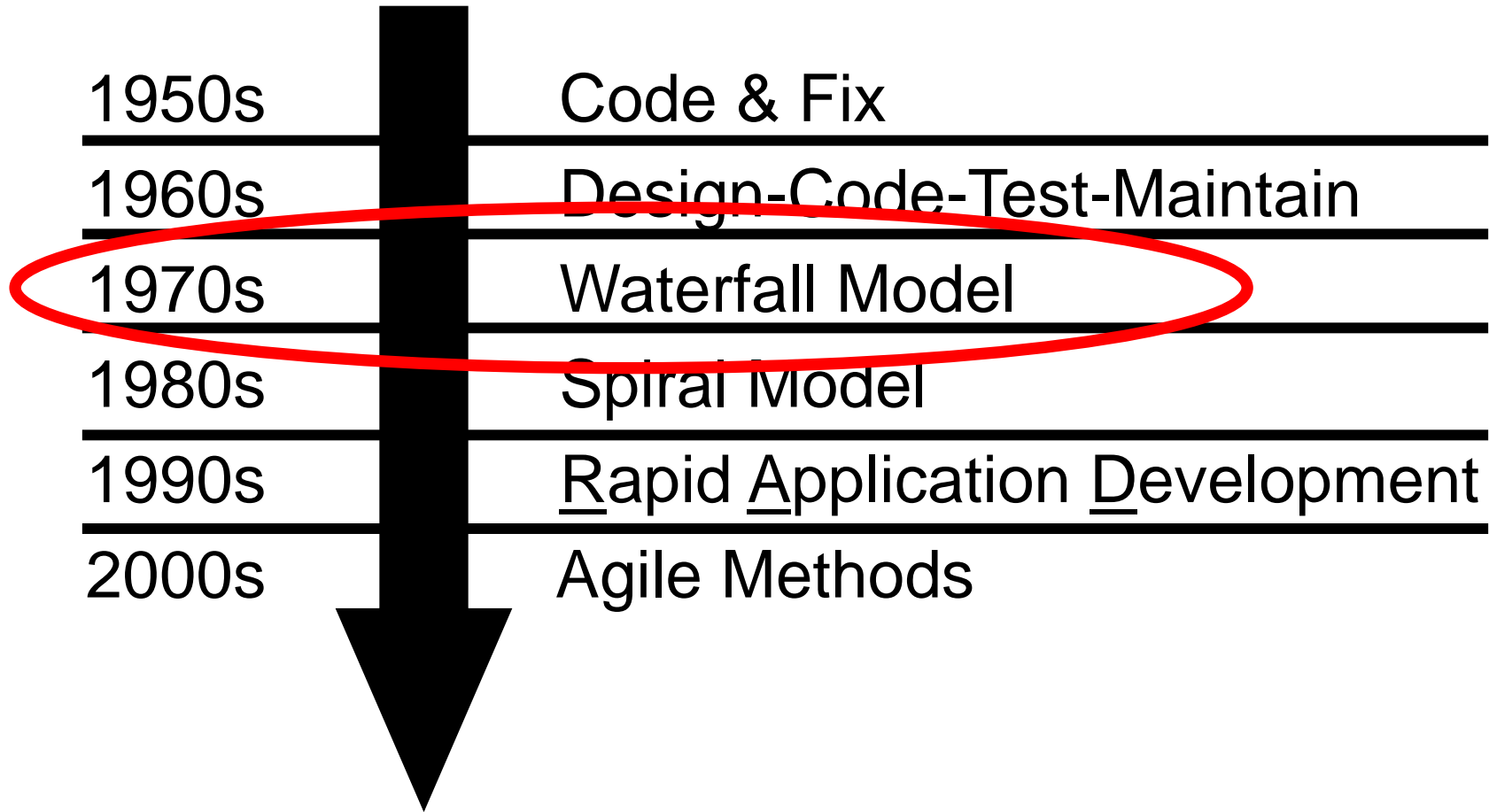


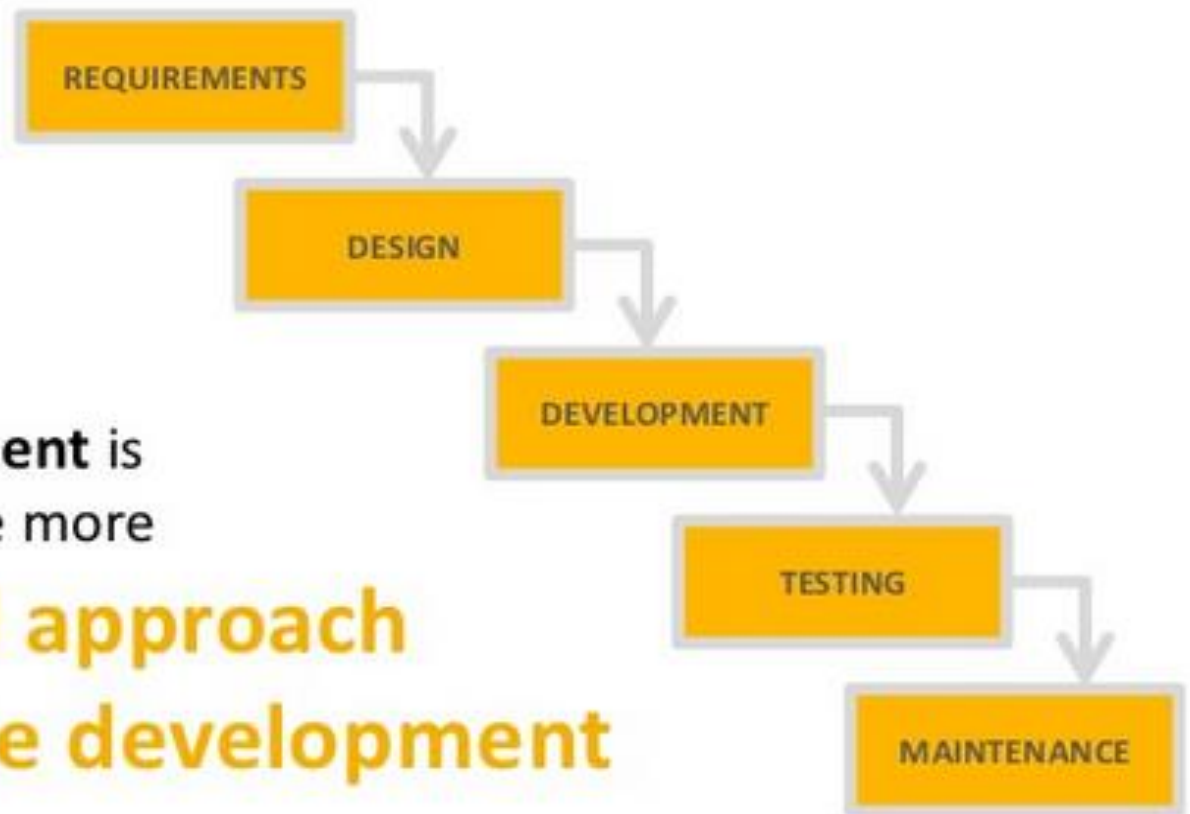
# 14. SOFTWARE DEVELOPMENT METHODOLOGIES 2

**What did we do last time?**

# Timeline of Methodologies



# Waterfall Development



**Waterfall Development** is  
another name for the more

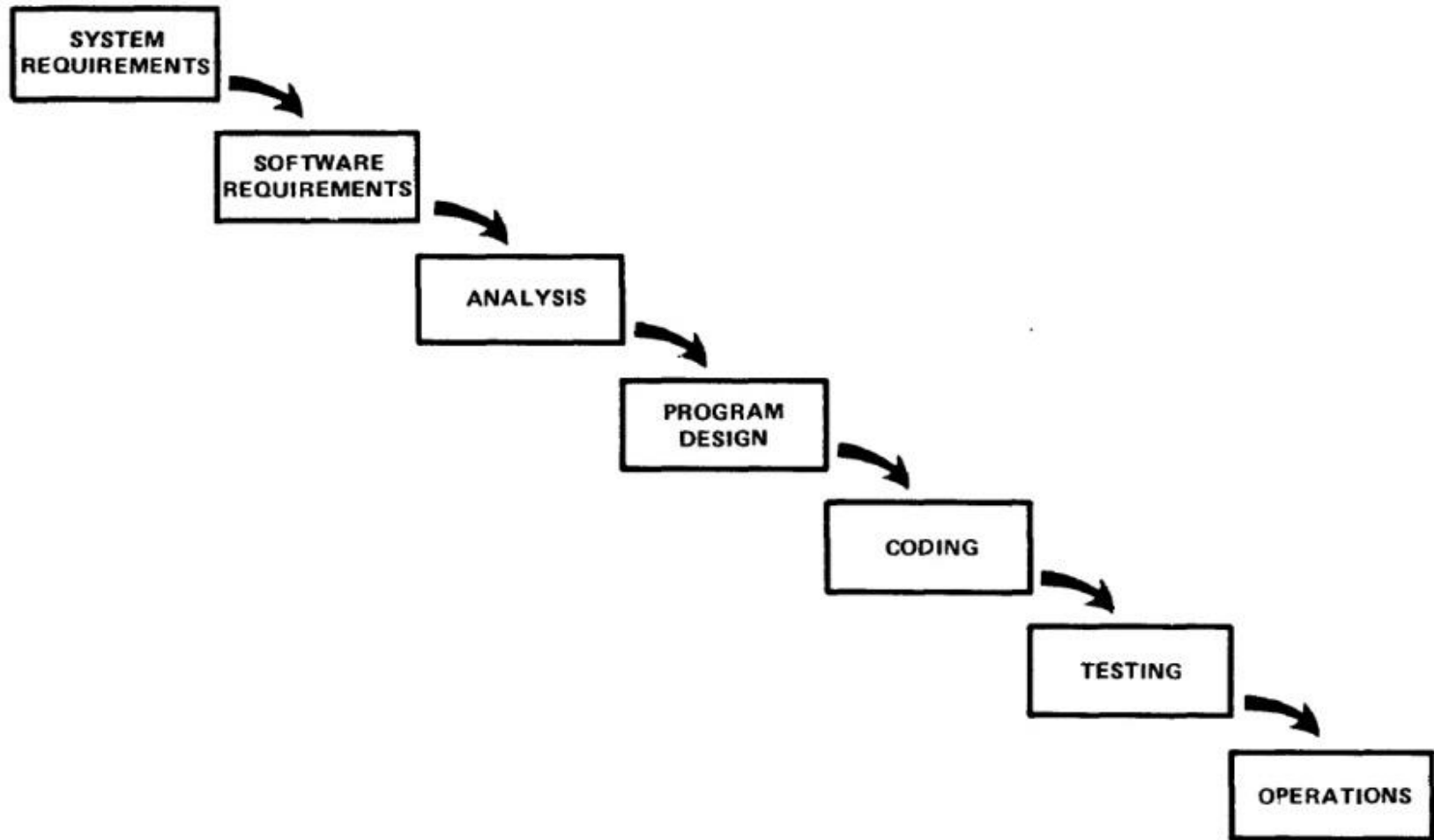
**traditional approach  
to software development**

# Waterfall Development (contd..)

You **complete one phase** (e.g. design) **before** moving on to the **next phase** (e.g. development)

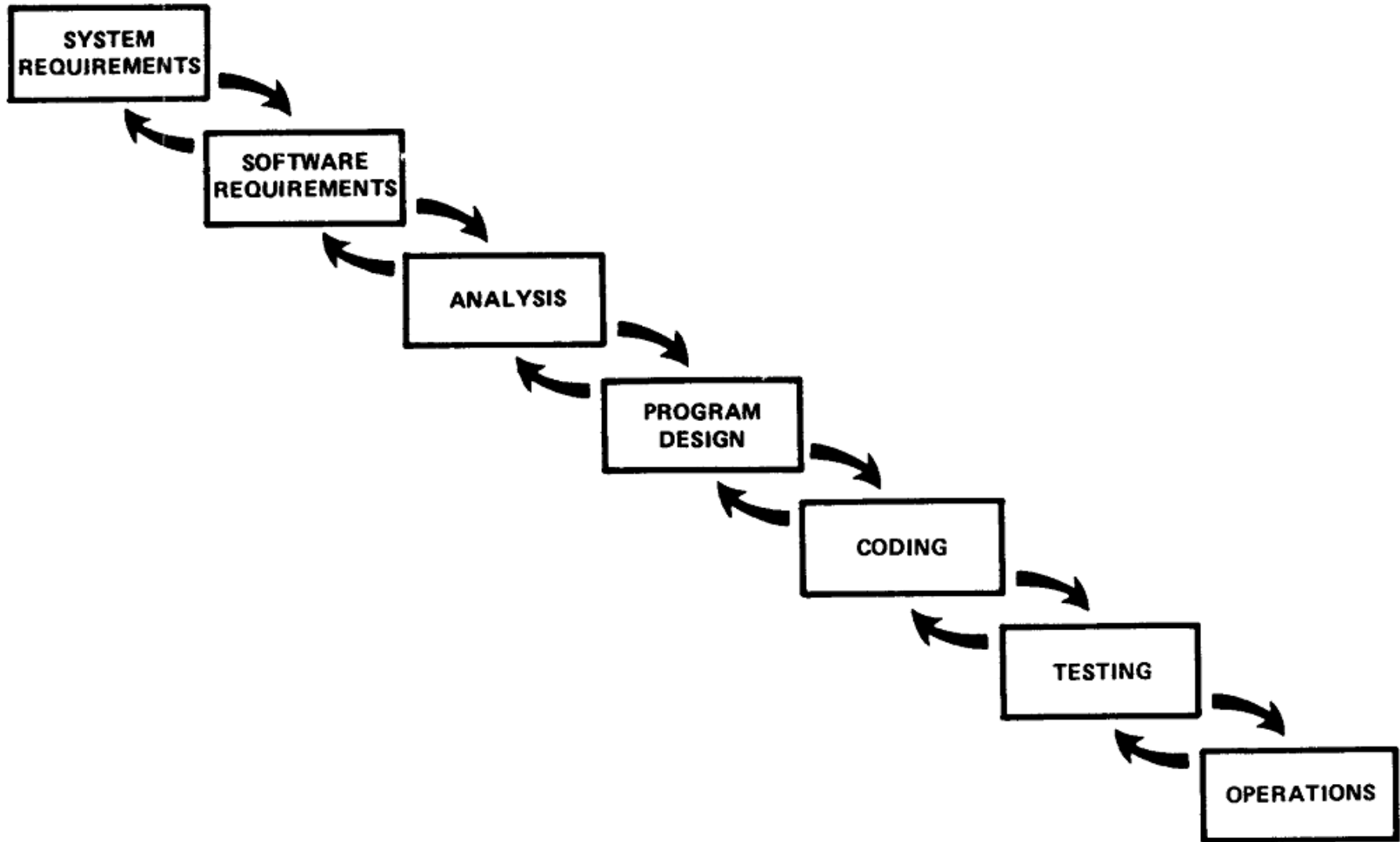
You **rarely aim to re-visit a 'phase' once it's completed**. That means, you **better get whatever you're doing right the first time!**



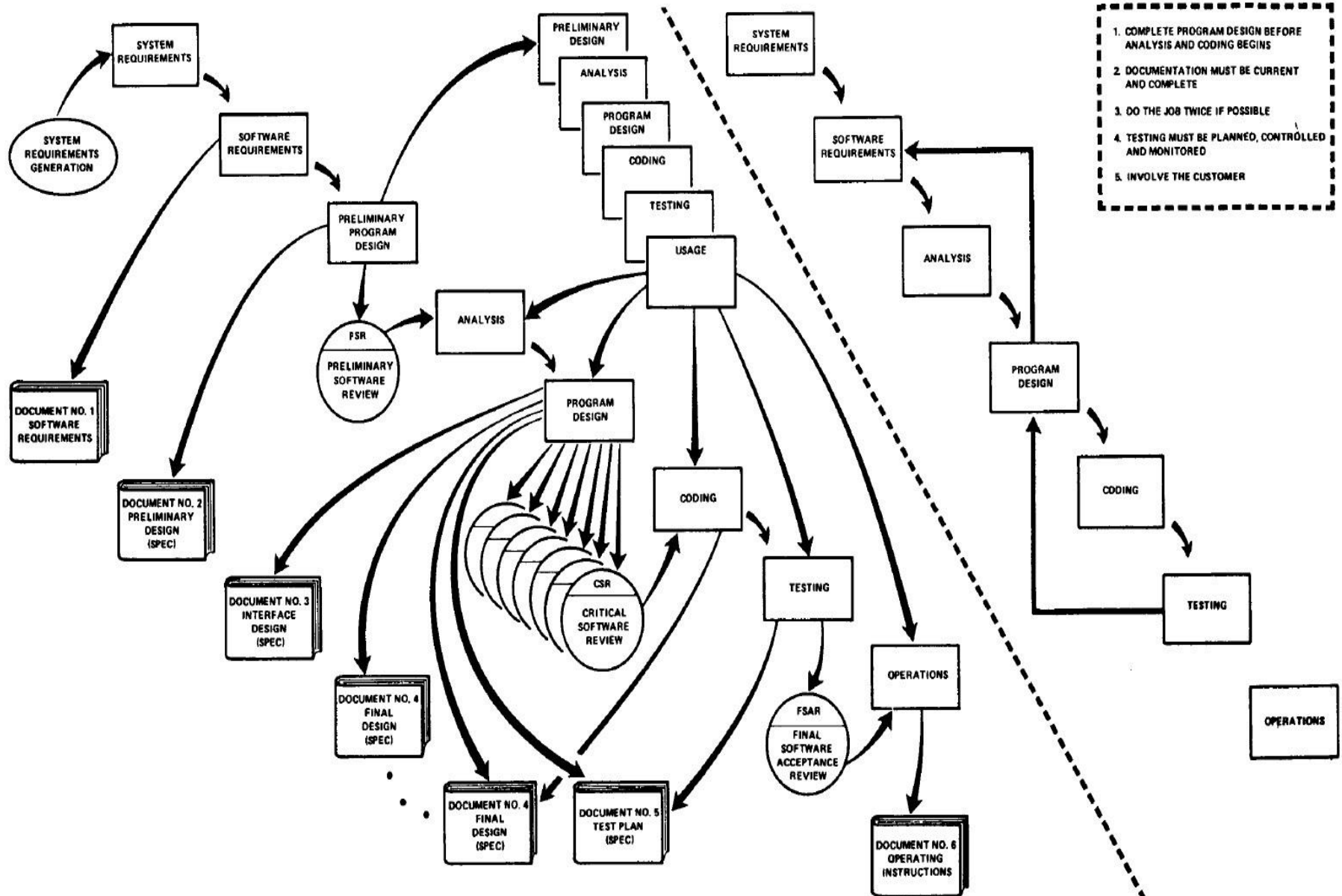


- Royce, W.W., 1970, "*Managing the Development of Large Software Systems*", Proceedings of IEEE WESCON 26 (August), pp.1–9.

# Iterative Relationship between Successive Development Phases



# Summary





**TODAY, WE ARE GOING TO TALK  
ABOUT:**

**PEOPLE IN DESIGN**

# People in Design

- Why do we care about people in design?



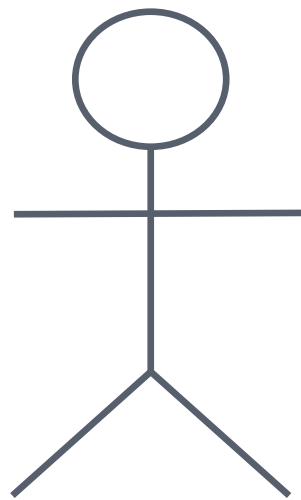
Because we build software systems for other people, so we have to give as much thought about how these people (the users) will experience the system, as we do in the building on the internal logic of the system.

# People in Design

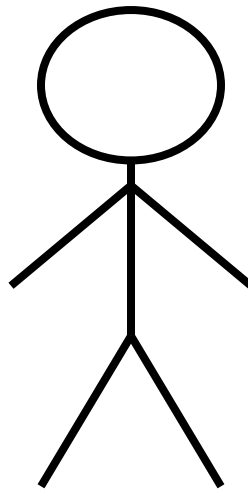
- How do we represent people in design?

# People in Design

- How do we represent people in design?
  - It's worse than you think.



or



In software  
engineering we  
refer them as  
actors!

# People in Design – an exercise

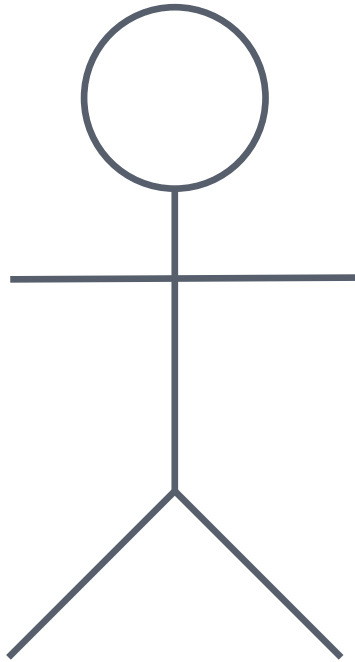
**What functionalities  
would an unregistered  
facebook user have?**



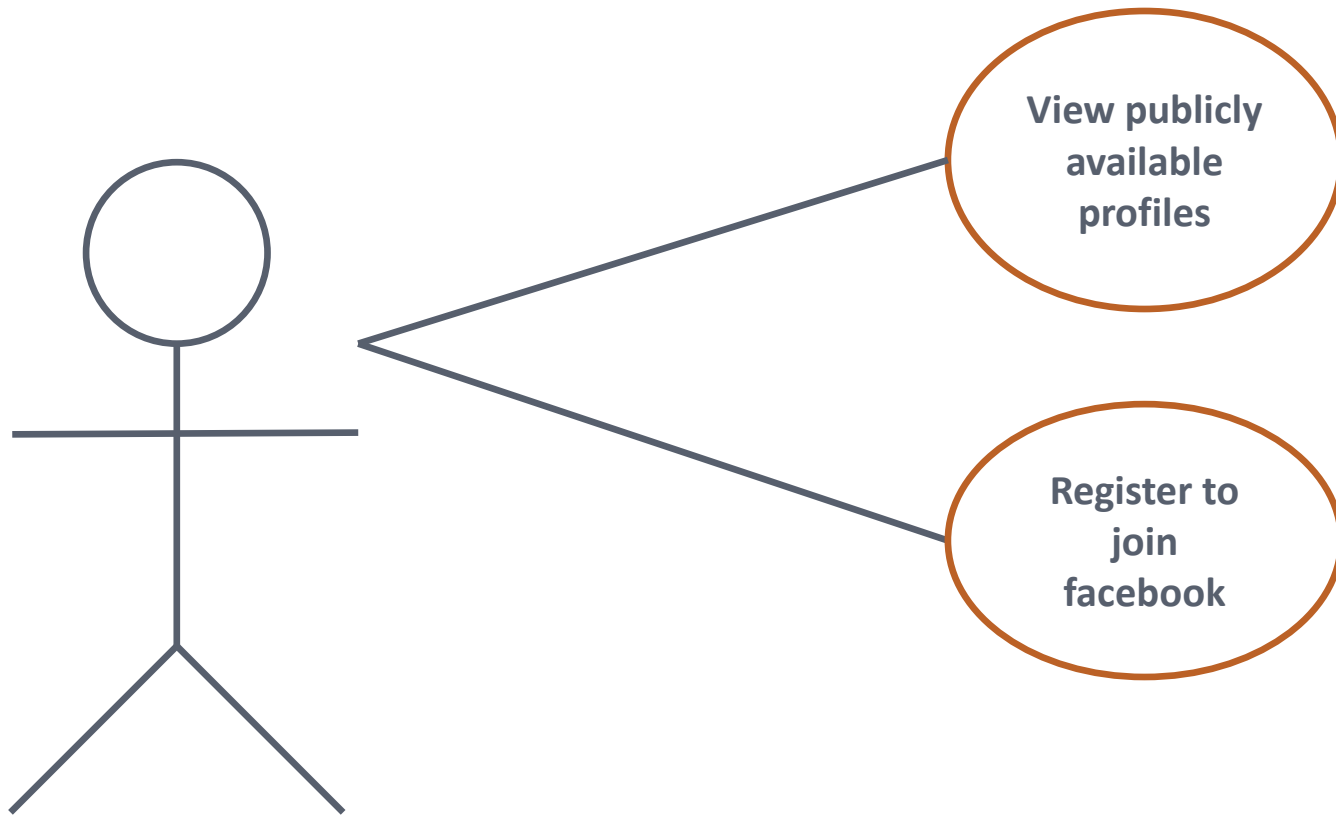
*Implementing  
Design Thinking*



**facebook®**



# Non-Registered Users



**facebook®**

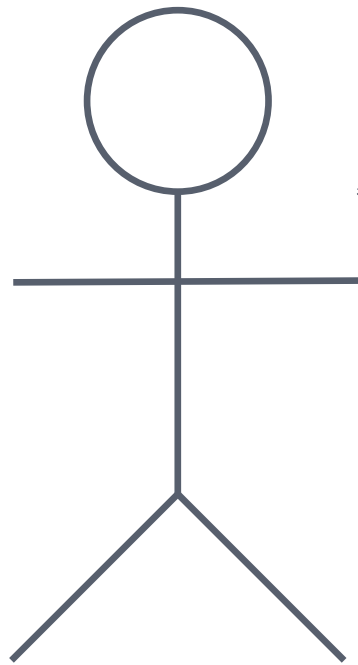


**What functionalities  
would an registered  
facebook user have?**

*Implementing  
Design Thinking*



# Registered Users



View publicly  
available  
profiles

Log in

Look at  
friends  
updates

Update own  
profile

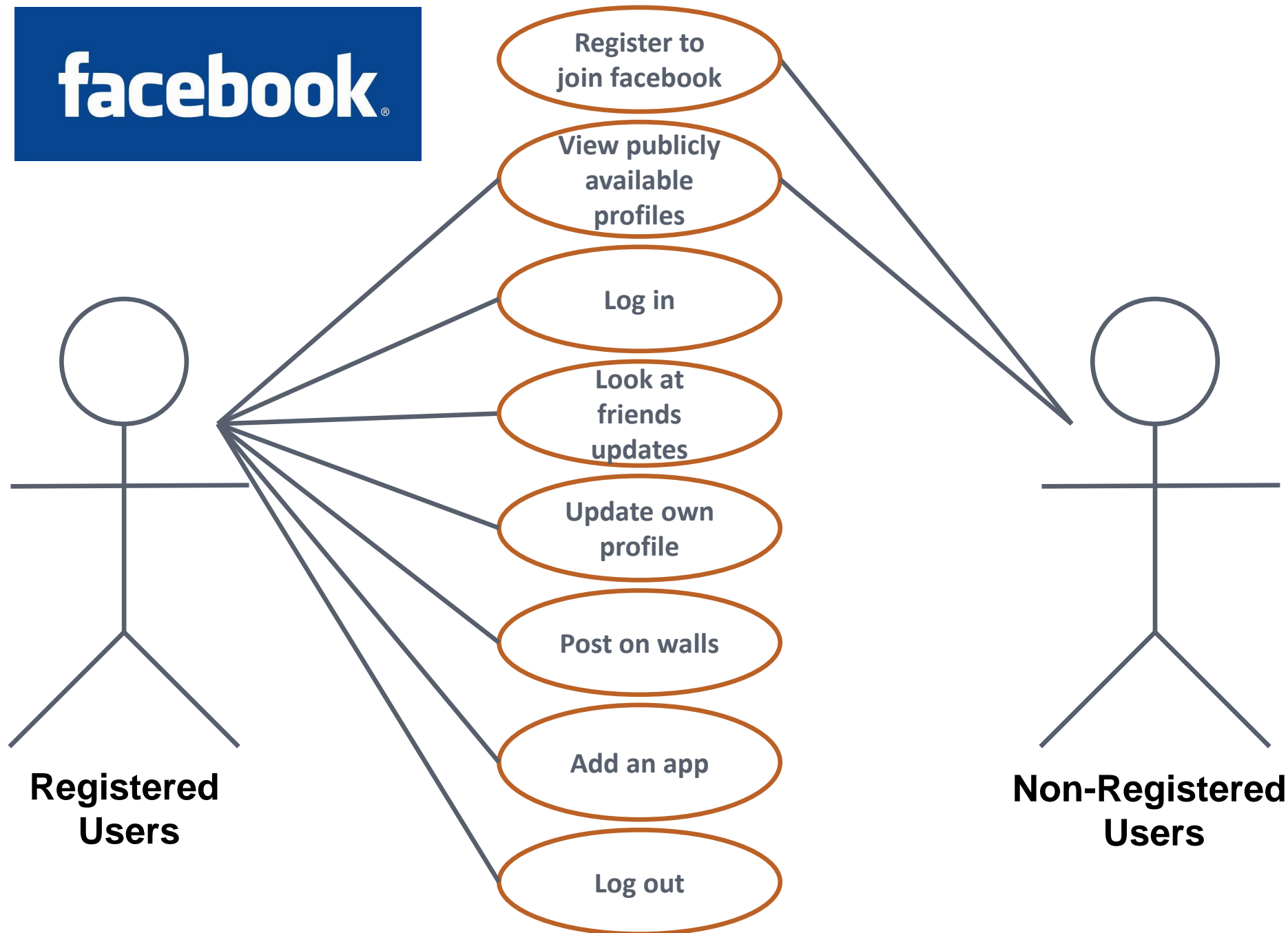
Post on walls

Add an app

Log out

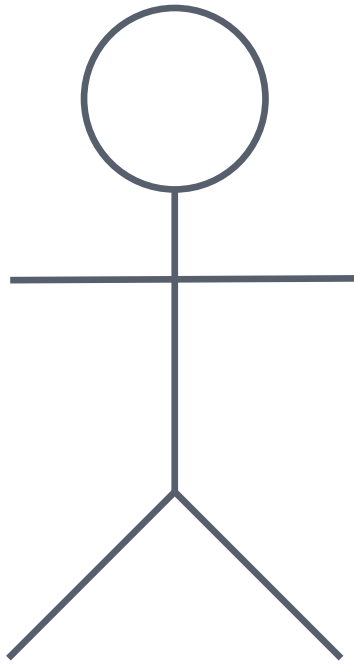


facebook®



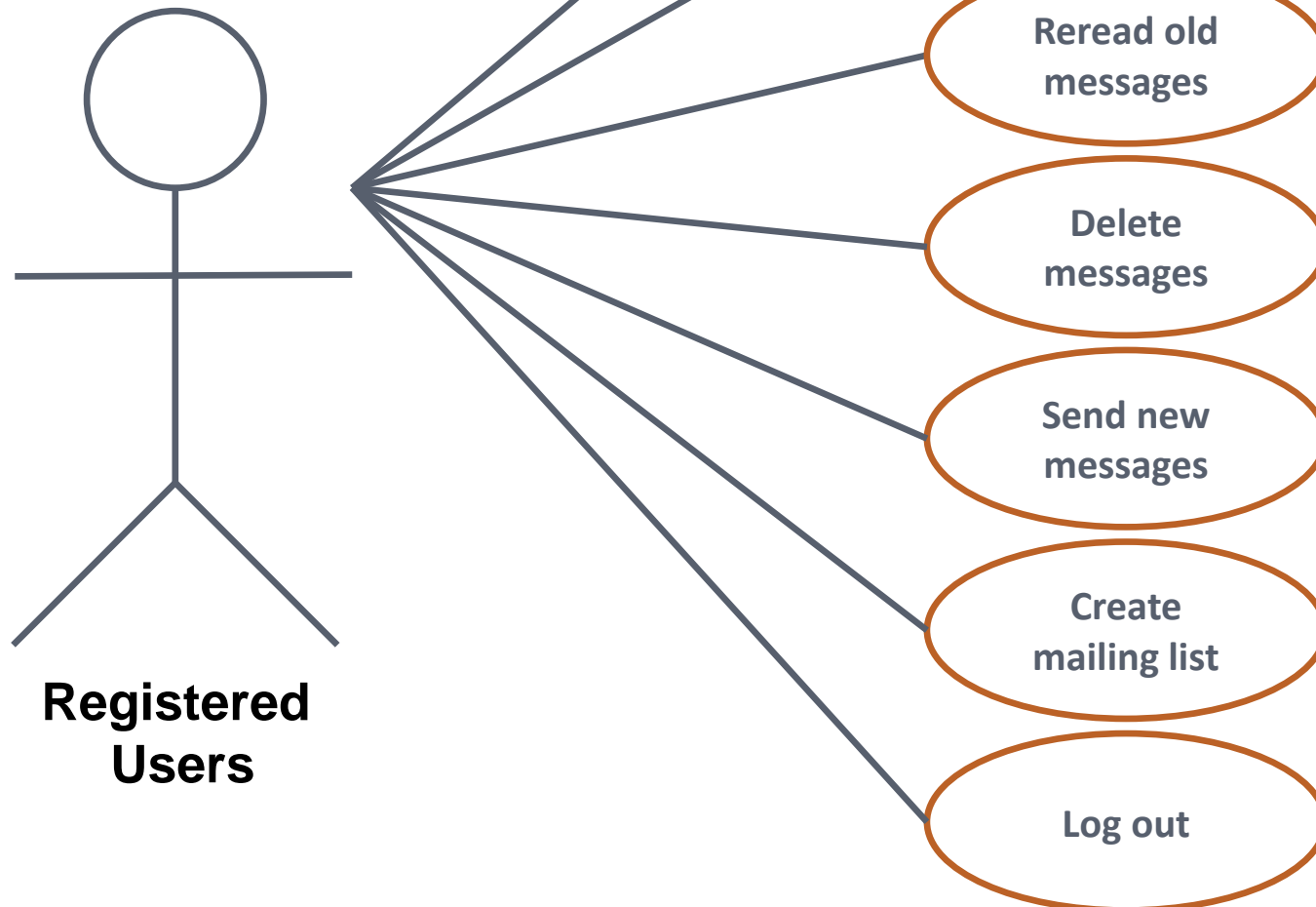
# People in Design

Let's take another example: **e-mail**

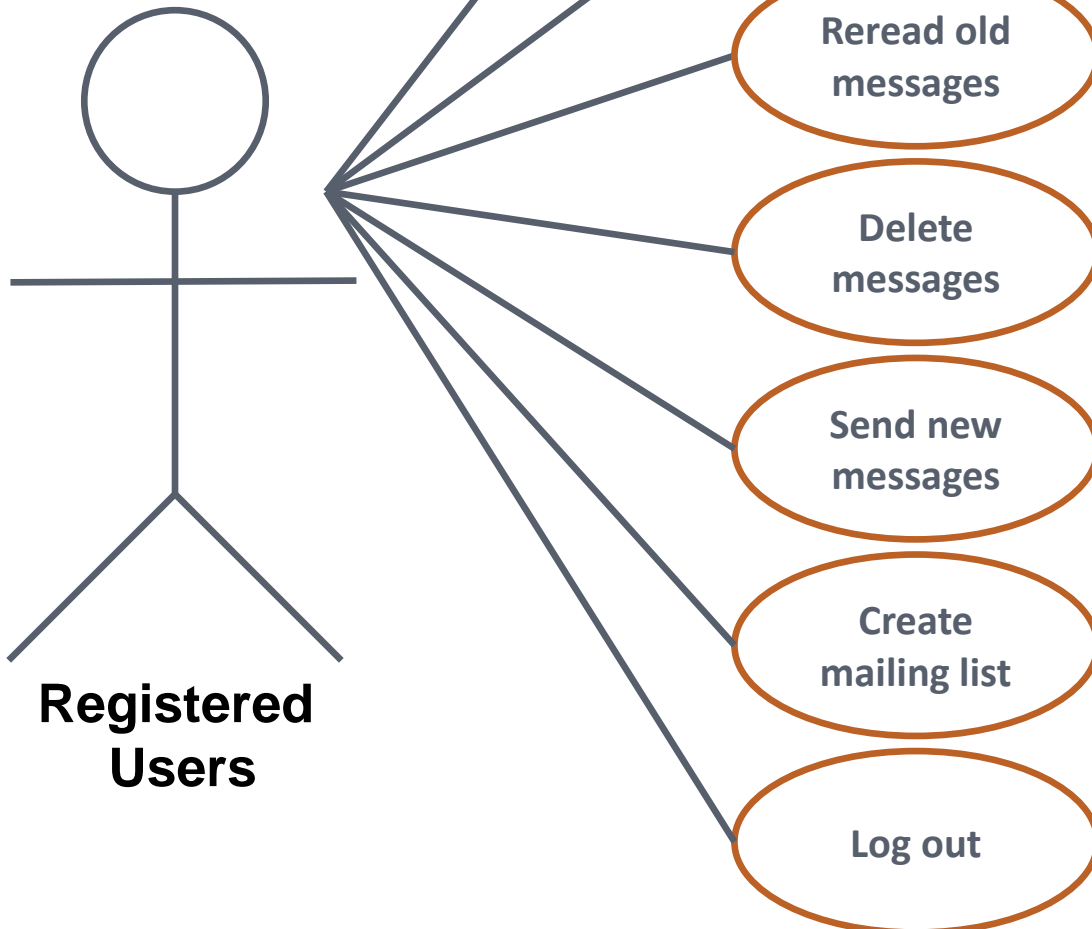


**Registered  
Users**

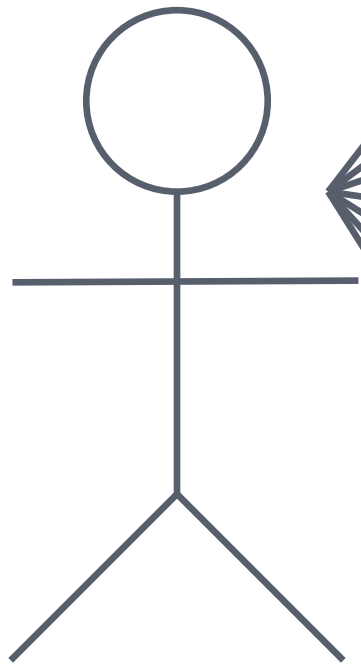
# e-Mail



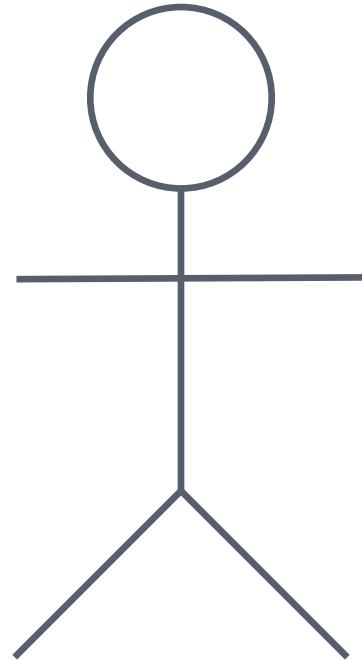
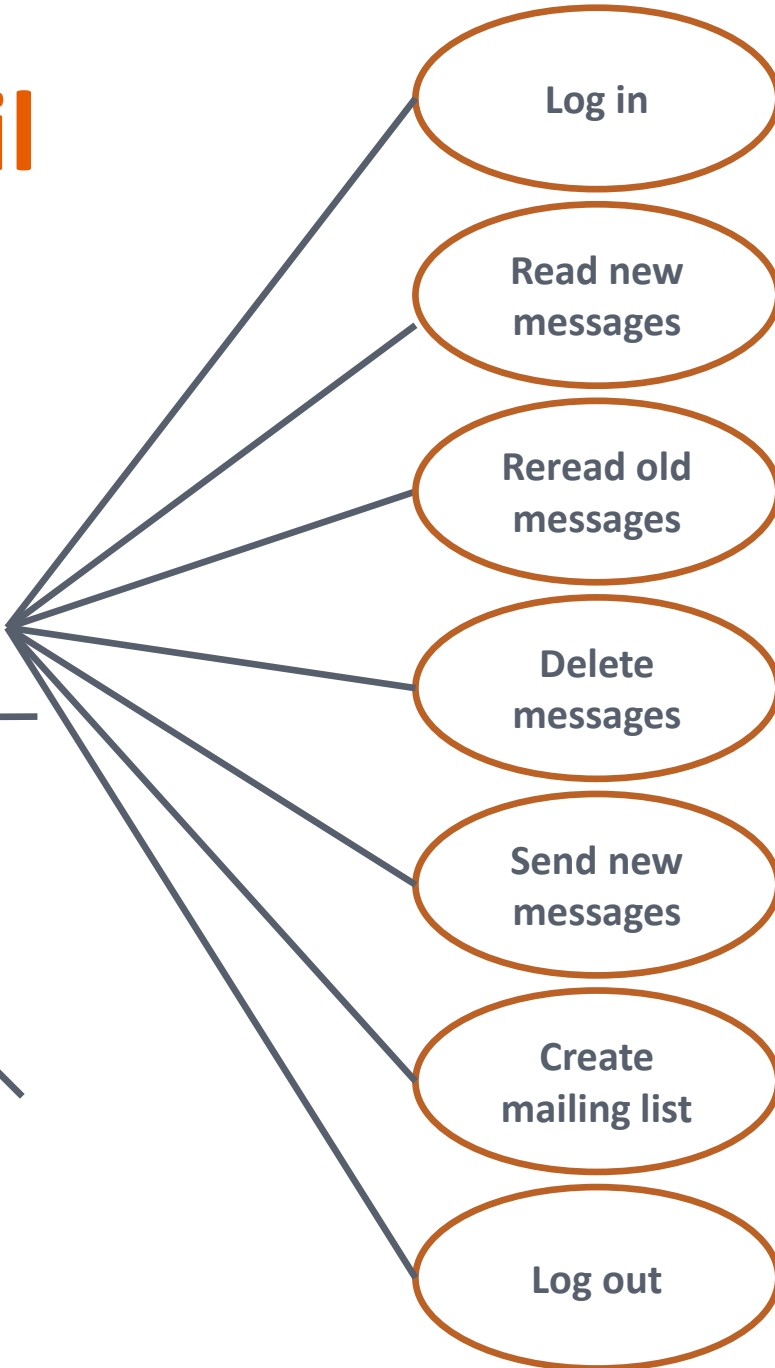
# e-Mail



# e-Mail

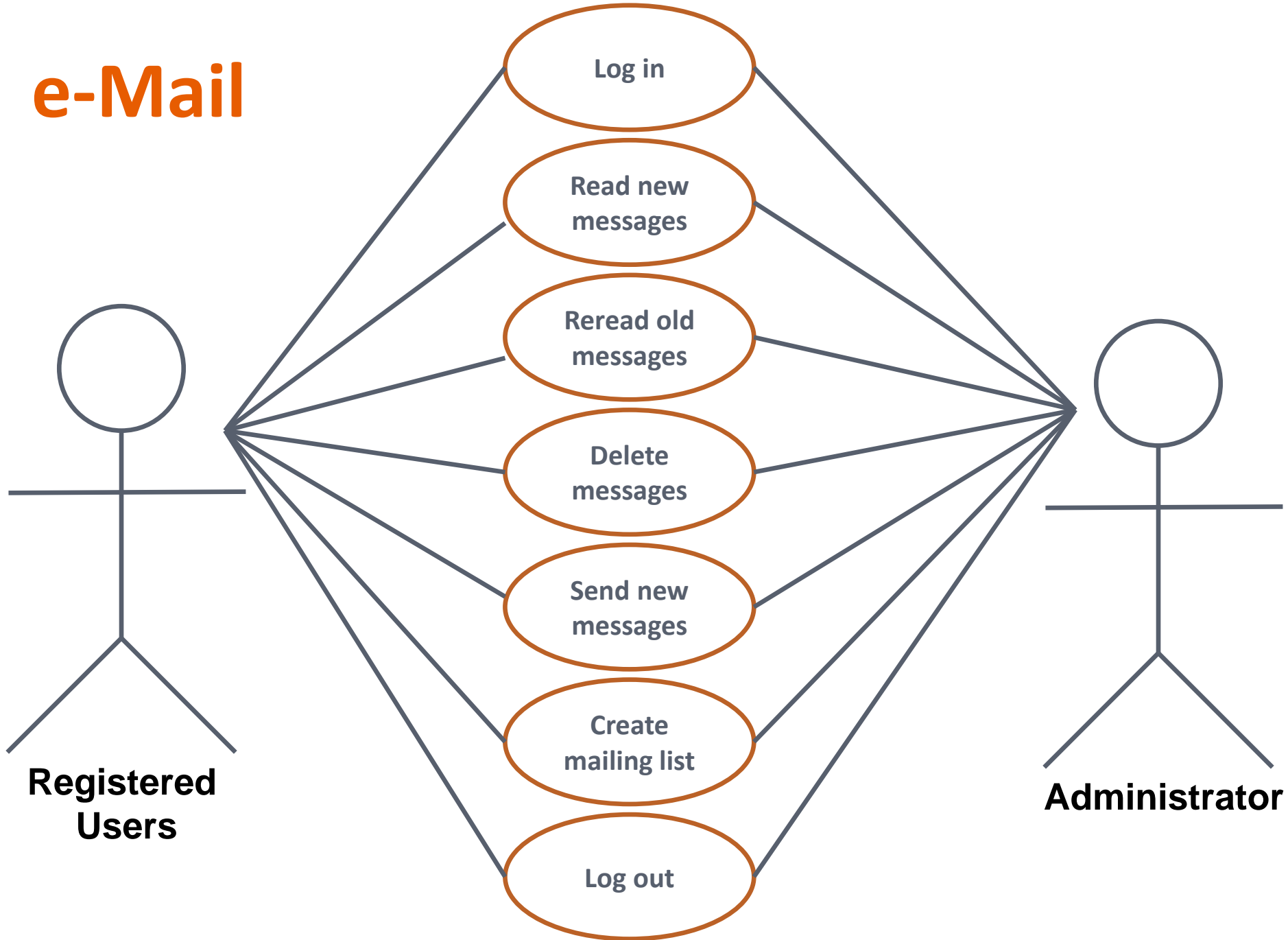


**Registered  
Users**

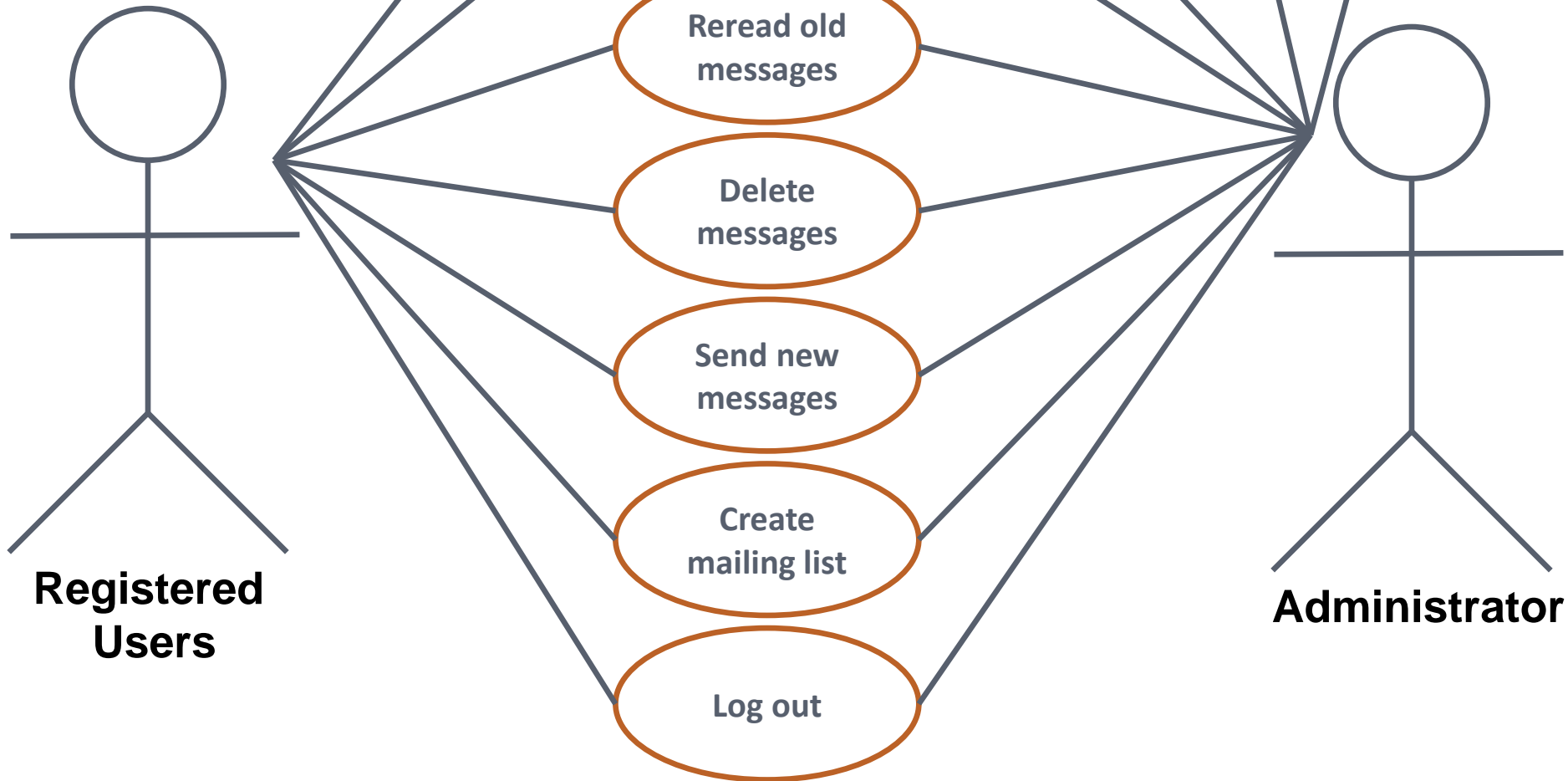


**Administrator**

# e-Mail



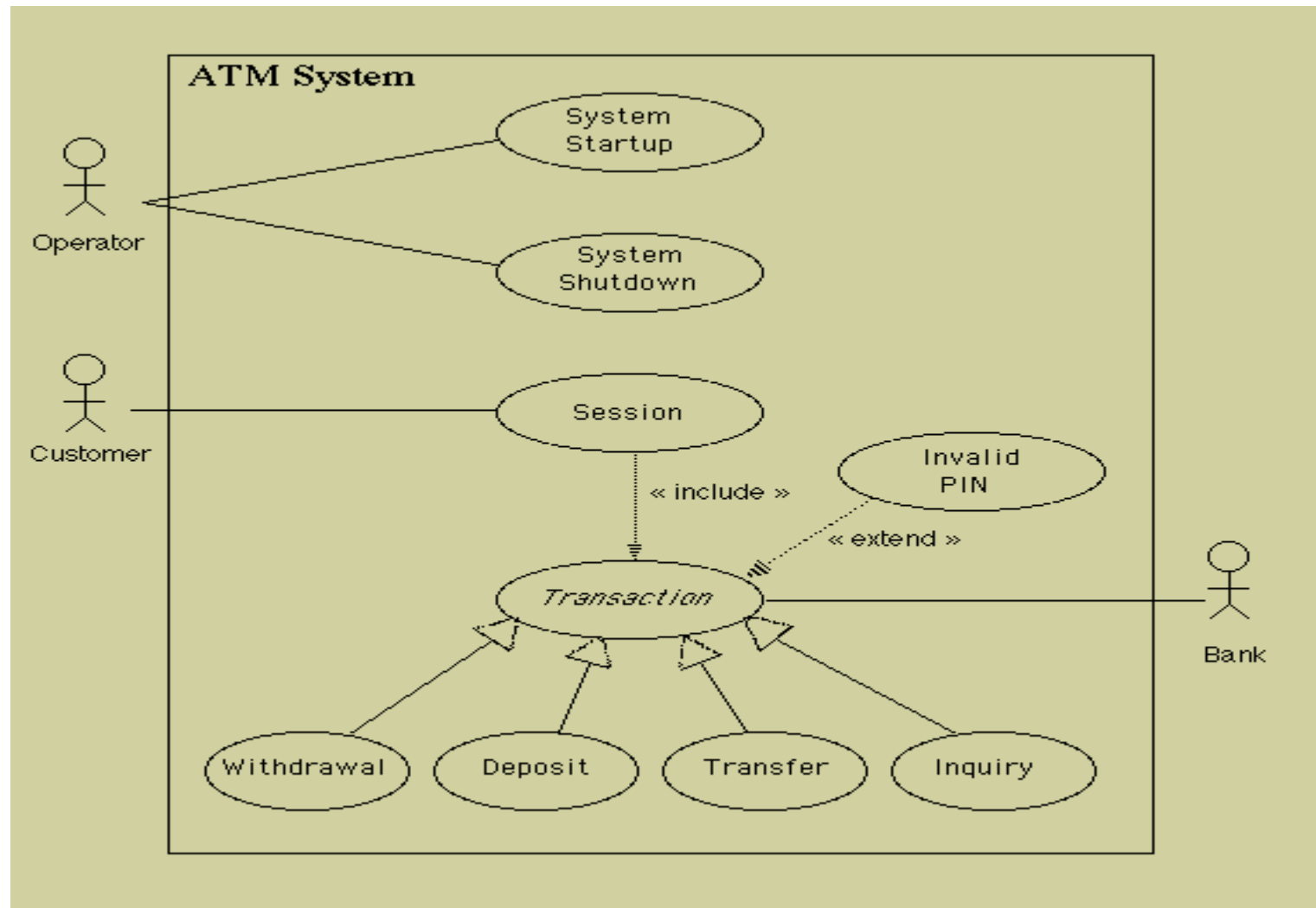
# e-Mail



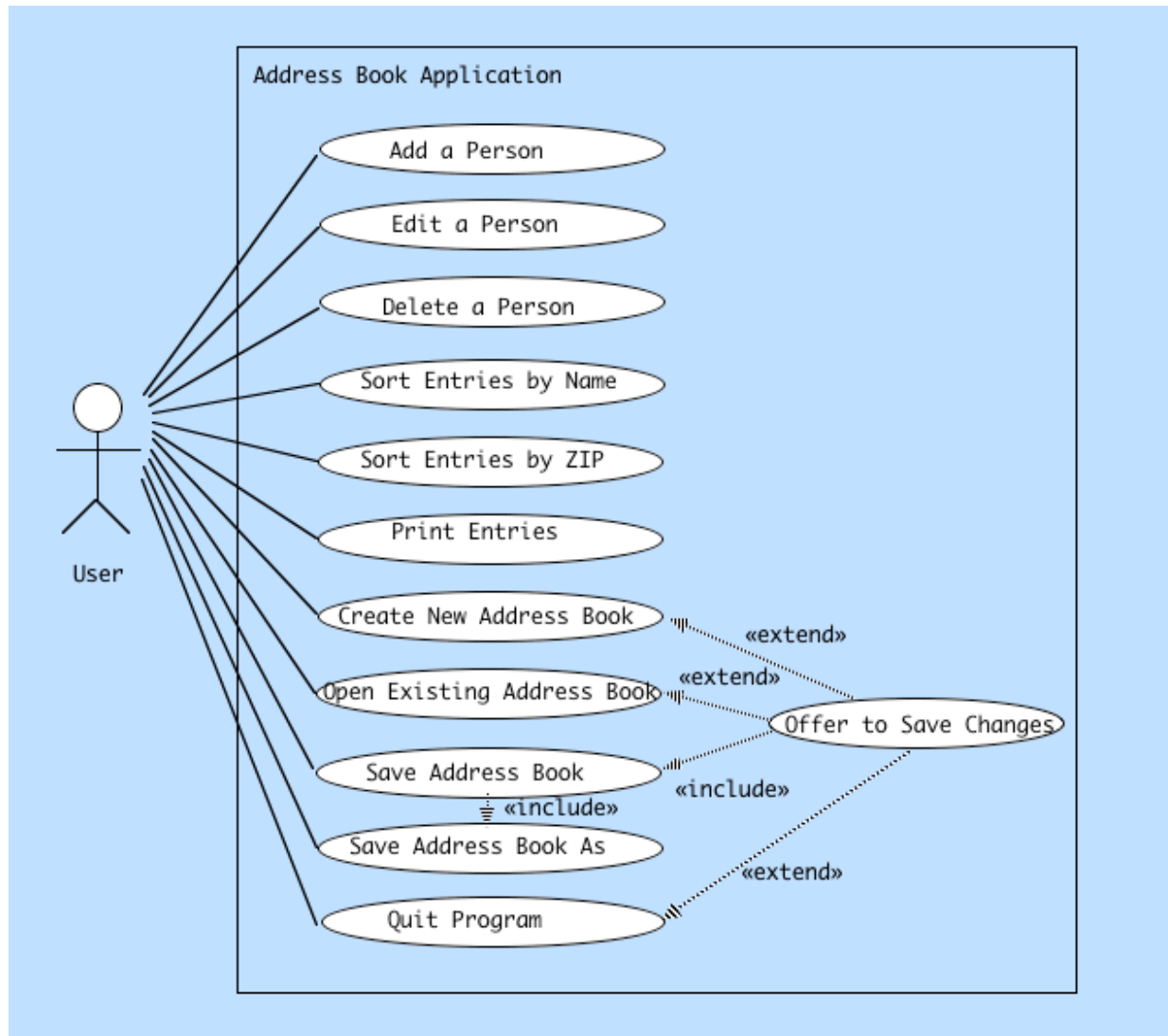


# Use case diagram

# Use Case for an ATM System



# Use Cases for a Simple Address Book

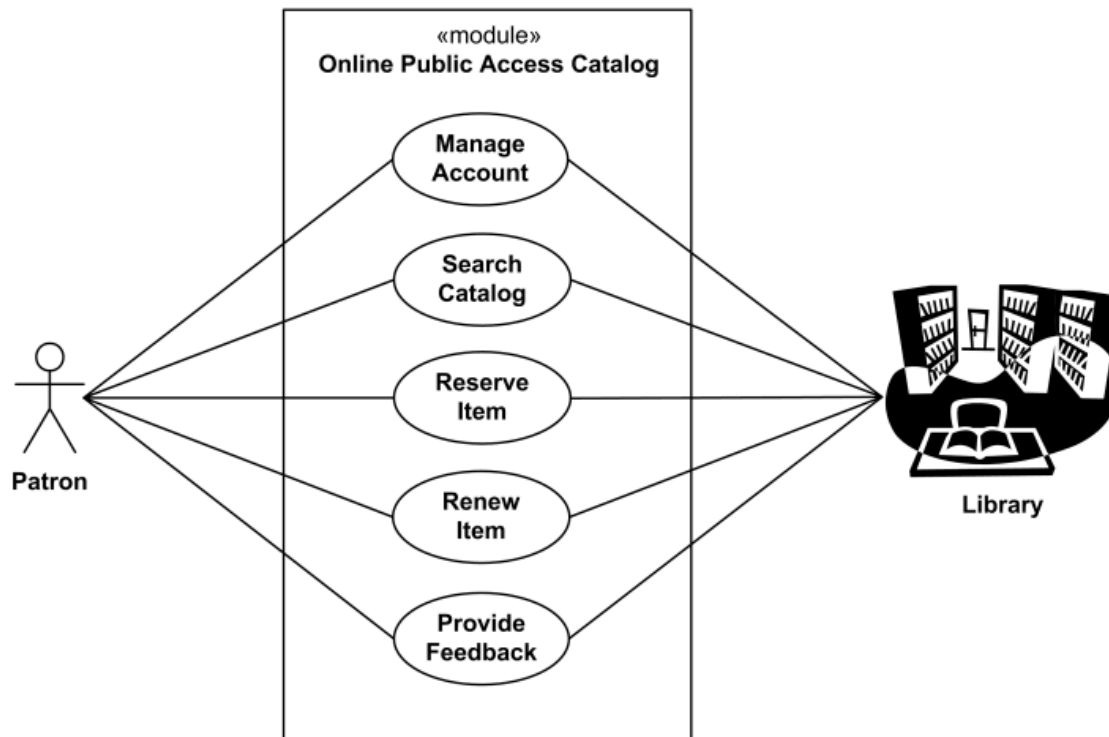


# Use Cases for e-library OPAC

## *e-Library OPAC*

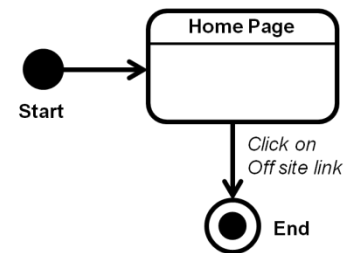
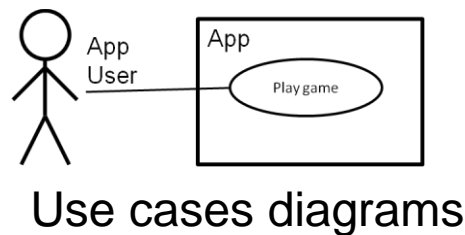
An **Online Public Access Catalog (OPAC)** is e-Library website which is part of **Integrated Library System (ILS)**, also known as a **Library Management System (LMS)**, and managed by a library or group of libraries.

Patrons of the library can search library catalog online to locate various resources - books, periodicals, audio and visual materials, or other items under control of the library. Patrons may reserve or renew item, provide feedback, and manage their account.



# UML

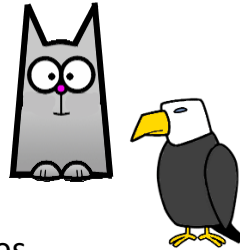
- Unified Modelling Language (v2.0)
- A visual language for designing systems by creating a visual model of the system before writing code
- 13 types of diagrams in 3 categories
- **Structure Diagrams** ( *represent the structure of code in a program* )
  - Class Diagram, Object Diagram, Component Diagram, Composite Structure Diagram, Package Diagram, and Deployment Diagram.
- **Behaviour Diagrams** ( *represent types of behaviour* )
  - Use Case Diagram, Activity Diagram, and State Machine Diagram.
- **Interaction Diagrams** ( *represent aspects of interaction* )
  - Sequence Diagram, Communication Diagram, Timing Diagram, and Interaction Overview Diagram.



# UNDERSTANDING THE USER

# User Characteristics

- User Characteristics
  - Abilities and skill
  - Nationality
  - Educational background
  - Preferences
  - Personal circumstances
  - Physical or mental disabilities
  - Age
  - Etc.
- Domain ability and knowledge
  - Novice
  - Expert
  - Casual user
  - Frequent user



## User Profile

- The **attributes** of a particular type of user
- A system will have **several types** of users or **actors**, with their own distinct profiles
- **Functionality** can be **grouped** according to user profiles

# Persona - Bringing users to life

## Personas (Cooper, 1999)

- **Rich descriptions** of **typical users** of the system, artefact, product or service under design
- **Realistic** not idealized
- Represent a **synthesis of characteristics** and **behaviours** from real potential users encountered during data gathering
- Each persona characterised by a **unique set of goals** relating to the system, artefact, product or service under design
- As people with the **same job role** may have very **different goals**
- And people with **very different job** roles may have the **same goal**
- A persona also includes a description of their **skills, attitudes, tasks and environment**
- Each persona has a name, a photograph, some personal details
  - Usually there will be a set of personas, not one
    - one **primary persona** may represent a large section of the intender users or a primary interface
    - A few **secondary personas** to additional users of the each major interface, with differing needs, skills and goals of the primary persona.
    - **Negative personas** – system not for them
    - One or two **buyer personas** who represent the buyer's needs, biases and goals. A buyer may or may not be a user of the product
  - The persona's pain-points

[1] <http://www.frontend.com/products-digital-devices/real-or-imaginary-the-effectiveness-of-using-personas-in-product-design.html>

[2] Cooper (1999) *The Inmates are Running the Asylum*

[3] Cooper and Reimann (2003) *About Face 2.0; The Essentials of Interaction Design - Goal-Directed Design*™





**Name:**

**Marty**

**Occupation:**

**Food finder**

**Age:**

**5 cat years**

**Education:**

**informal**

### **Personal Details**

- Likes to have his food moist with a mouse on the side
- Likes to be fed at least 3 times a day

### **Goal(s)**







- Get as much food as possible whilst doing as little as possible
- Sit in the sun all day, move only for feeding purposes
- Sick of waiting on the birds wants to fly up there and kill something

### **Attitude \ Skills**

- Minimum effort approach to work
- Zero attention to detail, jump and forget

# With Scenarios



The Greenhorn	The Casual User	The Texter	The Business User	The Power User	The Hacker
JOHN	EMILY	AKIKO	STEPHAN	ROBERTO	RICKY
					
<p><b>Profile</b></p> <ul style="list-style-type: none"> <li>- Probably the single biggest segment of mobile users.</li> <li>- Want simple: turn on their mobile, dial a number and talk to their intended party.</li> <li>- Don't care about anything other than the mobile being able to be used as a phone, and possibly contacts.</li> </ul> <p><b>Scenario</b></p> <p>I didn't get my first phone until 2001. My daughter bought it for me. I didn't feel it was necessary but since then, I have it with me all the time and use it more than my home phone.</p>	<p><b>Profile</b></p> <ul style="list-style-type: none"> <li>- Take advantage of most phones features, but not all.</li> <li>- Use the phone to make calls, use the contacts, send text messages, and take pictures.</li> <li>- Their mobile is always with them.</li> </ul> <p><b>Scenario</b></p> <p>My phone has to look cool. I personalize it with decals, charms, and ring tones. I talk on it everywhere, so my phone style is everything. Of course, it has to work too. I usually talk on the phone, but recently started taking pictures and recording video. My phone is my favorite accessory.</p>	<p><b>Profile</b></p> <ul style="list-style-type: none"> <li>- Texting is far more popular than calling.</li> <li>- Will send and receive thousands of text messages per month.</li> <li>- Rarely use their phones for calling.</li> <li>- Want a clean texting interface with the fastest possible input.</li> </ul> <p><b>Scenario</b></p> <p>I prefer texting than calling because it's more fun and creative. My friends and I probably text each other around 40 times a day. We'll even text to order food. It's far more interesting and less intrusive. I don't have to worry about disturbing people on the train with my talking. I love it.</p>	<p><b>Profile</b></p> <ul style="list-style-type: none"> <li>- Wants a phone that is simple, but functions as an integrated smart device.</li> <li>- Want to read email and call back the sender with the least amount of effort.</li> <li>- Needs "Popular" mail server integration, including Blackberry and Exchange.</li> </ul> <p><b>Scenario</b></p> <p>My mobi is my life. Without it my business would suffer. I take conference calls while driving down the M25. If someone text me, I need to respond with it.</p>	<p><b>Profile</b></p> <ul style="list-style-type: none"> <li>- Will use almost all of the built-in functionality.</li> <li>- Will also extend their phones functionality with additional software.</li> <li>- Will flip through every menu options and changing settings.</li> </ul> <p><b>Scenario</b></p> <p>I'm addicted to new toys. I get the latest gadgets as soon as they arrive on the market. I upgrade my phone every 6 months. I guess you can say this is</p>	<p><b>Profile</b></p> <ul style="list-style-type: none"> <li>- Care more about customization.</li> <li>- Want to make changes to every aspect of the phone.</li> <li>- Belong to mailing lists and forums about hacking the phone.</li> <li>- Contribute to the open source community.</li> </ul> <p><b>Scenario</b></p> <p>As soon as I found out about an open source phone, I jumped on it. I created two apps for the phone and am working on the texting</p>

Prefer texting to calling it's more fun

# Include accessibility in persona

## Persona: Kim, User Group: College Students

Date: September 2003

### Background

CellCall, Inc. is revising the design of its most popular phone model CC90310 to give it an updated look and increased functionality. The target users for model CC90310 are high school students, between the ages of 18 and 25.

### Persona



Kim Callahan is a freshman at Midwestern College, a small college with an undergraduate population of 3,000 students. Kim is planning to major in journalism, and will carry 14 credits during her first semester. She was the co-editor of the student newspaper at her high school and will continue to work on The Chronicle, the student newspaper at Midwestern College.

Kim has been deaf since age 5. She has Alport Syndrome, a genetic condition that often results in deafness. Because Kim was already speaking before she became deaf, she is able to communicate verbally with friends and family. However, her speech patterns have some initial difficulties. Kim's speech. Kim will be living in a residence hall on campus and is anxious about her first conversation with her roommate.

### Background

HRWeb is a Human Resources Web site for Acme Insurance. It provides information on compensation, benefits, and other HR related issues. HRWeb is used by HR managers, HR specialists, administrative assistants, and retired employees.

Hand tremor hard to click on small icons



Roger Thompson retired from Acme Insurance at age 62, after working for 35 years in the Underwriting department. At 65 years old, Roger is extremely healthy and active. He swims laps three times a week in the pool and walks an hour or two each day. He is also an avid fisherman.

Poor vision – can't do this



button or link he's trying to hit is fairly small.

[1] [http://www.uiaccess.com/accessucd/personas\\_eg.html](http://www.uiaccess.com/accessucd/personas_eg.html)

[2] <http://www.captcha.net/>

# Benefits of Personas

- The Personas method advocates a **psychologically compelling approach** to communicate information about users to development teams
- **Engage teams** in the consideration of user needs, behaviours and preferences, as personas are **memorable constructs**
- Designers can extrapolate from the personas to make design decisions - **turn users into identifiable human beings**
- User profiles can become inappropriately generalised. Personas maintain a **connection with a 'real / character' user**
- Facilitate **communication** with users and within the project \ product team
- Provide **another perspective** on functionality, usability and accessibility testing for testing the effectiveness of the design

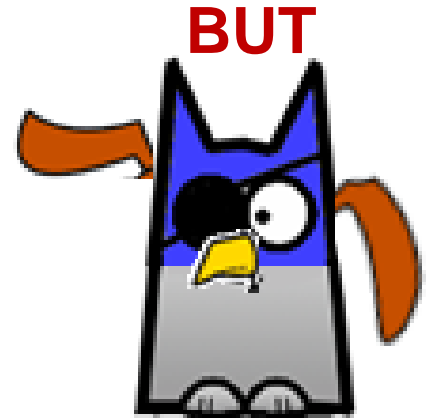
[1] Pruitt, J and Adlin, T (2006) *The Persona Lifecycle, keeping people in mind throughout product design*, San Francisco: Morgan Kaufman.

[2] Pruitt, J and Grudin, J (2003) *Personas Practice and Theory*, Proceedings of the conference on Designing for user experiences, June 06-07, San Francisco, ACM pp 1-15.

[3] Mulder (2007) *The User is Always Right: a Practical Guide for Creating and Using Personas on the Web*, California: New Riders

# Problems with Personas

- It is difficult to determine how **many**, if **any**, users are represented by a persona
- So it is difficult to know whether a persona is **relevant** for intended users.
- Personas cannot be adequately verified or falsified and therefore have **no demonstrable validity**.
- **political problem** - assertion of authority by the persona creators
- So maybe **used irresponsibly** to justify a design



**BUT**

**Another tool**

**Another perspective**

**Another model to think with**

**Can be inspiring and useful**

[1] Chapman, C.N, and Milham, R. P (2006) *'The persona's new clothes: methodological and practical arguments against a popular method'* Proceedings of the Human Factors and Ergonomics Society 50th Annual Meeting, pp. 634 –636. (Available online at:

<http://cnchapman.files.wordpress.com/2007/03/chapman-milham-personas-hfes2006-0139-0330.pdf>).

[2] Chapman, Love et la., (2008) Quantitative Evaluation of Personas as Information <http://www.userphilosophy.com/wp-content/uploads/2009/02/reprint-hfes08-chapman-love-milham-elrif-alford.pdf>



# NCAD Persona Study

NCAD study investigated the effects of using different presentation methods to present personas.

Concluded

- **Photographs worked better than illustrations**



[1] Cooper (1999) *The Inmates are Running the Asylum*

[2] Cooper and Reimann (2003) *About Face 2.0; The Essentials of Interaction Design - Goal-Directed Design™*

[3] Pruitt, J and Adlin, T (2006) *The Persona Lifecycle, keeping people in mind throughout product design*, San Francisco: Morgan Kaufman.

[4] Pruitt, J and Grudin, J (2003) *Personas Practice and Theory*, Proceedings of the conference on Designing for user experiences, June 06-07, San Francisco, ACM pp 1-15.

[5] Mulder (2007) *The User is Always Right: a Practical Guide for Creating and Using Personas on the Web*, California: New Riders

# NCAD Persona Study

- Visual storyboards were more effective in presenting task scenarios than text only versions.



Marie

Age: 33  
Professione Freelance Journalist - The Even Guide  
Location Dublin, Ireland

## Marie

**"...I know I'm not stupid, but sometimes trying to do things on the computer makes me feel that way"**

### Likes and Dislikes

**Cherish:** Lives - French and All-rounder Cherish, makes anything with Arnold Schwarzenegger  
**TV Shows:** Loves ER, Culture Show, Panorama makes Big Brother and Sport  
**Movies:** Has a wide appreciation from bedtimes to type, makes manufactured video pop  
**Shopping:** Has a weakness for bags and shoes - likes good design at the right price more than major brands

### Environment

She has an eye for design and in her living room there are some well chosen pieces from Gaby, Bertha and a vintage coffee table, as well as an old record and a gift framed mirror she picked up in France street. Work from up and coming young artists hang on her walls. Marie's flat for style above her to risk and match at all.

Marie's kitchen would be described as modern with clean lines and understated elegance. The counter top is white granite, and her tap and sink are a feature - however her units were a bargain and risk gone. She knows in quality where it counts. Around her antique oak kitchen table she has a Jackson chair, deliberately chosen in different colors. On her counter top is a Siemens Porsche designed Coffee maker, and matching juicer. She has a Porsche 300 which she uses regularly but works underneath as she doesn't like how it looks.

### Attitude to Computers and Technology

When she returned to the workplace after having her children Marie found it a struggle to adapt to computers. There was no many unfamiliar terms and steps that she had to remember when she got stuck there was no way of knowing what to do next. This really frustrated her and made her feel a little stupid.

After completing a night course she now is able to type and save a document and to attach it to an email which usually she needs to do for her work. She still is not very confident though and sometimes she loses files or encounters error messages that she doesn't understand.

She uses the internet every now and then maybe at most a week to check email, her favorite site is Google - from here she can usually find what she is looking for.

Her computer is a new Apple Mac book. The laptop - she believes Apple computers are easier to use and they look stylish. It was also recommended by a friend at the magazine.

She has internet access in her house - installed by her brother. Once it has been set up she hasn't touched any of the settings. She needed help to get her Mac online but now it seems to do it automatically which great.



Marie

Age: 33  
Professione Freelance Journalist - The Even Guide  
Location Dublin, Ireland

## Scenario 1

### Oobe and Set up

**"...I just want to listen to the radio, but do I need a degree in computer science to do it?"**

### Preamble

After years of listening to music with systems from the car and home Marie has finally decided to buy a new radio. Marie has never owned or used an internet radio before but has heard that it's not too late to start to listen to radio stations from all over the world with digital clear reception.

She decides to visit a large hi-fi store in the city to see what's available and to get answers to all her questions that she has. At this stage she doesn't really intend to buy anything - unless she sees something really nice, then maybe.

### Success Factors

- Choosing visual design that supports the quality and ease of the product
- The UI must show the user in and be intuitive to play with
- The Out of Box Experience must be a positive one - easy to follow instructions, intuitive set-up steps and a quick path to getting the product to play music
- Terminology should be easy to understand and non technical

### Marie visits the HiFi store.



The storyboard consists of four panels showing Marie's journey in a HiFi store. Panel 1: Marie is looking at a display of internet radios. A thought bubble says: 'Hmm, this looks good, sure colour would go well in the kitchen, nice design. I wonder what this control does?'. Panel 2: Marie is talking to a salesman. She says: 'I still prefer, Play of Play, streaming from multiple devices over the LAN radio looks...'. The salesman responds: 'I don't know what any of that really means, I just want to listen to French radio'. Panel 3: Marie is looking at a display of wireless speakers. A thought bubble says: 'So what do I need to do to get it online? I have a wireless network thing at home, will it work with that? I think its broadband, but I'm not 100% sure'. Panel 4: Marie is looking at a display of internet radios. A thought bubble says: 'The sales man points out all of the products qualities and lists the features. It's the best one in the store...and the most expensive'.