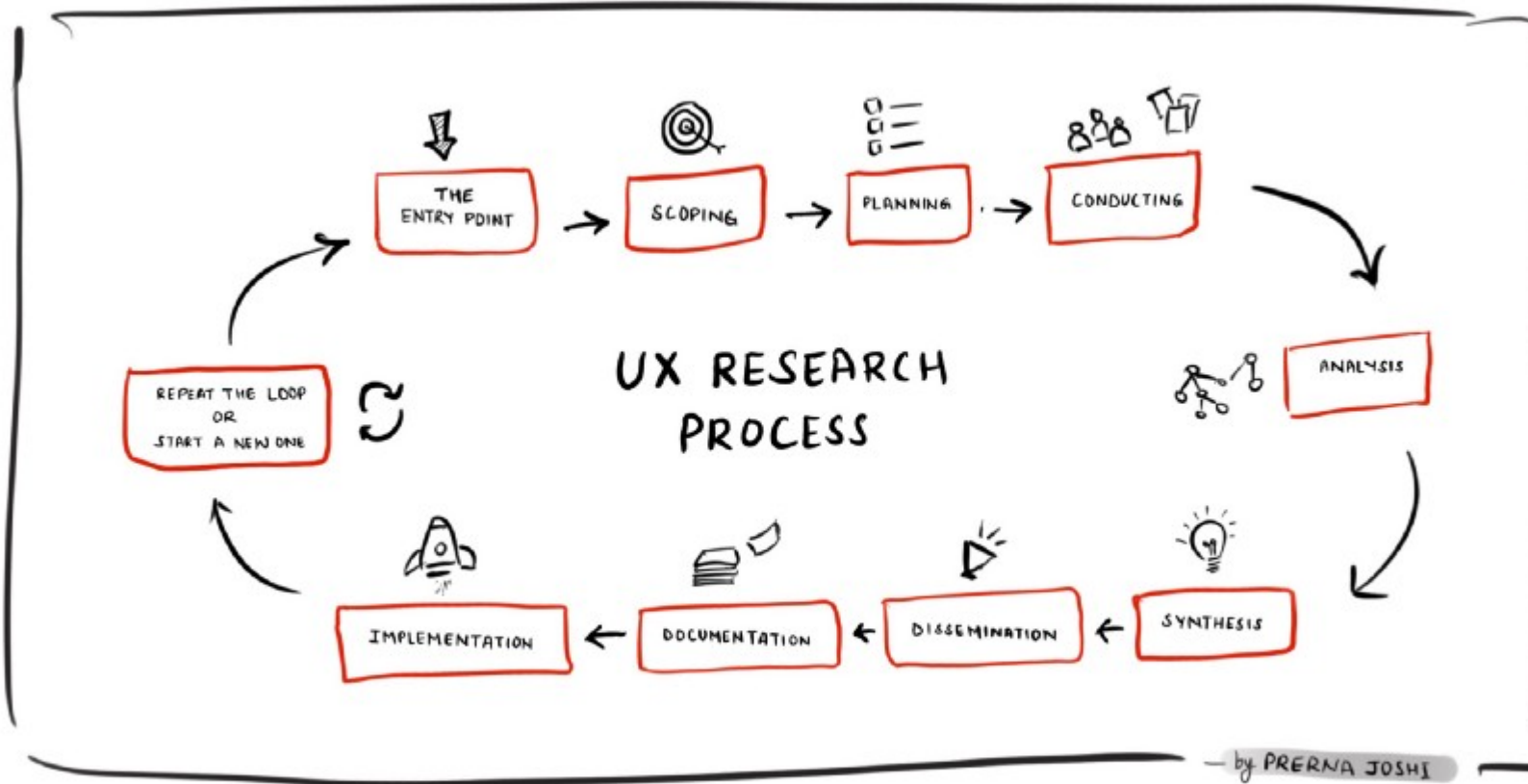


THE
AVERAGE
USER DOES
NOT EXIST.

Individual differences to consider:

- Physical
- Cognitive
- Cultural
- Organizational
- Temporary (of a context)

User research process



Start the User Research **before** design and development, to:

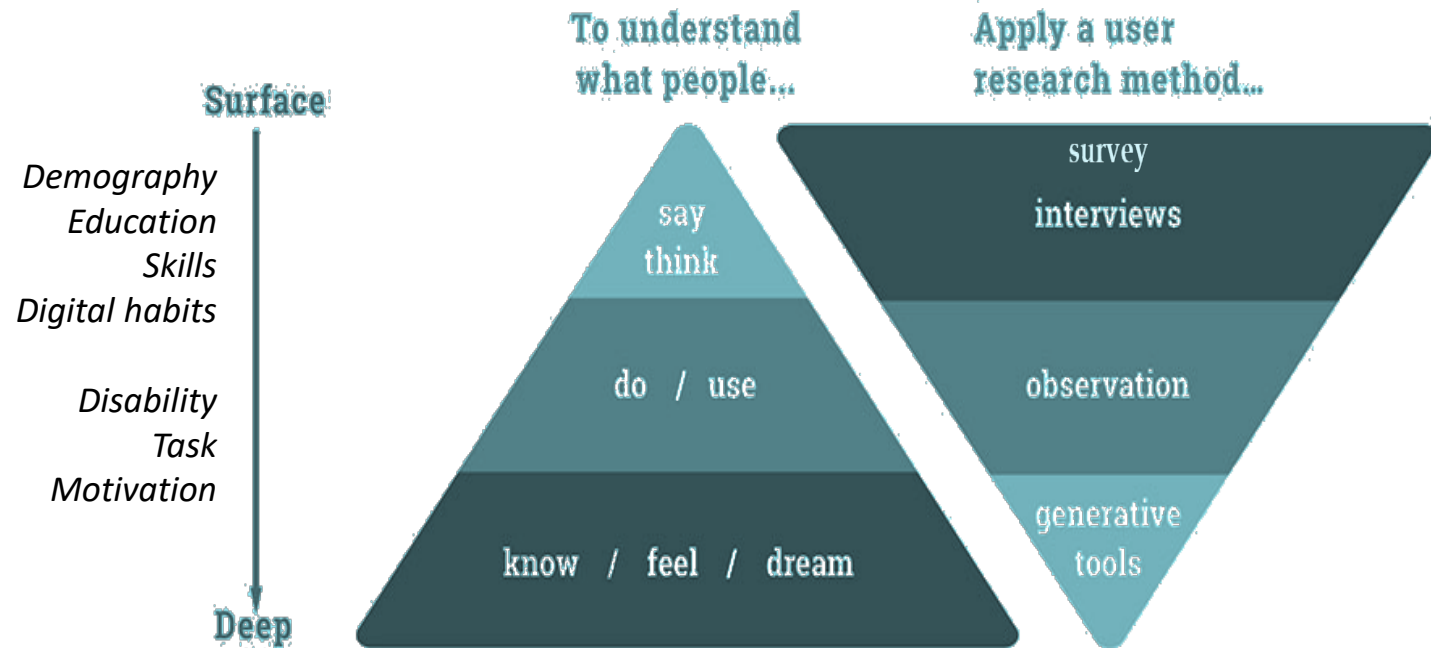
- Know the existing mental models associated with **specific tasks**
- **Detect and mitigate bias in data collection and processing**
- Experiment with **multiple UI metaphors**
- **Help users** adjust their existing mental models and expectations to the reality of ML-powered apps
- **Mitigate (even unwanted) effects** of the system

User research

Secondary Research is usually faster and more economical as compared to Primary Research. Decide where to look for data and why? This could be in-house materials/logs, product analytics, past research is done, competitor studies etc.
→ STAKEHOLDER ANALYSIS

Primary Research is for understanding the WHY of the problem, the problem areas and validating our hypothesis generated from secondary research.

Better if combined with Secondary Research the time invested in Primary Research could be used wisely for uncovering the WHY behind the problem areas which would have already been identified during Secondary Research.
→ PERSONAS, JOURNEY, USER TESTS



What do people need or want?
What is meaningful for the future users?
What technologies can help to reach their goal?
Which solutions or ideas are being tried in other areas?
What skill do they have in the field?
Will the use be occasional? Or repetitive?
Are they professional users?
What do those responsible for the system expect?

QUESTIONS ANSWERED BY RESEARCH METHODS ACROSS THE LANDSCAPE

BEHAVIORAL

WHAT PEOPLE DO

WHY &
HOW TO FIX

HOW MANY &
HOW MUCH

ATTITUDINAL

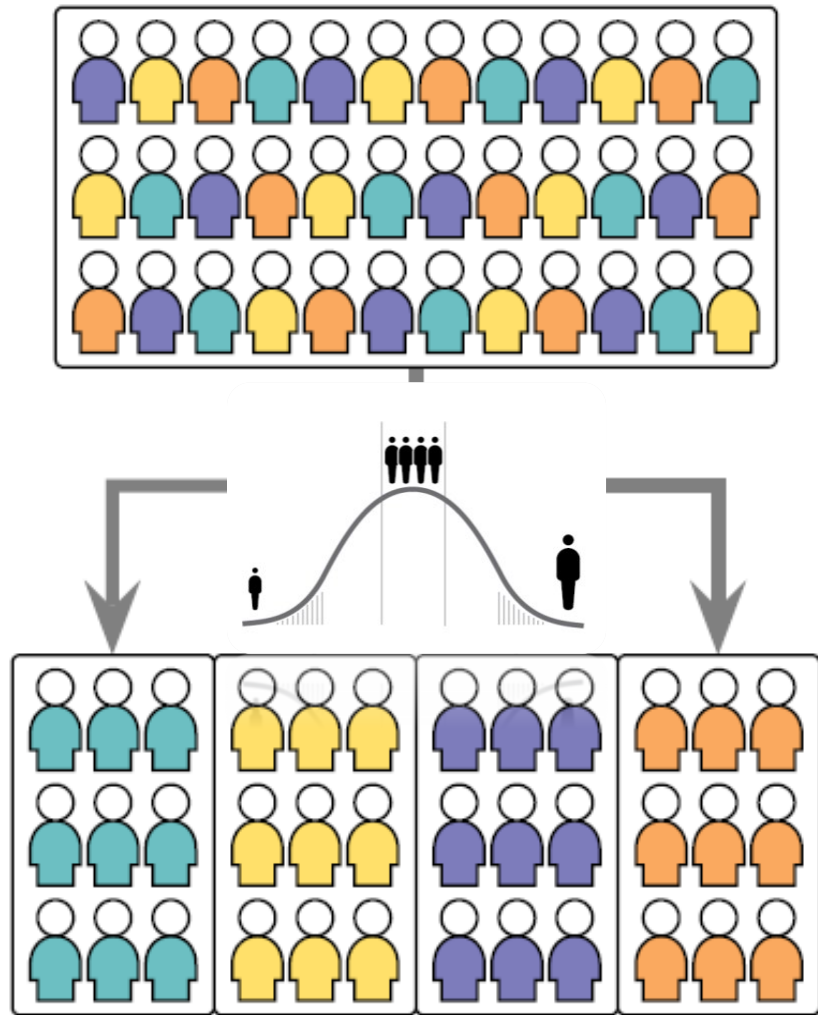
WHAT PEOPLE SAY

QUALITATIVE (DIRECT)

© 2014 Christian Rohrer

QUANTITATIVE (INDIRECT)

Sampling



The process allowing us to select a subset of observations (among all possible) in order to reach conclusions "generalizable" to the whole complex of possible observations.

Representativeness:

Samples are selected because it would not be possible to observe directly and completely.

Segmentation:

Divide the total audience into small groups of people

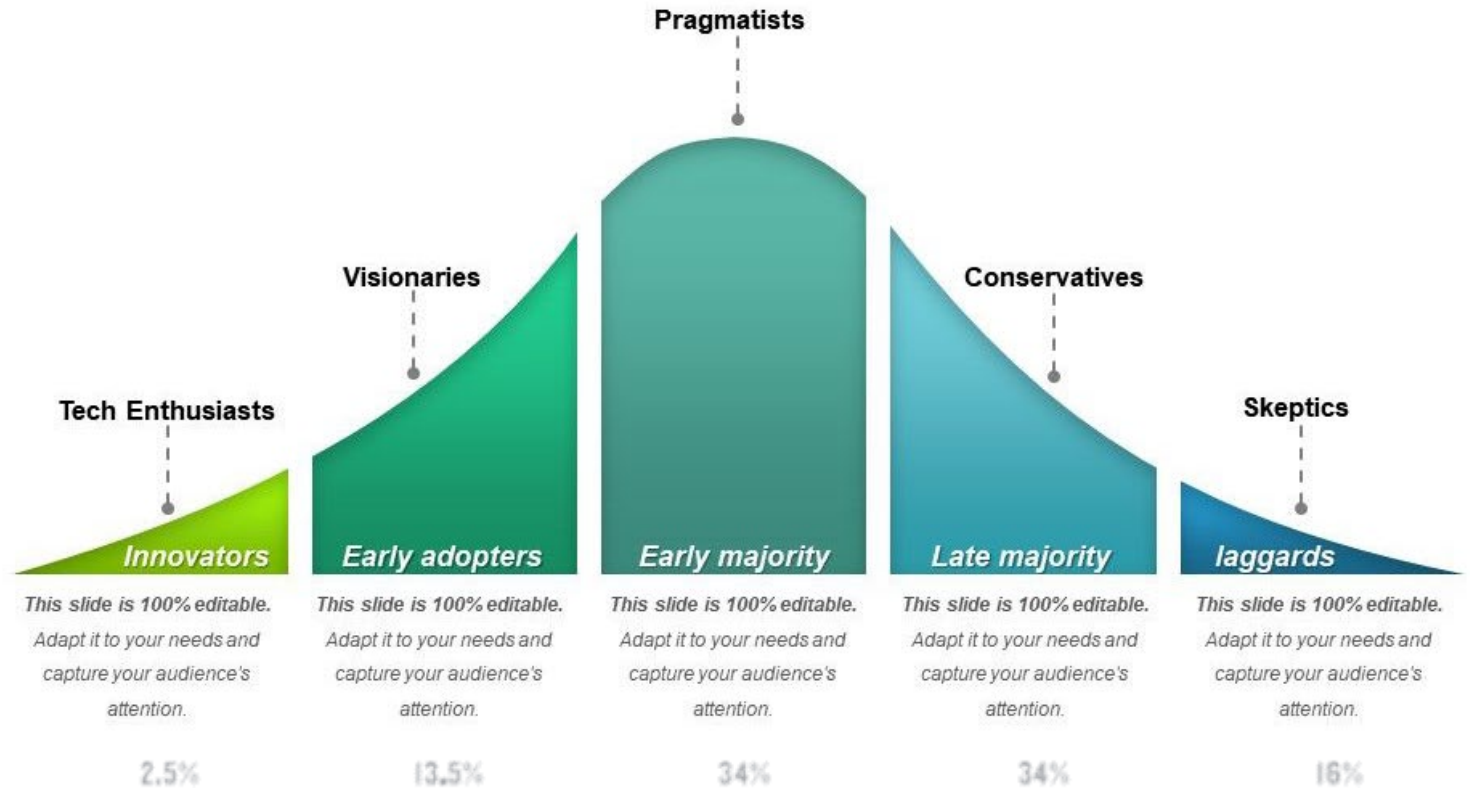
A normal distribution

The average user does not exist.
It's a conceptual mistake
that produces design errors

Engage, listen, observe, ask to people based on multiple criteria.

Explore data per different variables:

- Demographic criteria (gender, age, education, marital status, family composition, income)
- Psychographic profiles (attitudes, opinions, perceptions)
- Technological profiles (level of confidence with technologies, technological consumption)



FOCUS ON THE USERS: THE USER PERSONAS

The user personas

HCI method introduced In 1999 by Alan Cooper.

Personas are **data-driven portraits** of archetypical users that help designers and developers focus on the needs and goals of target users throughout the product development process.

- PRO: representing users **throughout the design process** of a software-based product, it enable designers and developers to empathize with these imaginary users and understand better their goals and needs and take on the perspective of underrepresented or easily overlooked users. For example, personas, which were specifically designed to represent users' diversity known from gender difference research, have been successfully used to detect gender-inclusiveness issues in software.
- The benefits of personas in the design and development of complex user interfaces are well known because personas closely approximate the mental model of various end users.
- CONS: However, personas are prone to activate and reinforce stereotypes. For this reason it is necessary to **ensure that the diversity of people is accounted. Minimize** stereotyping depicting multiple identities of a person.



Data display technique: THE USER PERSONA

Usually, when creating a persona, **not the whole person is described**, but the focus is put only on **relevant aspects** (goals, needs, attitudes, skills...) and specific context associated with these aspects. Personas usually encompass aspects such as **context and environment, tasks and workflows, skills and knowledge, personal traits, goals, values, motivations but also frustrations.**

- **Goal-oriented personas**, distinguished from one another based on their different goals (Cooper, 1999).
- **Role-based personas**, defined by their roles, (Pruitt et al, 2000)
- **Scenario-oriented engaging personas**, based on their individual characteristics, and their goals are based on these needs and appear only in the context of a specific scenario (Nielsen).
- **Pastiche personas**, fictional portraits established on user data but entirely grounded on fictional characters from literature or film (Blythe).

To adapt the personas method to the context of HAI, additional aspects describing the user's attitude regarding AI solutions as specifically relevant for personas for AI:

- **Trust** (How much trust does the user have in the decisions/output of the AI system?)
- **Acceptance** (Does the user accept (and follow) the decision of the AI system?)
- **Assent** (Is the user willing to accept/use the support by the AI system?)



What is a Persona?

One of the most effective ways to capture, communicate and use research findings.

*Personas are characters which **represent key attributes and behaviour** of customer segments. They are widely used in digital development but need to be **grounded in real user research** and customer data to be of value. The major benefits of developing personas include:*

- *Research findings can be encapsulated and personalized in individual users to **communicate complex research data**.*
- *Users' goals and needs can be a common point of focus for the UI development team.*
- ***Features** can be **prioritised** based on a clear understanding of which user groups will benefit.*
- ***User data can be segmented** by personas, giving a more intelligent understanding of user behaviour.*

UX24/7. eGUIDE INTERNATIONAL USER RESEARCH. <https://ux247.com/publications/> 

They are a sample of real users, not generic users but «archetypal», different for specific socio-demographic variables, roles, OBJECTIVES ... moving into specific scenarios.

They are

- *data-driven synthetic representation of complex knowledge, useful for internal communication*
- *dynamic documents, to be updated*
- *a reality check tool*

Cooper, A. About Face 3: The Essentials of Interaction Design, 2007

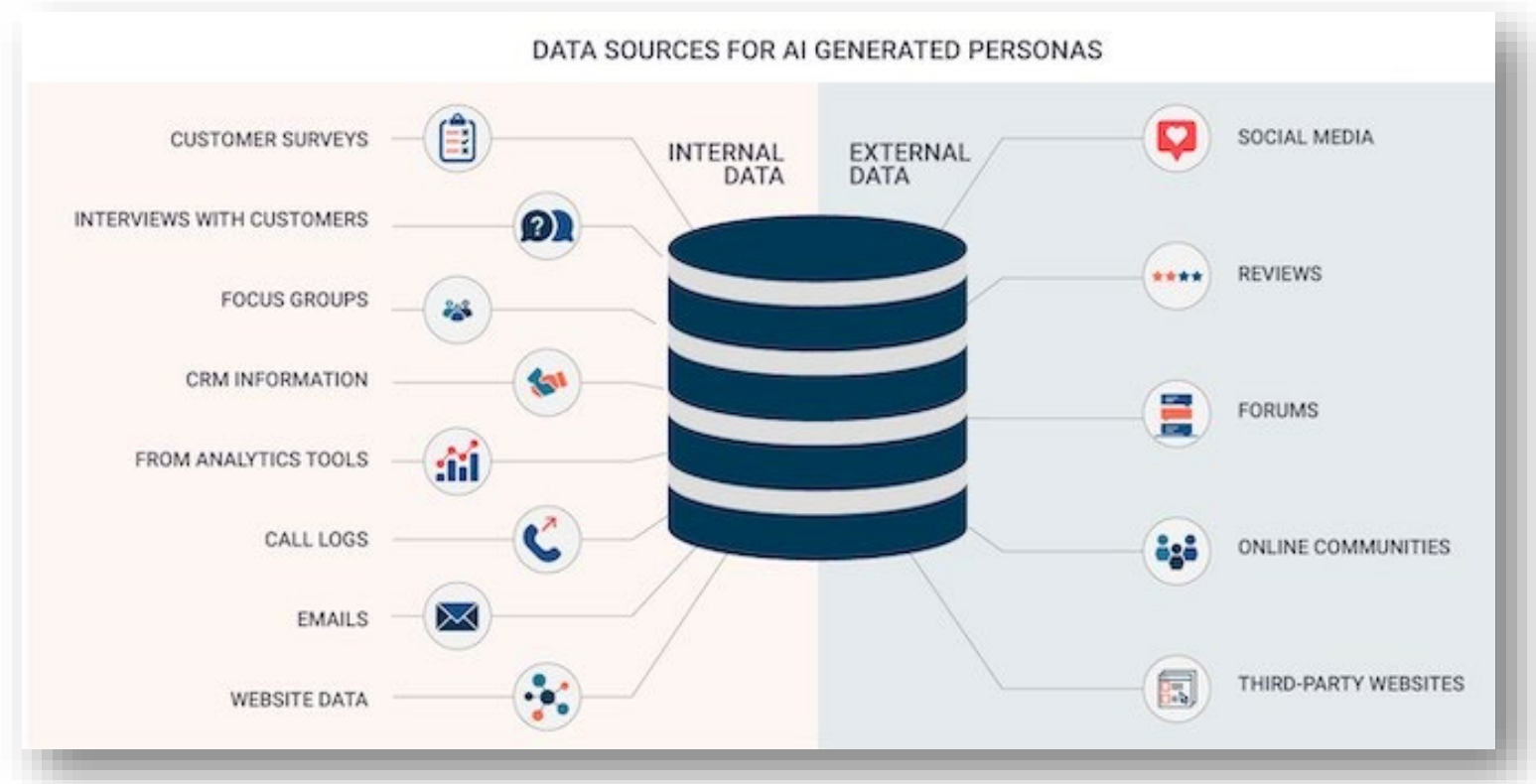


AI generated personas

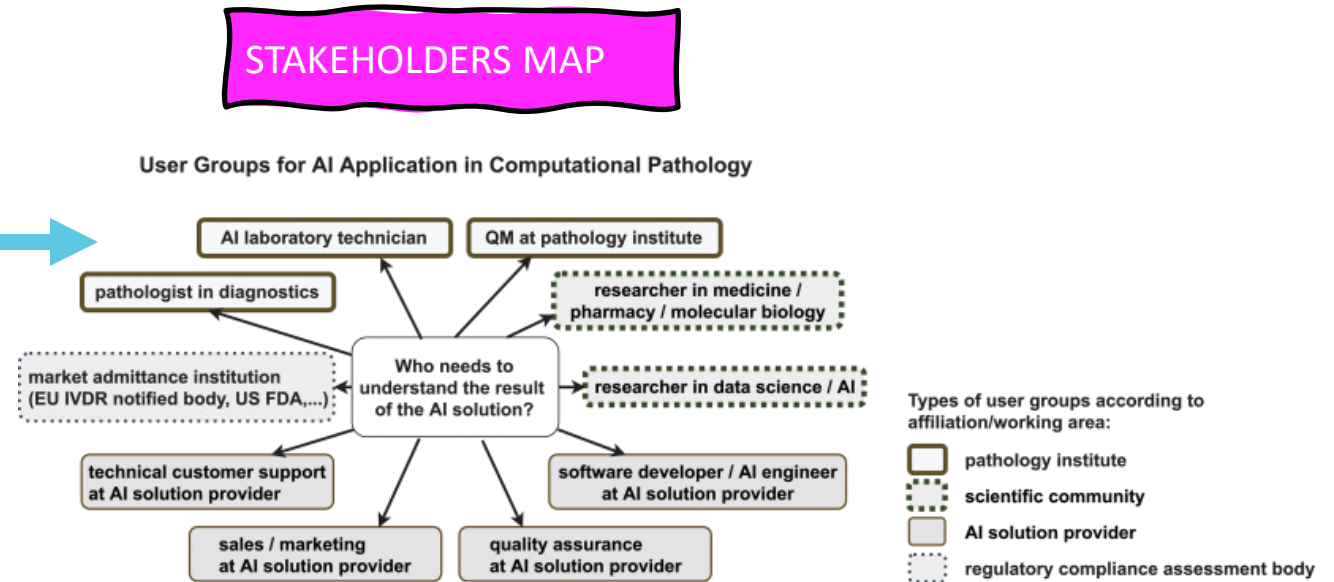
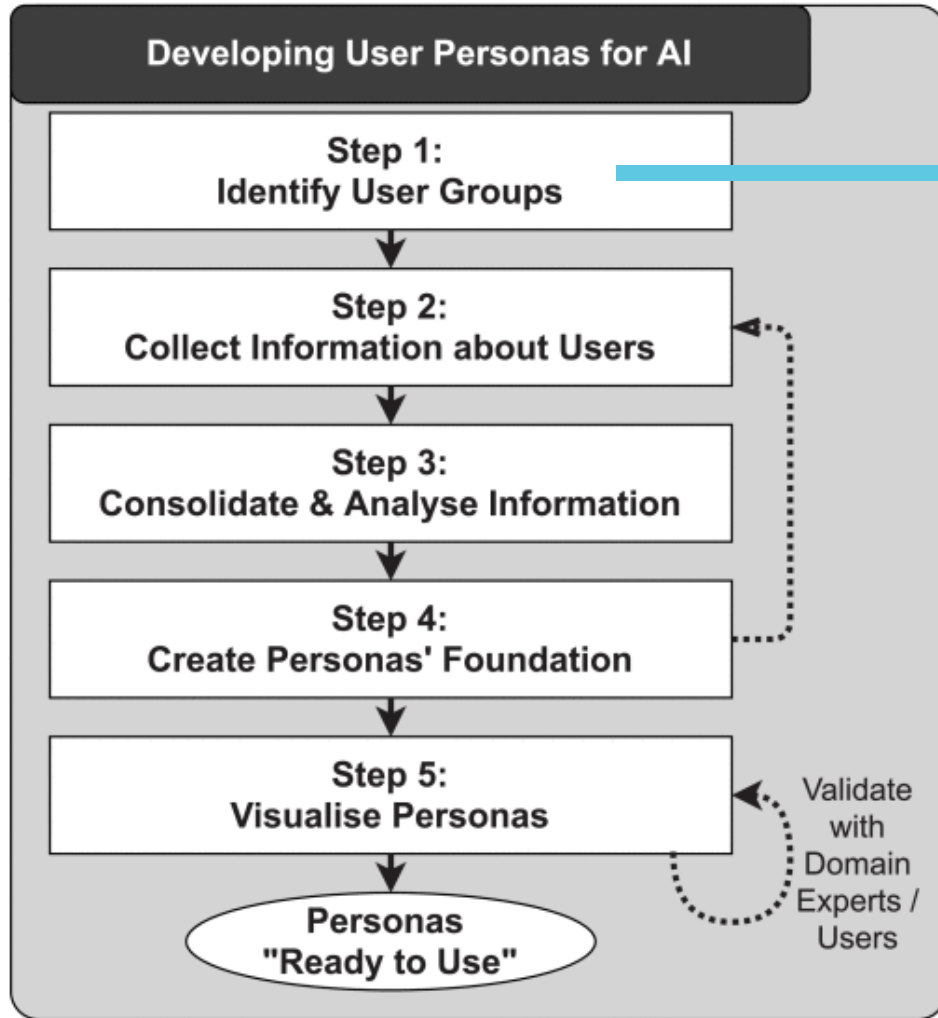
There is no single way of creating and using personas, neither in literature nor in practice.

Usually, with the exception of pastiche personas, **personas are based on data and information collected about real people**, by using **qualitative methods** such as ethnographic interviews, open-ended survey questions, or contextual inquiries and field studies.

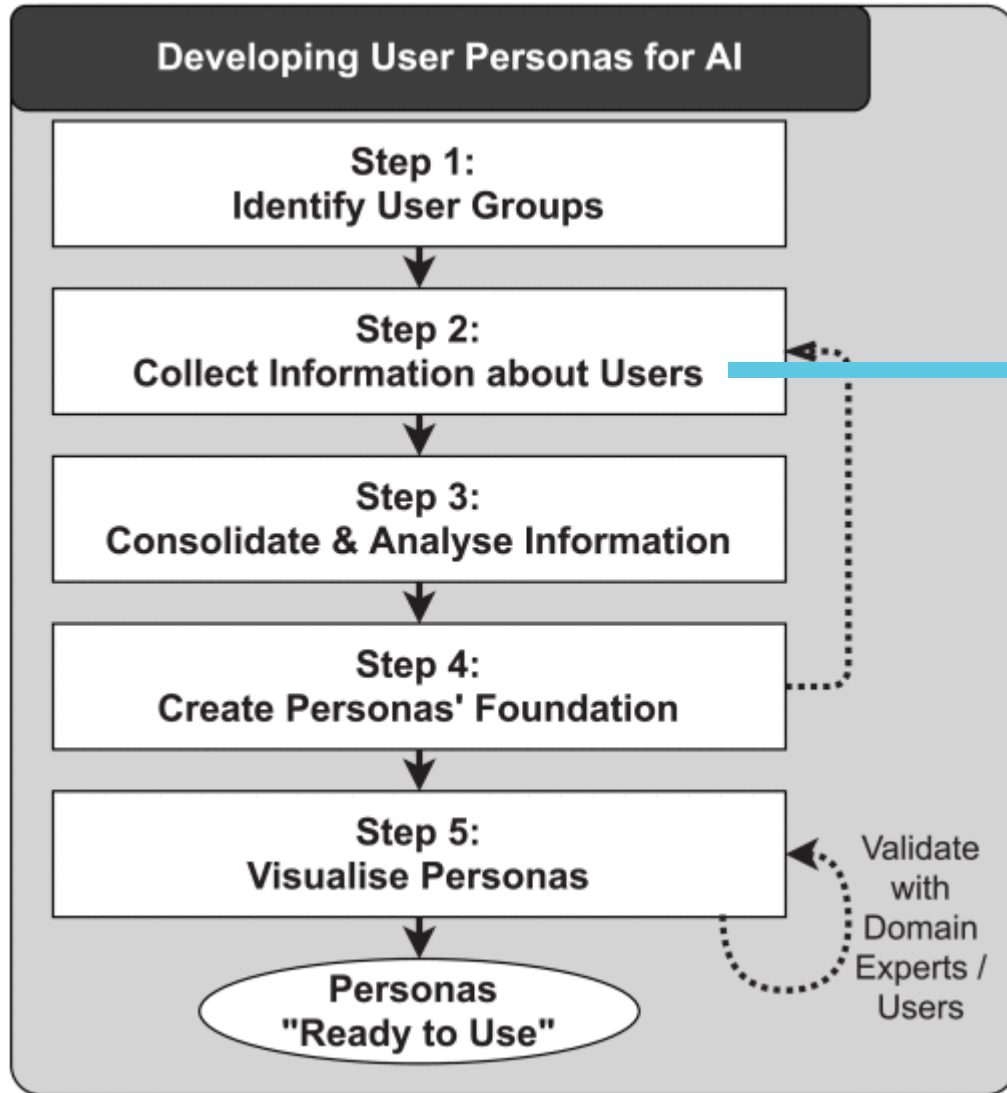
In the last 15 years, a collection of **large amounts of quantitative data** (for example from web analytics, social media, online customer data, and online surveys) together with machine learning techniques led to so-called **digital data-driven personas** (mainly used in marketing and customer research). So-called **hybrid personas** are created by utilising quantitative data from online analytics together with qualitative insights.



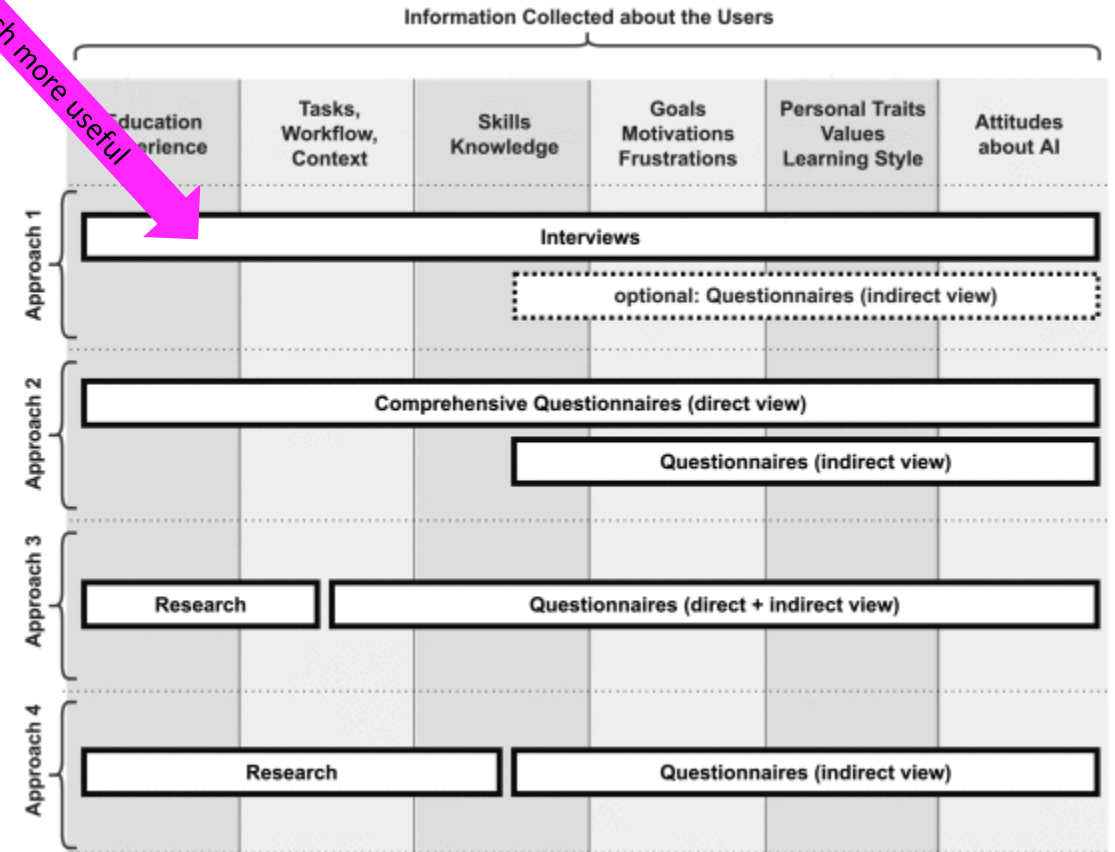
Design personas for AI



Design personas for AI



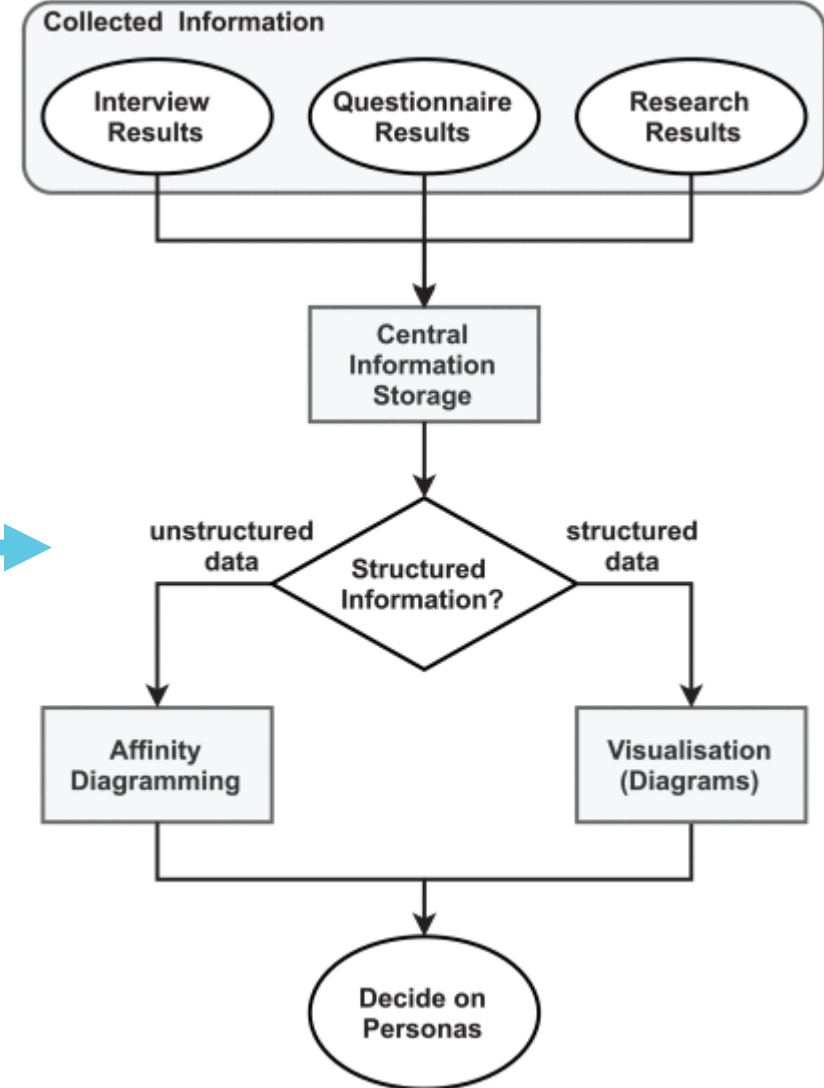
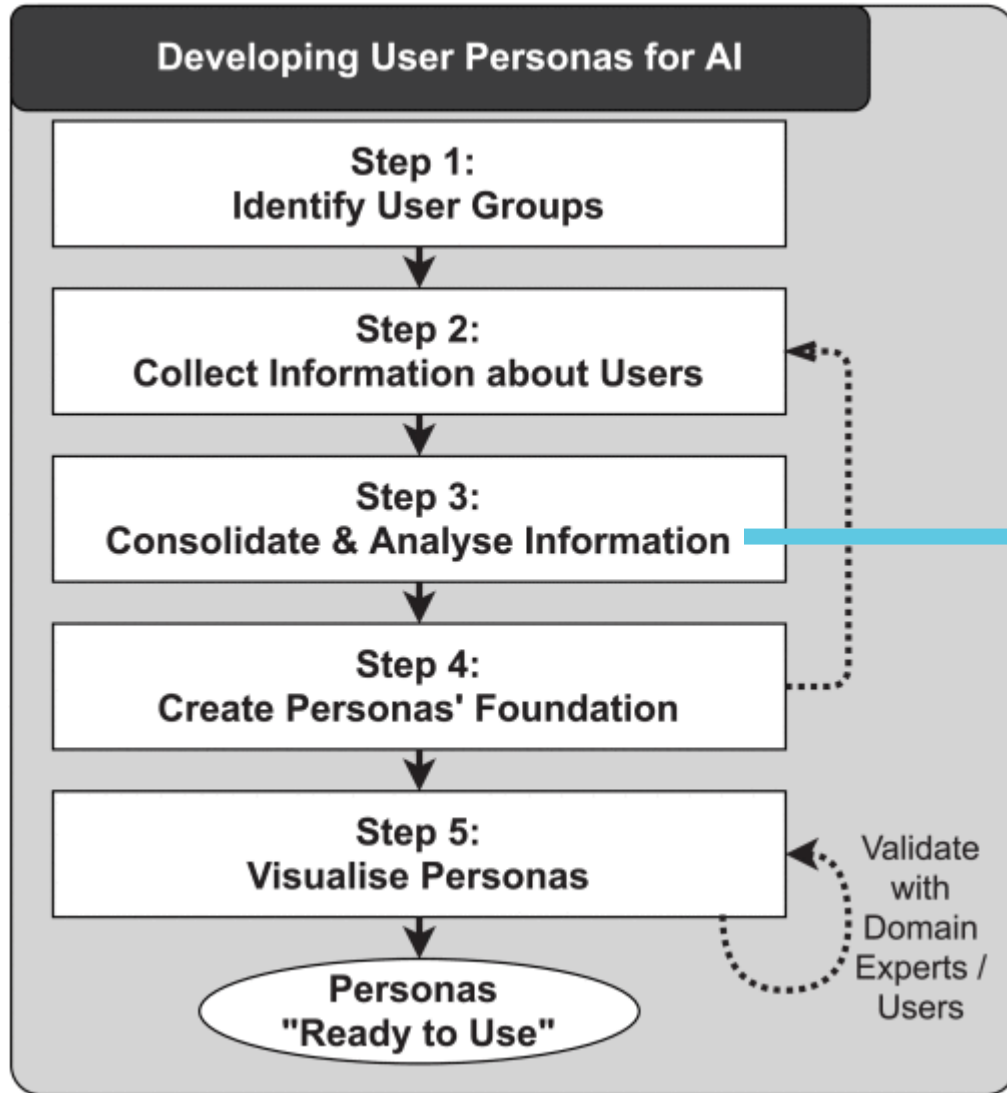
Very much more useful



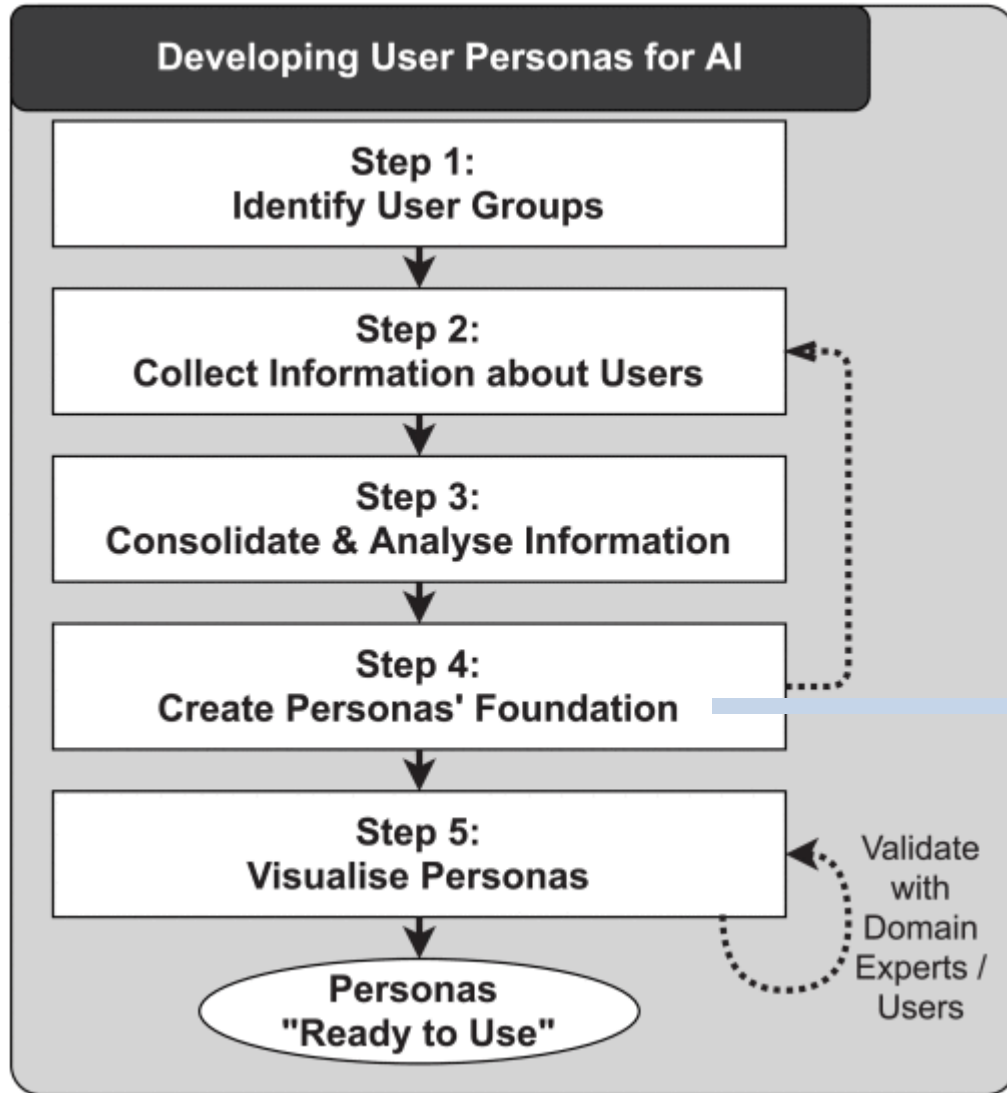
GOAL: to get to know (potential) users'

- goals and motivations, frustrations and hopes/aspirations, skills, education and knowledge, personal traits and aspirations
- tasks and context they would probably use the AI solution
- attitudes towards new technologies and innovations and machine decisions

Design personas for AI



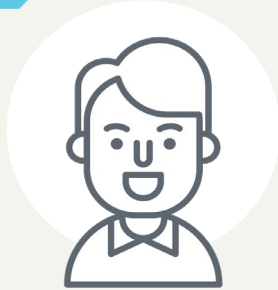
Design personas for AI



Include:

- A **photo**/portrait
- **Short bio** /demographic details
- **Mindset**: brief description of the point of view (specific and characteristic of the person in relation to one or more aspects of the project theme)
 - Interests, habits, values
 - Work (tasks, workflows, context)
 - Education/knowledge/skills
- **Goals**, values
- Relevant **pain points and gains, motivations and barriers**
- Attitudes towards **technology/AI**

Example



Amo prendermi cura dell'ambiente in cui vivo e collaborare alle iniziative organizzate dal Comune.



designers Italia
dalla parte dei cittadini

Giovanni

cittadino collaborativo

ATTIVITÀ

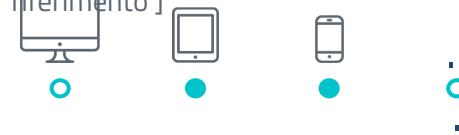
Giovanni ha 40 anni e vive in una piccola cittadina in provincia di Milano. Crede che la collaborazione tra cittadini sia molto importante al fine di vivere in un ambiente sereno e tranquillo. Per questo è molto attento alle iniziative organizzate dal Comune, alle quali partecipa attivamente.

OBIETTIVI E ASPIRAZIONI

Giovanni vorrebbe migliorare la propria vita riuscendo ad ottenere più aree verdi nelle quali far giocare i figli nel weekend e dove poter incontrare con maggiore facilità i vicini di casa.

STRUMENTI DIGITALI

[Qual è o quali sono le piattaforme di riferimento]



NECESSITÀ

- Giovanni ha necessità di comunicare in modo rapido e veloce con il comune;
- Giovanni vorrebbe conoscere meglio i vicini di casa ed organizzare insieme a loro qualche iniziativa per qualificare il quartiere;

DIFFICOLTÀ E FRUSTRAZIONI

- Difficoltà di trovare tutte le informazioni a proposito delle attività e dei nuovi progetti del Comune in un unico posto
- Giovanni non ha uno spazio di aggregazione nel vicinato dove può incontrare e proporre le proprie idee ai vicini di casa.

ESEMPIO

Example

ARCHETYPE 01 CECILE, KHAYELITSHA

“Life out of here will be much different!”

THE ACHIEVER

PROPERTY INVESTMENT

The achiever is a person who invested in his or her house, either to improve or expand the space available, create space for a commercial activity or buy the land where the house is built. Higher investments translate into more willingness to protect their property.

NEEDS

- PERSONAL & FAMILY SAFETY
- HOUSE PROTECTION
- PEACE OF MIND

FUTURE VISION

Everything the achiever is doing is improving his condition. In the future, she will be able to leave the settlement and start a different neighborhood. She is highly motivated; she wants better future years and is achieving the desired results.

ASPIRATIONS

- NICE HOUSE
- LARGER BUSINESS

ARCHETYPE 02 FRANCIS, ...

“I got KES for my business”

THE ASPIRER

PROPERTY INVESTMENT

The aspirers are making small investments to upgrade their business or living condition: they are in the process of becoming an “achiever” and every rand or shelling counts. The aspirer is very careful with

FUTURE VISION

Besides weak financial resources, the aspirer is working hard to get a better future for the family. They are strong and determined.

ARCHETYPE 03 PETER'S WIFE, NAIROBI

“Flooding but then the money went away...”

THE OPPORTUNIST

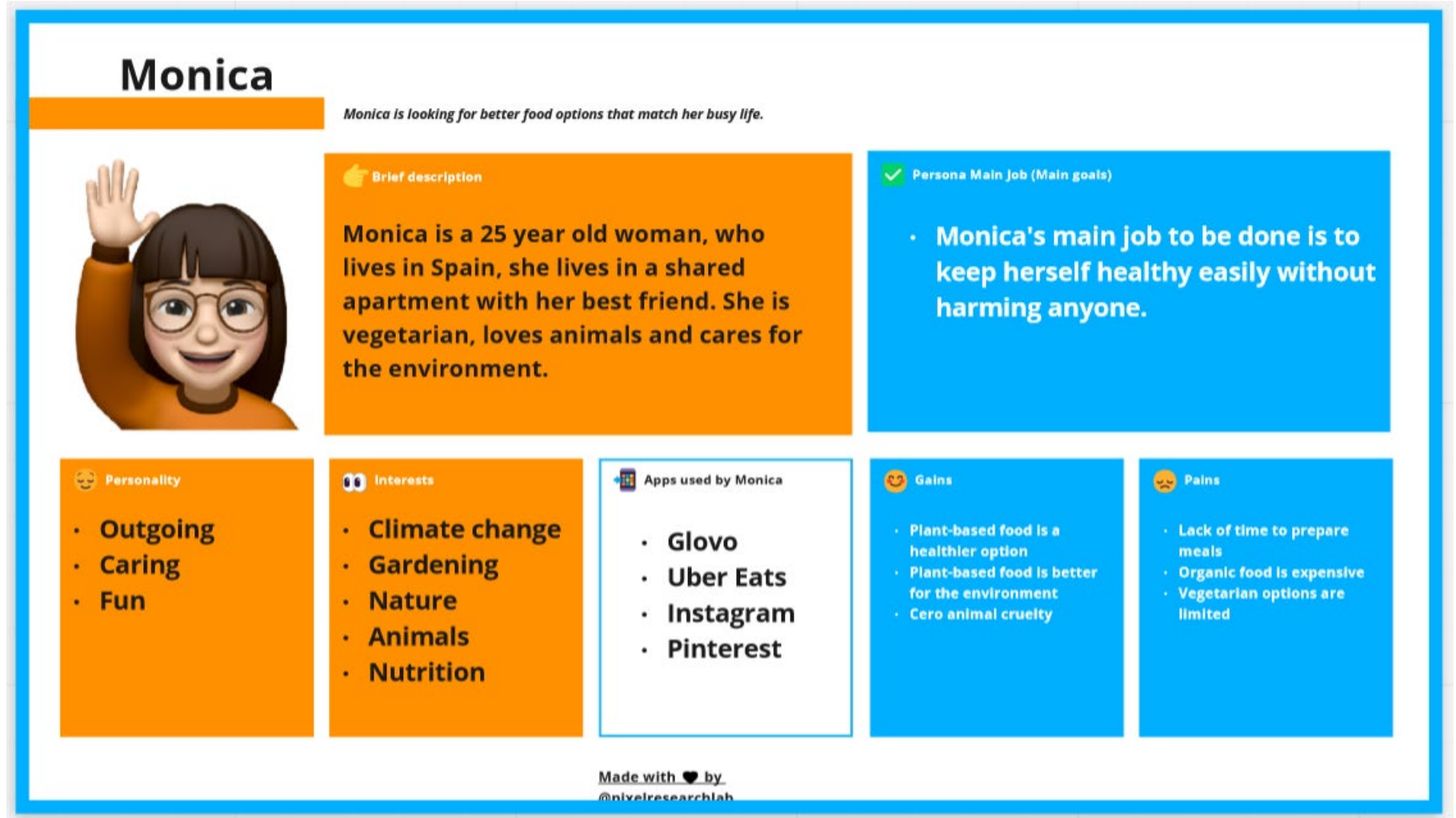
ARCHETYPE 04 PHUMISA, ...

“Saving money”

THE APATHETIC

HUMAN ARCHETYPES

Example



Example



Marie — The artist

Looking to sell her art easily online and gain exposure as an up and coming artist.

Age: 26

Marital status: Single

Occupation: Artist/Art Buyer

Location: London, UK

Income: £32,000

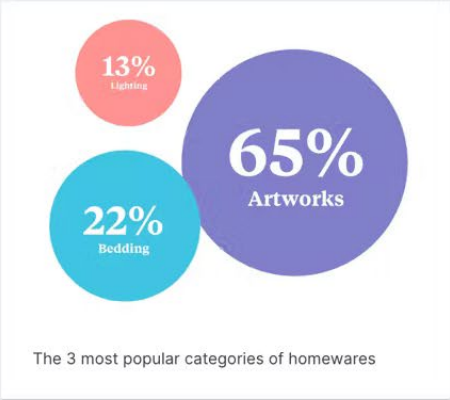
Bio

Julia is an artist in London. She graduated 4 years ago from art school and has been making art since joining a local studio 12 months ago.

Although she loves the people she works with, she has been giving serious thought to her future. While the studio that she works at is growing, she's worried that she won't develop a name for herself if she continues working with others. She's considering selling her art online and wants a reputable place to sell her pieces while gaining good exposure.

Needs

- To find the right website which offers the facilities she wants.
- To find a way to fund her artworks without incurring lots of debt.



- ### Pain points
- Concerned that she'll need to manage mailing artworks and won't be able to afford the website fees
 - Worried that she's one of many artists and won't get enough exposure
 - Doesn't want the service to take too high a percentage of her sales

- ### Ideal experience
- Mail her pieces internationally and ensure they arrive safely
 - Manage her inventory easily from her iPhone
 - Make great money to sustain her passion making art

Research

2 cards, 1 document

Quotes

- "It's important that I can connect with the buyers"
- "I really just need an easy way to promote my art and keep prospective buyers up to date"
- "The hardest part is managing the actual transaction."

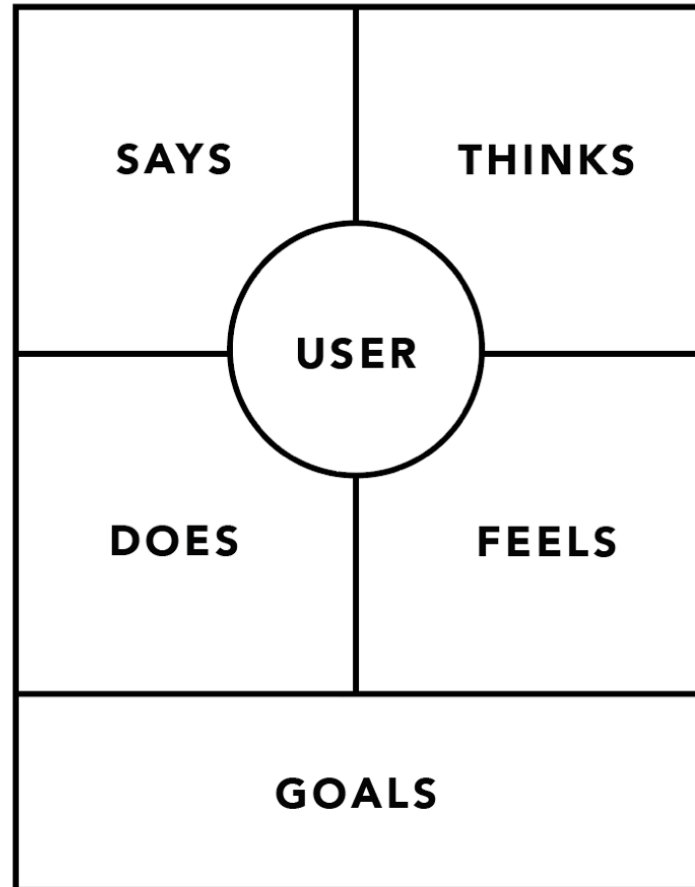
Survey results

3 words

E-Commerce Sales

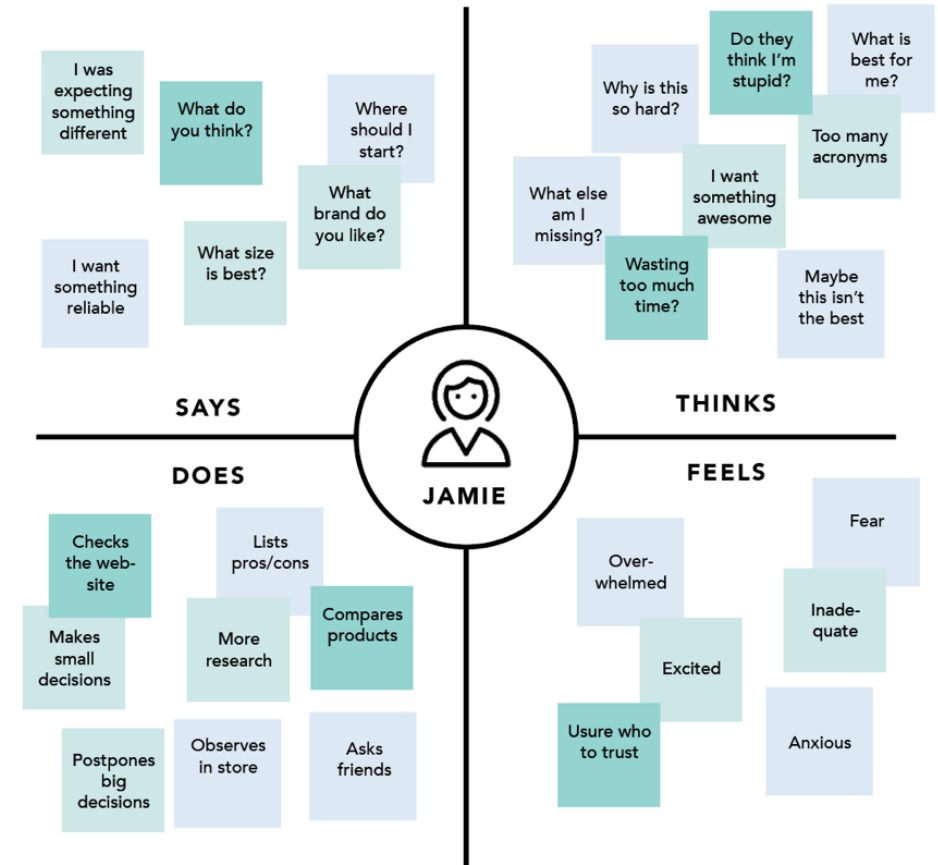
Year	E-Commerce Sales
2000	10,000
2001	12,000
2002	15,000
2003	18,000
2004	22,000
2005	28,000
2006	35,000
2007	42,000
2008	50,000
2009	60,000
2010	75,000
2011	90,000
2012	110,000
2013	130,000
2014	150,000
2015	170,000
2016	190,000
2017	210,000

Empathy map



NNGROUP.COM NN/g

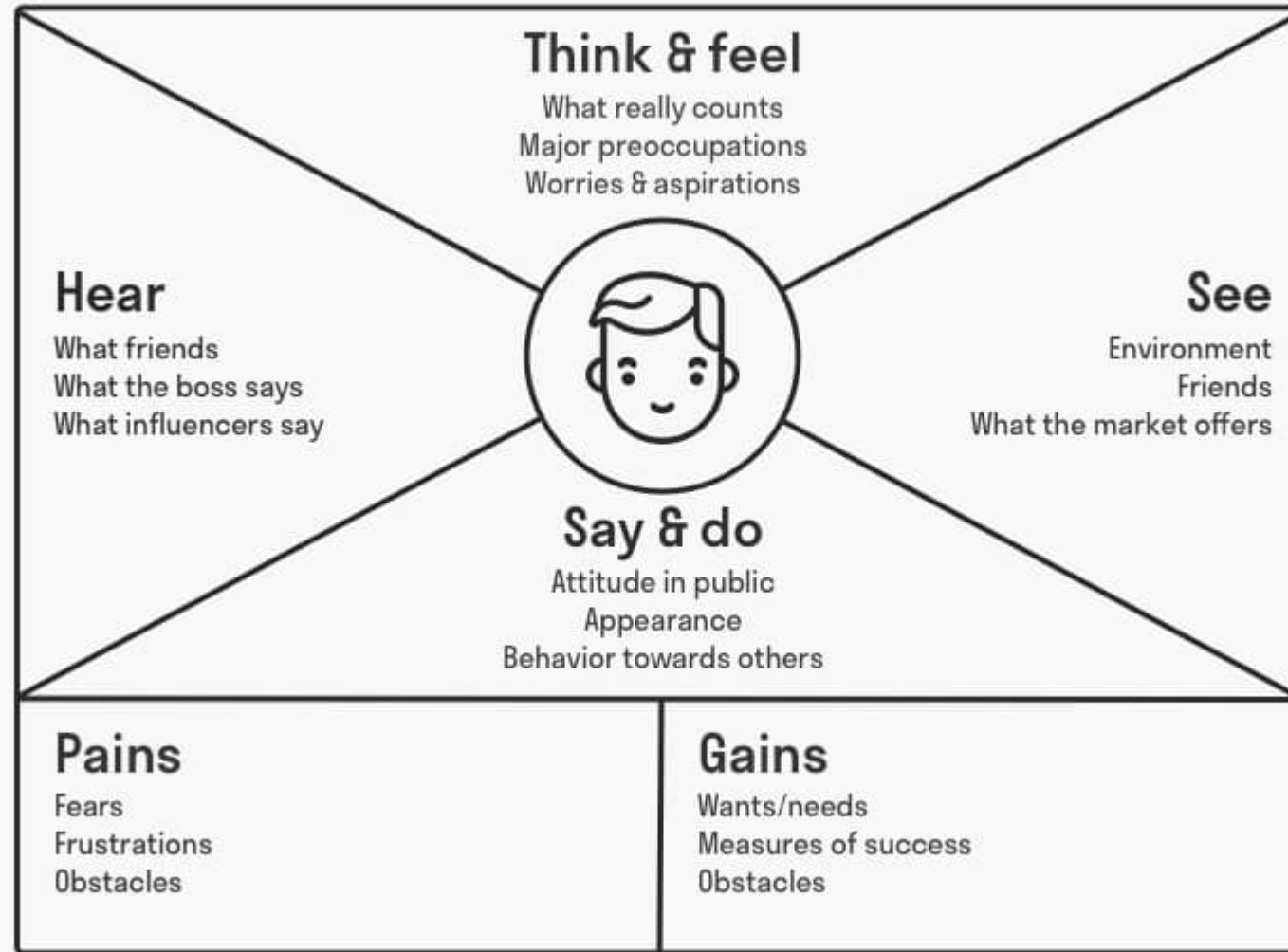
EMPATHY MAP Example (Buying a TV)



NNGROUP.COM NN/g

Empathy map

Visual tool developed by Scott Matthews at XPLANE

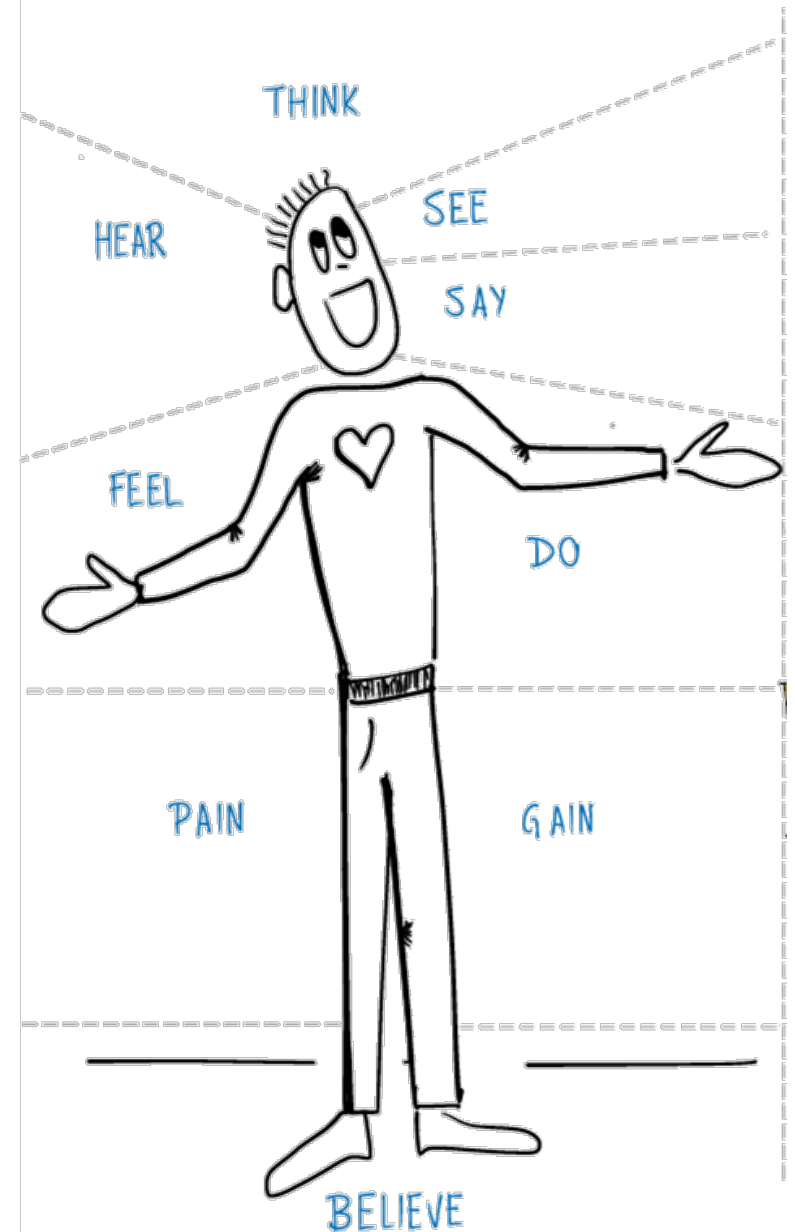


Enlarge empathy


Visual tool to build a stakeholder profile by quickly browsing the sources of information you have close at hand. The empathy map is intended for you to put yourself into a stakeholder's shoes and thereby see the challenge from a different perspective. It includes their main needs, drivers and expectations, as well as their behaviour and sources of information.

When to use

When you have identified your potential stakeholders and want to know more about them and don't have the time or the resources to carry out indepth market research. It is a tool to apply only with those stakeholders who you think you are going to engage with the process .




Example

PERSONA		Data	
 Foto Nome Ruolo Dati socio-demografici		Citazione	
		Livello di conoscenza tecnologica	
Biografia	Bisogni	Obiettivi / Aspirazioni	Difficoltà / Frustrazioni




WORKSHEET


Circular Buy-in


 A3 or bigger


Now, consider their perspectives to understand where they're coming from.


local and national government, suppliers, customers (existing and potential).


NAME:	WHAT MATTERS MOST TO ME?	HOW DO I SOLVE PROBLEMS?
		

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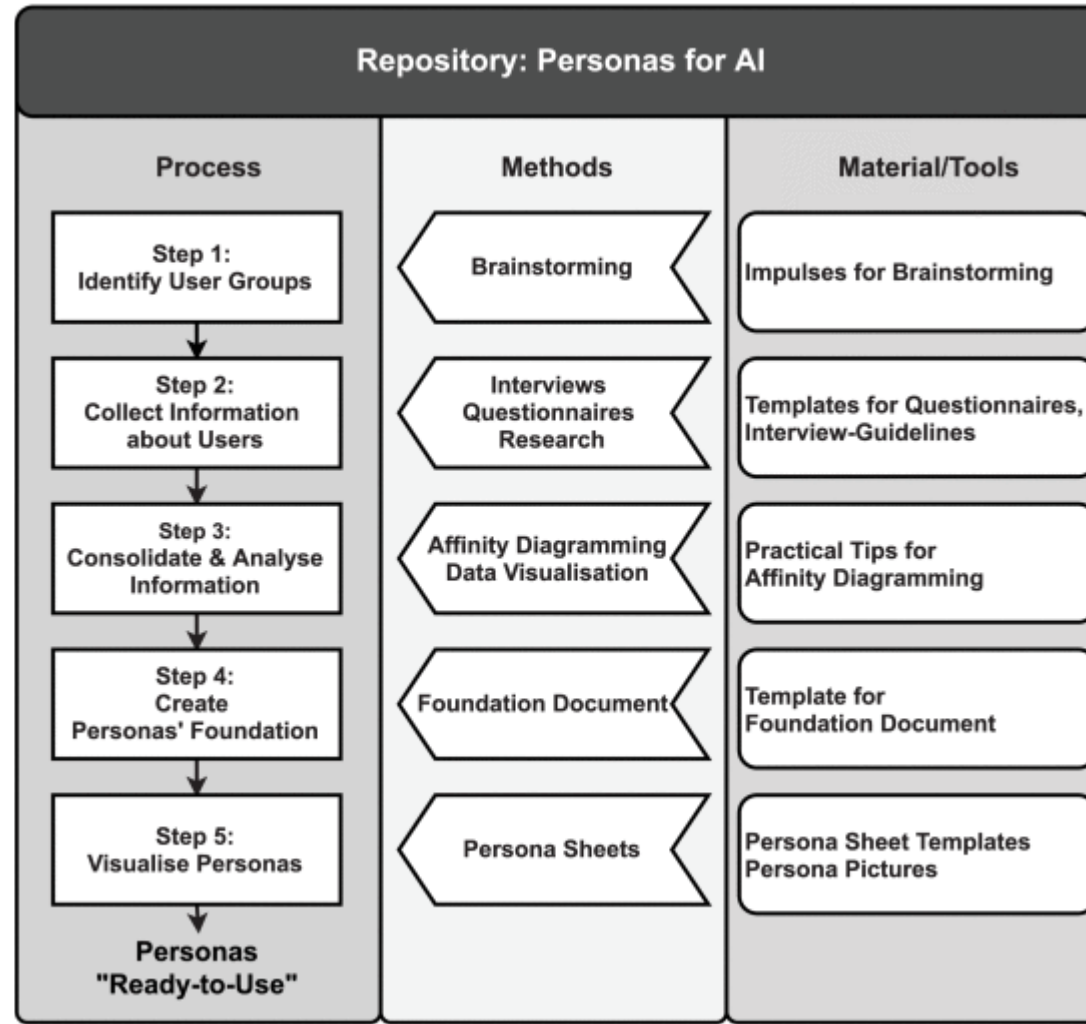
NAME:	WHAT MATTERS MOST TO ME?	HOW DO I SOLVE PROBLEMS?
		

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NAME:	WHAT MATTERS MOST TO ME?	HOW DO I SOLVE PROBLEMS?
		

In summary



Keep on working

Create more personas, dig the main users considering individual and contextual variables

- Searching for more data to get deeper insights.
- Interviewing and validating personas representatives
- Searching for alternative views, diverging from your first analysis
- Refine the visualization: create better labels, add additional data, identify inspiring visual representations.

Questions



Antonella

Frisiello

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