Departamento de Engenharia Electrotécnica e de Computadores

Prototyping

- In the previous class:
  - Methodology for conceiving apps
    - Problems and ideas; user requirements and tasks
  - Conceptual modelling
- In this class:
  - Prototyping
    - Benefits
    - Taxonomy, classes of prototypes
    - Test planning and execution

What is prototyping

- Develop concrete models to present and test ideas
  - of the identified problem
  - of the selected idea(s) or of THE idea
  - of the requirements, tasks and functionalities identified
  - of the design
  - of the conceptual model
- it allows to examine the contents, appearance and interaction techniques from the perspectives of designers, clients and users
- Instead of developing the whole application, certain parts are ignored, to restrict the feedback to gather and incorporate into the app
  - Fast way of collecting focussed feedback
  - Reduces the odds of developing something that is not useful to anyone

Prototyping added-value

- Get feedback on design, faster or earlier enough
- Save development time and money
- Experiment with design alternatives
- Solve problems before writing code
- Ensure user-centred design
    - the application meets expectations
    - reduces the odds of developing something that is not useful to anyone

Prototyping added-value

- How can time be saved?
  - In operational terms
    - eliminating parts hidden from the user
    - not implementing actions and interconnections between them
  - In terms of user interaction
    - reducing the value it offers the user
    - keeping only the most important/determinant/differentiator aspects

Classes of prototypes

- Two taxonomies
  - Horizontal vs Vertical
  - Low vs High fidelity

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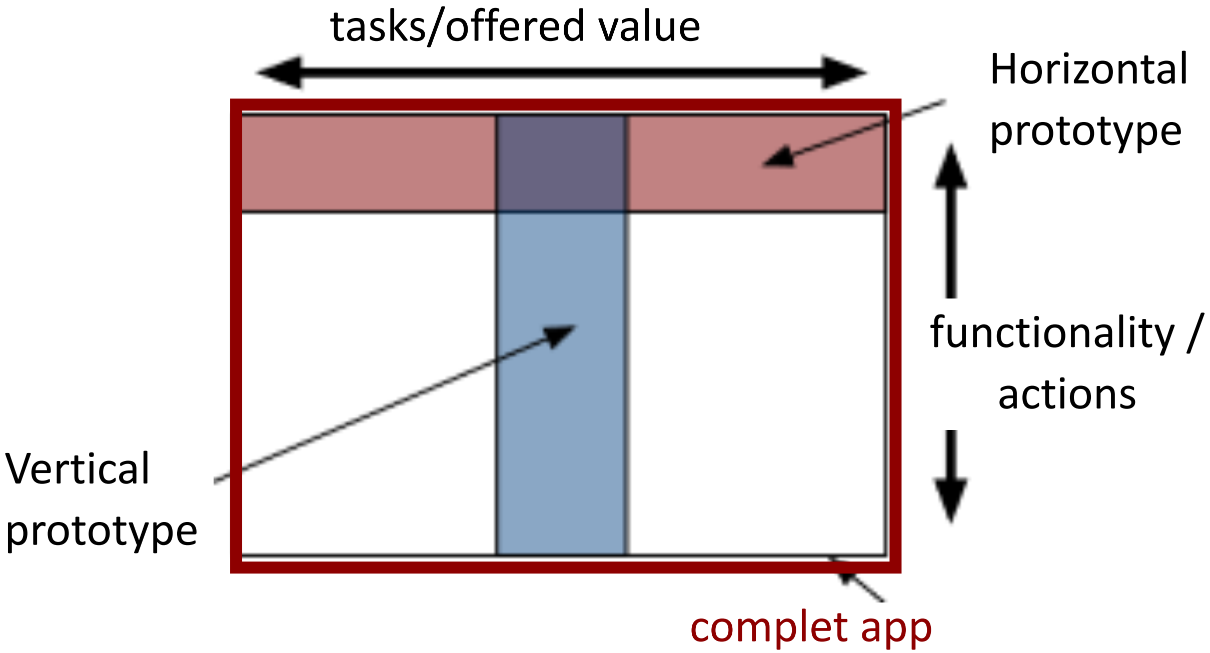
Classes of prototypes (1)

- Horizontal
  - Includes the complete interface but no implementation of actions behind
  - The system is simulated only through the interface
- Vertical
  - Limited interface, on the number of actions allowed, but all actions needed behind are implemented



Horizontal prototypes

- There is no operations on data
  - fake data can be used
  - or real data can be introduced but the app does not manipulate them
- however, it presents on the UI the enlarged set of use cases that the user can execute
  - but no real processing is going on behind

Horizontal prototypes (2)

- used when the intention is to present all the UI layout
  - thus, useful to evaluate the overall design
  - and to understand how users react to the proposed layout and how they will interact and whether friction occurs
- can be complemented with a description of the interaction scenarios
  - description of hypothetical but realistic use cases (sort of *storyboard*)
  - helps in overcoming the barriers on building the mental model of the final application and its added-value

Procedure to create a storyboard

- idealize a scenario with different types of users
- identify the elements to place on the screen
- organize/arrange the elements
- group related areas
- create a description of the flow of actions and interactions to be performed
  - questions and/or comments can be included

Vertical prototype

- The UI only presents some tasks or some use cases to the user
  - user is unable to freely navigate the UI
    - Only perform a limited set of tasks or use cases
  - but the presented use case(s) are implemented in their entirety
    - The user can enter data which will be effectively processed by the system and a real result will be returned.
  - the developer/designer can develop a storyboard, but in this case it will be more limited
    - it is restricted by the available/presented use cases

Classes of prototypes (2)

- In terms of faithfulness
  - High fidelity (HFP)
    - Prototype similar to final product
  - Low fidelidade (LFP)
    - Artistic representation with many missing details

Fidelity-based prototypes

- LFP
  - used in the initial phases
  - fast to obtain
  - low cost
    - papel and pencil
  - easy to make modifications so feedback is incorporated
    - both in the UI layout as in the sequence of actions/interactions
- HFP
  - used in are advanced phase
  - more labour-intense as it provides more accurate representation of the complete layout and behaviour
  - higher costs, involving the use of dedicated software
  - whilst modifications may be easily done in the layout, it will not be trivial to change the sequence of actions

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LFP - HowTo

- Developed typically with materials such as
  - cardboard, white paper, acetates
  - small cards
  - Glue Tape, Glue, Corrector
  - Colored Markers and Correctors
  - scissors, x-act
  - etc..

LFP – HowTo (2)

- cardboard screens
- cards to represent dynamic elements (menus, dialogs, etc.)
- create multiple screens, menus, dialogs, etc.
  - in order to contemplate the full (large) range of tasks offered and possible behaviors of the application
  - or from a subset, if script/storyboard is developed
- use photocopies (various versions)
- don't look at the details

LFP – planning tests

- Choose potential users
  - use questionnaires to identify target audience characteristics
- Prepare realistic usage scenarios for 1 hour maximum
  - required if prototype performed to simulate full operation
  - if performed according to storyboard/script, the usage scenario is as described by the script
- The expected reaction from the application, for each action that the user may take, should be well-known
  - i. e., what the computer would do
  - to thus simulate the computer's reactions
- Prepare final questionnaire to be delivered to the user

LFP – executing tests

- Screens are presented according to the user's actions and according to the scenario(s) developed
  - the person who impersonates the computer makes the decision about the next screen to be presented
- At least 3 involved persons
  - Facilitator: explains the interface and conducts the tests
  - Computer: knows the program and simulates answers without giving explanations
  - Observer: notes reactions, recommendations

LFP – executing tests (2)

- Facilitator
  - at the beginning, it provides clear and precise written instructions to the user
  - raises questions to get user feedback
    - what are you thinking now? Think out loud, etc.
- Observer
  - notes user reactions, responses and suggestions
  - Record tasks/steps in which the user hesitated or had difficulties
- At the end
  - user must fill in predefined questionnaire
  - but questions should also be asked regarding the difficulties that the user experienced

LFP - wireframes

- Wireframes are sketches / schemas / mockups
  - They are outline drawings that enable to experiment different structures for the interface
  - Their use can be split into two phases

Ideation and validation

- which are the alternatives for solving the problem?
  - to arrive to THE Idea it will be necessary to go through a lot of bad ideas
- do the alternative(s) really solve the problem?
  - Show the sketch(es) to stakeholders making sure they can transmit the idea(s)

- Should be seen as a form of visual communication and for evaluating usability

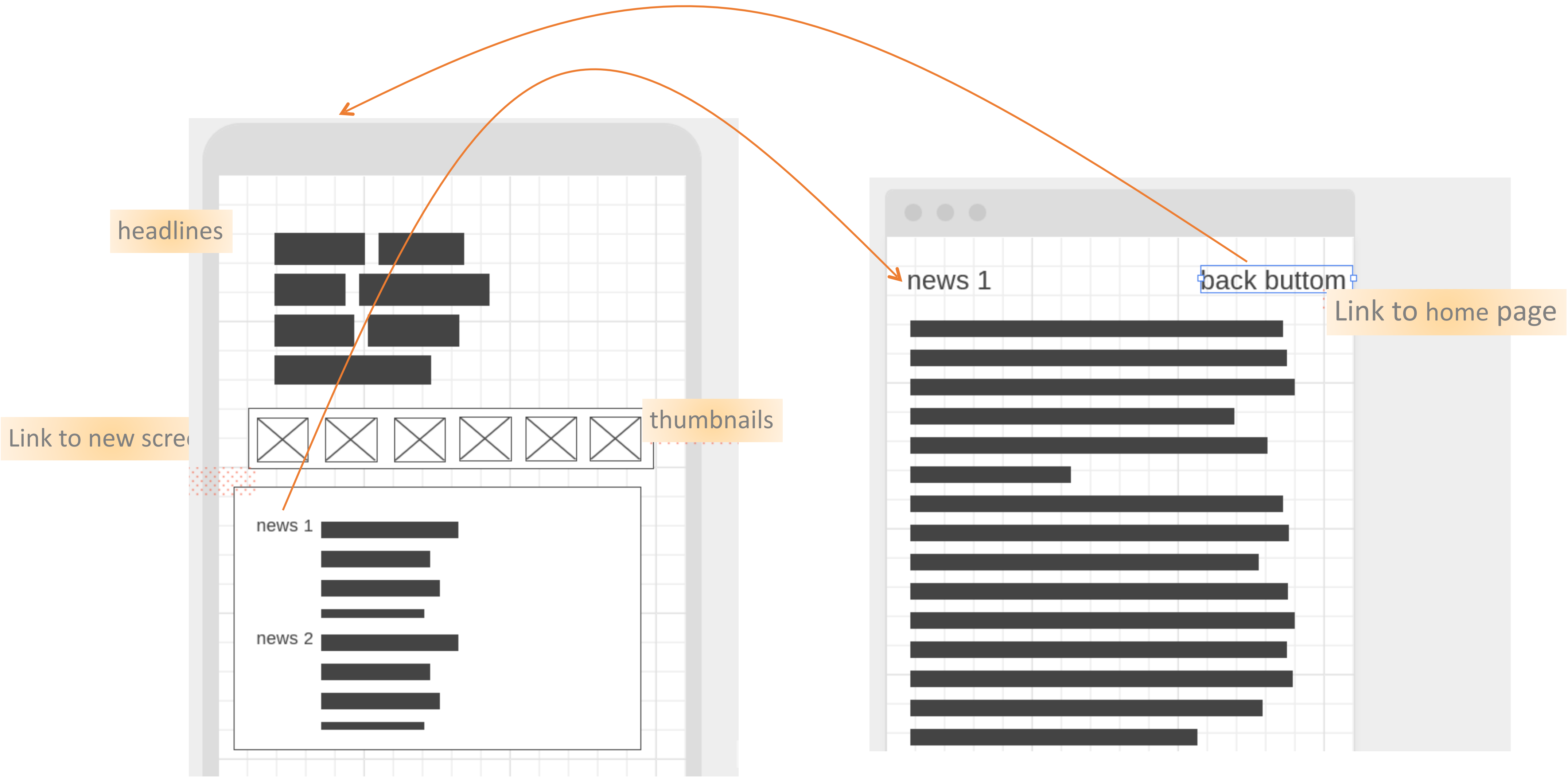
LFP - wireframes (2)

- Sketches that represent contents/objects/elements that should appear on a certain screen
    - use geometric figures or (real-world) concepts to show the existence and the placement of elements on the screen
    - do not include images, but use boxes with textual or graphical tags placed on the local the images should appear
    - normally do not use color but they may be considered useful to provide more information about the elements
        - Such as, the relative importance or priorities
- But, typically the idea is to schematise, not drawing or illustrating!

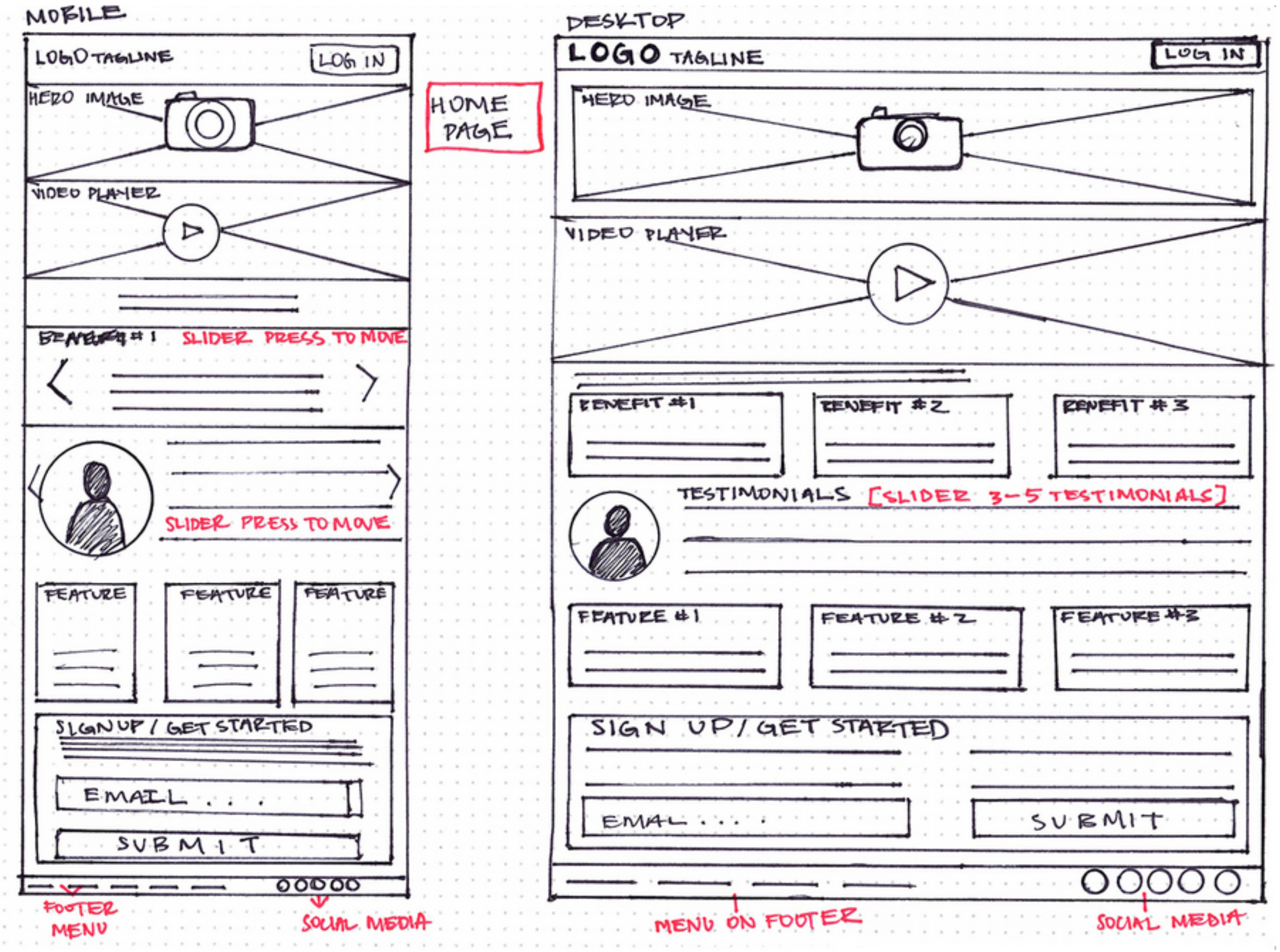
Wireframes

- Allows to define and plan how the elements will appear in the application
  - the order
  - hierarchy
  - position
  - type
- Which conditions, or is conditioned by, the way in which the user processes information

Wireframes - examples



Wireframes - examples (2)



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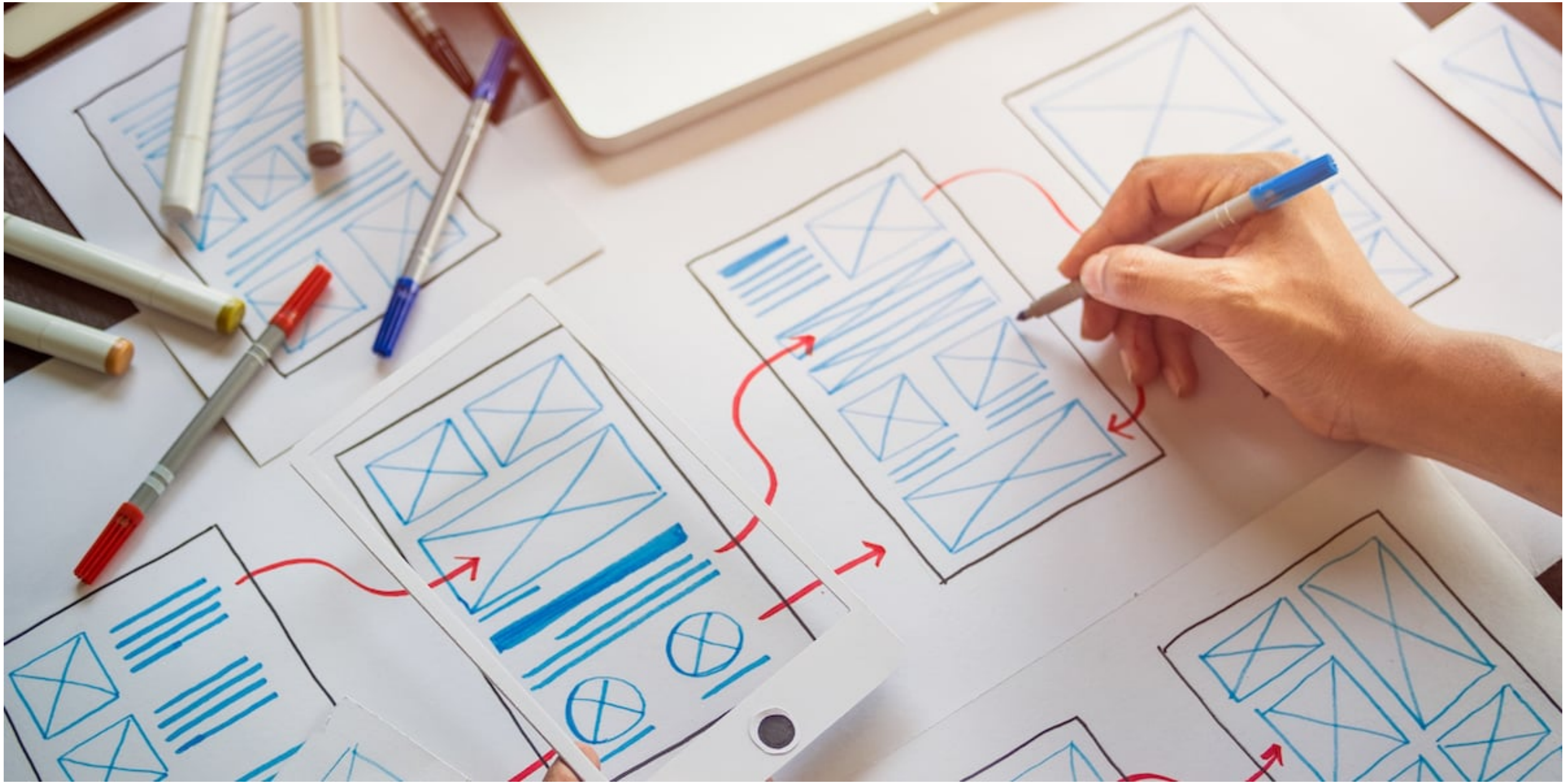
Wireframes - examples (3)



Low fidelity prototypes - examples

- Guided testing with interesting ideas:

  https://www.youtube.com/watch?v=yafaGNFu8Eg

- Guided testing (a bit more difficult to follow):

  https://www.youtube.com/watch?v=Car4IlhY3_0

- iTraveller with some written guidelines and interesting ideas for the testing:

  https://www.youtube.com/watch?v=_5FGeSQ7DBU

- *Pinterest* redesign with simple written guidelines:

  https://www.youtube.com/watch?v=B7M0fVXdovM

Low fidelity prototypes - examples (2)

- *Angry birds game* redesign with simple written guidelines:
- https://www.youtube.com/watch?v=pvg8GpdQZSQ
- No guidelines but useful for ideas for the prototype and testing:
- https://www.youtube.com/watch?v=x48qOA2Z_xQ
- Just for ideas:

  https://www.youtube.com/watch?v=y20E3qBmHpg

- Google series of short videos on prototyping:

  Sketching on paper: https://www.youtube.com/watch?v=JMjozqJS44M

  Digital prototyping: https://www.youtube.com/watch?v=KWGBGTGryFk

  Native prototyping: https://www.youtube.com/watch?v=lusOgox4xMI