38883171 – Reflective Report – Sprint 3

## Requirements:

This sprint, my main deliverables were centered around improving the general user experience when using our application. The main objectives of the sprint were:

* Make the webapp usable for mobile users.
* Get user’s location from browser and implement related functionality.
* Map reacts to selections in the ControlPanel.

## Architecture:

### Main View on mobile:

The design paradigm of the Main View had to be chosen carefully. This component contains both ControlPanel and map, and is in charge of placing them in a cohesive single view. On large horizontal resolutions, such as with desktops of tablets, the existing horizontal implementation works without issues. The ControlPanel and MapWidget are placed in a size-flexible single column, allowing it to adapt to varying degrees of variation in the x-axis resolution.

The issue came when the user was using a mostly y-axis resolution. The columnar approach stop being an effective way to display the information. To solve this problem, a new vertical mode was activated after the resolution reached x width.

The initial approach was to simply stack the components in a row. This didn’t work very well due to the changing size of the control panel, often resulting in the map not being visible and it resulted in a bad experience for users. As an alternative, an overlay concept with an ControlPanelIsActive state was utilized. When inactive, the controlPanel was shrunk, leaving more space for the map. To enable and disable the ControlPanel both a click and a drag interaction was added, making it friendly for all kinds of users.

### Retrieving User’s Current Location:

A new locationContext was created to contain all data related to the user location. This meant the actual location, whether the feature is enabled or disabled, and any errors that may have been registered. From here the ControlPanel and MapWidget simply had to implement the desired internal functionality and error handling.

The implementation of the locationUpdater was very straightforward. Querying the user location is natively supported using the react navigator. The only challenge that arose was that the user location was being queried every millisecond. To prevent this, adding a simple time out was sufficient. An additional accuracy check was added to ensure that the user location wasn’t being considered if the location estimate was too unreasonable (over 500m).

### Map moves to ControlPanel selections:

3 types of interactions were implemented. When searching for a specific station, the map is moved to the specified coordinates, when the user location loads or is manually centered via an interaction button, the map is moved to the specified coordinates, and when an itinerary is selected, the features of the itinerary are retrieved, and the map will move the view so that all features are visible. This was done via the fitToFeatures function, which aims to comply with the following design patterns:  
***Open-Closed Pattern (OCP):*** Self-contained function that performs a specific functionality, and  
is swappable if required (ex. If the map framework is changed).  
***Adapter Pattern:*** Feature types represent coordinates in different ways. The function standardizes these into a format that is accepted by the mapLibre fitbounds function.

## Testing

Support for the playwright testing platform was added to our CI-Testing job. When npm run test is triggered, both jest tests and playwright tests are executed. Given that playwright tests require the application to be ran separately, an additional step was added to the npm scripts that would run the application before running the tests and shut it down afterwards.

Idle State Performance Test – Implemented with Playwright, aims to ensure that a group of pre-configured context scenarios don’t cause unexpected long-running performance issues, such as those caused by memory leaks or infinite recursive loops.

1. Configure desired context scenarios (set values of contexts to desired states).  
2. Load page with these new scenarios, which the UI Components should react to.  
3. Record memory usage for 3 minutes and ensure that memory growth isn’t excessive.

LocationUpdater Test – Ensures that all functionality related to the location updater operates as expected, including updating location when a new location is available and handling low accuracy.

## Impediments and plans to address them

Low-Quality icons on Map  
At some stage from the process of converting an icon into a bitmap and loading it into the map, the outcome was noticeable low-quality images, as brought up by the LVB PO.  
***Solution***: Issue originates when MapLibre resizes the icons. Leave the icons on their native resolution, and manually resize them to the desired size.

Issues with data source for fitToFeatures  
After a layer’s data is loaded into the map, the generated features need to be extracted for then using them to determine their coordinates and moving the map to fit them all. When attempting to move to a large itinerary, only a partial section of it was fit into the screen. When attempting to load again a larger section would be fit, and by repeating the whole layer would be visible.  
***Solution***: When using MapLibre’s queryRenderedFeatures or querySourceFeatures, only the features in the current viewport (ie. map area). This explains the issue described above. To circumvent it, the geoJSON data used to generate the layer was stored raw, and when the action was triggered, instead of using MapLibre’s functions, the raw data was directly submitted to the fitToFeatures function.

# Appendix 1: Sample CI-Tests result

A black screen with red text

AI-generated content may be incorrect.

# Appendix 2: Sample Execution of Idle Performance Test

A screenshot of a computer

AI-generated content may be incorrect.

# Appendix 3: Sprint Requirements

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **GH Issue #** | **Title** | **Description** | **Size** | **Reporter** | **Status** |
|  | Distribute Sprint 3 Tasks |  | S | **Jorge** | **DELIVERED** |
|  | Sprint 3 Week 1 with Eva Kessler from LVB | Take notes and distribute further tasks based on comments. | S | **Jorge** | **DELIVERED**  [**https://docs.google.com/document/d/1zAt3gsUP\_1RVOgr3Itjj5MVTaVywqOuCxpsUtpoXFcM/edit?tab=t.0#heading=h.a3573bavnt3h**](https://docs.google.com/document/d/1zAt3gsUP_1RVOgr3Itjj5MVTaVywqOuCxpsUtpoXFcM/edit?tab=t.0#heading=h.a3573bavnt3h) |
| **#78** | Document used Dependencies |  | S | **Jorge** | **PENDING** |
|  | Implement nearbysearch service with conversion test |  | M | **Jorge** | **DELIVERED** |
|  | Convert nearbysearch objects to valid GeoJSONs |  | M | **Marlene** | **DELIVERED** |
|  | Implement nearbysearch layers (prettify with image icons based on type) |  | M | **Marlene** | **DELIVERED** |
|  | Add nearbysearch layers in MapWidget | Only for now only display objects of type stop. Leave other layers prepared.  Requires reworking loading-based-on-bounds concept. | L | **Jorge** | **DELIVERED** |
|  | Implement logging framework and migrate logs to new formats | To enable logging based on current environment (development, test, or production). | M | **Jorge** | **PENDING** |
|  | Controlpanel to control currentView when a stop is selected. | Currently done by MapWidget, not desired. | S | **Marcos** | **DELIVERED** |
|  | Connect currentItinerary to ControlPanel. | Alongside viewmode functionality. | XS | **Marcos** | **DELIVERED** |
|  | Fix Autocomplete Text Boxes |  | XS | **Jorge** | **DELIVERED** |
|  | Control Panel responds to click on map | Requires content context for source and destination coordinates.  ControlPanel must react to external changes to context.  - If source && destination coordinates are filled out, search route.  Convert coordinates into a location for the content of the textboxes (Done by LeipzigMOVE, APIs don’t seem to offer that functionality). | M | **Jorge** | **NOT IN SCOPE** |
|  | Context for source/destination Input fields | Contains:  Displayed text, coordinates / autocompleteObject.  Modify ControlPanel for integration. | M | **Jorge** | **NOT IN SCOPE** |
|  | Reverse Geocoding for map coordinates | Allows user to select from/to on the map.  Reverse geocode to get named address of the selected coordinates (requires 3rd party API).  Accompanied by modifying autocomplete context’s input fields. | M | **Jorge** | **NOT IN SCOPE** |
|  | Implement ClearState functionality on DataContexts | Make sure it’s threadsafe with useDataFetcher | S | **Jorge** | **PENDING** |
|  | Fix window scrolling caused by Layout. – Low Prio | Issue is very obvious on mobile.  When accessing lu-lvb-JourneyPlanner/test window scrolling is not present. When accessing normal page though, layout header seems to cause scrolling. | M | **Jorge** | **DELIVERED** |
|  | Control Panel ‘return’ functionality. | Reverts to previous state of window/query/etc.  Requires new ControlPanel Context | M | **Marlene** | **DELIVERED** |
|  | currentSelectedStop on mapContext is now object instead of just ID | Control Panel needs to parse id to then query stopsMonitor, as it comes in format ‘random-test-00000’.  ControlPanel to take more advantage of provided object.  (Load different controlPanel selectedObject layout based on object type, instead of just “stops”.) | S | **Jorge** | **DELIVERED** |
|  | “Simulate User Behavior” Test | Final proof that application will work for the user as expected.  Simulate the journey of a user through the UI. From searching for stops, to getting the route.  From selecting a station on the map, to reading the results. | L | **Marlene** | **PARTIALLY DELIVERED** -Doesn't verify map reactions |
|  | New SearchStation ControlPanel Component View | Lets user write a stop name and opens up the StationDetails view | M | **Marcos** | **DELIVERED** |
|  |  |  |  |  |  |
|  | Add labels to Haltestelle nearbySearch map layer |  | XS | **Jorge** | **DELIVERED** |
|  | Correct Icon Sizes | Standardize all to 256x256  Resize on map | XS | **Jorge** | **DELIVERED** |
|  | Improve/prettify existing layers | Intermediate Stops, Itinerary Lines, etc… | S | **Marlene** | **DELIVERED** |
|  | Zoom button +/- connected to MapWidget |  | M | **Jorge** | **DELIVERED** |
|  | Find and import new more functional style into MapWidget. |  | M | **Marlene** | **PENDING** |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **… Sprint 3 Week 1 UI/UX Improvements based on comments from Eva …**  [**https://docs.google.com/document/d/1zAt3gsUP\_1RVOgr3Itjj5MVTaVywqOuCxpsUtpoXFcM/edit?usp=sharing**](https://docs.google.com/document/d/1zAt3gsUP_1RVOgr3Itjj5MVTaVywqOuCxpsUtpoXFcM/edit?usp=sharing) | | | | | |
|  | Routes and Itineraries controlpanel pages display more information | Based LeipzigMOVE concept changes provided by Eva.  Includes:  Display more information (delays, etc)  Routes & Itinerary stop times to include delay (Wants special sorting, but might be out of scope)  Distance to location | M | **Marcos** | **PARTIALLY DELIVERED** - Distance to Location missing |
|  | Improve Translations |  | XS | **Marlene** | **DELIVERED** |
|  | Use colors in itinerary legs to display on ControlPanel and map instead of hardcoded colors | not possible.  otp API doesn’t provide itinerary leg colors in objects | S | **Marlene** | **DELIVERED** |
|  | Fix Switch origin and destination button overlapping with route input fields. |  | S | **Marcos** | **DELIVERED** |
|  | Get user current location |  | S | **Jorge** | **DELIVERED** |
|  | Display current user location on map | Auto-center on user location on start-up.  Center-button to move back to the current location. | M | **Jorge** | **DELIVERED** |
|  | Allow user to select current location as source/destination |  | M | **Marcos** | **DELIVERED** |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  | Sprint 3 Week 2 with Eva Kessler from LVB | Take notes and distribute further tasks based on comments. | S | **Jorge** | **PENDING**  [**https://docs.google.com/document/d/1\_fmk-u1X-nSdifnqcUVKxh2EHgiJ0eUSl9SXCWsQUsM/edit?tab=t.0#heading=h.a3573bavnt3h**](https://docs.google.com/document/d/1_fmk-u1X-nSdifnqcUVKxh2EHgiJ0eUSl9SXCWsQUsM/edit?tab=t.0#heading=h.a3573bavnt3h) |
| **… Sprint 3 Week 2 UI/UX Improvements based on comments from Eva …**  [**https://docs.google.com/document/d/1\_fmk-u1X-nSdifnqcUVKxh2EHgiJ0eUSl9SXCWsQUsM/edit?usp=sharing**](https://docs.google.com/document/d/1zAt3gsUP_1RVOgr3Itjj5MVTaVywqOuCxpsUtpoXFcM/edit?usp=sharing) | | | | | |
|  | Review notes from Sprint 3 Week 2 with Eva Kessler from LVB | Review Notes | XS | **Marlene** | **DELIVERED**  [**https://docs.google.com/document/d/1\_fmk-u1X-nSdifnqcUVKxh2EHgiJ0eUSl9SXCWsQUsM/edit?tab=t.0#heading=h.a3573bavnt3h**](https://docs.google.com/document/d/1_fmk-u1X-nSdifnqcUVKxh2EHgiJ0eUSl9SXCWsQUsM/edit?tab=t.0#heading=h.a3573bavnt3h) |
|  | Comments from David | In Email "Software Design Studio" | S | **Jorge** | **DELIVERED** |
|  | Stylistic changes to ControlPanel components | Based on feedback from LVB | M | **Marcos** | **DELIVERED** |
|  | Use Itinerary Leg and Stop colors from LVB API's on ControlPanel | Instead of the currently hard-coded approach | S | **Marcos** | **DELIVERED** |
|  | Use Itinerary Leg and Stop colors from LVB API's on Map | Instead of the currently hard-coded approach | S | **Marlene** | **DELIVERED** |
|  | Improve translations |  | S | **Marlene** | **DELIVERED** |
|  | Visual improvements to Map Interaction buttons |  | S | **Marlene** | **DELIVERED** |
|  | Fade-in Map Layers when loaded in | Currently they just spawn into existance.  Makes experience smoother for user. | S | **Jorge** | **DELIVERED** |
|  | Improve MainView for use in Mobile Devices (or devices with low resolution) | - Hideable controlPanel overlay.  - ControlPanel interactions disabled when hidden.  - ControlPanel can be hidden/unhidden by drag or by click interaction.  - Add visible state to a context so other components can trigger custom interactions. | M | **Jorge** | **DELIVERED** |
|  | Map reacts to selection in SearchStation view | Set the ControlPanel to hidden, move Map view to the selected stop, Set ControlPanel to Visible | S | **Jorge** | **DELIVERED** |
|  | Map reacts to itinerary selection by ControlPanel | When an itinerary is selected, show the whole itinerary path on the user's view. | M | **Jorge** | **DELIVERED** |
|  | Map Icons need to be sharper | Currently look blurry. Issue is caused when MapLibre resizes icons. Change native resolution and display that instead. | S | **Jorge** | **DELIVERED** |
|  | Fix Layout overlap issues | Only occurs on pages with NavBar. Container size set to 100% doesn't take into account existing NavBar, causing it to go outside the user's window resolution. | S | **Jorge** | **DELIVERED** |
|  | Memory Leak / Infinite Loop Detection Test | Take advantage of Context architecture.  Create scenarios based on contexs, which should be reacted on by underlying components, and monitor idle performance. | M | **Jorge** | **DELIVERED** |
|  | Test LocationUpdater to ensure functionality and that expected errors occur. |  | S | **Jorge** | **DELIVERED** |