**Bürgerbus mConcAppt Interaction Concept Documentation**

**Authors:**

Students of the TU Kaiserslautern

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# 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](http://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.

# 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.

# 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

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## 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

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|  |
| --- |
| **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

# 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

# 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.

# 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

# 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

# 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

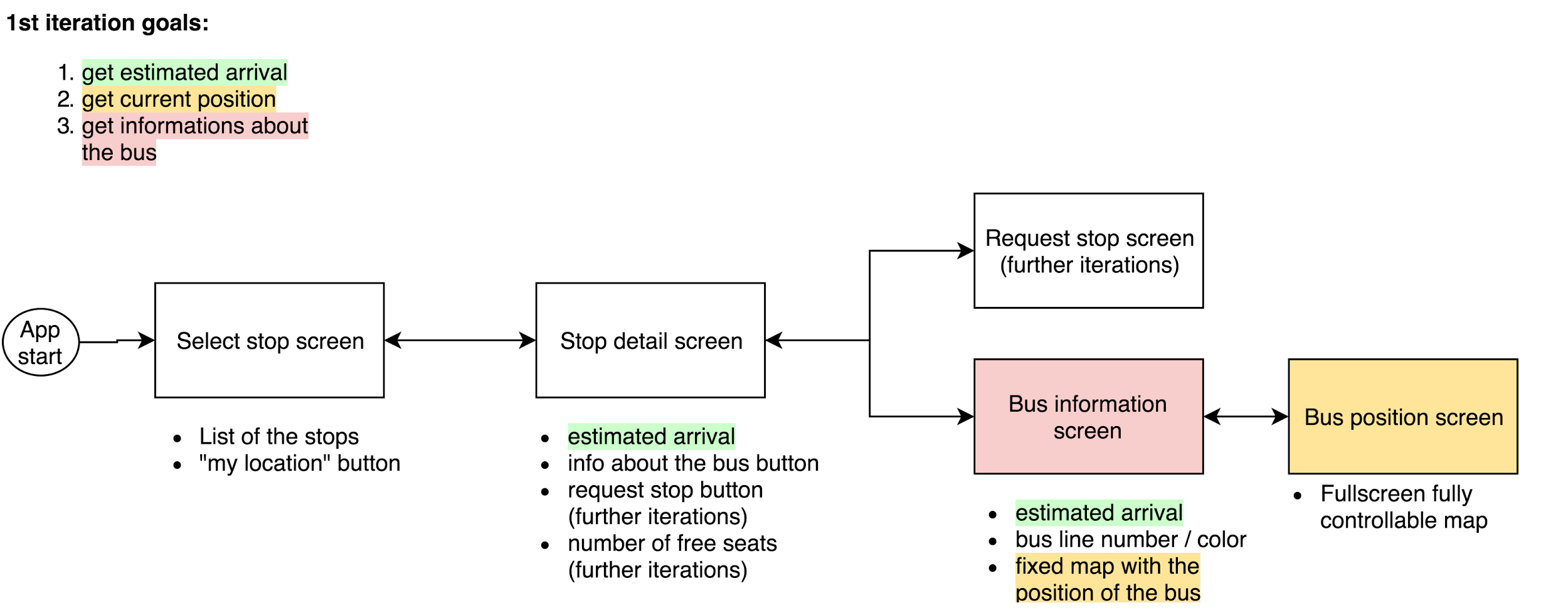
**Author:** Oliver Säger

**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

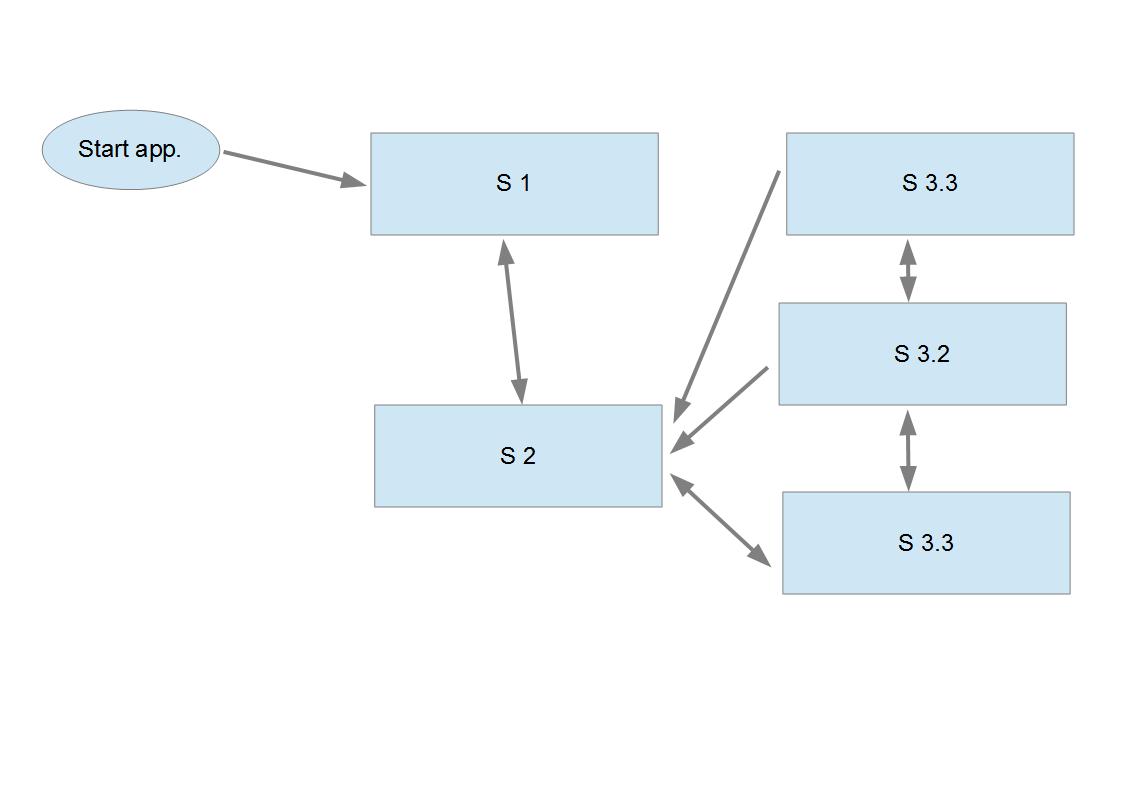


Figure xx: Screen flow of the BusDriveApp

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

# 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 |