Strategies for IT-development

June 11, 2019

MOBIHUB

www.mobihubs.eu

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Introduction

The aim of this document is to zoom out and give a helicopter view of the IT-challenges we are facing with the mobihub project. Later on, the development milestones can be defined based on the suggested main structure.

What is a Mobihub?

A Mobihub is a place where transit between different types of transport or within a single type of transport is possible. This way, it concerns many transportation hubs. A Mobihub should be a well-equipped transportation hub of high quality, aiming to make a transit as swift and comfortable as possible.

In a report by research agency BUUR, the Flemish government defines different layers of functionalities associated to mobihubs:

- Transportation
- Services
- Oriëntation
- Spatial integration
- Development

The software development regarding mobihubs is focused on 'oriëntation', in terms of providing information, giving a general context for the project.

A. MOBILITEITSAANBOD

1. regulier openbaar vervoer
2. vraaggericht collectief vervoer
3. deelwagens
4. parkeerplaatsen
5. taxi
6. kiss & ride
7. deelfietsen en deelsteps
8. fietsenstalling

B. DIENSTEN

9. ticketing
10. wachtaccommodatie
11. aanvullende diensten in het mobipunt
12. aanvullende diensten in de buurt

C. ORIËNTATIE

13. zichtbaarheid
14. herkenbaarheid
15. leesbaarheid
16. informatieverstrekking

D. RUIMTELIJKE INTEGRATIE

17. bereikbaarheid
18. verkeersleefbaarheid
19. verkeersveiligheid
20. toegankelijkheid
21. sociale veiligheid
22. verblijfskwaliteit

E. ONTWIKKELING

24. wonen
25. attractoren

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Main structure

This scheme identifies the main sectors for development and their (inter) dependencies.

Today, only a part of this scheme has been created in the form of a prototype kiosk application with a database and some APIs (B-rail, De Lijn, MIVB) and seperate Wordpress websites (mobihubs.eu, mobipunt.be, ...).

The long-term goal is to develop each of the sectors connected to a central database that will be managed by Mobipunt vzw.

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Database

The database will act as the backbone for all further development. To ensure the long-term usability, the database needs to meet certain standards and must be ajustable to new applications or integrations.

The database will thus be the first priority for development.

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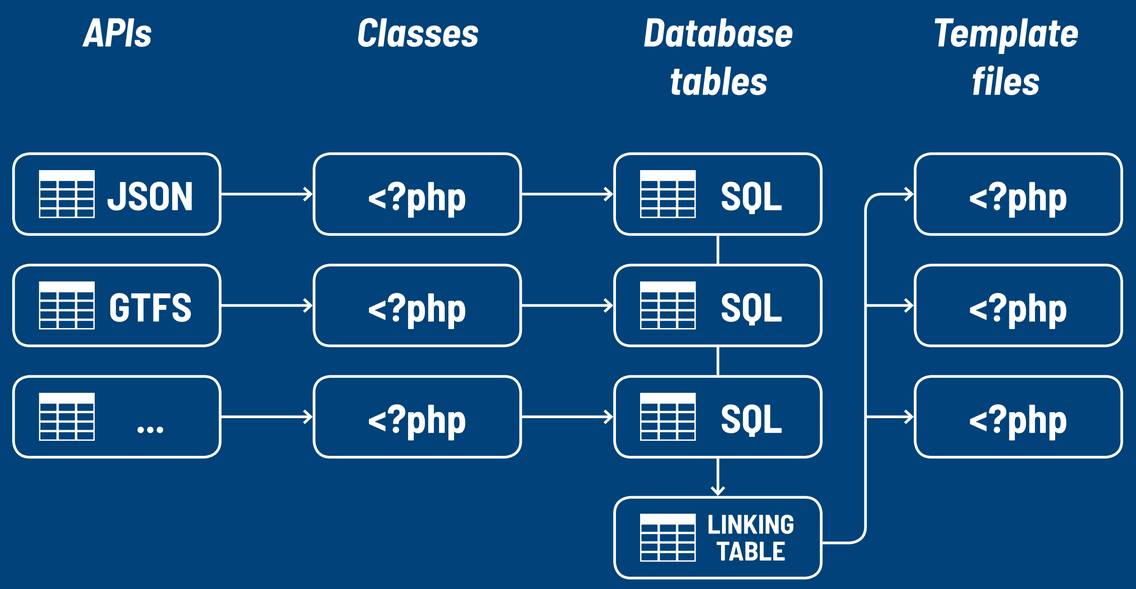
Available APIs

In the prototype architecture, each API (indifferent what format) is pulled into a seperate database table and linked to a specific mobihub ID through various linking tables. That way, for example, only the departures of Vilvoorde train station are shown on mobihub 1800.2 'Vilvoorde Station'.

In the current situation, there are 'Class' php-files inside the kiosk web application that handle the link between the external API and the database, and is constructed so that it works specifically for the interactive kiosks.

Note that in a more complex architecture a more sophisticated method needs to be created: the information is not only shown on the kiosks, but also on the website(s) and perhaps a 'super user' needs to be able to link and unlink certain data to a specific mobihub.



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Dashboard A

For management purposes, we need a primary dashbord (web application) that will allow us to:

» add and remove mobihub-entities;

» modify mobihub-attributes;

» check statistics (Google Analytics?);

» send android shell commands to kiosks (eg.: 'reboot');

» grant access to third parties to use Dashboard B and assign mobihubs (users, roles and capabilities management);

» recieve notifications on several events (eg.: "Warning: MP-1800.2 seems offline");

» manage uploaded media files;

» ...

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Dashboard B

A secondary dashboard is needed to allow third parties to manage one or several mobihubs. They need to be able to:

» monitor if a mobihub kiosk is still active;

» recieve notifications;

» view and modify details of every mobihub within their jurisdiction (even those that do not have an interactive kiosk, details will be shown on the website);

» upload and manage advertisements specific for their mobihubs;

» add (or request) a new mobihub entity (mobipunt vzw will need to verify);

» ...

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Kiosk application

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The outdoor information kiosk runs on Android OS with a dedicated Mobihub app with a web-view. De web pages that are displayed show specific information regarding the mobihub the user is at.

In the user interface, the different kinds of information can be prioritised as shown in the matrix on the right. Each type of use on different points during a users travel results in a type of informaton a user may need. The most important information in the first quadrant must be available and easily accessible at all times, the other quadrants follow (through tapping on sub-menu buttons for instance).

There is an important difference between a mobile (web)app and the information kiosk: where the link between the information kiosk and the physical world must be emphasised, websites and apps can theoretically show all kinds of information regardless of the current location of the user.

Types of use

Travel status	Functional	Facultative
Transit or 'flow'	**1** » Bus » Streetcar » Train » Shared bikes » Shared cars » Taxi » Parkings » ... *< 100 m*	**3** » Hiking routes » Bike routes » Landmarks and scenic routes » ... *< 500 m*
Destination or 'stay'	**2** » Bakery » Supermarket » Sheds, benches » Bike chargers » Phone chargers » Bike lockers » ... *< 250 m*	**4** » City centre » Parks » Concert hall » Shopping centre » ... *nearest*

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Website

Currently the website relies on a wordpress installation with its own database. There is no connection yet between this database and the interactive kiosks.

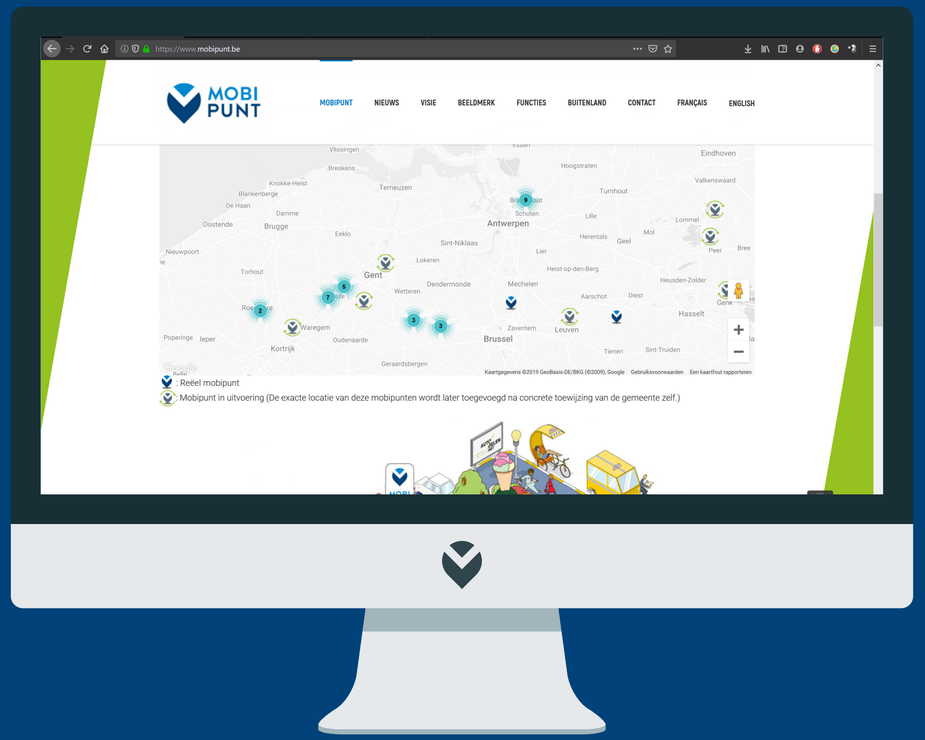
Things to consider for the website:

» data for the mobihubs should be drawn from the central database and managed with the superuser dashboard;

» a new layout might be needed to focus on transport information instead of general information about the project (see for example https://www.tim-graz.at/);

» the layout must be fully responsive (mobile-first);

» the mobihub corporate identity must be integrated as much as possible.



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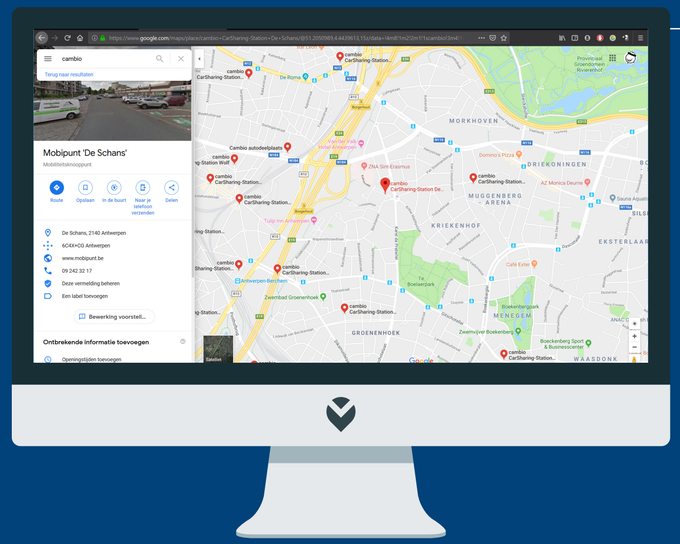
Collaboration

In the long run, Mobipunt vzw can also enrich other services with the available data. Various applications are conceivable, for example the integration in existing map services and route planners.

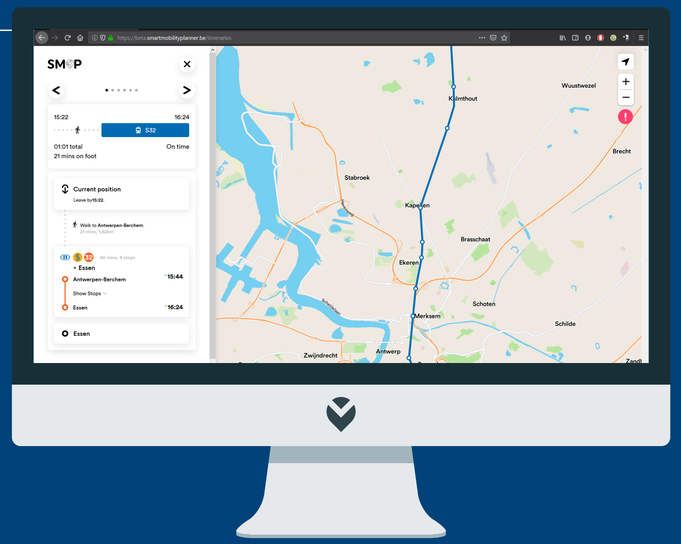
We need to make sure the mobihub data is stored in a usable format that can be shared, and perhaps create an API for mobihubs.



Mobihubs show up on Google Maps

SMOP

Integration with smart mobility planner



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Development priorities

Based on the main structure and the specific 'development sectors', general milestones can be defined in a specific following order.

Starting from the experiences with the prototype, we can start developing a database architecture that can serve as a backbone for all other sectors.

Parallel to the main development, the prototype kiosk application can be adjusted slightly to serve on te first few interactive kiosks in the meantime.

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