Professors IDI

IDI – Usability Testing

Outline

- **Concepts**
- Usability testing
- Formal usability tests
- Use cases

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Concepts

- Usability:
  - **Ease of use** and **acceptability** of a system or product for a particular class of users carrying out specific tasks in a specific environment.
    - Where "Ease of use" affects user performance (efficacy, efficiency), satisfaction (comfort).
    - And "Acceptability" affects whether or not the product is used.

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Concepts

- Usability:
  - 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.
  - To be useful, usability has to be specific. It must refer to particular tasks, particular environments and particular users.
    - **So has to be its testing!**

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Concepts

- How to test?
  - Ease of use is inversely proportional to the number and severity of difficulties people have in using software.
  - Let's examine the difficulties!!!

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Outline

- *Concepts*
- **Usability testing**
- Formal usability tests
- Use cases

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Usability testing

- Two major families by goals:
  - Determine usability problems (*i.e.text editor*):
    - Discovery, prioritization, and resolution of usability problems
    - Iterative testing
  - Measure task performance (*i.e. 3D selection*). Include two fundamental tasks:
    - The development of the usability objectives
    - Iterative testing to determine if the product under test has met the objectives

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Usability testing

- Great variety of usability tests:
  - Can be very informal or very formal
  - Observer might sit next to the participant, watch through a one-way glass, or watch the on-screen behaviour of a participant who is performing specified tasks.
  - Often use think-aloud (TA)
  - Observers might watch one or two participants at a time
  - Evaluated software can be varied:
    - Prototypes, under development, competitive products…

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Usability testing

- Think-Aloud:
  - Participants must talk about what they are doing as they do it
    - Prompt participants to resume if they stop talking
    - What users say during tasks is more reliable than posterior interviews
      - In interviews users are inclined to answer what they think you would like them to
      - When people verbalize after the experiment, they only note what they remember
      - People tries to rationalize their behaviour (giving reasons why they did not see a button…)

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Usability testing

- Think Aloud:
  - Can be apply to almost any usability testing method
  - Seem to work better with pairs of participants
  - Seem to be best suited than silent participation in problem discovery
  - Better for problem discovery than measurement

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Usability testing

- Testing techniques:
  - **"Formal" usability tests**
  - Remote testing
  - Heuristic/expert evaluation

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Outline

- *Concepts*
- *Usability testing*
- **Formal usability tests**
  - Environment
  - Usability tests tasks and roles
  - Development
  - Reporting
  - Cheap tests
- Use cases

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Formal usability tests. Environment

- "Formal" usability tests require a controlled environment
  - Inside a room, outside…
    - Illumination conditions (useful for perception studies)
  - Devices used (e.g. computer with Internet connection and a browser, or a mobile…)
  - Other conditions (e.g. connection quality…)

Usability lab ☺

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Formal usability tests. Environment

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Formal usability tests. Environment

- Set of soundproofed rooms
  - Proper recording and avoiding distractions to participants
- Different areas and equipment
  - Participant area (where the experiment is carried out)
  - Observer area with one-way glass
  - Executive viewing area behind the primary observer area
  - Video cameras and microphones, telephone…

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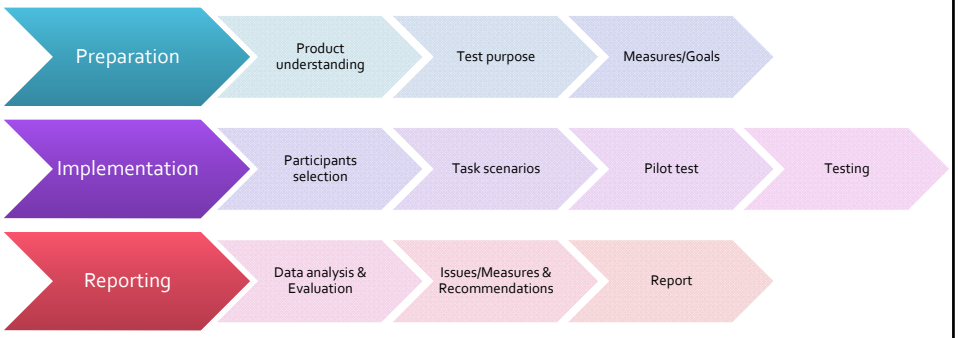
Formal usability tests. Tasks and roles

- Usability test workflow:



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Formal usability tests. Tasks and roles

- Usability test roles:
  - **A**: Test administrator
  - **B**: Briefer
  - **CO**: Camera Operator
  - **DR**: Data Recorder
  - **HD**: Help Desk Operator
  - **PE**: Product Expert
  - **S**: Statistician

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Formal usability tests. Tasks and roles

- **<u>Preparation:</u>**
  - **Product understanding**: Purpose of the product, parts ready to test, type of users…: **A, PE**
  - Test purpose: Product comparison, within/between subjects…: **A, S**
  - Measures/Goals: Number of iterations, counting mistakes/errors, timings…: **A, S**

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Formal usability tests. Tasks and roles

- Product understanding (**A**):
  1. Understand the purpose of the product
  2. Parts of the product are ready for testing
  3. Types of people who will use the product
  4. Determine the use given to the product
  5. Conditions of usage of the product

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Formal usability tests. Tasks and roles

- Preparation:
  - **Product understanding**: Purpose of the product, parts ready to test, type of users…: **A, PE**
  - **Test purpose**: Product comparison, within/between subjects…: **A, S**
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  - **Measures/Goals:** Number of iterations, counting mistakes/errors, timings…: **A, S**

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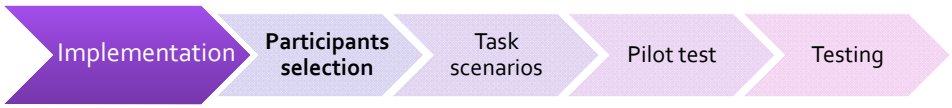
Formal usability tests. Tasks and roles

- **Implementation:**
  - Participants' selection: **A**
  - Task scenarios: initial conditions, steps: **A**
  - Pilot test: Members of the team: **A, B, CO, DR, HD**
  - Testing, **A, B, CO, DR, HD**



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Formal usability tests. Tasks and roles

- Participants' selection
  - It's complicated!
  - Should be payed. Factors to consider:
    - Time needed, qualification of the participant, would be the person be payed for her time?
    - Non-monetary for internal participants that are already being payed for their time
  - Always offer food and beverages!!!

Implementation | **Participants selection** | Task scenarios | Pilot test | Testing

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Formal usability tests. Tasks and roles

- Participants' selection
  - Should be representative
    - People that could be real users
      - E.g. no other managers!!!
    - Specialized recruiting agencies are a possibility
  - No-show rates above 10%
  - Sometimes may be correct to reuse participants

Implementation | **Participants selection** | Task scenarios | Pilot test | Testing

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Formal usability tests. Tasks and roles

- Participants' selection
  - For statistical significance: 10-12 participants
  - Less formal: 4-5 participants per user group
  - Ensure recruiting criteria reflects user characteristics
    - E.g. for a website, ensure participants have prior experience browsing

Implementation | **Participants selection** | Task scenarios | Pilot test | Testing

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Formal usability tests. Tasks and roles

- Test task scenarios:
  - Must be representative
    - Core tasks: Features that everybody uses (write a text)
    - Peripheral tasks: Features used less often (table insertion)
  - Once the tasks are defined, scenarios of use must be created
    - Define initial conditions
    - Description of the scenario: what to do and why
      - Some action must be taken on finish
      - Should not provide step-by-step instructions but should include details
      - Not all users must be provided with the same scenarios (may depend on the user profile)

Implementation | Participants selection | **Task scenarios** | Pilot test | Testing

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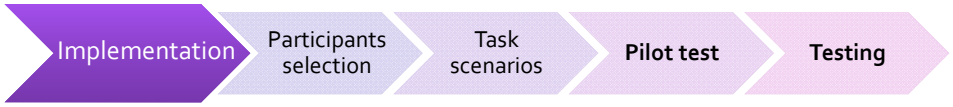
Formal usability tests. Tasks and roles

- Testing (**A, B, CO, DR,** [**HD**]):
  - Brief participants: **B**
  - Initial questionnaire: **B**
  - Develop tasks: **B, CO, DR,** [**HD**], **A**
  - Debrief: **B**
  - Final questionnaires: **B**



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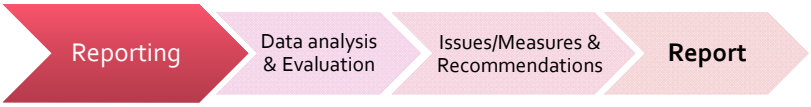
Formal usability tests. Tasks and roles

- **Reporting** (whole team):
  - Data Analysis & Evaluation: **A, S**
  - Issues/Measures & Recommendations: **A, S,** team
  - Report: **A, S,** team



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Formal usability tests. Reporting

Problem evaluation:

- Frequency: Number of users that find a problem divided by the number of users testing the app or web
  - Easy (objective) to evaluate
- Severity: Importance of the problem
  - Might be completely catastrophic or simply cosmetic
  - Difficult (more subjective) to evaluate

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Formal usability tests. Reporting

- Reporting. Usability problems:
  - Should indicate the importance: severity
  - Can be classified:
    - Mistakes: Errors due to incorrect intention
    - Slips: Errors due to appropriate intention but incorrect action
  - Expertise does not affect on the number of errors
    - But affects how fast they are handled

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Formal usability tests. Reporting

- Rating the severity of usability problems:
  - Some thoughts on severity and frequency
  - Local evaluation: Jeff Rubin, Jakob Nielsen…
  - Global evaluation: Dumas and Redish

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Formal usability tests. Reporting

- Problem evaluation**. Dumas and Redish:**
  - **Level 1**: Prevents Task Completion
  - **Level 2**: Creates significant delay and frustration
  - **Level 3**: Problems have a minor effect on usability
  - **Level 4**: Subtle and possible enhancements/suggestions

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Formal usability tests. Reporting

Problem evaluation. **Jeff Rubin:**

- **4: Unusable:** The user is not able to or will not want to use a particular part of the product because of the way that the product has been designed and implemented.
- **3: Severe**: The user will probably use or attempt to use the product here, but will be severely limited in his or her ability to do so.
- **2: Moderate**: The user will be able to use the product in most cases, but will have to undertake some moderate effort in getting around the problem.
- **1: Irritant**: The problem occurs only intermittently, can be circumvented easily, or is dependent on a standard that is outside the product's boundaries. Could also be a cosmetic problem.

Formal usability tests. Reporting

- Reporting. *Recommendations*:
  - Create a problem grid: frequency/impact
  - Global changes (prevent task completion) first
  - Must be checked:
    - A *missing help* may be a global problem or something related with a concrete UI
  - Try to give at least one recommendation for each problem
    - Present the different trade-offs clearly

Formal usability tests. Reporting

- Problem evaluation. Conclusions
  - Do not use a large number of categories
    - Do not get obsessed by the number of categories either
  - Different evaluators may disagree on some problems' severity
  - Treat frequency separately from severity
  - Do not forget to point out positive findings

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Formal usability tests. Cheap tests

- Testing just a single person early is much better than 50 near the end
- The point of testing is to inform your judgment

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Formal usability tests. Cheap tests

- Testing on the cheap
  - Guerrilla usability testing
  - Steve Krug's "usability testing on 10 cents a day"

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Formal usability tests. Cheap tests

- **Guerrilla usability testing**
  - Take someone in a coffee or public space and ask her to use a website for a couple of minutes
  - Observe users
    - Ask open-ended questions such as "What would you do here?"
  - Get to know them a bit
    - Offer coffee or bagels
  - Analyse captured data
    - Considering your audience

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Formal usability tests. Cheap tests

- **"Usability testing on 10 cents a day"**
  - Prepare some tasks to evaluate
  - Grab somebody from the company as user
  - Gather stakeholders in an observing room
  - Let the user do a set of tasks
  - Capture gestures, mouse, record…
  - Discuss over lunch (order pizza for everybody)
  - Report

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Usability testing

- Remote testing
  - Like traditional tests but participant and facilitator are in different physical locations
    - Participants can do the test at home
    - Facilitator watches remotely

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Usability testing

- Remote testing. Advantages
  - Cheaper
  - Easier test setup
  - Usually faster (in terms of allocating/securing facilities travel…)
  - Can get geographically dispersed users

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Usability testing

- Remote testing. Disadvantages
  - Cannot read body language
  - Difficult to decide when to talk/interact
  - Variability in participants' motivation
  - No-show rates higher than in-person studies

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Usability testing

- Two types of remote testing
  - Unmoderated:
    - Users do the task completely alone
  - Moderated:
    - Users have access to a facilitator

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Usability testing

- Unmoderated remote testing
  - Users don't have real-time support
  - Don't get any clue on how the session went
  - No opportunity to ask detailed questions
    - Sometimes the software allows to have some of them predefined
  - Preferable to work only on a few specific elements than a broad view of a product
  - Good for tight timeframes

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Usability testing

- Moderated remote testing
  - Facilitator can change or reorder tasks as needed
  - Facilitator can ask follow-up questions or clarifications
  - Participant is less likely to spend time on tasks not related to the test
  - Test sessions can be longer (usually about an hour)
  - Can perform more in-depth tests
  - The team can watch the test and discuss afterwards

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Usability testing

- Heuristic evaluation:
  - 3-5 usability experts evaluate an app or UI
  - Use pre-defined principles (heuristics)
  - Can highlight usability issues before user testing

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Usability testing

- Heuristic evaluation. Advantages
  - Can be quick and cost effective
    - If we have internal resources
  - Can be used early in the design process
  - Can give a comprehensive usability status of a product's UI
  - Is compatible with other usability testing methods

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Usability testing

- Heuristic evaluation. Process:
  - Collect the UI
  - Use a minimum of 3 experts
  - Define the heuristics
  - Understand the business and users' needs
  - Understand user motivations and tasks to accomplish

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Usability testing

- Heuristic evaluation. Process (ii):
  - Define the heuristics to use
  - Set up a consistent evaluation system
  - Highlight problem(s) and its rating
  - Compare and analyse the results of multiple experts

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Outline

- *Concepts*
- *Usability testing*
- *Formal usability tests*
- **Use cases**
  - Guerrilla testing: WhatsApp web app
  - Measure test: Depth perception in VR

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Use case. WhatsApp web app

- Web application

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Use case. WhatsApp web app

- Type of usability test: Guerrilla
- Objective
  - Identify common problems on WhatApp web
- Testing parameters
  - What is tested: Just two common tasks
  - Participants: 3 users, 2 never used it previously
  - Test procedure: Observation + interview

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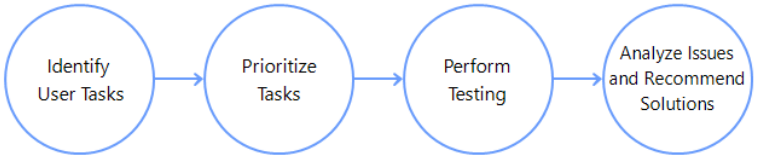
Use case. WhatsApp web app

- Test process



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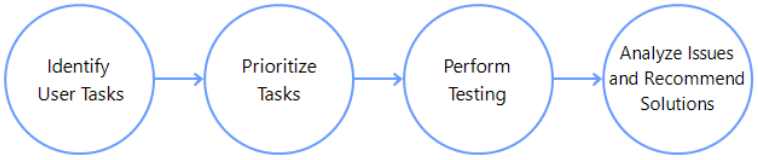
Use case. WhatsApp web app

- User tasks
  - Send a message to a friend
  - Share photos with a friend



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Use case. WhatsApp web app

- Development (perform testing)
  - Give the instructions to the users
    - Users are observed with performing actions
    - Asked about the experience on certain subtasks

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Use case. WhatsApp web app

- Development of task 1

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Use case. WhatsApp web app

- Development of task 2

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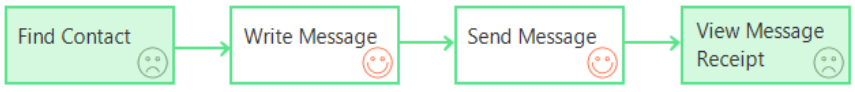
Use case. WhatsApp web app

- Analyse problems. **Finding a contact**:
  - There are two ways to start a new chat:
    - (i) Search within Chats list
    - (ii) Go to New Chat icon on top and search contact
  - The user was not clear to differentiate between these two options



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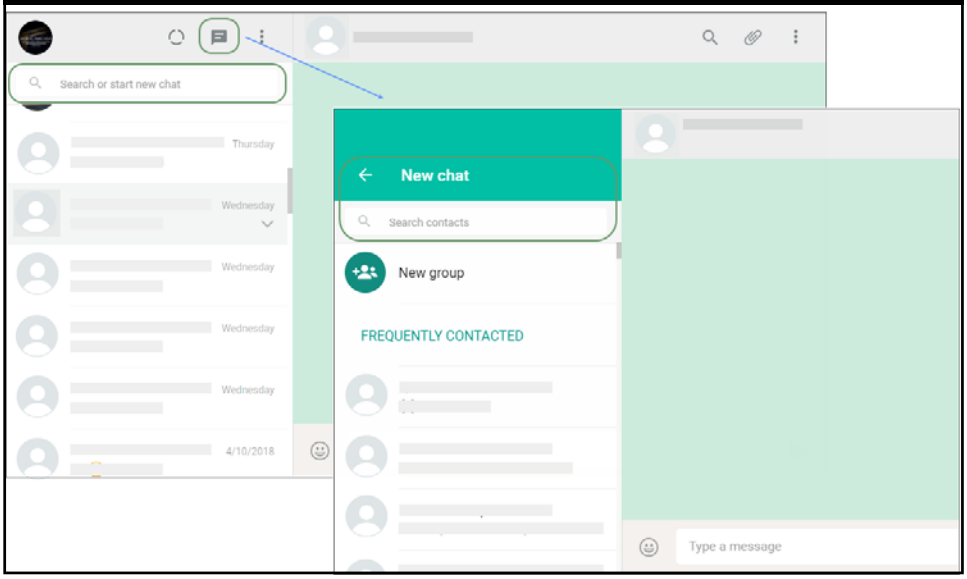
Use case. WhatsApp web app



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Use case. WhatsApp web app

- **Recommendation:**
  - A clear separation between Chats and Contacts is needed
    - Can be done by giving a filter option in Contact list, or a single list can be sorted based on Recent Chats or Contact names.

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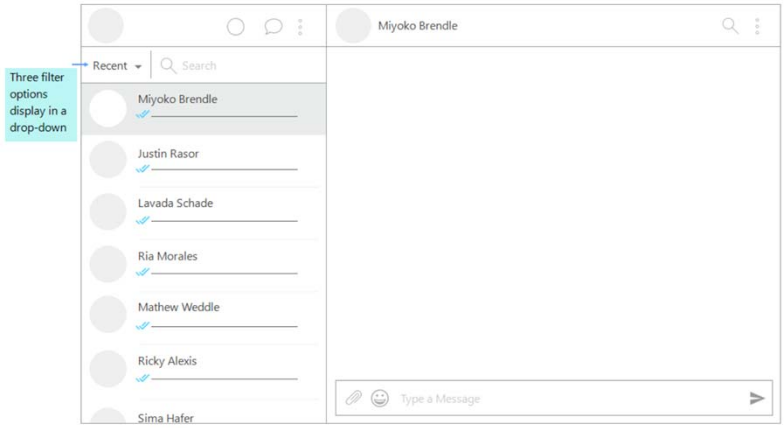
Use case. WhatsApp web app



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Use case. WhatsApp web app

- Analyse problems. **Viewing Message Receipt**:
  - In Message Info pane, the area showing message status is merged with the Message pane
  - Also, it is not clear that user is viewing status of which message
  - Also, it took time for the user to find Close icon on top on Message Info pane

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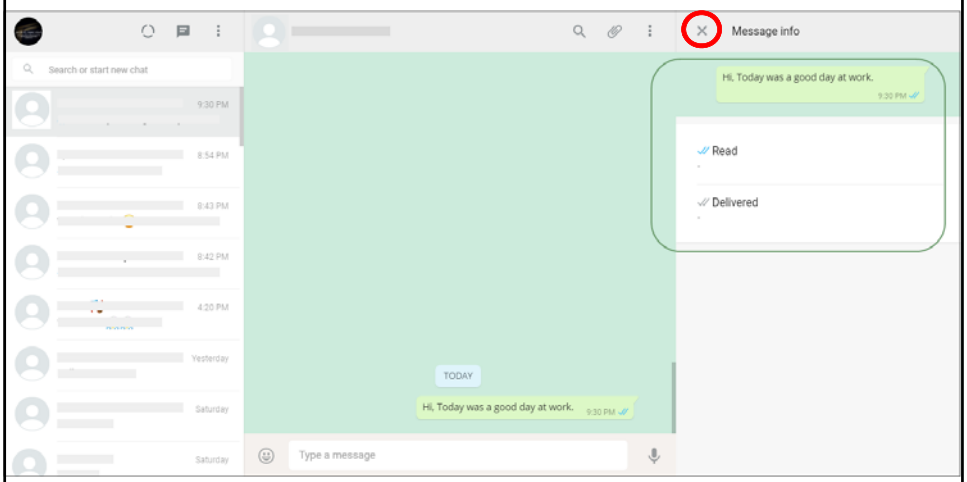
Use case. WhatsApp web app



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Use case. WhatsApp web app

- **Recommendation:** The area of Message info pane and Message pane needs to differentiate clearly
  - Since this is desktop version and Message area is still visible when Info pane is opened, the link between message and its info could be made more prominent

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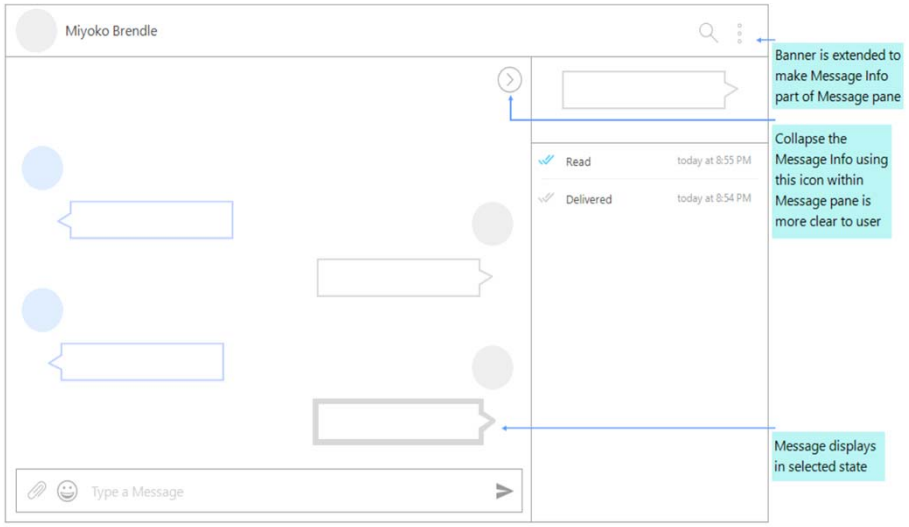
Use case. WhatsApp web app



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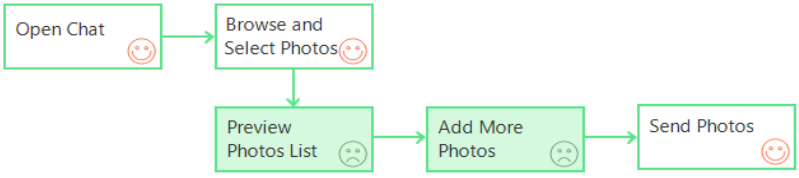
Use case. WhatsApp web app

- Analyse problems. **Using attach**
  - The Attach menu and tooltips do not match with the UI
    - Shows a totally different theme and experience in current screen



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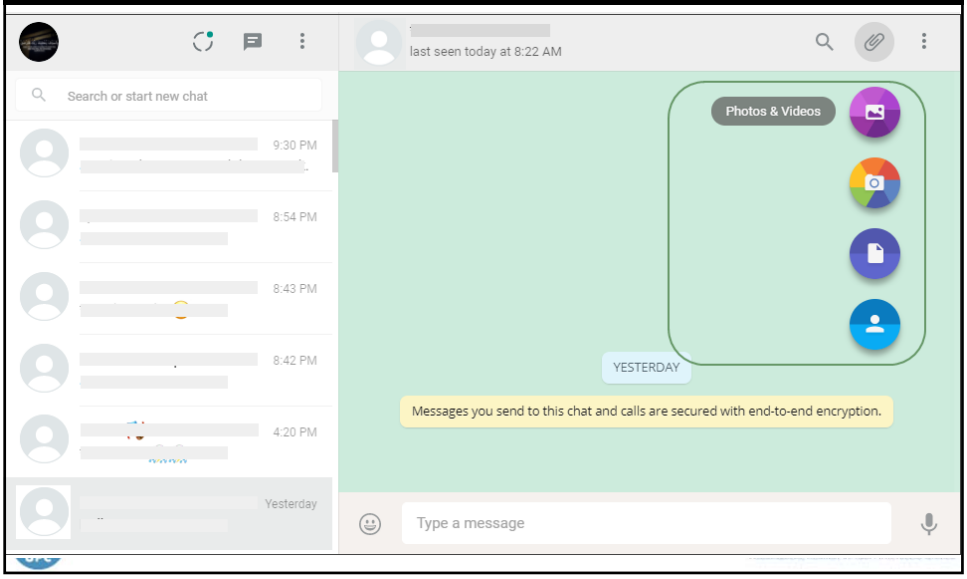
Use case. WhatsApp web app



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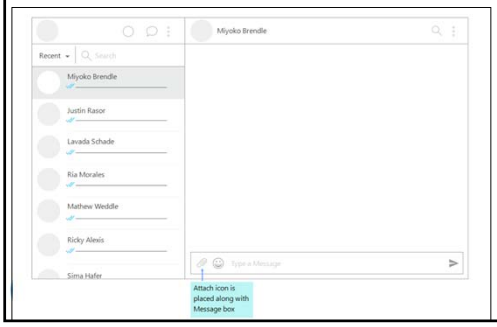
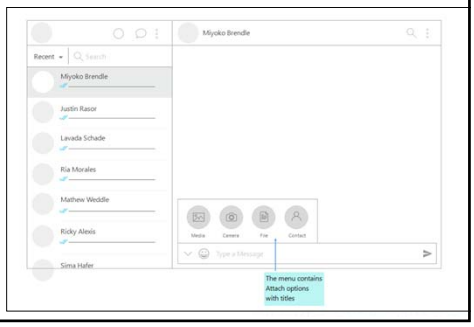
Use case. WhatsApp web app

- **Recommendation:** Make menu placement and theme consistent with UI.
  - Instead of Tooltips, the option names along with icons seems more helpful.





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Use case. WhatsApp web app

- Analyse problems. **Attaching photos:**
  - Close icon with Preview title is confusing.
    - The user clicked it just to close the preview of selected photos, but it discards all the selected photos.
  - Adding more files option is not clear.
    - The Attach icon still displays on top, but it is not functional. The user clicked on that icon first.
  - It is difficult to navigate large number of selected files.

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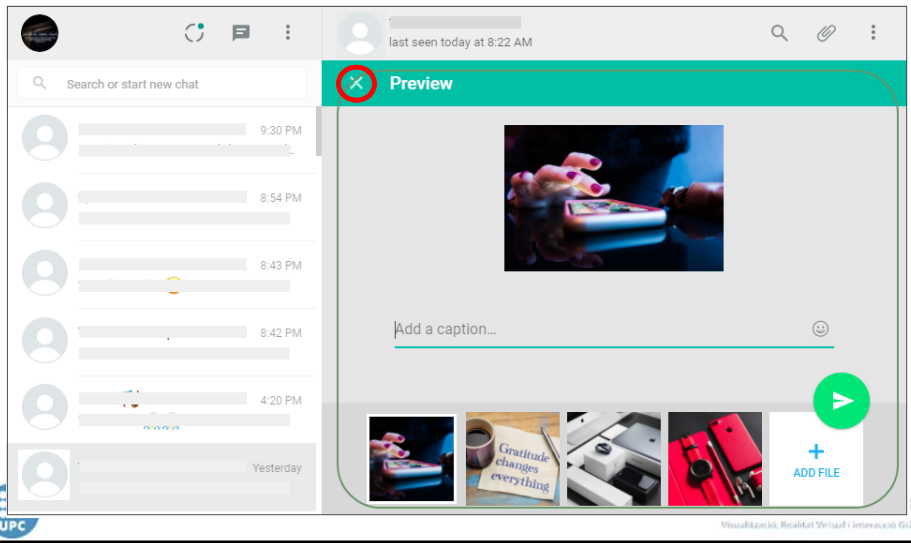
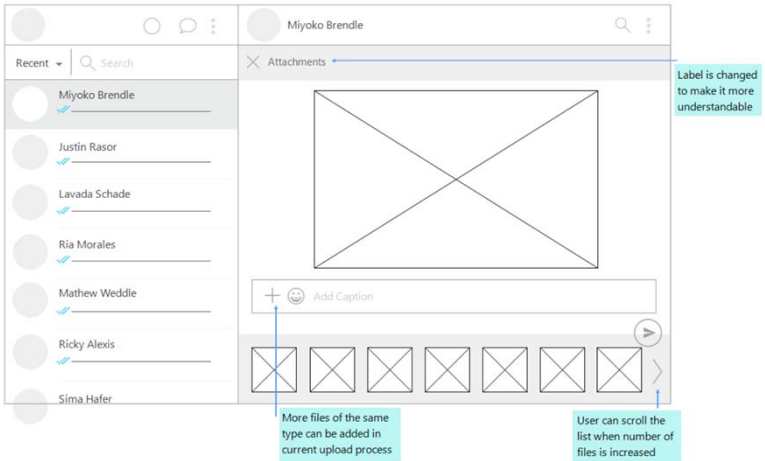
Use case. WhatsApp web app



Use case. WhatsApp web app

- **Recommendation:**
  - Rename preview area to Attachments to avoid any confusion for the user.
  - Scrolling in thumbnails area
  - User should be able to add more files by clicking an Add icon with caption

Use case. WhatsApp web app



Use case. WhatsApp web app

- More Observations
  - Using a scrollbar requires high accuracy to hold the bar and scroll it
    - Cursor is changed to resize when user tries to scroll Message pane
    - No keyboard scroll allowed in Contacts & Contact/Group Info
  - Little visibility of actions' visual feedback (bottom left)
    - Were skipped multiple times
  - Status cannot be updated on desktop version
    - Users cannot see others' status

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