

# Software Engineering Project



**POLITECNICO**  
MILANO 1863

## **PoliSAM**

### **Polimi Study Area Manager**

### **Application**



**POLITECNICO**  
**MILANO 1863**

SCHOOL OF  
**INDUSTRIAL AND INFORMATION  
ENGINEERING**

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- Marcelo Noriega: 876290
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PROFESSOR:

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# Agenda



1. Feasibility Analysis
2. Requirements Analysis and Specifications
3. Design
4. Testing
5. Demonstration
6. Conclusions

# Feasibility Analysis

# Feasibility Analysis

Problem  
Description



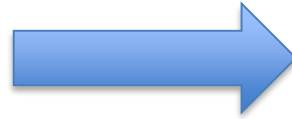
Overview  
PoliSAM

- Reliability
- Robustness

- Maintainability
- Portability

# Feasibility Analysis

Technical  
Feasibility

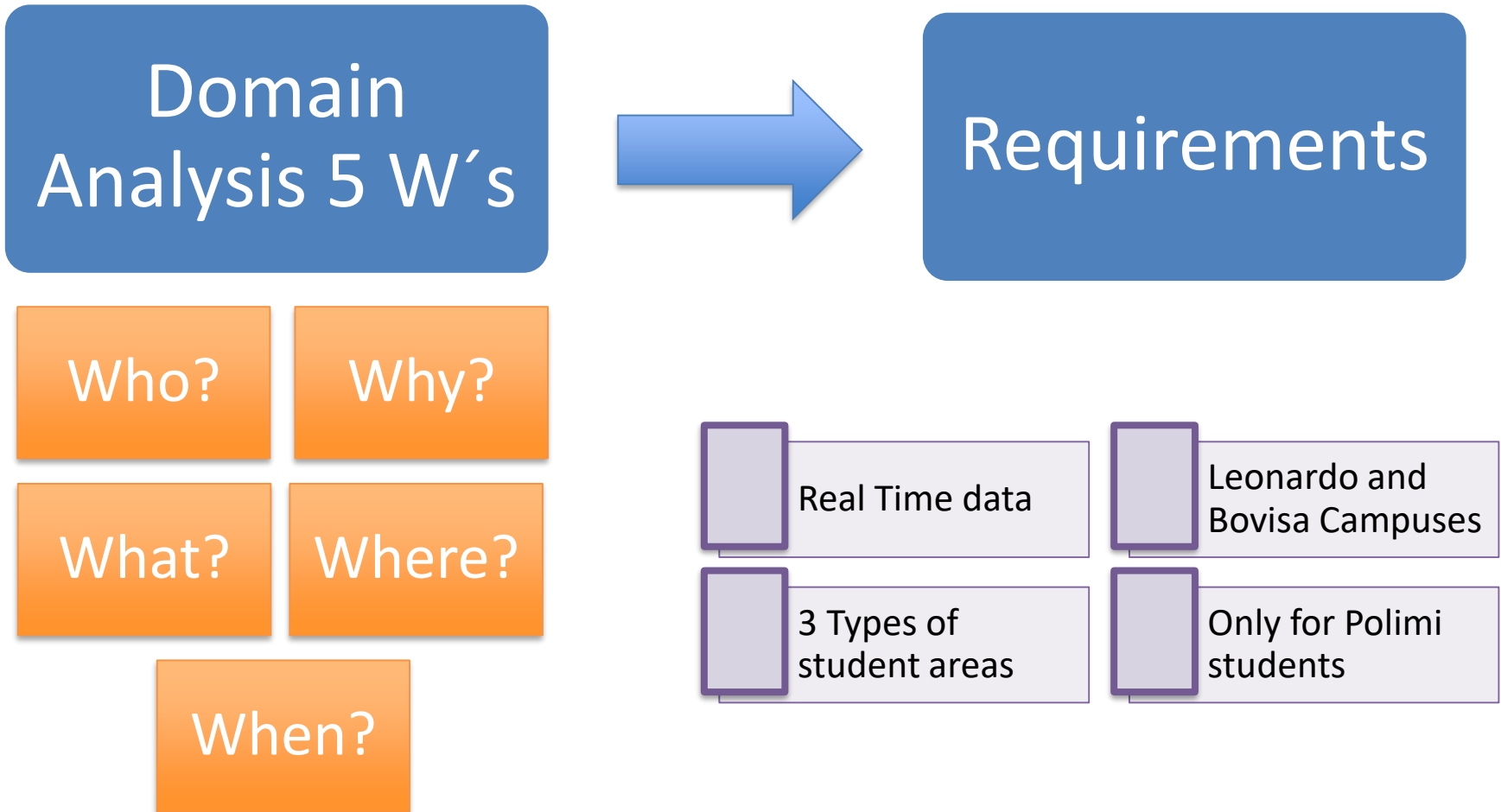


Alternatives

- HTML / CSS / Javascript / for Front – End
- Java / Python / for Back – End
- Mean – Stack
- Visual Programming Environments

# **Requirements Analysis and Specifications**

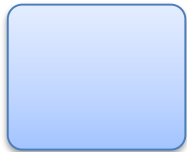
# Requirements Analysis and Specifications





# Requirements Analysis and Specifications

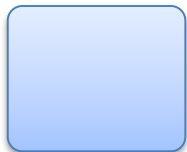
## Specifications



- Login credentials
- Duplication of credentials



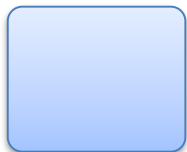
- Reset option
- User's location



- Remember passwords
- Displays username and logout



- Chat room for teams
- Constraints for study areas



- List of study areas
- Filtering process



- Capacity - Occupancy
- Check out status

# Requirements Analysis and Specifications

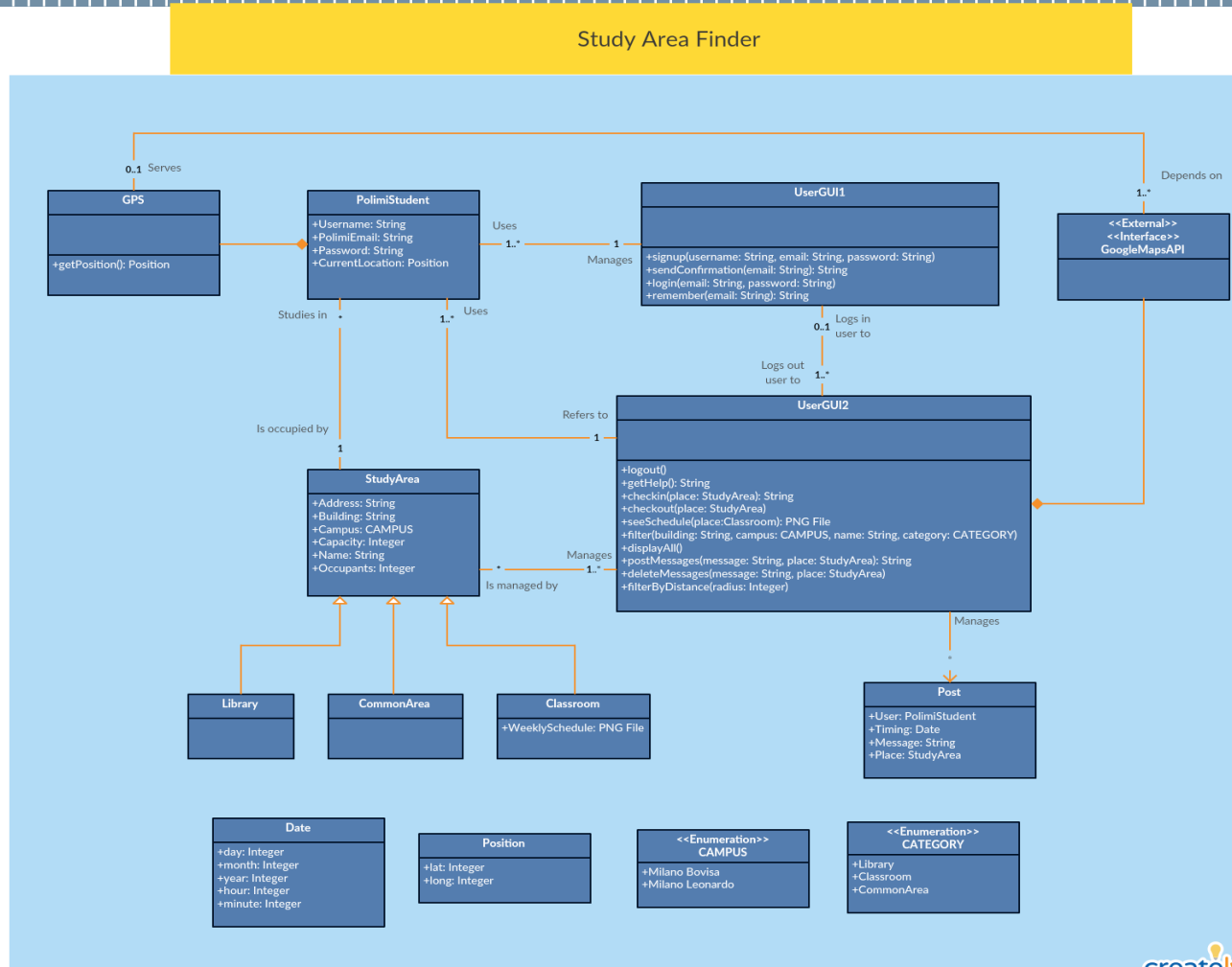
Assumptions

Selection Criteria

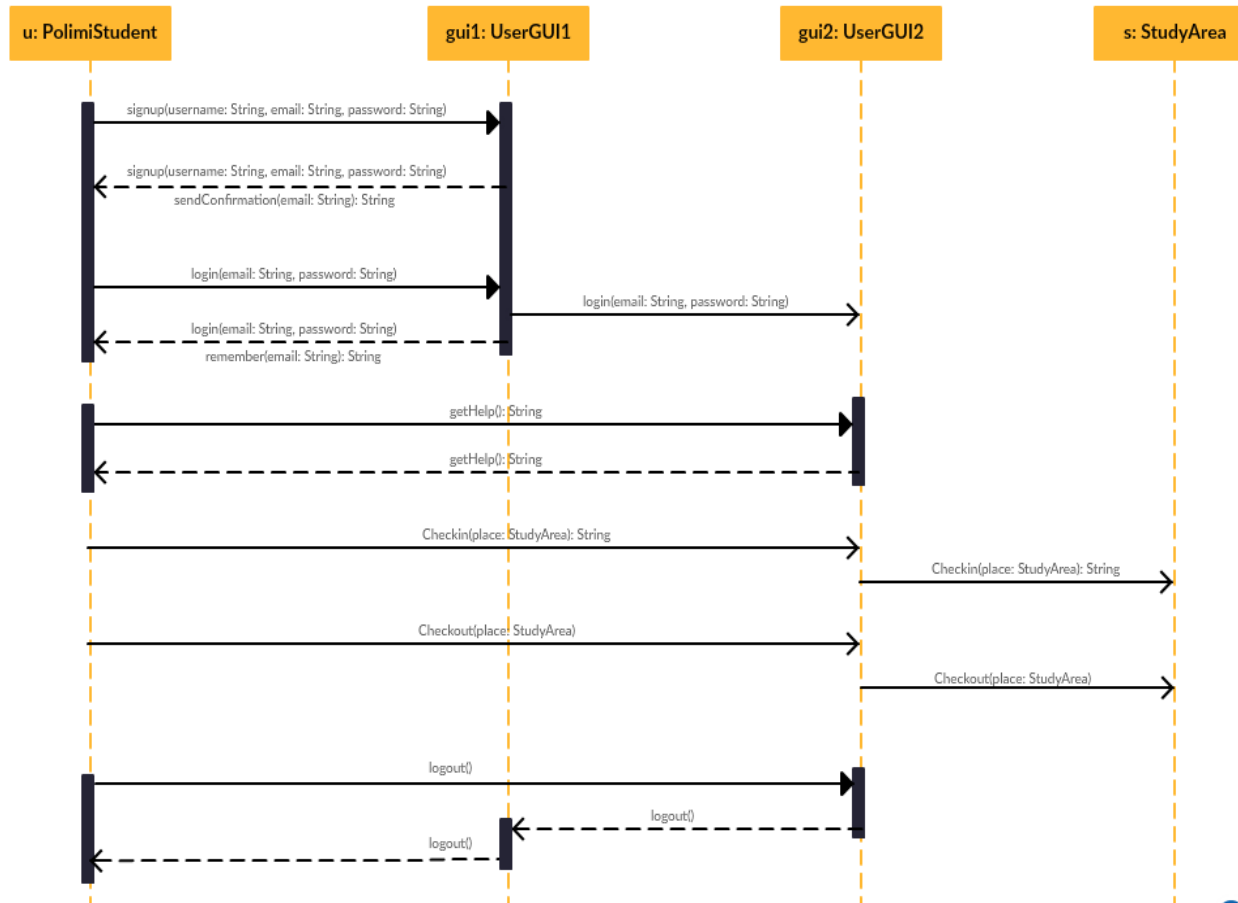
Why a Visual  
Programming  
Environment?

WHY BUBBLE?

# Requirements Analysis and Specifications



# Requirements Analysis and Specifications



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# **Software Design Document**

# Design Goals



Scalability

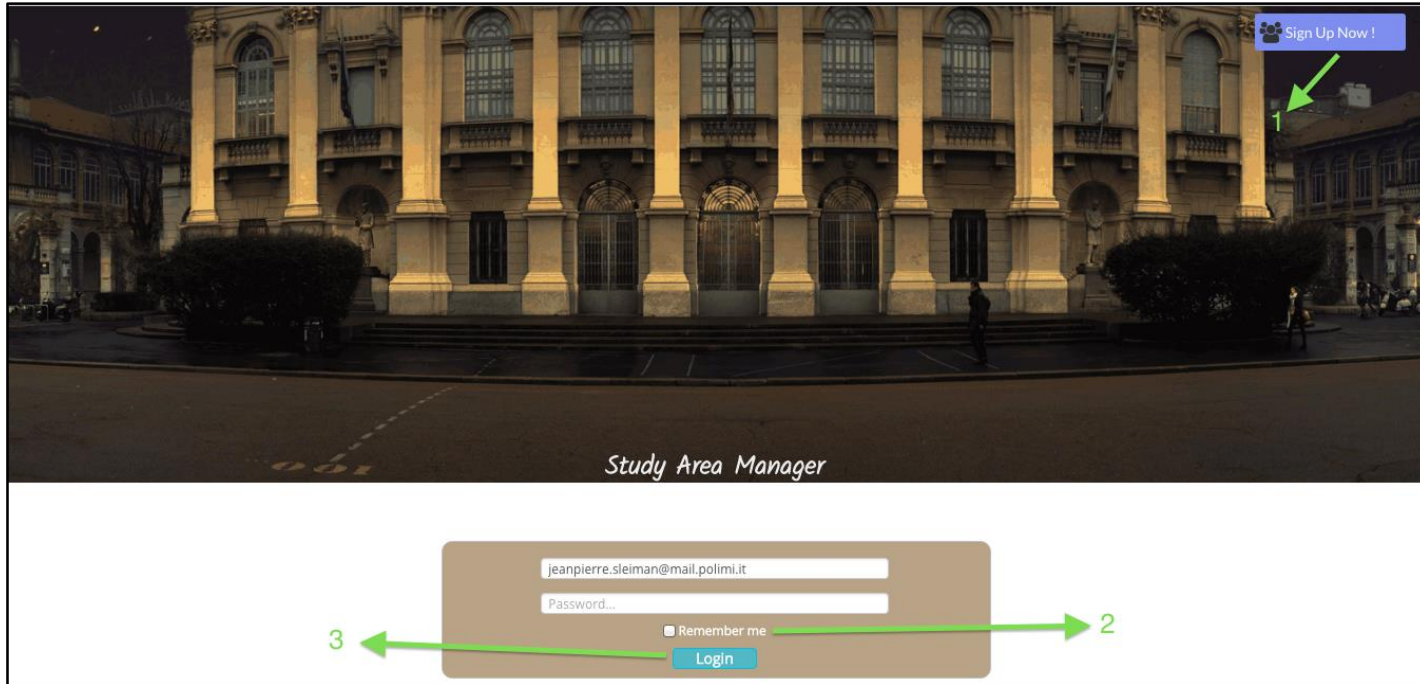
Efficient  
Implementation

Usability

Cross-Device  
Compatibility

# General High-Level Architecture

## User GUI 1



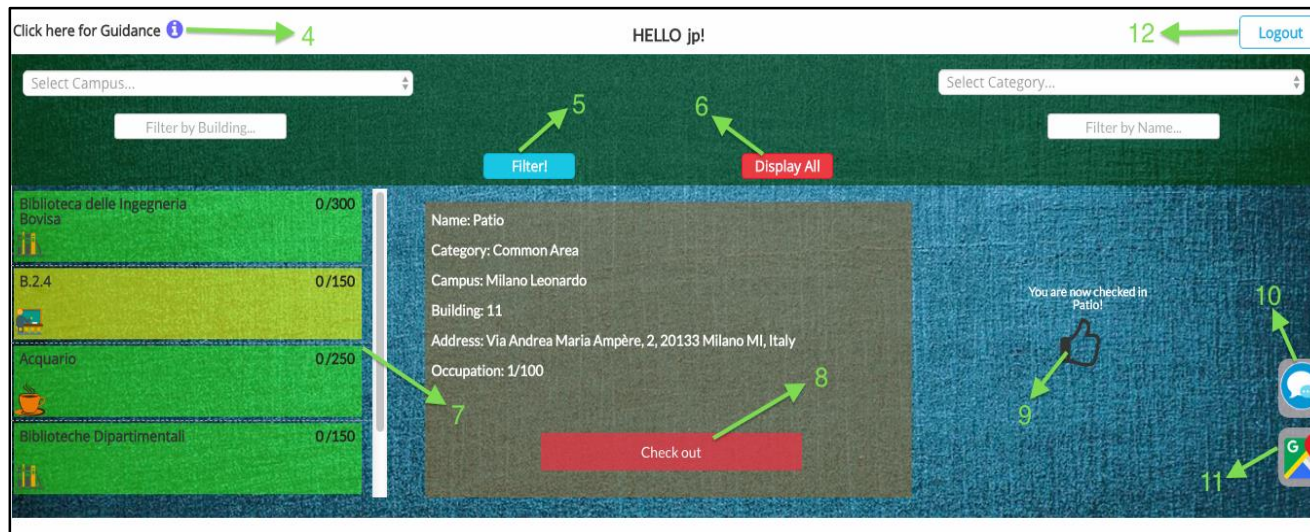
Sign Up

Remember  
User Email

Login

# General High-Level Architecture

## User GUI 2



Assistance

Filter

Display All

Select Option

Check-in / Check-out

Display Check-in Option

Messaging

Interactive Map

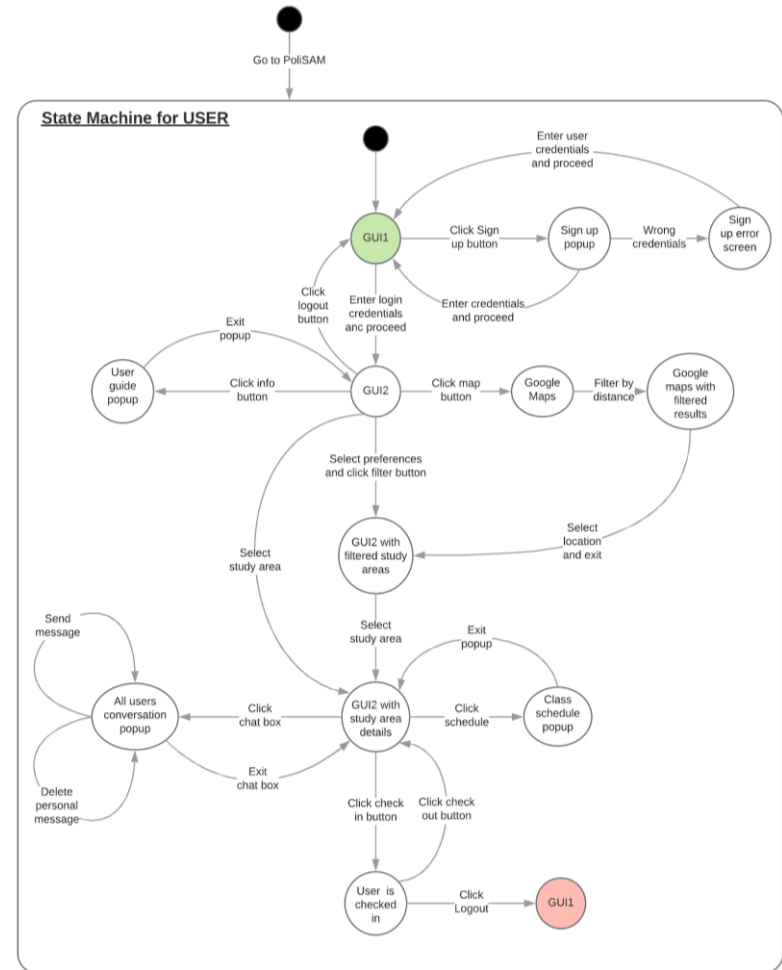


# General High-Level Architecture

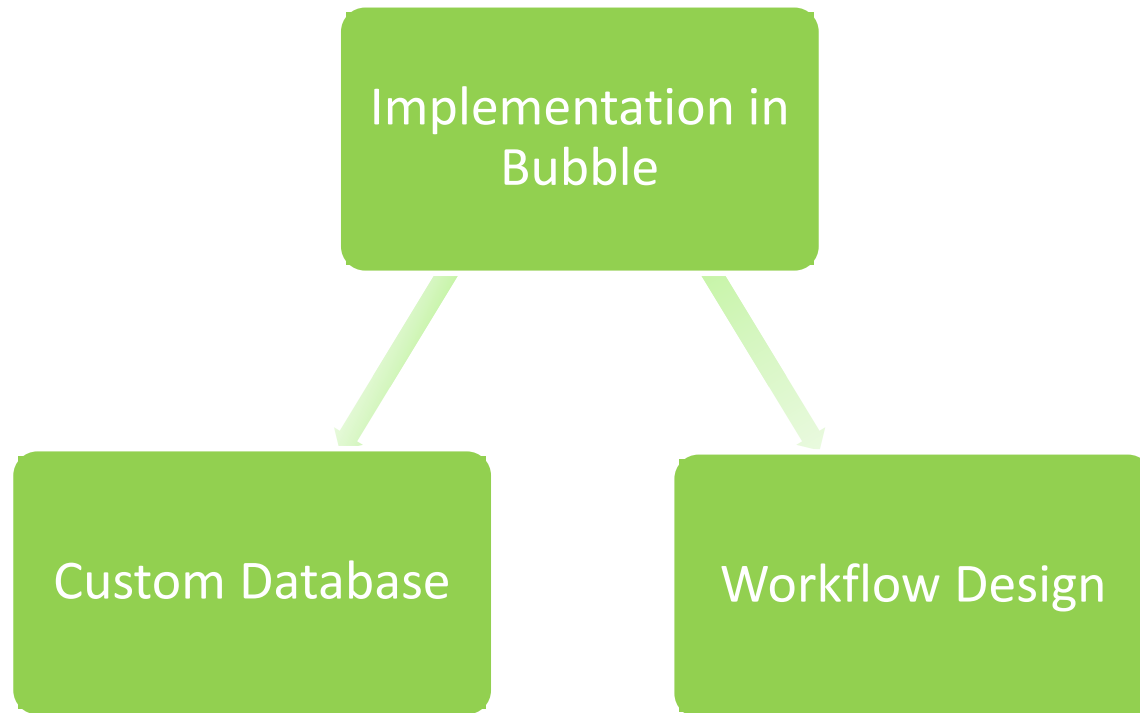
Integrating all functionalities together



Full system behavior modeled with an FSM



# Low-Level Implementation



# Custom Database

## TYPE: User

Fields for type User (show deleted fields)

Type name  

yes / no

Study Area

text

email text

## TYPE: Study Area

Fields for type Study Area (show deleted fields)

Type name  

geographic address

text

text

number

text

text

number

number

image

## TYPE: Post

Fields for type Post

Type name  

text

User

Study Area

date

# Workflow Design

## Workflow Events for GUI 1

Page: index

Pick an event...

Edit Help Saved

Workflow

When Do every 0.001 seconds and Input Username... 's value is not empty

When Button Login is clicked

When Button Sign Up is clicked and index's UserList.count > 0

When Button Sign Up is clicked and Input Polimi Email... 's value contains @mail.polimi.it and index's UserList.count is 0 and Input

When Button Sign Up is clicked and Input Polimi Email... 's value doesn't contain @mail.polimi.it

When Button Sign Up Now! is clicked

Click here to add an event...

## Workflow Events for GUI 2

Page: main\_page

Pick an event...

Edit Help Saved

Workflow

When Page is loaded

When Do every 1 seconds

When Do every 120 seconds

When Do when This Page's CurrentTime:formatted as 5:31 am is 12:00 am

When Button Logout is clicked

When Button Check in is clicked and Current User's Checked in is "no" and Parent group's Study Area's Occupants < Parent

When Button Check out is clicked and Current User's Place is Parent group's Study Area and Current User's Checked in is "yes" and Parent group's

When Button Display All is clicked

When Button FilterI is clicked

When Button OK! is clicked

When Button Post! is clicked and Group Study Area's Study Area is not empty

When Button Search! is clicked and Input 's value > 0

When Button Search! is clicked and Input 's value ≤ 0

When Icon fa fa-hand-o-up is clicked

When Icon fa fa-info-circle is clicked

When Icon fa fa-trash-o is clicked

When Image A is clicked

When Image C is clicked

When Image G is clicked

When Image H is clicked

When Shape A is clicked

When Text Current cell's Study is clicked

When Text Current cell's Study is clicked

When Map A's marker is clicked and This Map's current marker's Capacity is not empty

Click here to add an event...

# Workflow Design

## Signing Up

When  
Do every 0.001 seconds and Input Username... 's value is not empty

Search for Users

Type: User

Username = Input Username... 's value

+ Add a new constraint

Close Delete

Set state

Element: index

Custom state: UserList

Value: Search for Users More...

Only when: Click

Add a breakpoint in debug mode

Button Sign Up is clicked

Element: Button Sign Up

Event color: Gray

Workflow folder:

Only when: Input Polimi Email... 's value contains "@mail.polimi.it" and index 's UserList:count is 0 and Input Username... 's value is not empty

Add a breakpoint in debug mode

Sign the user up

Email: Input Polimi Email... 's value

Password: Input Password... 's value

Require a password confirmation:

Send an email to confirm the email: ✓

Confirmation page: index

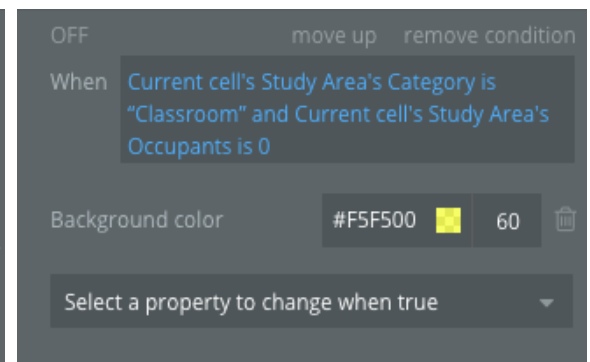
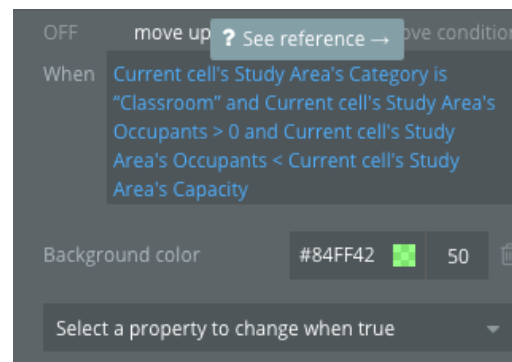
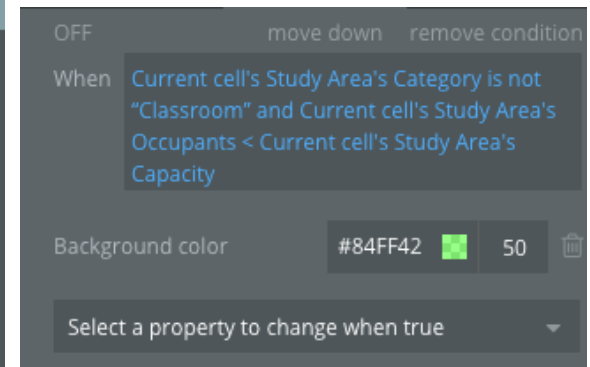
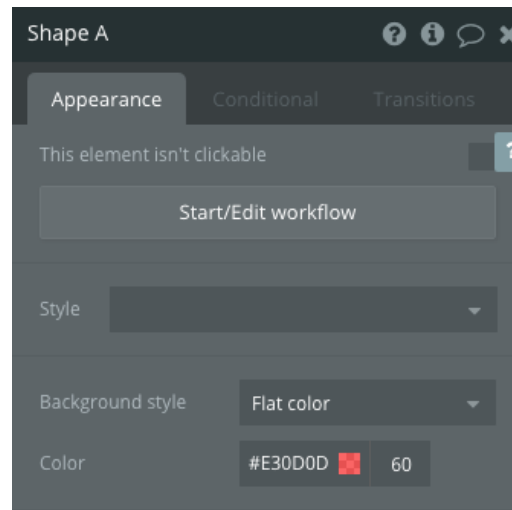
Remember the email: Click

Username = Input Username... 's value

# Workflow Design

## Display of Study Areas

LM.4	0/150
CS.03	0/98
B6.2.1	0/220
B.2.4	150/150
Acquario	0/250
Biblioteche Dipartimentali	0/150
Edificio 26	0/100



# Workflow Design

## Checking-In & Checking-Out

Button Check in is clicked

Element: Button Check in

Event color: Gray

Workflow folder:

Only when: Current User's Checked in is "no" and Parent group's Study Area's Occupants < Parent group's Study Area's Capacity

Button Check in

Appearance Conditional Transitions

OFF remove condition

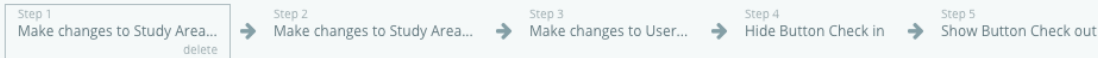
When: Parent group's Study Area is not empty and Current User's Place is empty

Button Check out

Appearance Conditional Transitions

OFF remove condition

When: Current User's Place is not empty



Make changes to Study Area...

Thing to change: Parent group's Study Area

Occupants = This Study Area's Occupants + 1

Make changes to User...

Thing to change: Current User

Checked in = "yes"

Place = Parent group's Study Area

Make changes to Study Area...

Thing to change: Parent group's Study Area

Ratio = This Study Area's Occupants / This Study Area's Capacity

Step 1

Step 2

Step 3

# Workflow Design

## Google Maps Feature

Display list

Element

RepeatingGroup Study ...

Data source

Search for Study Areas

More...

Search for Study Areas

Type

Study Area

Address is within Input's value kms of Current geographic position

Capacity isn't empty

+ Add a new constraint

Sort by

Address

Distance from

Current geographic position

Descending

"no"

When

Do every 120 seconds

Step 1

Delete a list of Study Areas...

→

Step 2

Create a new Study Area...

Delete a list of Study Areas...

Type of things

Study Area

List to delete

Search for Study Areas

Search for Study Areas

Type

Study Area

Capacity is empty

Create a new Study Area...

Type

Study Area

Address = Current geographic position

Building = You are here!

Campus =

Capacity = Click

Category =

Name =

Occupants = Click

Ratio = Click

Schedule =



# Workflow Design

## Messaging Feature

When  
Do every 1 seconds

Set state

Element	main_page
Custom state	CurrentTime
Value	Current date/time

Delete a list of Posts...

Type of things	Post
List to delete	Search for Posts
Only when	main_page's CurrentTime:formatted as 7/04/18 is not Search for Posts:first item's Timing:formatted as 7/04/18

Add a breakpoint in debug mode

When

Button Post! is clicked  
and Group Study  
Area's Study Area is  
not empty

Step 1  
Create a new Post...



Step 2  
Reset relevant inputs

Create a new Post...

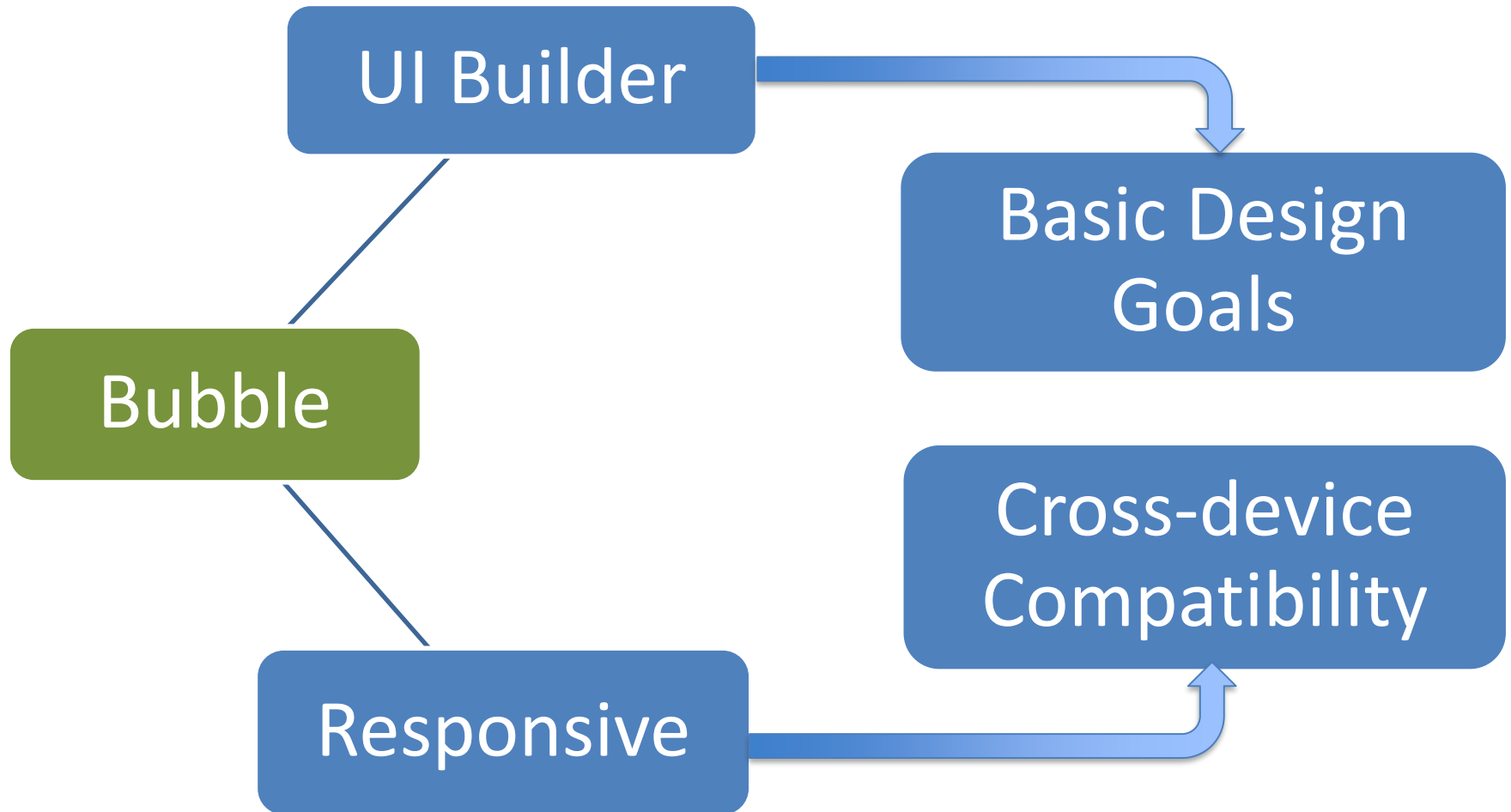
Type	Post
Message =	Input Place your post here's value
Timing =	Current date/time
Person =	Current User
PostPlace =	Group Study Area's Study Area

+ Set another field

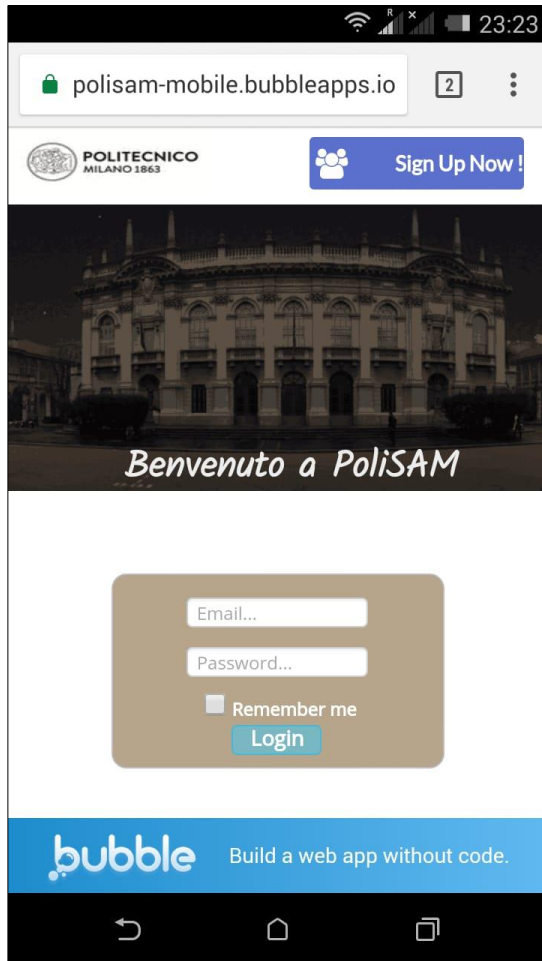
Icon fa fa-trash-o

Appearance	Conditional	Transitions
OFF		remove condition
When	Current cell's Post's Person is Current User	
This element is visible		

# Responsive Mode of Bubble



# Responsive Mode of Bubble



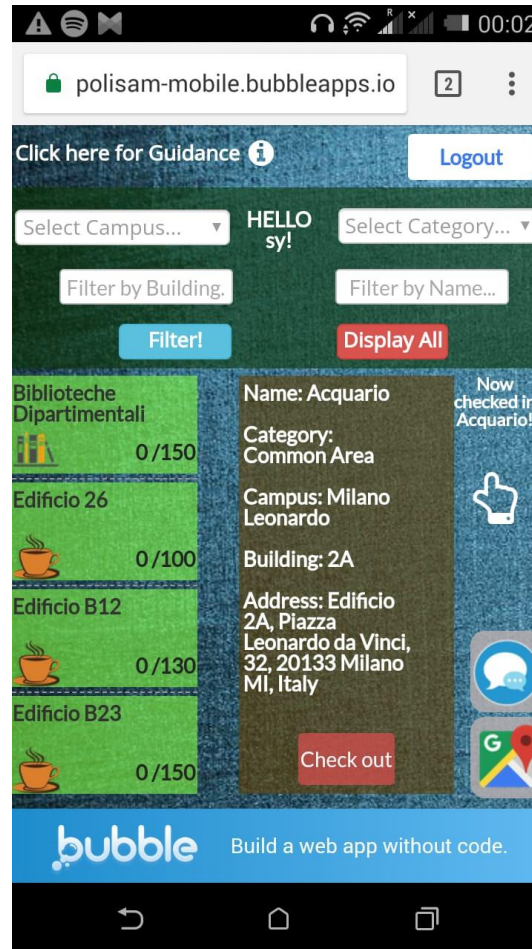
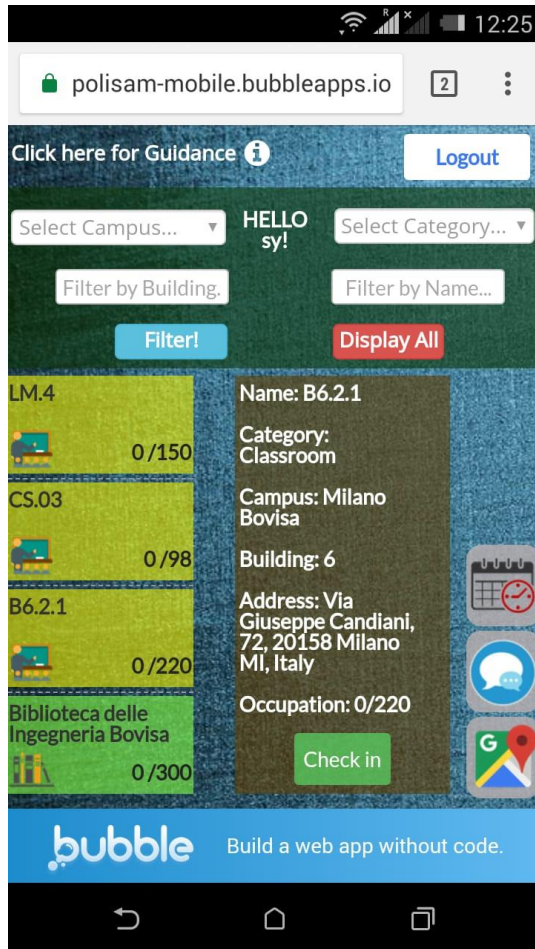
**User GUI 1**

Sign Up

Remember  
User Email

Login

# Responsive Mode of Bubble



## User GUI 2

All previous features

Adaptive Margins/Size

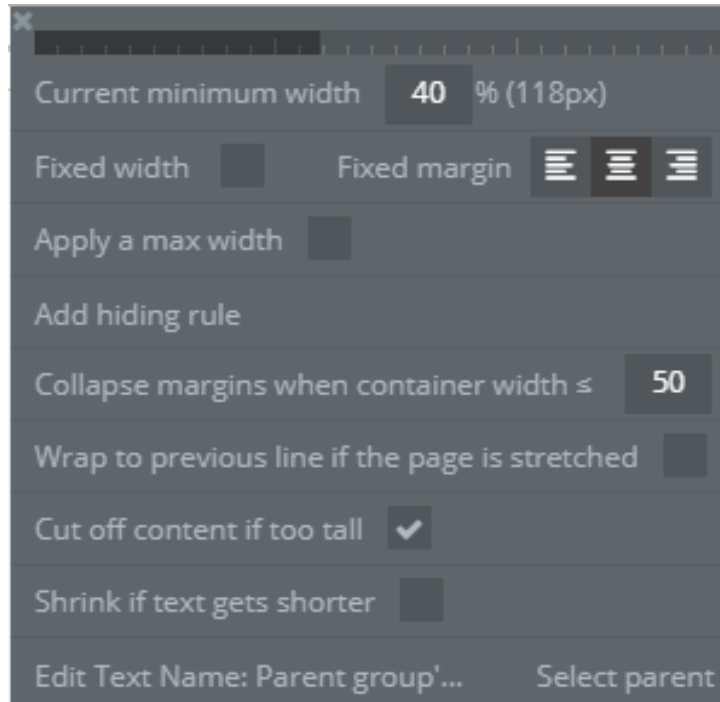
Toggle Schedule button

Floating Buttons

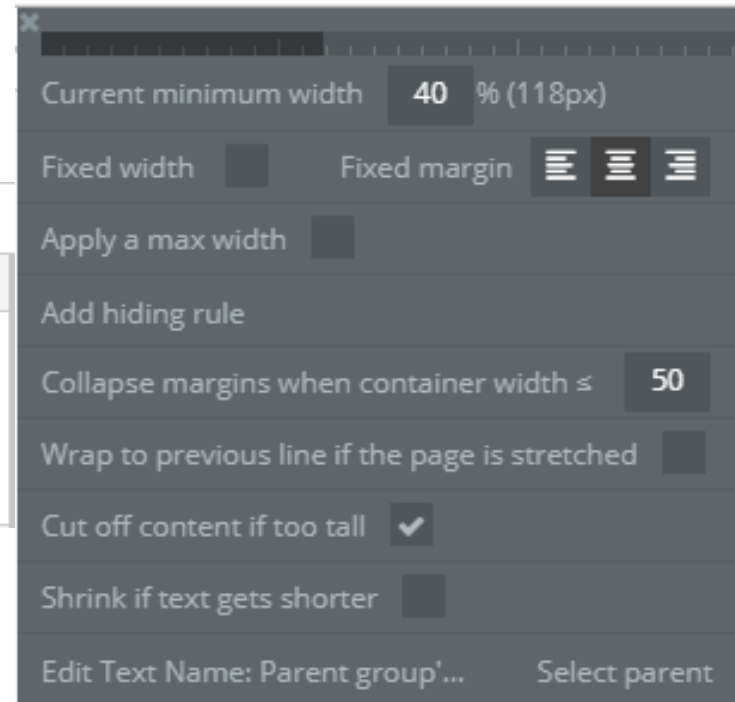
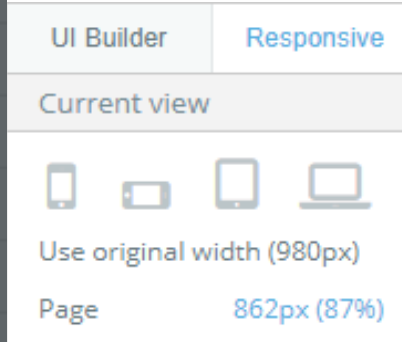
Minimum / Maximum dimensions

Cut-off text

# Responsive Mode of Bubble



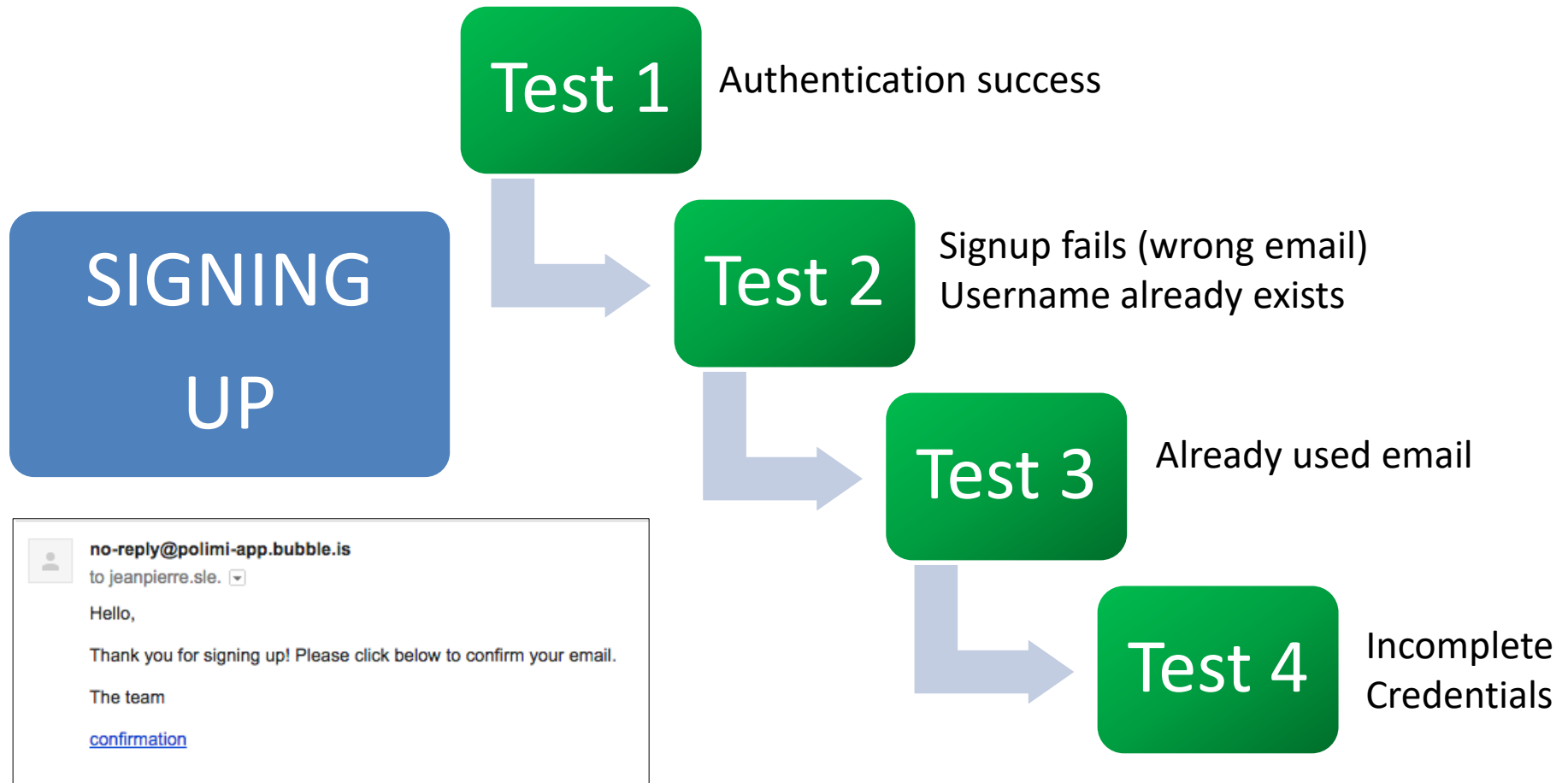
**Cut-off content**



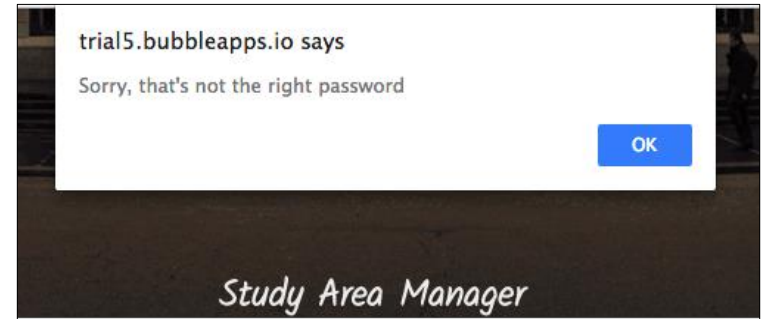
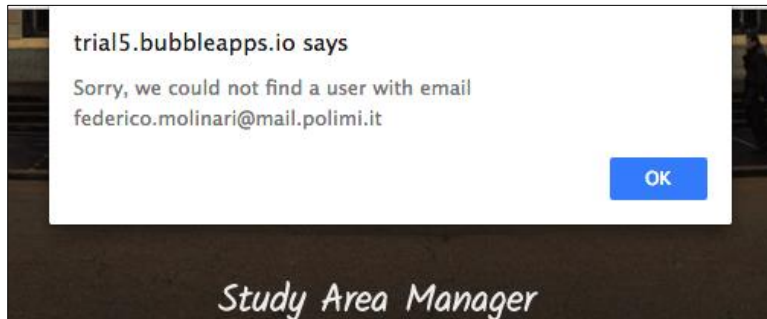
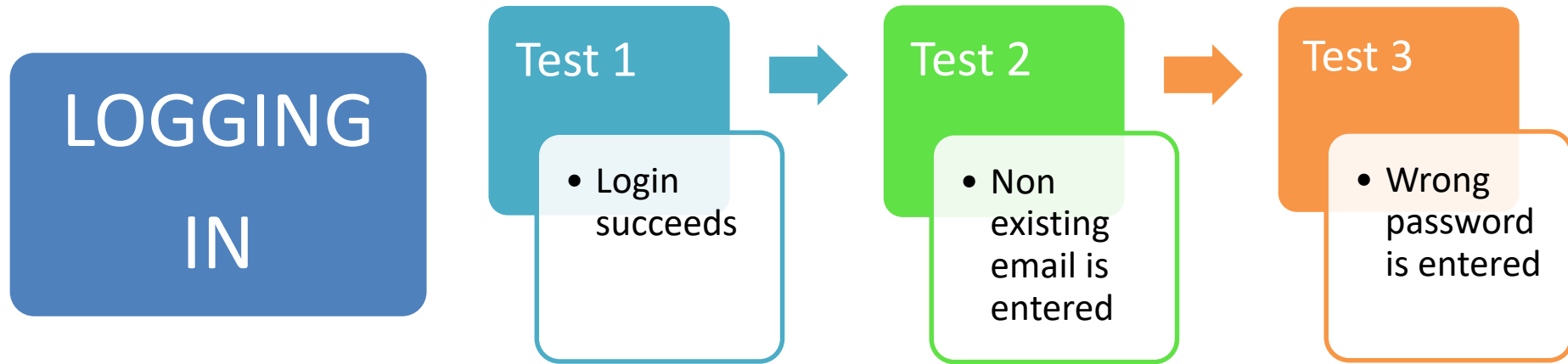
**Max/Min Dimension**

# Testing

# Testing



# Testing





# Testing

## FILTERING

Filtering  
success

Test 1

Study area  
does not  
exist

Test 2

Select Campus... HELLO sy! Library

11 Filter by Name...

Filter! Display All

Biblioteca Centrale 0 / 400

Name: Biblioteche Dipartimentali

Category: Library

Campus: Milano Leonardo

Now checked in Acquario!

Select Campus... HELLO sy! Library

T Filter by Name...

Filter! Display All

Name: Biblioteche Dipartimentali

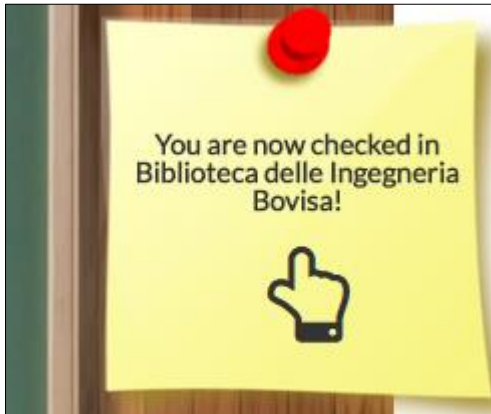
Category: Library

Campus: Milano Leonardo

Now checked in Acquario!

# Testing

CHECK IN /  
CHECK OUT



## Test 1

- Check in button does not appear if study area not selected

## Test 2

- Normal check in

## Test 3

- Check in other study areas while checked in

## Test 4

- Check out fails if checked in area is not selected

# Testing

CHECK IN /  
CHECK OUT

## Test 5

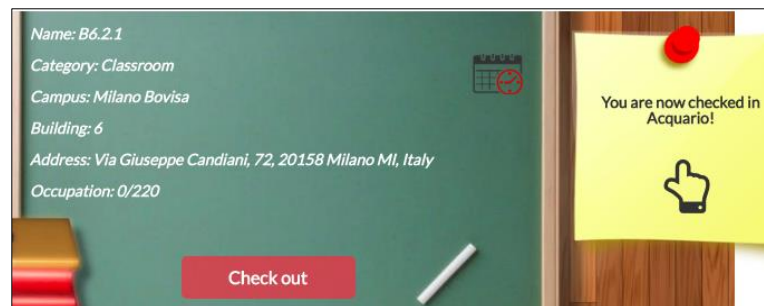
- Refresh check in status is preserved

## Test 6

- Normal check out

## Test 7

- Check in fails if study area already full



# Testing

## SEARCH BY MAP

Test 1

- Not enough distance



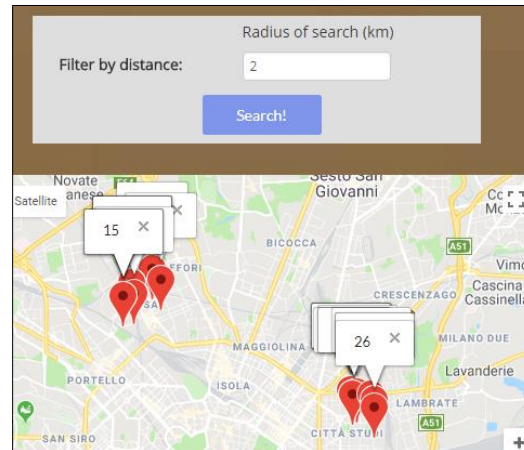
Test 2

- Normal search



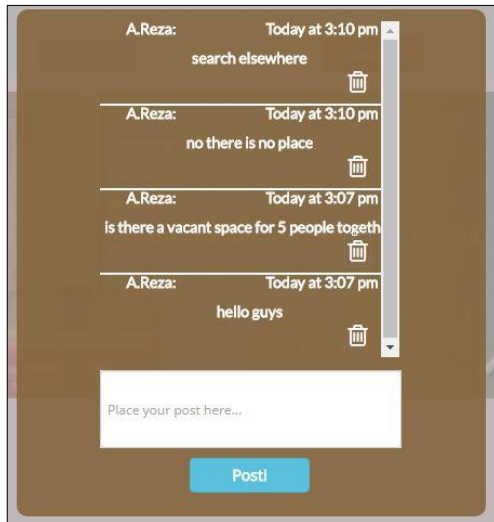
Test 3

- Negative distance invalid input



# Testing

## CHAT BOX



Test 1

If no study area selected no chatbox

Test 2

Successful posting

Test 3

Successful deleting

Test 4

Cannot delete other user's messages

# Testing



Experimental  
Tests

Alpha Test

Beta Test

# Conclusion

- Learning software development process
- Effort distribution
- Deployment
- Maintenance
- Delivery of requirements (Correctness)
- Reliability (depends on Polimi students)
- Bubble Advantages vs Disadvantages

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# Thank You