User Requirement Revised

* User Requirement 1: When entering text on mobile devices, user should not make more typos (slips) when operating with one hand compared to operating with both hands (U05-07, U5-08, U05-13, U05-23, U05-27, U05-29, U05-35, U01-14, U01-15, U03-04).
* User Requirement 2: User should not need to manually fix any mistakes produced by the system’s keyboard assistive features (e.g., autocorrect) when entering text on their mobile device with one hand (U05-09, U05-10, U05-11, U05-12, U05-13, U05-25, U05-27, U05-30).
  + **List of 9 words**
* User Requirement 3: User should be able to remove any text entered on their mobile device using one hand without accidentally removing any other characters or words the user did not intend (U05-25, U05-26, U05-27, U02-06, U04-17).
  + **Backspace advanced**
* User Requirement 4: User should be able to navigate, communicate and interact with different keyboard elements using one hand without introducing slips and without straining (overextending) their thumb (hand) or repositioning the mobile device (U04-02, U04-03, U04-05, U04-06, U04-12, U01-05, U01-07, U01-13, U02-02, U02-03, U02-08, U02-17, U02-20, U03-06, U03-08, U03-12, U04-06, U04-07, U04-09, U04-10, U04-11, U05-37).
  + **One-handed shifted keyboard**
* User Requirement 5: User should be able to locate and enter emojis, punctuations, and numbers on the mobile device with one hand more efficiently (faster) than their default (i.e., current or existing) method of entry (U05-15, U05-16, U05-17, U05-37, U04-09, U04-18, U02-08, U03-06, U03-18, U03-19).
  + **Extra keys on bottom right & One-handed shifted keyboard**
* User Requirement 6: Users should be able to hold their mobile device one-handed in a secure manner without inflicting physical discomfort (U01-07, U01-08, U01-09, U01-20, U01-21, U02-09, U02-10, U03-07, U03-13, U03-14, 04-04).

<https://miro.com/app/board/uXjVNU_AOdc=/>

Goal: Send the message “Cool, good kick! 😂” to a friend on the phone using only the right hand.

Tests user requirements 2, 3, 4, 5

Ask the user to hold the phone with one hand for the entire duration of the study

Breakdown of goal in to subgoals/tasks:

1. Switch to one-handed keyboard & adjust keyboard width
2. Enter text “Cool, good”
3. Enter “luck”
4. Assume the user accidentally made a typo (i.e., entered “lyck”), fix the typo
   1. (Tell the user that they accidentally made a typo)
5. You changed your mind and wanted to enter “kick” instead, replace luck with kick
6. Enter “!”
7. Enter 😂 emoji
   1. U+1F602
   2. HTML &#128514
8. Send message

Print out paper prototype, each frame should be about the size of regular iPhone

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HEURISTICS EVALUATION

Purpose:

To identify usability issues with our new keyboard design with respect to the 10 usability heuristics.

Method:

* Ask for the usability expert’s information such as uniqname and group name
* First demo to the usability expert how you would expect the user to interact with our paper prototype and accomplish the goal
* Ask the usability expert to identify and rate the usability issues using the 10 usability heuristics while we demo our product. The rating is scaled from 0 - 4 where 0 is there is no usability problem and 4 is there is a usability catastrophe
* Pick one or more user goals (or sub-goals)
* Recruit 3-5 usability experts
* Demo to them how you expect the user to interact with your design prototype to accomplish the goal
  + they are not directly interacting with the prototype
* Ask experts to rate the usability of the prototype using the 10 Usability Heuristics
  + during the demo, the expert notes usability issues down; the usability issues should correspond to the 10 heuristics
* Severity of the problem/issue
  + 0 = I don't agree that this is a usability problem at all
  + 1 = Cosmetic problem only: need not be fixed unless extra time is available on project
  + 2 = Minor usability problem: fixing this should be given low priority
  + 3 = Major usability problem: important to fix, so should be given high priority
  + 4 = Usability catastrophe: imperative to fix this before product can be released

Tasks and Procedure

* Held meeting for about 30 - 45 mins
* Demonstrate the prototype by completing a goal (with subgoals) to the usability expert and inquire them about specific issues, the severity of those issues on a scale from 0 to 4, as well as what usability heuristics did these issues break.’
* During their demonstration, take notes about specific issues, the severity of those issues and what usability heuristics was broken by each individual issue.
* At any time, the expert was allowed to stop the demo or re-introduce some aspect of the design

SIMPLIFIED USER TESTING

Purpose:

The purpose of simplified user testing is to test the usability and the features of our mobile device text entry prototype against our designated user requirements.

Method:

* Disclose the purpose of the interview
* Make participants aware that participation is voluntary
* Any information about the users will be either confidential or declassified
* State this is a think aloud and explain how a think aloud works
* Place paper prototype against a portable surface and change IPhone interface based on user input
* Give users tasks/subgoals to perform
* Take note of any breakdowns user experiences to discuss as a group

Tasks and Procedure:

* Show the participant the video.
  + <https://www.nngroup.com/articles/thinking-aloud-demo-video/>
  + Ask them to use your design prototype to accomplish the goal and ask them to perform a think-aloud

- Have a team member to Wizard-of-Oz the functionality

Take notes: note the tasks they perform, note the difficulties they face, note the errors they make

* Ask users to talk while performing tasks and verbalize their thoughts as they move through the user interface
  + You as observer
    - Make sure you can tell what they are doing
    - Prompt them to talk if necessary
    - Prompt the user “Please keep talking”
    - If there are questions, leave until the end, don’t interrupt the user
    - Do not ask the user to explain during the think-aloud (introduces extra cognitive load).
  + Watch for:
    - – Errors
    - – Long stalls (indicating confusion or indecision)
    - – Confusion
    - – Unexpected paths
    - – Statements of distress
    - – Unexpected events and use

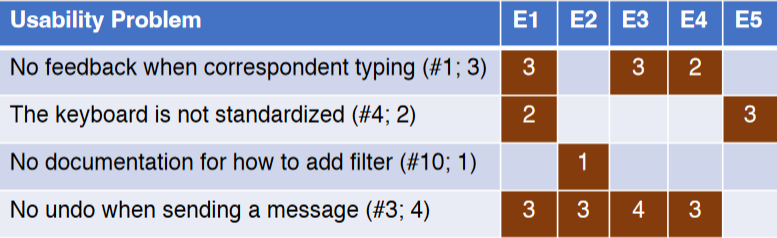
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Print out paper prototype, each frame should be about the size of regular iPhone

Goal: Enter the message “Cool, good kick!” with one hand & send it to the friend.

1. Break this down into sub-goals/tasks
   * Switch to 1 handed keyboard
   * Enter “Cool“
   * Enter “,”
   * Enter “Good kick” → force them to make a typo
     + or allow them to accurately do it the first time, but then force them to make a mistake
   * Fix typo with autocorrect
   * Fix typo with delete
   * Enter “!”
   * Send message

Heuristic Evaluation

* purpose
* method
  + Leverages usability experts and not users
  + Uses heuristics to identify usability issues
    - #1 Visibility of system status
    - #2: Match between system and the real world
    - #3: User control and freedom
    - #4: Consistency and standards
    - #5: Error prevention
    - #6: Recognition rather than recall
    - #7: Flexibility and efficiency of use
    - #8: Aesthetic and minimalist design
    - #9: Help users recognize, diagnose, and recover from errors
    - #10: Help and documentation
  + How?
    - Pick one or more user goals (or sub-goals)
    - Recruit 3-5 usability experts
    - Demo to them how you expect the user to interact with your design prototype to accomplish the goal
      * they are not directly interacting with the prototype
    - Ask experts to rate the usability of the prototype using the 10 Usability Heuristics
      * during the demo, the expert notes usability issues down; the usability issues should correspond to the 10 heuristics
    - Severity of the problem/issue
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  + Reporting (group)
    - 
    - show the number of heuristic which the design violates
    - show which evaluator indicated that this was a violation
    - show the severity
    - note that not all evaluators may identify the problem, but usually with 3-5 evaluators, almost all potential issues would be revealed by at least one evaluators
* tasks and procedures
* participants

Think-Aloud

* purpose
* method
  + Does the method subsection indicate which user requirements the evaluation tested the designs against?
  + How?
    - Pick one or more user goals (or sub-goals)
    - Recruit 3 to 5 participants
      * The end-users of our product
    - Ask them to use your design prototype to accomplish the goal and ask them to perform a think-aloud
    - Have a team member to Wizard-of-Oz the functionality
    - Take notes: note the tasks they perform, note the difficulties they face, note the errors they make
  + Picking the tasks
    - Should reflect what real tasks will be like
    - Use goals that you identified when studying and understanding the context of use
    - Avoid bending tasks in direction of what your design best supports
    - Concrete task (e.g. create a playlist using a music app)
  + Think-Aloud Protocol
    - Main evaluation technique when you need to know what users are thinking, not just what they are doing
    - Ask users to talk while performing tasks and verbalize their thoughts as they move through the user interface
    - You as observer
      * Make sure you can tell what they are doing
      * Prompt them to talk if necessary
    - Very widely used in research and industry settings
    - Prompt the user “Please keep talking”
    - If there are questions, leave until the end, don’t interrupt the user
    - Do not ask the user to explain during the think-aloud (introduces extra cognitive load).
  + Watch for:
    - – Errors
    - – Long stalls (indicating confusion or indecision)
    - – Confusion
    - – Unexpected paths
    - – Statements of distress
    - – Unexpected events and use
* tasks and procedures
  + Use this video: <https://www.nngroup.com/articles/thinking-aloud-demo-video/>
* participants