A Human and a Machine Enter Into a Bar

Samuel Silva

sss@ua.pt

Office **2.01** @ **IEETA**
Dep. of Electronics, Telecommunications and Informatics

Summary

Until now:

- User-centred design approach
- Know the users (**Personas**)
- Understand when, where, and how the solution will be used (**Scenarios**)

Today:

- Define what features should the solution provide (**Requirements**)
- **Start thinking about the technology** that can support them

Why User-Centred Design

- Why haven't we started by designing the interface?
  - Designing and developing an interface takes time and human resources
  - If after making a huge development effort we discover that what we did is not useful: that work has been wasted
- So, we first apply methods to understand the users and the problem and make our best to have a first good approach

Today, we will arrive to a first list of functionalities for our system

Requirements

"A **requirement** is a statement about an intended product that **specifies what it should do or how it should perform**. One of the aims of the requirements activity is to make the requirements **as specific, unambiguous, and clear as possible**."

-- Rogers et al., *Interaction Design*

Requirements

Types of Requirements:

- **Functional**: What the system should do, e.g.:
  - Support user accounts and signing in/up
  - Add new event to calendar
  - Define alarms for specific events

- **Nonfunctional**: What constraints we need to consider for the system during development, e.g.:
  - Run on smartphones (technical/form factor)
  - The device should be lightweight (techincal)
  - It will be used in public places (environment)
  - Users cannot read (user abilities)

How do we get requirements?

We have been preparing for this ;)

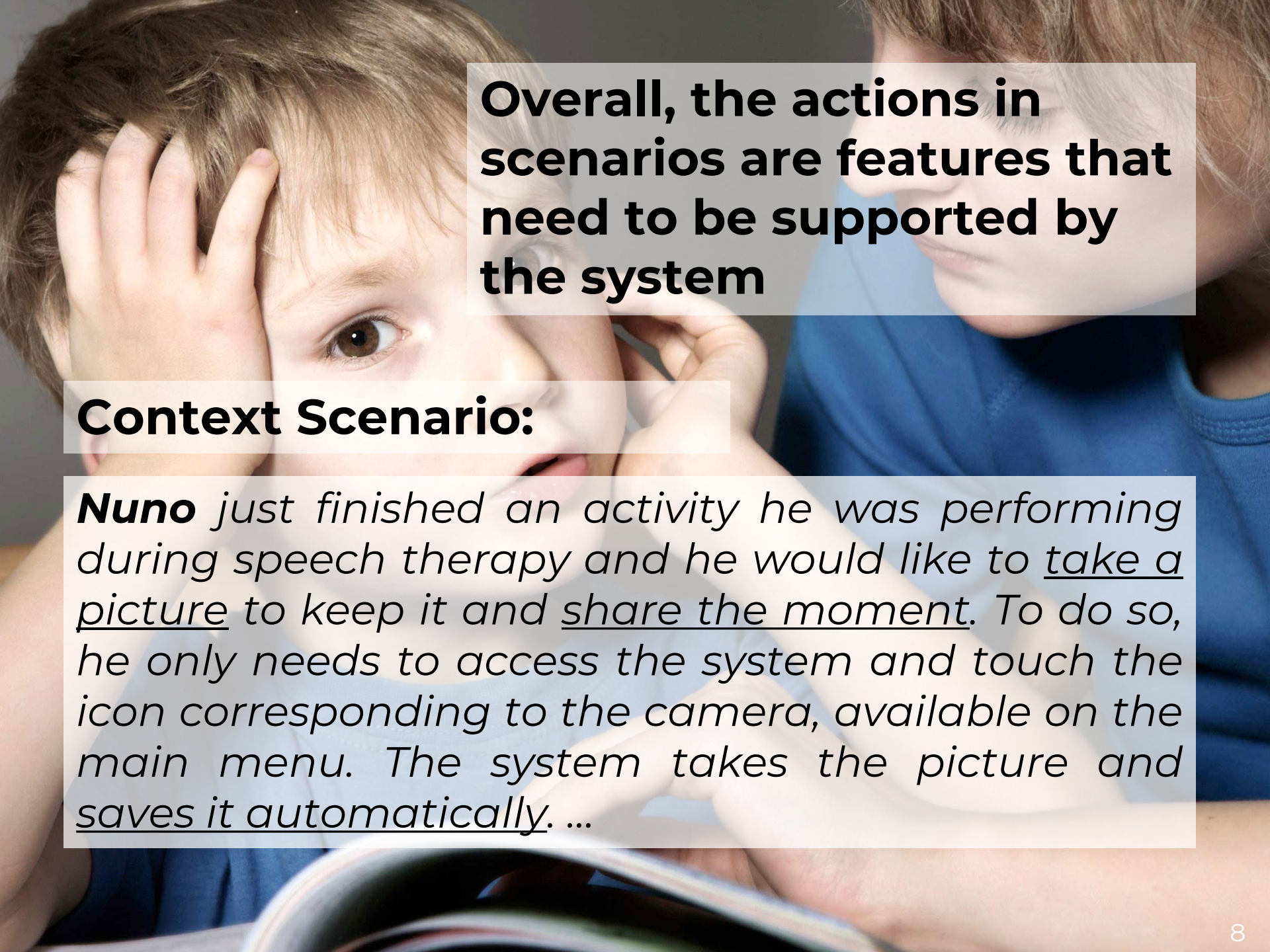
Francisco is a 30 years old Internal Medicine Physician who obtained his degree one and a half years ago. Besides his studies, he enjoys jogging, at least twice a week, and going to the movies with his girlfriend.

During his studies he never had specific training about geriatric patients and how to diagnose them considering CGA. The first contact he had with CGA happened about one year ago, when he started his work in Aveiro's Hospital.

His patients usually present several pathologies, tend to display multiple geriatric syndromes, and have autonomy problems in daily life activities, such as cleaning up their homes, doing

Personas as actors in movie scenes doing things

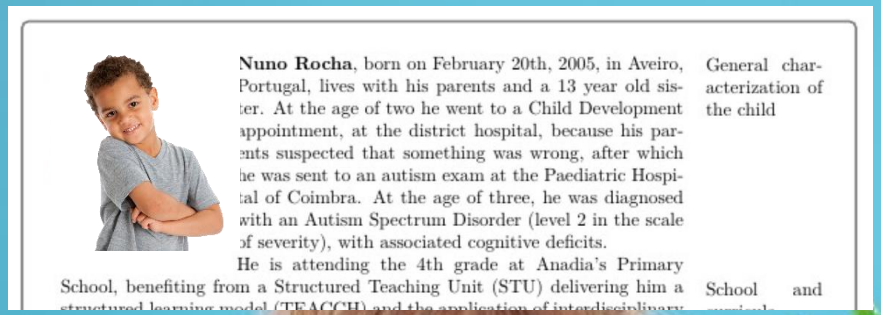
Francisco performs a CGA assessment— Francisco opens the application and sees a welcome message which informs him about the key features of the application. He is informed that only the standard features are activated, and additional functionalities are available for activation from the menu. He explores the information regarding the application of CGA and reviews some of the scales that he usually applies, during his practice. He experiments with filling a few and checks the computed results.



Overall, the actions in scenarios are features that need to be supported by the system

Context Scenario:

Nuno *just finished an activity he was performing during speech therapy and he would like to take a picture to keep it and share the moment. To do so, he only needs to access the system and touch the icon corresponding to the camera, available on the main menu. The system takes the picture and saves it automatically. …*



Nuno Rocha, born on February 20th, 2005, in Aveiro, Portugal, lives with his parents and a 13 year old sister. At the age of two he went to a Child Development appointment, at the district hospital, because his parents suspected that something was wrong, after which he was sent to an autism exam at the Paediatric Hospital of Coimbra. At the age of three, he was diagnosed with an Autism Spectrum Disorder (level 2 in the scale of severity), with associated cognitive deficits.

General characterization of the child

He is attending the 4th grade at Anadia's Primary School, benefiting from a Structured Teaching Unit (STU) delivering him a

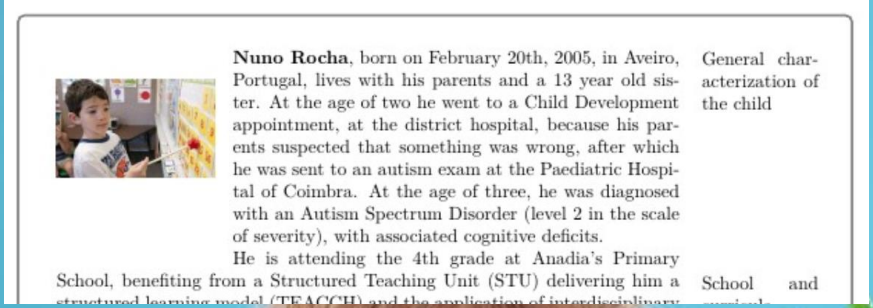
School and

Context

Scenario

Scene 2: Comment picture taken

Next, the application displays the edit menu so that Nuno can choose an option: attach an emotion to the photo; add a comment to the photo; or share it in his diary so that Nuno's family and friends can be aware of what he is doing at school. Choosing the first option, six different emotions are presented, and Nuno picks the one associated with laughing. Going back, he wants to add a small text explaining what he was

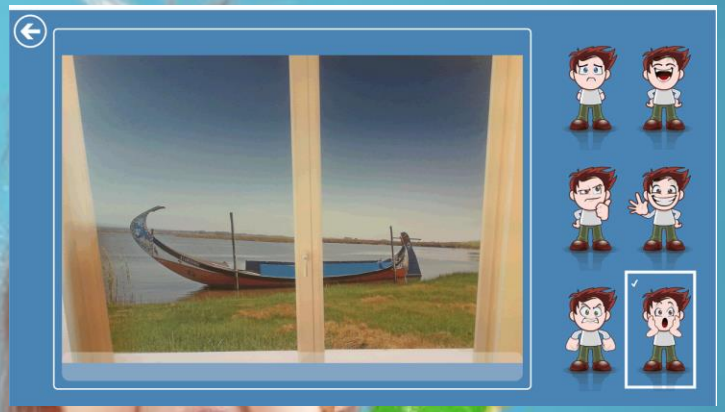


Nuno Rocha, born on February 20th, 2005, in Aveiro, Portugal, lives with his parents and a 13 year old sister. At the age of two he went to a Child Development appointment, at the district hospital, because his parents suspected that something was wrong, after which he was sent to an autism exam at the Paediatric Hospital of Coimbra. At the age of three, he was diagnosed with an Autism Spectrum Disorder (level 2 in the scale of severity), with associated cognitive deficits.

General characterization of the child

He is attending the 4th grade at Anadia's Primary School, benefiting from a Structured Teaching Unit (STU) delivering him a

School and



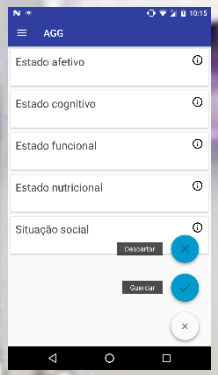
Context Scenario:

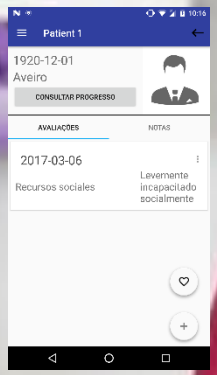
e.g., **HTA**

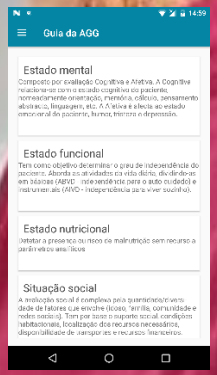
Scene 2: Comment picture taken

Next, the application displays the edit menu so that Nuno can choose an option: **attach an emotion to the photo**; add a comment to the photo; or share it in his diary so that Nuno's family and friends can be aware of what he is doing at school. Choosing the first option, **six different emotions** are presented and Nuno picks the one associated with laughter. Going back, he wants to **add a small text** explaining what he was

Scenarios depict the tasks and features that need to be addressed







Prescribing medication to Lurdes — *The physician needs to be careful since Lourdes already takes medication for other health issues and the drug he is going to prescribe must not interfere, causing new health complications. Since he needs to consult medication-related criteria, which is not visible by default, he heads to the settings menu. He browses a list of the modules that can be activated and deactivated and proceeds to activate the Clinical Criteria module. Francisco consults the app and searches for the name of the medicine he has in mind. The app tells him that medicine should be avoided for a health issue Lourdes already has. Francisco then proceeds by using the Start criteria that inform which drugs are best for certain conditions.*

List of Requirements

How are requirements presented?

- In a list for each type of requirement (functional, nonfunctional)
- Establish priorities for each requirement by paying attention to how you order them
- By looking into your requirements and user abilities you then need to complete them regarding devices and interaction modalities

Input Devices

- Keyboards
- Pointing devices
  - Mouse
  - Touch screen
  - Touch pad
  - Joy stick
  - Track ball, …
- Voice recognizers
- Eye trackers
- Motion and position trackers
- 3D input devices
- …

Keyboards

- QWERTY layout

- Ergonomic Keyboards

Help avoid RSI (Repetitive Strain Injury) WRULD (Work Related Upper Limb Disorder) and KRP (Keyboard Related Pain)

Pointing Device: Mice

Advantages:

- Direct relation between hand and cursor movement
- Allow speed control
- Allow continuous movement in all directions

Disadvantages:

- Require hand movement between mouse and keyboard
- Additional space (footprint)
- Hand-eye coordination

Touch Screens

Use touch screens when:

- There is no training
- Targets are large, discrete and scattered
- Space is important
- No (or little) text entry
- Are not used for a long time

Voice Input

Has advantages when the user:

- Has physical deficiency
- Must move around
- Has hands/eyes busy
- Is in a low visibility or cluttered environment

Has inherent disadvantages:

- Voice is transient
- May disturb other people
- May result in lack of privacy
- May be slower and more tiresome (overloading STM)

Voice Input

Consider voice input when:

- The user has to move
- Has eyes or hands busy

Avoid voice input when:

- Privacy is important
- Error taxes, even low, are not acceptable
- Usage frequency is high
- Speed is important

Input Devices

When choosing an input device, consider:

- Ergonomics / human factors
- Typical scenarios of use
- Cost
- Generality
- DOFs (Degrees Of Freedom)
- Output devices
- Interaction techniques

Output Devices

Provide output to our different senses:

- Visual displays
- Sound
- Touch/haptic
- Smell

Voice Output

It has become a major trend due to a strong evolution of the diferente technologies

Advantages of using voice output:

When the user has:

- physical deficiency
- to move around
- hands and eyes busy
- Adverse conditions: low visibility, high Gs

Disadvantages:

- Is tiresome and uncomfortable for long periods
- Is transient (taxes STM)
- May have privacy issues
- May disturb other people

Conclusion

- Choosing the input and output modalities needs to be performed with attention to the contexts, tasks, and user abilities

- If using a particular device is a requirement, then any problem that may arise from it should be considered when designing interaction

  e.g., typing long text in a smartwatch….

Task 04

- Discuss your scenarios with the teacher
- Define the list of requirements
- Decide what are the best/required options for device and input and output modalities
- Update the project logbook