

# **Designing an E-Government Portal Accessible to Illiterate Citizens**

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# Agenda

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- Introduction
- Project's Requirements
- Software Engineering Process
- Literature Review
- Architecture and Technologies of Fez E-Gov Portal
- Design Approach of Fez E-Gov Portal
- Applying the Design Approach
- Assessment of Fez E-Gov Portal
- Conclusion & Future Work

# Introduction

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## □ Context

- Sub-project of the “Fez E-Gov” project conducted by the ICT4D lab research group at AUI
  
- Funded by the Canadian IDRC

# Introduction (Cont.)

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## □ Objective

- Improving knowledge about how illiterate citizens in Morocco can interact with E-government services
- Designing a GUI for Fez E-Gov portal that is usable both by literate and illiterate citizens

# Project's Requirements

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## □ Functional Requirements

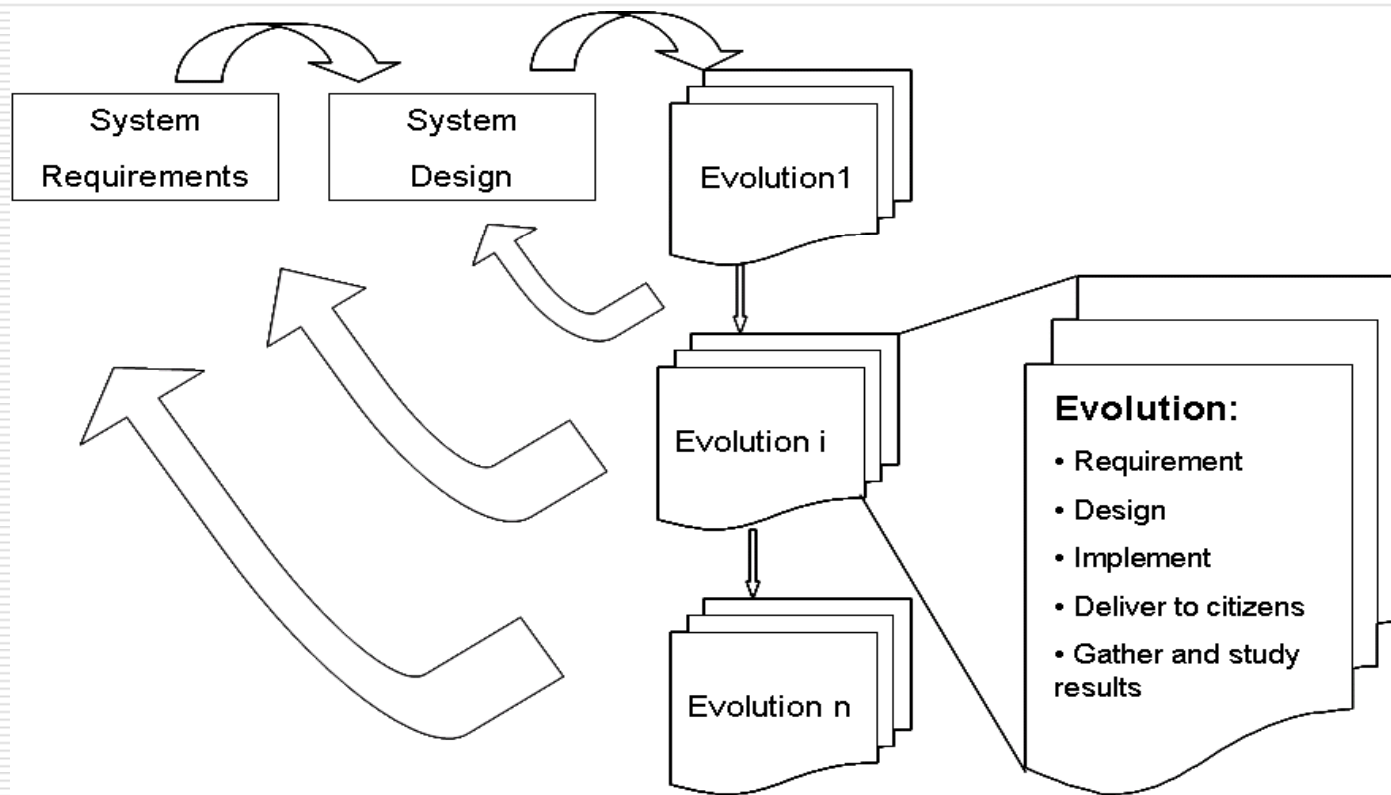
- Allow citizens to get their official papers electronically
- Allow citizens to get information about government services

## □ Non-Functional Requirement

- The system must be easy to use since it is aimed to be usable by all types of citizens: literate, digitally illiterate and functionally illiterate citizens
- The system should interface with the existing database containing the civil state electronic registers
- Pilot site: Arrondissement of AGDAL in Fez and its related Office of the Civil State

# Software Engineering Process

## □ Evolutionary Development Model



# Literature Review

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- Architectures to Build an Illiterate User System
  - Server Based Approach (browser programming + speech synthesis)
  - Client Based Approach (custom written web browser based on pictures)
  
- Architectures to Build an E-Gov System Accessible to Illiterate Users
  - Existing documented experience in South Africa: Telephone-Based Service Delivery

# Literature Review (Cont.)

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## Interface Design Approaches:

### Experimental Approaches

- Holding focus groups with potential users of the system,
- Observing users of the system working in their current environment,
- Organizing Wizard-of-Oz tests,
- Running usability experiments

### Non-Experimental Approaches

- Task analysis
- Structured design
- Visual or Holistic design
- Hypothetical design scenarios

# Architecture and Technologies of Fez e-Gov Portal

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- Hybrid architectural solution:
  - Browser Programming
  - Pictures with speech
  - Pre-recorded words

# Design Approach of Fez e-Gov Portal

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- Non-Experimental Approach:
  - hypothetical design scenarios
  
- Experimental Approaches
  - Organizing Wizard-of-Oz tests,
  - Running usability experiments

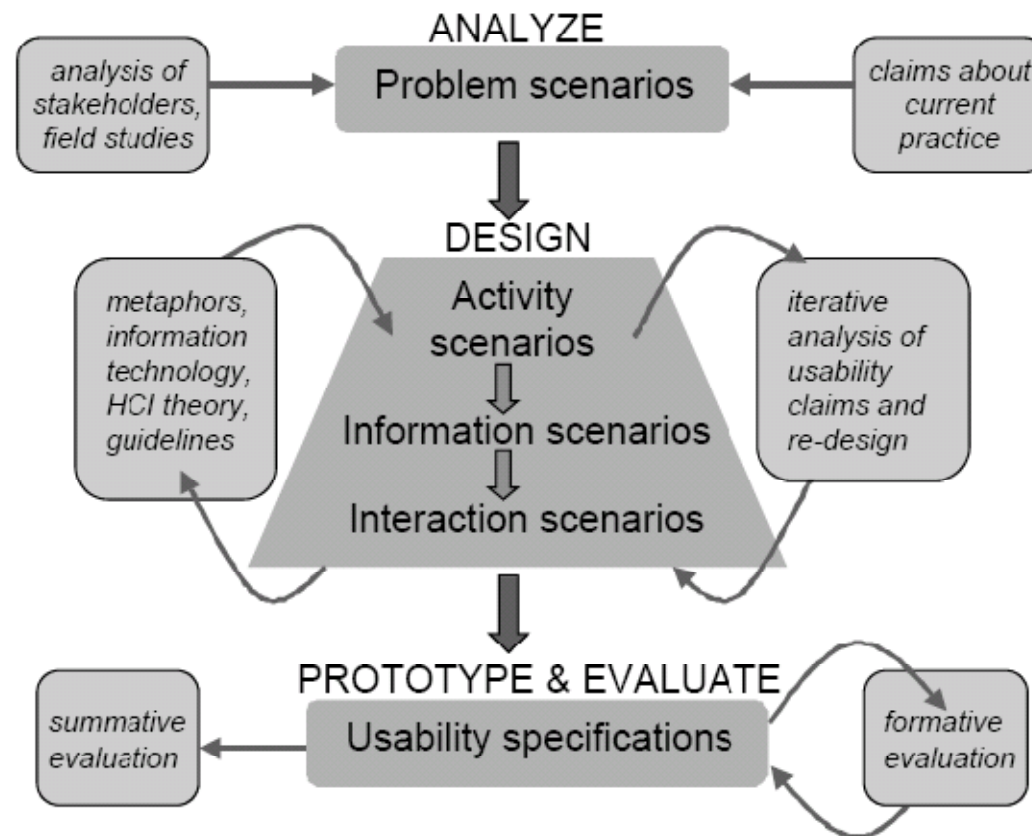
# Applying the Architecture and Technologies

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- ❑ **Browser programming:** *JavaScript*
- ❑ **Pre-recorded words:** RealAudio 3.0 to efficiently store and transmit the sounds
- ❑ **Pictures:** the choice and the use of pictures based on well defined principles and participatory design sessions
- ❑ **Touchscreen:** the interaction technique is based on direct manipulation

# Applying the Design Approach

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# Applying the Design Approach (Cont.)

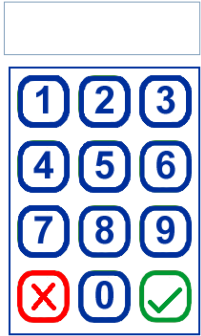
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## □ **Design Decisions**

- Highlighting the text that is read in bold
- Hearing the sound will be enabled once we click on the sound icon.
- A demo will be provided with voice explanations
- Sound and image icons will be on the right side of the text.
- Include print function
- Build a convention on the type of symbols to be use

# Applying the Design Approach (Cont.)

## □ First Prototype

- Use a numeric keypad for data entry → 
- More interactive vocal instructions are needed
- The help icon was not used
- The introduction to the GUI symbols should be done gradually at each step
- base the explanations not only on the vocal instructions
- After finishing the process, tell to the citizen that they have finished
- wizard of oz testing

# Applying the Design Approach (Cont.)



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## خدمات الحالة المدنية



نسخة كاملة من رسم الولادة



التصريح بالولادة



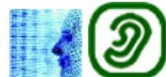
شهادة الحياة إما فردية أو جماعية



شهادة الخطوبة



شهادة ثبوت الشخصية



عقد الأزدادياد



نسخة موجزة من رسم الوفاة



شهادة العزوبة



شهادة عدم الزواج




الدقتر العائلي



# Applying the Chosen Design Approach (Cont.)

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## □ Second Prototype

- Change the function triggered by clicking the pictures
- Incite the citizen to use the ear symbol → 

# Assesment of Fez E-Gov Portal

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- Heuristic Evaluation (Expert Reviews)
  - Methodology:
    - 3 evaluators expect the GUI based on rules
    - The 10 Usability heuristics specified by Jakob Nielsen
  - Results
  
- Usability Testing (User Reviews)
  - Methodology:
    - Testing Form: % error in performing eah task
  - Results

# Assessment of Fez E-Gov Portal (Cont.)

- Usability testing results
  - number of test cases: 155

Educational Level	Percentage
Illiterate	7.1%
Primary School	2.7%
Secondary School	6.8%
High School	29.7%
University Education	53.4%

Tasks	% Errors
Recognizing the needed service	29.2%
Using the ear symbol	8.4%
Inserting Birth Certificate Year	1.9%
Inserting Birth Certificate Number	3.9%
Using the print icon	0.6%
Choosing the number of copies	1.3%
Confirming printing	2.6%
Knowing what to do afterwards (going to the officer to get the printed copies)	11%
Ability to recover from errors	11.5%

# Assessment of Fez E-Gov Portal (Cont.)

- Illiterate Users' Usability Results
  - number of test cases: 62

Tasks	% Errors
Recognizing the needed service	22.6%
Using the ear symbol	6.5%
Inserting Birth Certificate Year	12.9%
Inserting Birth Certificate Number	24.2%
Using the print icon	4.8%
Choosing the number of copies	1.6%
Confirming printing	1.6%
Knowing what to do afterwards (going to the officer to get the printed copies)	0%
Ability to recover from errors	5%

# Assessment of Fez E-Gov Portal (Cont.)

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- Categories of the findings from the testing results
  - Culture change management
  - Illiteracy Level Definition
  - Learning Curve Discussion
  - Literate vs. Illiterate Citizens' Experience Comparison

# Conclusion

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- ❑ Design a graphical user interface that is usable by both literate and illiterate people.
- ❑ We came out with some design principles that are adapted to the context of our system
- ❑ We discovered that the culture change management aspect of the project is very important

# Thank You

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**Questions ?**