



Module II. Technical

6. Info
graphic
course

Topic 1. Design Process
and Visual Design Basics
in UX

Lesson 1.
User-Centered Design



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This lesson introduces students to the main topics of the design process that should be applied when creating an infographic.

It contains an overview of the most used theories and methodologies for the design of information visualizations and user interfaces.

Specifically, explicit reference is made to the Usability and the **User-Centered Design methodology**, as their goal is optimizing the User eXperience (UX).

In this lesson, we will learn:

What is the User-Centered Design.

At first, we describe **Design Process and Usability**, and then we will pass to **Context of Use and User Needs**.



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Design process and Usability

User-Centered Design (UCD), is fully part of a broader methodology called Human-Centered Design, an approach oriented towards the creation of **usable systems**.

Applying human factors principles to system design **assures that human** abilities, skills, limitations and needs **were properly taken into account**, in respect of the system and its functional requirements.

Human-Centered Design
places the user at the **center!**





Photo credits by Ian Taylor, Unsplash

In summary, while traditional design approaches focus attention on the system and its functional requirements, User-Centered Design studies and analyzes the **characteristics, needs and habits** of the **user**, identifying the various contexts in which the system will be used.

This means that you always have **your user in mind!**

In physical and virtual museum too, **visual information** and **contents have to be adequate** to the capabilities and needs of the users.



Photo source <https://www.nga.gov/education/kids.html>

For example, the National Gallery of Art (London) offers to kids a **more engaging** and **accessible visit** to the museum thanks to an app with visual elements and targeted information.

Users need to easily understand and be able to **find the right information** in physical and digital environments!

This is especially important, since nowadays many documents of our cultural and natural heritage are available in the form of **digital resources** (data, photos, videos...) and they can be easily searched and used through **interactive tools**.



Photo credits by Joanna Kosinska Unsplash

For example, let's see how the French department of Hauts-de-Seine chose to **share** a large iconographic collection in **open data** through the portal powered by Opendatasoft.

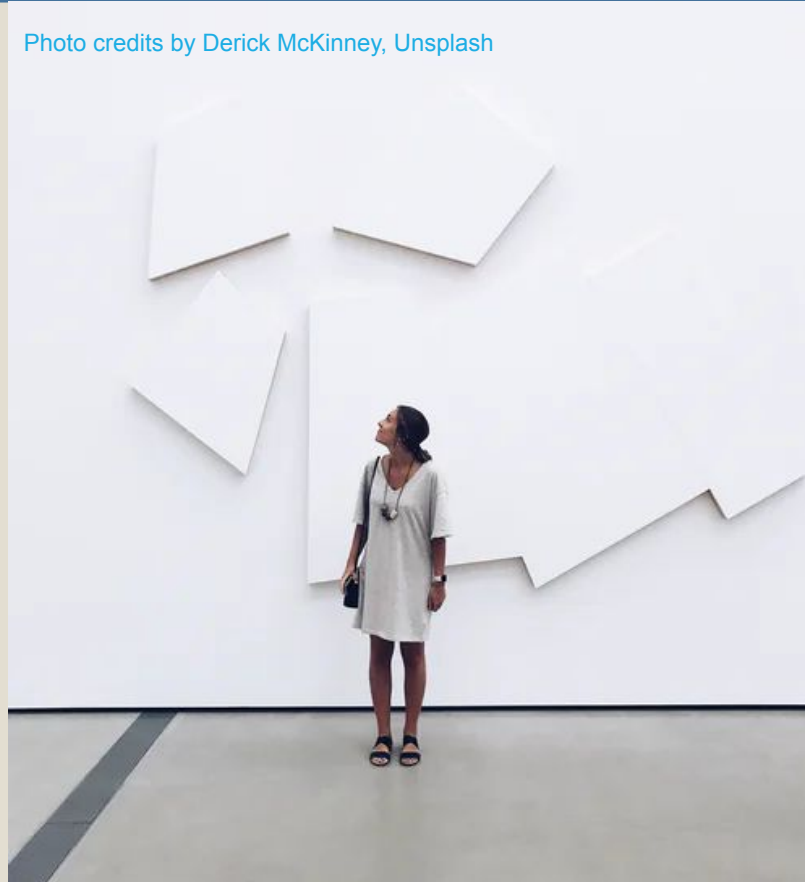
In one of the storymaps created about the city by using the open data about the cultural heritage, they show on an interactive map the places illustrated in the vintage postcards of the Departmental Archives.

(Source: <https://opendata.hauts-de-seine.fr/page/accueil/>)

The image shows the 'OPEN DATA hauts-de-seine' portal. The top navigation bar includes 'DONNÉES', 'API', 'DÉMARCHE', 'LICENCES', 'PARTENAIRES', 'RÉUTILISATIONS', and 'CONTACT'. A search bar is prominently displayed with the text 'Rechercher un jeu de données...'. Below the search bar is a horizontal row of various blue icons representing different data categories like environment, transport, and economics. The main content area features a grid of vintage postcard images, each with a small numbered label. To the right of the grid is an interactive map of the Hauts-de-Seine region, with orange markers indicating the locations of the postcard subjects. The map includes labels for various towns and districts such as Argenteuil, Nanterre, and Saint-Denis.

Visual content and information design are fundamental in creating a **satisfying user experience** for physical museums, too.

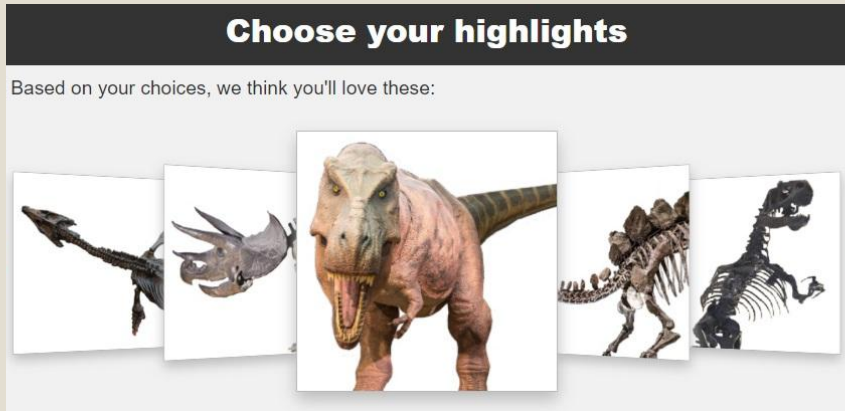
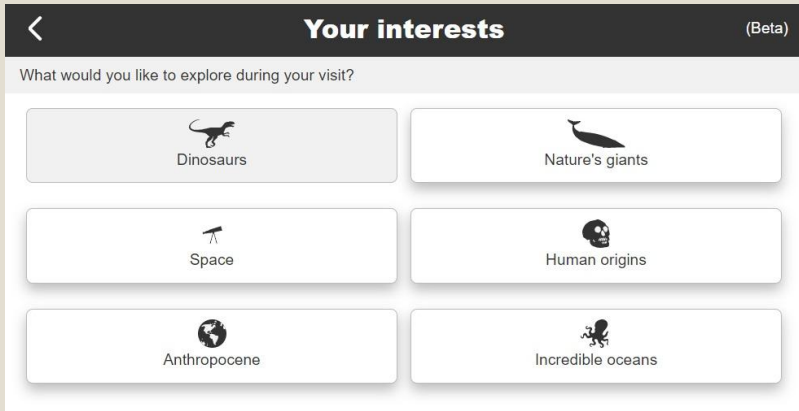
Photo credits by Derick McKinney, Unsplash



It is important to consider how the **integration of physical and digital spaces could support the user** in finding the right and desired information.

For example, the ***Museum visit planner*** app was created by The Natural History Museum in London to support visitors in creating the best itinerary based on their **specific interests!**
Look at some pictures of this app!

Tell us what you're interested in and we'll plan your next day at the Museum!





Applying the User-Centered Design process to user interface and information design allow to create a proper **User Experience.**



Moreover, one of the main aspects to take into consideration during the design process for the creation of a good experience is its **quality of use**, called usability when referring to an interactive system.

By definition, usability is:

“The extent to which a product can be used by specified users to achieve specified goals with **effectiveness, efficiency, and satisfaction** in a specified **context of use**”.

Definition provided in the technical standards UNI EN ISO 9241-11: 2002, ISO 20282: 2006 and UNI 11377: 2010



Photo credits by Aaron Burden, Unsplash

- **"Effectiveness"** is the accuracy and completeness with which users achieve specific goals.
- **"Efficiency"** refers to the resources spent in relation to the accuracy and completeness with which users achieve results (i.e. effectiveness).
- **"Satisfaction of use"** is the comfort with and the positive attitude towards the use of the product (or system).

The degree of usability in using a product is **verified** by techniques, tools and methods of investigation.



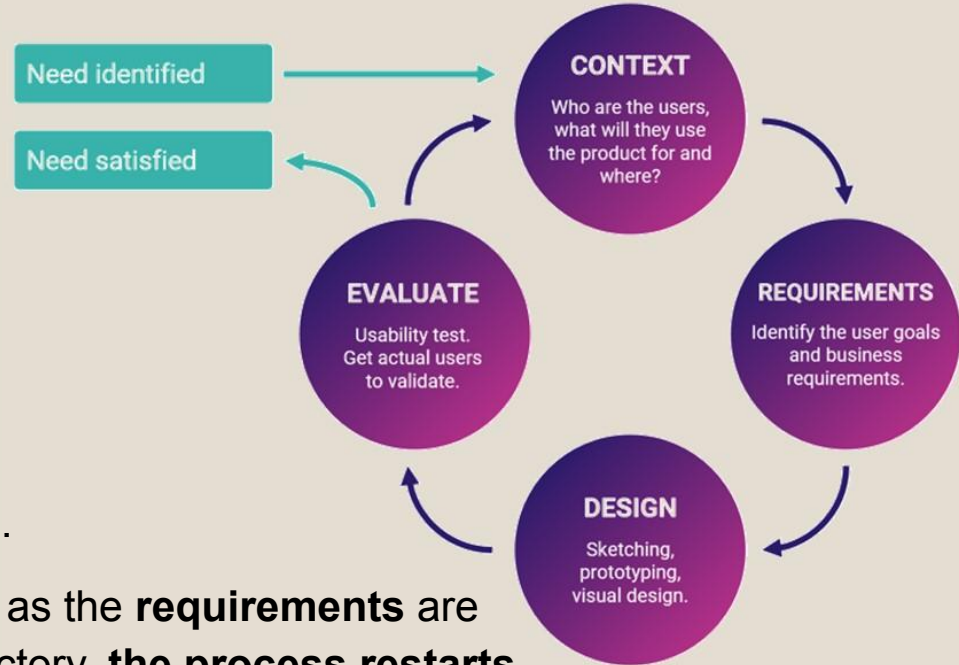
Measuring usability means take into account all the **different aspects** of the interface **in addition to the aesthetic ones**:



- The fluidity of interactions
- The ease and speed of data entry
- The clarity and responsiveness of the system
- Intuitiveness and naturalness in the workflow
- The comprehensibility of information and functionalities
- A fast and easy learning curve
- The accuracy of the information presented, in terms of correctness and contextuality
- The aesthetic of the interface (i.e. its visual appeal), but always in relation to the context of use.

The UCD process is **cyclical**, and consists of 4 main phases:

- **Specify the context of use**
Identify who will use the product
- **Specify the requirements**
Identify the user objectives
- **Create alternative solutions**
Starting from the prototypes
- **Evaluate what has been done**
Test with users and expert analysis.



The product is ready to be implemented as the **requirements** are fully met but if the results are not satisfactory, **the process restarts** from the beginning!



Photo credits by Pixabay

Context of use and User Needs



Photo credits by Calum MacAulay, Unsplash

The UCD process starts with the **identification** of the type or types of **user**, specifying their **characteristics, wants** and **needs**. Equal importance should be attributed to the **context (where and when)** in which the product or system will be used.

In the case of **infographic and data visualization**, it is fundamental to know what activity the user would do on the basis of the information acquired.



To identify the user's needs it is necessary to understand his/her models and mental representations, **observing how** the user does a certain activity.



The research tools include:

- **Quantitative surveys**, such as structured interviews and questionnaires.
- **Qualitative surveys**, such as interviews and focus groups.
- **Field observations**, carried out in order to collect information to understand the context.
- **Analysis of competitors** and best practices (i.e. the best solutions adopted in the sector of interest).

Methods and analysis tools are selected by designers to gather meaningful **data and information**.

The resulting research data, duly evaluated, will give the key insights for defining the **requirements** that the system should have in accordance with **the user needs and goals** (User Requirement).



Photo credits by Brandon Lopez, Unsplash

Don't base the design on what users say they want, but **watch what people actually do!**
Users rarely know what is possible or what they really need.



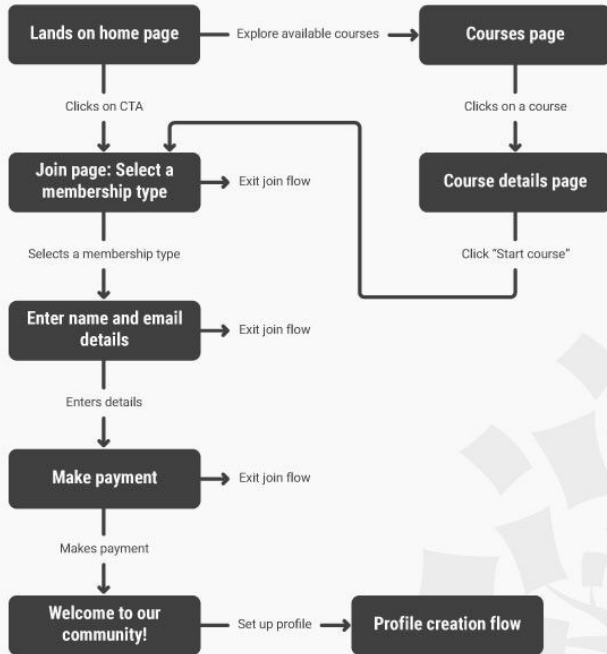
What are **functional requirements**?

They are statements describing the **functions** and **attributes** that the final product should have, along with how the system should behave from the **point of view of the user**.

The features of the system are **strongly related to the users' goals, activities, habits** and to the **context of use** in which the activity takes place.

When you design information visualizations, you should define which features they should have to satisfy users goals and needs.

User Flow Diagram



The most used technique to define the required functionalities is the **use case diagram** (or user flow) that describes a **set of interactions** between one or more actors in the system in order to meet a goal.

A use case or scenario is initiated by an actor **for a specific purpose** and ends when it has been achieved.

Card sorting is another very widespread technique for **organizing and structuring** digital and physical **information environments**. It helps to group, prioritize and structure the content **based on user input**.

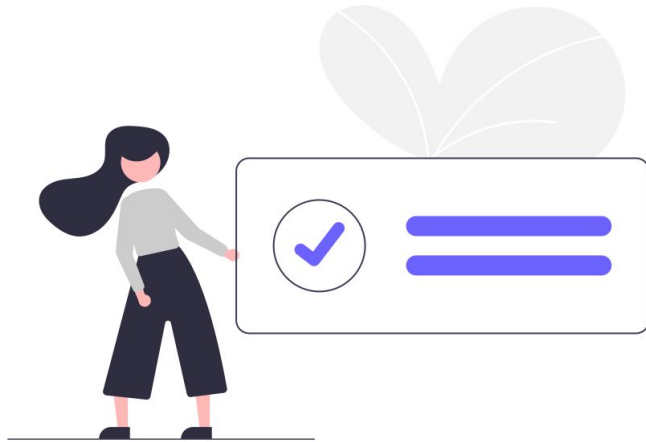
It can also be used in the last phase of the User-Centered Design process as an evaluation technique for **validating the designer choices with users**.



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Conclusions

The concepts learned in this lesson will allow us to design the infographic, and more in general user interfaces, following a User-Centered Design process.

Thank you for your attention!

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