Bürgerbus mConcAppt Interaction Concept Documentation

Authors:
Students of the TU Kaiserslautern

Table of Contents

List of tables

1 Introduction

This document includes the results from the first requirements workshop with the customer about the development of a mobile system for the local Bürgerbus on the 22.04.2016. The Bürgerbus system consists of 2 mobile applications, the BusDriveApp for the Bus driver and the BürgerApp for the citizens. It is intended, that the system will be used within the project Digitale Dörfer (for further information see www.digitale-doerfer.de) in cooperation with the Fraunhofer IESE.

The following chapters are structured as follows. The chapters 2 to 4 are covering the before stage, which means they describes the usage context, the people who will be influenced by the project and the current as-is situations with scenarios for a better understanding of how the Bürgerbus works today. From Chapter 5 to 9 this document explains how the finished product should function seen in the system functions and the to-be scenarios of how the Bürgerbus will function in the future with our product.

2 Usage Context

Weilerbach is a small city near Kaiserslautern. It has a very good infrastructure, but the distance between points of interest for the normal citizens is normally very far. Let us imagine Emma Meier (see in persona section 3.2). She has been living in Weilerbach all her life. She is living at the beginning of Weilerbach and wants to go shopping at the local supermarket. Mrs. Meier cannot walk properly and has no car instead she uses the Bürgerbus to get to the supermarket, but has problems with the time schedule of the bus and sometimes she needs to get picked up at her house. The Bürgerbus system wants to ease her life and make her a more satisfied stakeholder.

3 Stakeholder Description

3.1 Stakeholders and Goals

Stakeholder Name	Stakeholder Role	Stakeholder Main Goals
Bus driver	The Bus driver drives a given bus route and stops at bus stations where passengers are waiting.	His main goal is to get people to their destination and be on time according to the schedule.
Citizen User	Main User	Mobility, possibility to transport the goods, socialization (meet other people). /*See where the bus actually is to get on.*/
Developer	Developing the BürgerApp, the BusDriveApp or the backend	Developing the system good time effort high quality results.
Customer	Wants the System to be developed	High quality system all use cases covered reliability.
Boss of the Bus driver(s)	Evaluates the system Distributes the app	Continuous improvement of the system and service, paths optimization. /*See statistics.*/

Table 1: Stakeholders and Goals

Author: Marcel Müller, Erik Gruener
Status: Complete
Reviewer: Dominik Skalnik
Review status: Complete

3.2 User Personas

Helmut Schmidt

- Age: 55
- Role: Bus driver for the community (drives 4-5 times a month)
- Family background: married, 2 children

Main characteristics
- He has lived in Weilerbach all his life.
- He works from home for an IT Company and knows how to use a smartphone.
- He is also involved in other community project.

Main Goals
- to drive the route through Weilerbach and pick up people.
- be on time so the passengers do not have to wait for long time.
- Have an easy system that does not distract him too much.

Typical Challenges
- There is a schedule but as of now it does not work perfectly.
- If he has to pick up a person from their home his schedule will change.

Prospective concrete usage context:
- The system should be running during the time the bus is driving around.
- The Bus driver can interact with the device during breaks or at stops.

Table 2: Persona Bus driver

Author: Erik Gruener
Status: Complete
Reviewer: Sascha Müller
Review status: Complete

Emma Meier

- Age: 70
- Role: Citizen (uses the Bürgerbus 1-2 times a week)
- Family background: married, children, grandchildren

Main characteristics
- She has lived in Weilerbach all her life.
- Manages the household, is in charge of the groceries purchases.
- Owns a (low end) smartphone that confuses her most of the time.
- Is involved in other senior oriented communities.

Main Goals
- Uses the Bürgerbus for trips to and from the grocery store and the community center
- Does not want to wait too long on the street for a ride.
- Sometimes needs to get picked up from her house.
- Have a well readable, simple system that provides her the information

Typical Challenges
- There is a schedule but as of now it does not work perfectly.
- She may needs assistance with the purchases (From the store to the bus and from the bus to my home) which changes the schedule of the Bürgerbus

Prospective concrete usage context:
- The citizen app will be used inside and outside of buildings mostly with mobile low bandwidth data

Table 3: Persona Citizen

Author: Steffen Holzer
Status: Complete
Reviewer: Marcel Müller
Review status: Complete

4 As-is Situation

4.1 As-is Situation Scenarios

Picking up at bus stations

Item	Description
Context	The Bus driver is driving around town and picking up people at the bus stations.
Precondition	There are free seats in the bus. There is a person at the bus stop. If no person is at the bus station the bus will continue driving.
Step 1	The Bus driver gets close to a bus stop on the route.
Step 2	A Citizen signals that he wants to get picked up.
Step 3	The Bus driver pulls over and stops.
Step 4	The Citizen enters bus.
Step 5	The Bus driver continues route.
Postcondition	There is one less seat available on the bus.

Table 4: As is Situation #1

Author: Dominik Skalnik, Erik Gruener
Status: Complete
Reviewer: Marcel Müller
Review status: Complete

Picking up at home

Item	Description
Context	The Office in Weilerbach receives a call from a Citizen that wants to get picked up at home due to health-problems etc.
Precondition	There are free seats in the bus. The Citizen is at home and ready at a specific time.
Step 1	The Bus driver takes a detour and arrives at the Citizen's door
Step 2	The Bus driver honks to tell the person that he is there.
Step 3	The Citizen comes out the door and enters the bus.
Step 4	The Bus driver continues to his old route.
Postcondition	The Citizen is picked up from home and bus is on his usual route.There is one less seat available on the bus.

Table 5: As is Situation #2

Author: Dominik Skalnik, Erik Gruener
Status: Complete
Reviewer: Marcel Müller
Review status: Complete

4.2 Problems in As-is Situation

- Sometimes it happens that a bus is full with Citizens and no more can fit in the bus. The Citizens waited only to see that they cannot take this bus but have to wait for the next one. When this scenario occurs it also possible for the Bus driver to drive the Citizens to the destination, if they all want to go to the same, and then return to pick up the waiting Citizens to minimize their waiting time.
- A Problem with a Citizen calling to get picked up is that the office has to call the Bus driver that day or the next day to tell him where to go at what time which disturbs the schedule. It is also possible that the Citizen is not at home and the Bus driver's time would get wasted. Also for now there is no confirmation that the Bus driver is informed and the Citizens will be picked up.
- Of course it is possible that due to obstacles or detours the set schedule for the bus to arrive at a station cannot be met. In this Situation the Citizen does not know when the bus is coming or if it has already past.

Author: Erik Gruener
Status: Complete
Reviewer: Sascha Müller
Review status: Complete

5 Product Philosophy

Easy to use: The apps should be easy to use. No instruction or helo manual should be needed to use the functionality of the applications.

6 To-be Situation

To-be Situation Scenarios

#TBS_01 Picking up at bus stations

Item	Description
Context	The bus is on its route around the town and sends information about its current status.
Precondition	The Bus driver's phone and the BusDriveApp are running. The phone is connected to the internet. Citizens are waiting at the bus stations.
Step 1	The Bus driver drives on his route from stop to stop.
Step 2	The BusDriveApp sends the GPS location to the server.
Step 3	The Citizens at the bus stations can see the status of the bus with the BürgerApp
Step 4	The bus stops, Citizens leave and enter the bus, the Bus driver sets the number of available seats on the BusDriveApp.
Step 5	Bus continues its route.
Postcondition	Citizens are satisfied because they know the current location of the bus and when it will arrive.

Refined in system functions	#SF_B03, #SF_B04, #SF_S1, #SF_S2

Table 6: To-be situation #1

Author: Erik Gruener, Sascha Müller
Status: Complete
Reviewer: Hafiz Ahsan Raza
Review status: Complete

#TBS_02 Picking up Citizens at their homes

Item	Description
Context	The bus drives around town and on request it takes a detour to pick a person up at their house. The arrival time at the next stops will change.
Precondition	The BusDriveApp is running and is connected to the internet. Citizens are waiting at bus stations and custom stops (their homes).
Step 1	The Bus driver receives information about a custom stop.
Step 2	Bus drives to a requested stop to pick up a citizen
Step 3	Bus continues driving its regular route.
Step 4	The App sends information about current status and the Citizens waiting for bus can see that the arrival time has changed.
Postcondition	Citizens are satisfied because: they can be picked up at their house and other Citizens know where the bus currently is and when it will arrive.
Refined in system functions	#SF_B05 (it2), #SF_S1, #SF_S2

Table 7: To-be situation #2

Author: Sascha Müller
Status: Complete
Reviewer: Hafiz Ahsan Raza, Erik Gruener
Review status: Complete

7 Solution

7.1 Assumptions

The device running the BusDriveApp is stationary in all busses.

7.2 Key Solution Concepts

The Bus driver uses BusDriveApp to communicate with server about current tour status and updates. Citizens use BürgerApp to check on the busses and request custom stops.

Author: Sascha Müller
Status: Complete (BusDriveApp)
Reviewer:
Review status:

7.3 Main System Functions

SF_Bx = system functions for BusDriveApp
SF_Cx = system functions for BürgerApp
SF_Sx = system functions for server

Item	Description
ID	#SF_B0
Name	Request Data
Input Data	-
Precondition	The Bus driver starts the BusDriveApp.
Description	When the BusDriveApp starts, the current lists of all busses and lines are received from the server.
Exception	No connection to server;
Business rules	-
Quality Management	-
Output Data	List of busses, list of lines (containing stops and routes)
Postcondition(s)	The Bus driver is able to select bus #SF_B1 and line #SF_B2

Used in	#IC_B1

Table 8: System Function for BusDriveApp#0

Author: Sascha Müller
Status: Complete
Reviewer: Patrick Pschorn
Review status: Complete

Item	Description
ID	#SF_B1
Name	Select bus
Input Data	List of busses
Precondition	Successful receipt of data #SF_B0
Description	On the Select Bus Screen #SC_B1 the Bus driver selects the bus he will be driving that day and will be forwarded to the Select Line Screen #SC_B2.
Exception	-
Business rules	-
Quality Management	-
Output Data	Selected bus
Postcondition(s)	Bus was selected by the Bus driver, Select Line Screen #SC_B2 is shown.
Used in	#IC_B1

Table 9: System Function for BusDriveApp#1

Author: Erik Grüner, Sascha Müller
Status: Complete
Reviewer: Patrick Pschorn
Review status: Complete

Item	Description
ID	#SF_B2
Name	Select busline

Input Data	List of lines
Precondition	Bus was selected in #SF_B1
Description	On the Select Line Screen #SC_B2 the Bus driver selects the line that he will be driving that day and will be forwarded to the Drive Screen #SC_B3.
Exception	-
Business rules	-
Quality Management	-
Output Data	Selected line
Postcondition(s)	Line was selected by driver. Information will be sent to the server #SF_B3, driver starts tour, Drive Screen #SC_B3 is shown.
Used in	#IC_B1

Table 10: System Function for BusDriveApp#2

Author: Erik Grüner, Sascha Müller
Status: Complete
Reviewer: Patrick Pschorn
Review status: Complete

Item	Description
ID	#SF_B3
Name	Send data to server
Input Data	Bus and Line Information
Precondition	GPS signal and connection to the server; Bus and Line selected
Description	The app sends the current bus position, selected bus and line, number of seats taken, last stop reached (it2), timestamp to the server
Exception	No GPS signal, no server connection
Business rules	The signal is sent every 15-20 seconds
Quality Management	-

Output Data	Current bus location, bus and line, number of seats taken (it2), last stop reached (it2), timestamp
Postcondition(s)	data is sent to server
Used in	#TBS_01

Table 11: System Function for BusDriveApp#3

Author: Sascha Müller,
Status: Complete
Reviewer: Patrick Pschorn
Review status: Complete

Item	Description
ID	#SF_B4
Name	add/remove available seats on the bus
Input Data	-
Precondition	The Drive Screen #SC_B3 is shown.
Description	A Citizen enters (leaves) the bus and the Bus driver increases (decreases) the number of passengers on the bus.
Exception	-
Business rules	-
Quality Management	The numbers go from 0 to max. number of seats according to used bus.
Output Data	The number of seats available
Postcondition(s)	The number of seats has changed to current situation, (it2: information will be sent to server in #SF_B3,) driver continues tour.
Used in	#TBS_01, #IC_B2

Table 12: System Function for BusDriveApp#4

Author: Sascha Müller, Erik Grüner
Status: Complete
Reviewer: Patrick Pschorn
Review status: Complete

Item	Description
ID	#SF_B5
Name	Receive stop request / iteration 2
Input Data	Receive data of the location where the Citizen wants to get picked up.
Precondition	connection to the server
Description	The Bus driver receives a request to pick up a Citizen at their house and drives to the address.
Exception	no connection to the internet
Business rules	The Bus driver receives the request at the next stop.
Quality Management	the driver has to accept the request within a certain time. Iteration 2: place “Extra Stop” at the best possible route-position
Output Data	The Bus driver accepts request
Postcondition(s)	The Bus driver picked up the Citizen at their home.
Used in	#TBS_02

Table 13: System Function for BusDriveApp#5

Item	Description
ID	#SF_B6
Name	Show Map of current position
Input Data	Current Position
Precondition	GPS signal, internet connection
Description	The Bus driver can see his position on a map and can see the tour on the Map Screen #SC_B5
Exception	Lost internet connection and GPS signal

Business rules	-
Quality Management	The position should be realtime
Output Data	-
Postcondition(s)	-
Used in	#IC_B3

Table 14: System Function for BusDriveApp#6

Author: Erik Grüner
Status: Complete
Reviewer: Sascha Müller
Review status: Complete

Item	Description
ID	#SF_B7
Name	Show the stops
Input Data	List of stops provided by the server
Precondition	-
Description	On the Stops Screen #SC_B4 a list of all stops of the chosen line is shown
Exception	-
Business rules	next stop on top /highlighted (it-2); Once a stop has been reached, it should vanish(it-2)
Quality Management	stops ordered
Output Data	-
Postcondition(s)	-
Used in	#IC_B4

Table 15: System Function for BusDriveApp#7

Author: Erik Grüner, Patrick Pschorn
Status: Complete
Reviewer: Sascha Müller
Review status: Complete

Item	Description

ID	#SF_C1
Name	get current bus position
Input Data	-
Precondition	the bus is driving on its route
Description	shows the citizen where the bus actually is on a map
Exception	no connection to the internet
Business rules	the position is transmitted once it is requested
Quality Management	the location should be accurate (delta 20 m)
Output Data	the current location of the bus
Postcondition(s)	the location is transmitted to the citizen

Table 16: System Function for BürgerApp#1

Author: Dominik Skalnik,
Status: Complete
Reviewer: Marcel Müller
Review status: Complete

Item	Description
ID	#SF_C2
Name	Get estimated arrival time for stop / current position
Input Data	Bus Position, bus station
Precondition	#SF_C1 is successful
Description	Estimates the time of arrival of the bus at the selected bus station
Exception	-
Business rules	
Quality Management	Time to arrival in h:mm, mean estimation error <= 20%
Output Data	Time of arrival at bus station, time to arrival

Postcondition(s)	Estimated t.o.a. Is presented to the citizen

Table 17: System Function for BürgerApp#2

Author: Dominik Skalnik,
Status: Complete
Reviewer: Marcel Müller
Review status: Complete

Item	Description
ID	#SF_C3
Name	Get information about the bus (line/color/bus photo)
Input Data	-
Precondition	Bus is driving on the route
Description	Provides detailed information about the bus on the route
Exception	Bus information doesn't exists (e.g. a bus that is not in the database has to be used because of reasons)
Business rules	One successful transmission per bus line
Quality Management	Information should match the used bus (color matches the bus photo, bus photo shows the used bus)
Output Data	Information about the bus
Postcondition(s)	Citizen knows how the bus looks like

Table 18: System Function for BürgerApp#3

Author: Dominik Skalnik,
Status: Complete
Reviewer: Marcel Müller
Review status: Complete

Item	Description
ID	#SF_C4
Name	Request a stop /iteration 2
Input Data	Bus station, time of departure

Precondition	Bus is driving on the route
Description	Requests a stop of the bus at the selected bus station
Exception	Bus is on it's last round and already passed the bus station
Business rules	Retry transmission every 5-10s
Quality Management	Transmission state is visible, notify user about the planned schedule (15 min before t.o.d.)
Output Data	Answer to the request (accepted, declined)
Postcondition(s)	Citizen know if the bus stops at her station

Table 19: System Function for BürgerApp#4

Author: Dominik Skalnik,
Status: Complete
Reviewer: Marcel Müller
Review status: Complete

Item	Description
ID	#SF_C5
Name	Notify the user about changes in the schedule /iteration 2
Input Data	Schedule changes
Precondition	App is running on the citizen device
Description	Inform the citizen about changes in the schedule
Exception	-
Business rules	Check at least once per (minimal driving time between two successive bus stations) for changes or push notifications
Quality Management	Display changes in an easy to understandable form (e.g. - The bus will be xy minutes too late - The bus will skip station xy)

Output Data	Notification with schedule changes
Postcondition(s)	The citizen knows about the changes in the schedule

Table 20: System Function for BürgerApp#5

Author: Dominik Skalnik,
Status: Complete
Reviewer: Marcel Müller
Review status: Complete

Item	Description
ID	#SF_C6
Name	Show number of free seats /iteration x
Input Data	-
Precondition	Bus drives on the route
Description	Shows the number of free seats in the bus
Exception	-
Business rules	Check no more than the minimal driving time between two successive bus stations
Quality Management	Different text design for 100-50%, 49-25% and 24-0% free seats
Output Data	Number of free seats in the bus
Postcondition(s)	Citizen knows if the bus currently has a free seat for her

Table 21: System Function for BürgerApp#6

Author: Dominik Skalnik,
Status: Complete
Reviewer: Marcel Müller
Review status: Complete

Item	Description
ID	#SF_C7
Name	Request help for shopping /iteration x
Input Data	-

Precondition	Bus is driving on the route, #FC04 is successful
Description	Requests help for shopping
Exception	-
Business rules	See #SF_C4
Quality Management	See #SF_C4
Output Data	See #SF_C4
Postcondition(s)	Citizen knows if she will have help with the shopping trip

Table 22: System Function for BürgerApp#7

Author: Dominik Skalnik,
Status: Complete
Reviewer: Marcel Müller
Review status: Complete

Item	Description
ID	#SF_C8
Name	Schedule wayback /iteration x
Input Data	Time of departure
Precondition	Bus is on the route
Description	Schedules the return of the citizen from the current destination to the start destination
Exception	T.o.d. is in the working time of the Bürgerbus
Business rules	Manage via predated #FC04
Quality Management	See #SF_C4
Output Data	See #SF_C4
Postcondition(s)	Citizen planned her way back

Table 23: System Function for BürgerApp#8

Item	Description
ID	#SF_C9
Name	Show schedule for current stop
Input Data	Stop identifier
Precondition	none
Description	Shows the schedule for the current stop
Exception	No data
Business rules	
Quality Management	
Output Data	Schedule data for the current stop
Postcondition(s)	Citizen knows when a bus arrives at the current stop

Table 24: System Function for BürgerApp#9

Author: Steffen Holzer,
Status: Complete
Reviewer: Marcel Müller
Review status: Complete

Item	Description
ID	#SF_C10
Name	Show List of Stops
Input Data	none
Precondition	none
Description	Shows all available stops
Exception	No data
Business rules	
Quality Management	
Output Data	List of all available stops
Postcondition(s)	Citizen knows where the bus stops

Table 25: System Function for BürgerApp#10

Author: Steffen Holzer,
Status: Complete
Reviewer: Marcel Müller
Review status: Complete

Item	Description
ID	#SF_S1
Name	Provide Interface to apps
Input Data	http-Request
Precondition	Service is available
Description	Returns the corresponding to the http-Request
Exception	No data
Business rules	
Quality Management	Time
Output Data	Requested data
Postcondition(s)	The apps received the requested data

Table 26: System Function for Sever#1

Author: Marcel Müller,
Status: Complete
Reviewer: Johann Heinz
Review status: Complete

Item	Description
ID	#SF_S2
Name	Stores transmitted information
Input Data	Received http
Precondition	Service is available
Description	Stores the information provided by the http-Request of the bus driver or citizen app

Exception	No data
Business rules	
Quality Management	Time
Output Data	-
Postcondition(s)	The provided information is stored

Table 28: System Function for Sever#2

Author: Marcel Müller,
Status: Complete
Reviewer: Johann Heinz
Review status: Complete

8 App Functionality

8.1 Interaction Cases

Item	Description
ID	**IC_C1**
Usage Context	**The user wants to check when the bus arrives**
Screen Arrangement 1	**The screen shows:** ● The select stop screen shows the available stops **The screen includes:** ● A scroll view with the available bus stops ● A search input box ● A button to set the current location as the bus stop
Human Action 1	**The user starts the application** **Usage type: single tap**
System Action 1	**The application is started, the system fetches the bus stop data and shows the “select stop” screen**
Human Action 2	**The user selects the stop or current location**
System Action 2	**The system fetches the detail data about the location /**

	stop and shows the “stop detail” screen
Post conditions	**The system shows the “stop detail” screen**

Table 29: Interaction Case BürgerApp#1

Author: Dominik Skalnik,
Status: Complete
Reviewer: Marcel Müller
Review status: Complete

Item	Description
ID	**IC_C2**
Usage Context	**The user wants to see more information about the bus**
Screen Arrangement 2	**The screen shows:** ● Detailed information about the bus **The screen includes:** ● Estimated arrival of the bus ● Bus line number / color ● Map with the position of the bus (fixed, without zoom or pan option)
Pre conditions	**User is at the “stop detail” screen**
Human Action 1	**User clicks at the show bus details button**
System Action 1	**System switches the view to the “bus information” screen**
Post conditions	**The system shows the “bus information” screen**

Table 30: Interaction Case BürgerApp#2

Author: Dominik Skalnik,
Status: Complete
Reviewer: Marcel Müller
Review status: Complete

Item	Description
ID	**IC_C3**
Usage Context	**The user wants to get detailed information about the position of the bus**

Screen Arrangement 1	**The screen shows:** ● Detailed information about the position of the bus **The screen includes:** ● A full feature native mapview with option to pan and zoom
Pre conditions	**User is now at the "bus information" screen**
Human Action 1	**User taps on the map**
System Action 1	**System switches the view to the "bus position" screen**
Post conditions	**The system shows the "bus position" screen**

Table 31: Interaction Case BürgerApp#3

Author: Dominik Skalnik,
Status: Complete
Reviewer: Marcel Müller
Review status: Complete

Item	Description
ID	**IC_C4**
Usage Context	**The user request a stop /further iterations..**
Screen Arrangement 2	**The screen shows:** ● **The screen includes:** ●
Pre conditions	**-**
Human Action 1	**-**
System Action 1	**-**
Post conditions	**-**

Table29: Interaction Case BürgerApp#4

Item	Description
ID	**#IC_B1**
Usage Context	**The Bus driver wants to set up for driving**

Pre conditions	**Application is installed on device**
Human Action 1	**The driver starts the BusDriveApp**
System Action 1	**The system gets a list of busses and lines provided by the server**
Screen Arrangement 1	**The screen shows:** ● Select Bus Screen **The screen includes:** ● A list of available busses
Human Action 2	**The Bus driver selects a bus**
System Action 2	**The system remembers the choice of the Bus driver and shows the Select Line Screen**
Screen Arrangement 2	**The screen shows:** ● Select Line Screen **The screen includes:** ● A list of available lines ● An option to go back to the Select Bus Screen
Human Action 3	**The Bus driver selects a line**
System Action 3	**The system remembers the choice of the Bus driver and shows the Drive Screen**
Post conditions	**The system is set up for driving and shows the Drive Screen**

Table 32: Interaction Case BusDriveApp#1

Author: Oliver Säger
Status: Complete
Reviewer: Sascha Müller; Patrick Pschorn
Review status: Complete; Complete

Item	Description
ID	**#IC_B2**
Usage Context	**The Bus driver wants to document the number of Citizens riding the bus**
Screen Arrangement	**The screen shows:**

	● Drive Screen **The screen includes:** ● Next Stop (it2) ● Number of passengers ● Options to increase and decrease the number of people riding the bus ● Tabs to go to the Map Screen and Stops Screen ● An option to go back to the Select Line Screen
Pre conditions	**The Bus driver sets up the BusDriveApp and is shown the Drive Screen**
Human Action 1	**1. The Bus driver taps the "Increase" button** **2. The Bus driver taps the "Decrease" button**
System Action 1.1	**The displayed number of passengers is increased by one.**
System Action 1.2	**The displayed number of passengers is decreased by one.**
Post conditions	**The number of Citizens inside the bus is displayed on the screen.**

Table 33: Interaction Case BusDriveApp#2

Author: Oliver Säger
Status: Complete
Reviewer: Patrick Pschorn, Sascha Müller
Review status: Complete, Complete

Item	Description
ID	**#IC_B3**
Usage Context	**The Bus driver wants to see the route he selected**
Pre conditions	**The Bus driver sets up the BusDriveApp and is shown the Drive Screen**
Screen Arrangement 1	**The screen shows:** ● Drive Screen **The screen includes:** ● Next Stop (it2) ● Number of passengers ● Options to increase and decrease the number of people riding the bus ● Tabs to go to the Map Screen and Stops Screen

	• An option to go back to the Select Line Screen
Human Action 1	**The Bus driver selects the Map tab**
System Action 1	**The BusDriveApp shows the Map Screen**
Post conditions	**The BusDriveApp shows the Map Screen where the route is displayed on the map**

Table 34: Interaction Case BusDriveApp#3

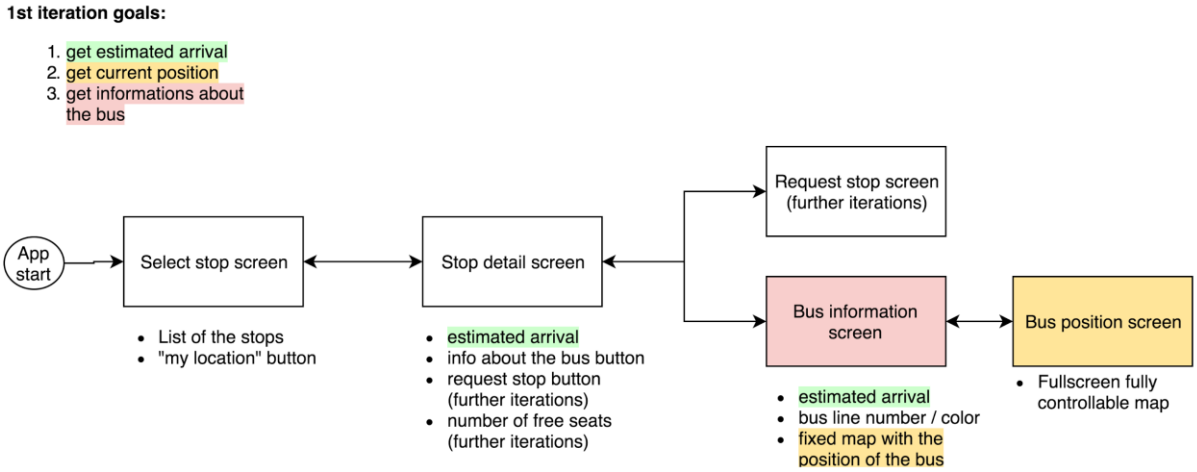
Author: Oliver Säger
Status: Complete
Reviewer: Patrick Pschorn, Sascha Müller
Review status: Complete

Item	Description
ID	**#IC_B4**
Usage Context	**The Bus driver wants to know where he has to stop**
Pre conditions	**The Bus driver sets up the BusDriveApp and is shown the Drive Screen or Map Screen**
Screen Arrangement 1	**The screen shows:** • Drive Screen **The screen includes:** • Next Stop (it2) • Number of passengers • Options to increase and decrease the number of people riding the bus • Tabs to go to the Map Screen and Stops Screen • An option to go back to the Select Line Screen
Human Action 1	**The Bus driver selects the Stops tab**
System Action 1	**The BusDriveApp shows the Stops screen**
Post conditions	**The BusDriveApp shows the Stops Screen where a list of all stops is displayed**

Table 35: Interaction Case BusDriveApp#4

Author: Oliver Säger
Status: Complete
Reviewer: Patrick Pschorn, Sascha Müller
Review status: Complete

8.2 Screen flow and Mockups



Author: Dominik Skalnik,
Status: Complete

Figure xx: Screen flow of the citizen application

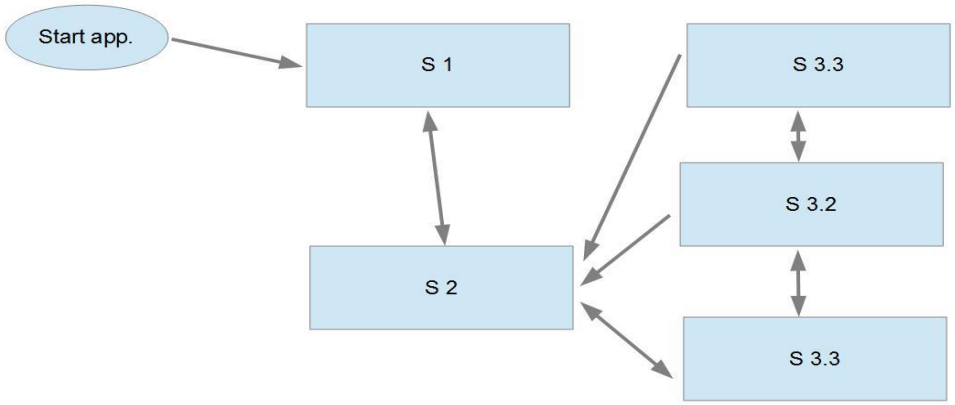
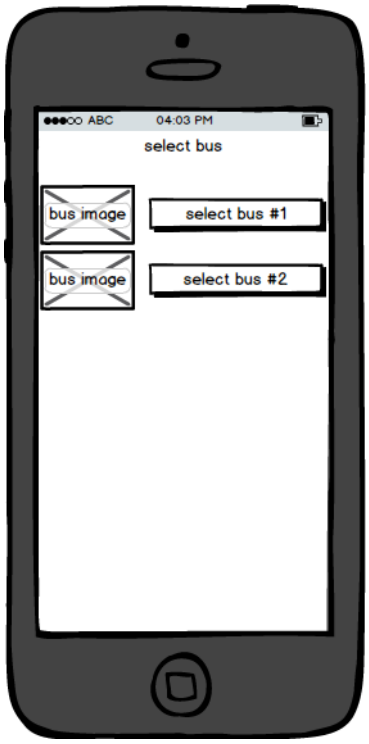
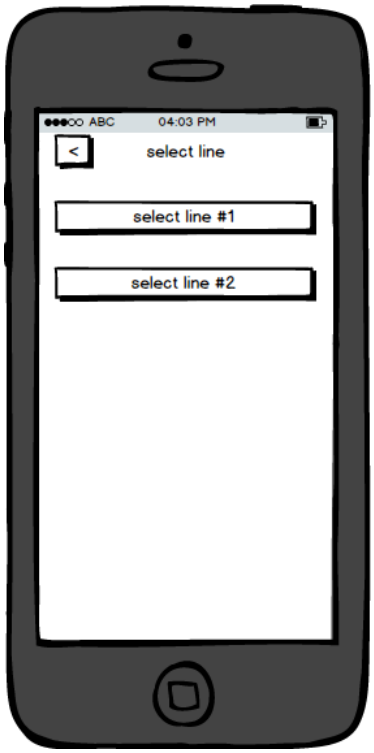
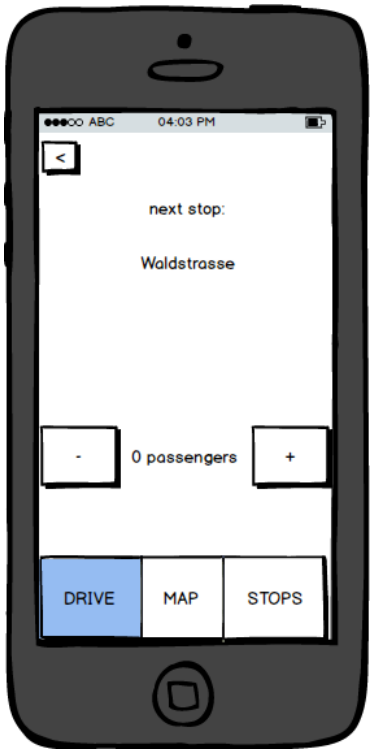


Figure xx: Screen flow of the BusDriveApp

Mockups:

Author: Erik Gruener(Bus Mockups)
Status: Complete
Reviewer: Patrick Pschorn (Bus Mockups)
Review status: Complete

#SC_B1: Select Bus Screen This is the first screen of the BusDriveApp. It shows a list of the busses available including number plate and a picture. The bus is chosen by tapping the element and the app changes to the Select Line Screen.	
#SC_B2: Select Line Screen The screen shows a list of the lines. A Line is chosen by tapping the element and the app changes to the Drive Screen.	

#SC_B3: Drive Screen On this screen the Bus driver can change the number of passengers on his bus by pressing the +/- button. On the top of the screen he can go back to the Select Line Screen by pressing the '<' button. Furthermore the next stop of his route is shown (it2). Via tab bar the screen can be changed to the Map Screen and Stops Screen.	
#SC_B4: Stops Screen On this screen the Bus driver can see the list of stops on his current route. On the top of the screen he can go back to the Select Line Screen by pressing the '<' button. Via tab bar the screen can be changed to the Map Screen and Drive Screen.	

#SC_B5: Map Screen The screen shows the map of the area of the chosen route including markers for the stops and the Bus driver's current position. Via tab bar the screen can be changed to the Stops Screen and Drive Screen.	

Table 36: Screen Mockups

9 Glossary

Name	Description
Bürgerbus system	Consists of BusDriveApp, BürgerApp, server backend
BusDriveApp	Mobile application to be used by the Bus driver
BürgerApp	Mobile application to be used by the Citizens