DEMO FINAL REPORT WIELKOPOLSKA (INTEGRATED ONLINE JOURNEY PLANNER)

D.T2.5.5.

Title	Demo final report Wielkopolska (integrated online journey planner)
Deliverable	D.T2.5.5
Authors	Piotr Kupczyk
Contributors	
Status	Final
Reviewed by	Domokos Esztergár-Kiss, Attila Aba, Tamás Mátrai
Submission	31.03.2022.

Interreg
CENTRAL EUROPE
European Union
European Regional
Development Fund
RegiaMobil

1. Objectives of the pilot

In years 2017-2020 the UMWW participated in the project Subnodes supported from the ERDF in the range of the Interreg Central Europe Programme. The project tackled the weak intermodal integration of peri-urban hinterland regions to primary TEN-T rail hubs. The partners defined small cities as "subnodes" and implemented several pilot actions with a goal of improving the quality of connections and infrastructure between main nodes, subnodes, and the hinterland.
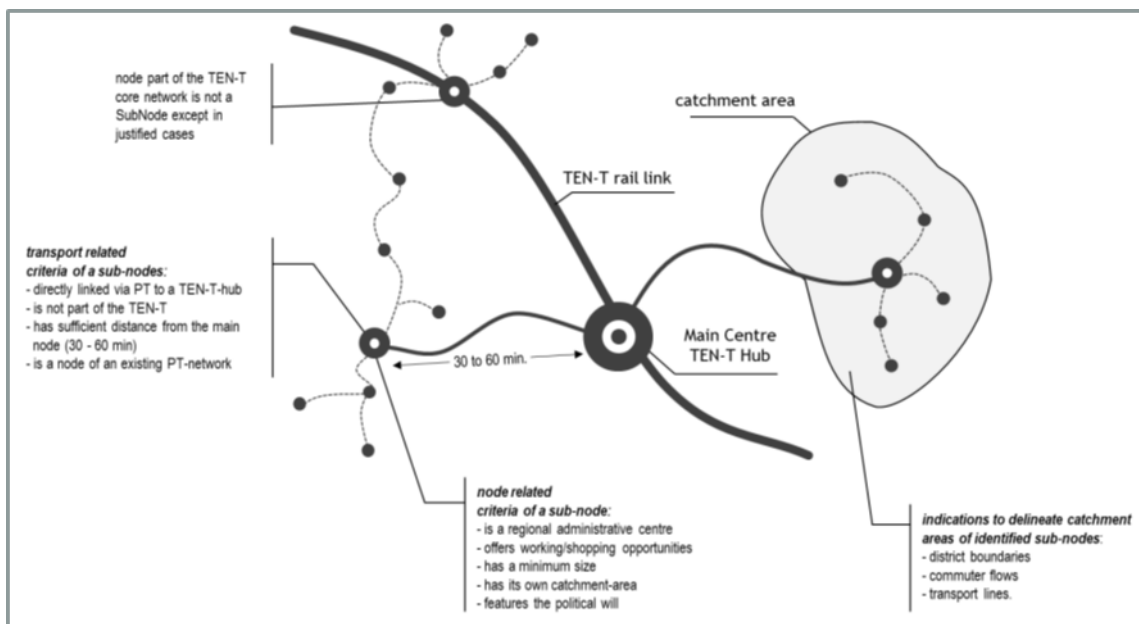
1. Figure Transport related criteria of Subnodes (source: the UMWW Transport Department in Poznań).

During the pilot action within the project SUBNODES the UMWW has created an internet platform which enables the collection, storage, and sharing of data related to public transport in Wielkopolska voivodship.

- Data collection - is a continuous process consisting in obtaining relevant data from local government units and carriers, so that they are valid at all times.

- Data storage - collected data are stored so far as static data on timetable,

- Data sharing -it is assumed that data collected on the platform will be widely available and downloading them will be free. Local government units at all levels, carriers and passengers are three groups particularly interested in collecting current data related to public transport.

Having the platform, the UMWW planned during realization of the project RegiaMobil to set up a real-time information from bus services in the voivodship and an online journey planning. Thus, passengers from rural territories could get on-line information regarding the public transport nearby and the regional government would get valuable information to implement its task as the organiser of the regional public transportation.

To develop the demo, it was necessary to modernize the data base set up in the Google cloud what enables to collect a large amount of information but as it was in a NoSQL format, it turned out to be quite slow for using the data for journey planner. So, the SQL base had to be launched. The next very important factor to make the demo successful is to unify all information obtained into GTFS and GTFS Real Time format. A proper software should be prepared for that reason. At least but not at last the data base should be connected to the Infrastructure of Spatial Information that make the results visible all over the world.

The modernized data base will be established no more in the Google cloud as it is quite costly for the UMWW now and would be much more costly when the real time dynamic actions will be displayed and much more people than so far will use it. It would be more cost-effective if the UMWW had for the data base a more efficient cloud from another local supplier.

The service will be controlled by the UMWW. The project requires a strict cooperation between two railway companies which operates in the Wielkopolska voivodship and with ca. 100 private bus operators which the Wielkopolska Region has undersigned contracts for re-foundation of reduced tickets with, according to the Polish law. The cooperation with the railway company Koleje Wielkopolskie is quite easy as the firm is owned by the Wielkopolska Region 100 %. The cooperation with the second train provider: POLREGIO runs also well – the Wielkopolska Region has ca. 4 % shares in the former state railway company.

The pilot has no goal to compete with other companies in the region or in Poland which share journey planners – in contrary – the data will be shared with them on request for free.
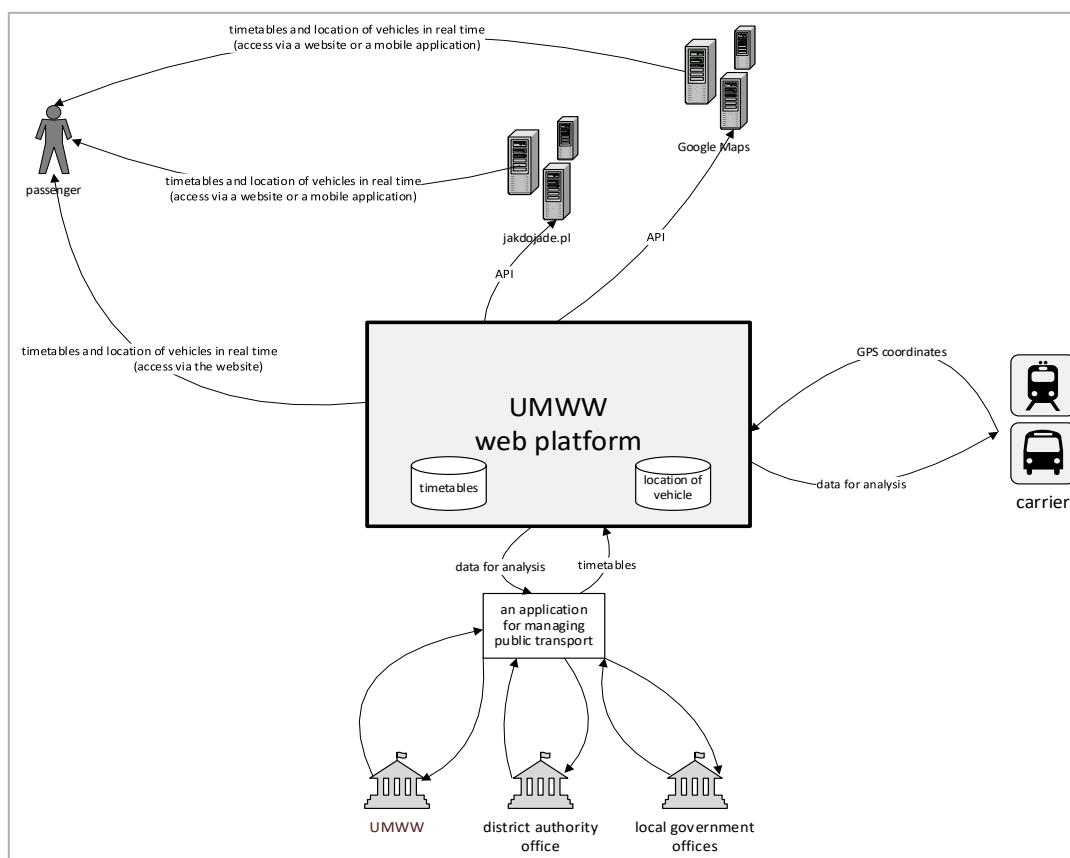
2. Figure Scheme of the transportation web platform planned by the UMWW (source: the UMWW Transport Department in Poznań).

2. Pilot area description

The learning from another partner's projects shows that institutions in Central Europe have different views on how to make the public transport smart enough to get more users of it. For instance, in case of MaaS4EU project implemented by the Budapest University of Technology and Economics (BME) legislation and a good graphical user interface turned out to be a key to success for preparing application to share cars or rent bicycles. The MoTiV project (financed by Horizon 2020 scheme) implemented by the University of Žlina using data collected from smartphones explored the dynamics of individual preferences, behaviours and lifestyles that influence travel and mobility choices – crucial information for transport organizers. A partner from Italy - the aMO proved that a bus for call system can be a very good remedy for excluding of public transport in rural and less populated areas.

The idea of the UMWW is not only focused on the passengers who for example get an application to share cars or pay for renting bicycles or to establish a bus for call. It is focused on the organizing of the public transport on different levels in the region and giving the passengers in the rural territories the best transport connections and information about it. The UMWW focused on the two main means of public transport in the region: trains and buses.

The popularity of public transport depends largely on the attractiveness of the offer prepared by the carriers. The development and launch of the connection network require analysis of, inter alia, line runs, hours of running, obtaining administrative decisions. All these activities require data processing. If they are aggregated in one place, carrying out analyses and completing the formalities requires less time and makes it easier to make better decisions. In the case of equipping transport vehicles with GPS locators, information on the current location of vehicles would be directly sent to the UMWW data base. As a result, the information on the historical location of vehicles gathered in one place (e.g., a monthly history of temporary deviations from the timetable) allows for performing analyses of the implementation of timetables. Such a list can help to identify critical points on routes where deviations from timetables are most common. Ultimately, it allows to optimize the timetable and improve the quality of services.

Every year the UMWW receives over 150 emails and letters from the region's residents with request to enter a dynamic passenger's information regarding the rural areas. These signals come from all over the region. It is a clear prove that all potential passengers would like to get a high-quality PI. The survey on that topic for the whole region would be than not only very costly but will not bring other results as that they support projects like the demo.

The issue of data openness is constantly a very popular topic in the European Union. In 2003, the re-use directive requiring the disclosure of public information entered into force. Its aim is to improve the transparency of public institutions' activities and to enable the re-use of data. More and more data are collected every year, but in many cases, they are intended only for internal use of institutions operating within the public sector. Aggregating, standardizing, and sharing information stimulates development, allows for better planning and optimal use of resources. Based on them, any recipient of the data can carry out an analysis, build an innovative application or use it in any way in the current activity.

During many meetings conducted by the UMWW with the local bus organizers or providers they underlined how important is to unify names and other characteristics of bus stops in the region. Differences in this field are the main obstacle e.g., to cooperate with journey planners like Google or others. So, it is also clear that it is a huge demand between the two key stakeholders. To make the cooperation fluent and harmonized the UMWW has planned several meetings with the local bus organizers.

3. Pilot implementation

3.1. Realization of the pilot

The first step of the pilot implementation was a preparatory phase. It started in January 2021 after signing an agreement between the UMWW and the external expert – an IT company Medway sp. z o.o. The expert conducted consultations with the stakeholders regarding their experiences and demands on the pilot's topic. In March 2021 the external IT expert prepared a detailed "Concept of software development of the Transport Department". The results were presented during the expert workshop "Digitalization applied to Public Transport in rural regions: MaaS and other IT solutions" held on-line on 29 June 2021 as part of the deliverable D.T2.2.5 "Documentation of an expert workshop on IT tools to promote seamless journey planning".

The concept was a base to prepare tender documents to contract an IT expert for preparing of the IT application. Some remarks emerged in discussion during the workshop were included into the detailed description of the product.

Due to the problems connected with the Covid-19 the original workplan was fallen apart and the tender was published first on 8 November 2021. There was one offer entered unfortunately the requested reward was too high to the estimated budget. The next tender was published in December 2021. This time the offer was accepted and in January 2022 and the external expert – an IT company TDC sp. z o.o. was contracted. The contractor was obliged to prepare following products:

1. Pre-implementation analysis.

2. IT basic module created in the system MySQL and with standard WCAG 2.1.(frontend).

As part of the module, the data storage system will be modified to a relational database. Data stored in the NoSQL database will be migrated to the newly created database. On the publicly accessible part of the platform, the WCAG 2.1 standard will be implemented. The platform will be migrated from a cloud service to a physical server purchased by TD and installed in the UMWW server room (its specification is presented in the chapter "Hardware infrastructure"). An extended ACL system will be implemented, which will allow more extensive user management and the possibility of supporting future modules that will extend the functionality of the Transport Platform will be introduced.

3. Data base of bus stops.

As part of the pilot, a bus stop management module will be developed. A Google Maps mechanism will be implemented, allowing to determine the position of a bus stop on the basis of a satellite image. Stops coming from the RJA system will be imported. As part of the Transport Platform, a tool for moderation of newly added stops will be developed. A parameter "Bus stop administrator" will be introduced, which will indicate the administrative manager of the bus stop in reality and will allow this manager to modify the name of the bus stop or to move its position (if it is necessary to create a temporary bus stop).

4. Application for mobile devices.

A module introducing full support for mobile devices, so that it fully adapts to the screens of all these devices.

The IT application should be ready to the end of May 2022 at the latest. The IT company is obliged to provide a technical support for three years. Large display with passenger information based on the data collected in the IT application is to establish at the intermodal train-bus station in Puszczykowo, a small town in the rural area on the border with the Wielkopolski National Park.

The cost of the whole application, technical support of it an PI screen is 52 600 EURO.

3.2. Involved stakeholders

3.2.1. Public transport carriers (ca. 100 bus providers and 2 railway providers)

The popularity of public transport depends largely on the attractiveness of the offer prepared by the carriers. The development and launch of the connection network require analysis of, inter alia, line runs, hours of running, obtaining administrative decisions. All these activities require data processing. If they are aggregated in one place, carrying out analyses and completing the formalities requires less time and makes it easier to make better decisions. In the case of equipping transport vehicles with GPS locators, information on the current location of vehicles will be directly sent to the UMWW data base. As a result, the information on the historical location of vehicles gathered in one place (e.g., a monthly history of temporary deviations from the timetable) allows for performing analyses of the implementation of timetables. Such a list can help to identify critical points on routes where deviations from timetables are most common). Ultimately, it allows to optimize the timetable and improve the quality of services. As the application consists also of a journey planner the carriers get the possibility to inform passengers about schedules. There were several video-meetings with bus and train carriers to optimize functionality of the IT application. For interested stakeholders some trainings on how to use the IT application will be organized. So, the public transport carriers are the crucial stakeholders for success of the pilot and the cooperation with them will be dynamic and long-term.

3.2.2. The Marshal Office of the Wielkopolska Region and local government units in the region responsible for organization of the public transport

The Marshal Office of the Wielkopolska Region is responsible for the management of public collective transport - rail and bus - in the region if the route crosses at least 2 counties. It is necessary to analyse data from many sources to efficiently perform its duties. Counties are responsible for the management of the public bus transport in the county if the route crosses at least 2 communes. Communes are responsible for the management of the public bus transport in the commune. Both counties and communes collect their own transportation data and can share them with the UMWW. They could also obtain data from the UMWW's data base created during the pilot action. One of the crucial cooperation ought to be provided with the local authorities of the commune Puszczykowo, where a large display with passenger information will be installed. The above-mentioned stakeholders were informed about the pilot via video meetings.

3.3. Promotional activities

The pilot action was or will be promoted by:

- direct contacts with the key actors (train and bus providers, local transport organizers),
- a mailing action directed to key actors,
- trainings for key actors on using the IT platform,
- information in mass media about the service,
- Information about the pilot will be included into a film about the project,
- Information about the pilot on the official RegiaMobil website,
- Information about the pilot included into the project's leaflet,
- Information about the pilot on the UMWW's official website and in the UMWW's magazine,

- Information about the pilot on the IT application,

- Information about the pilot displayed on the screen with the passenger information

  - at the intermodal rail/bus station in Puszczykowo,

  - a plate attached to the PI display with the information about the pilot action

- Information about the pilot included into the application's user manual prepared for stakeholders.

3.4. Final service

The service will be monitored by its owner - the UMWW- by collecting information about users of the service as well as by feedback getting from the local transport organizers and providers. Statistical data will be obtained from the system and analysed periodically. The IT application will be tested by the UMWW before launching regarding security of collected data and resistance to hacker attacks. The tests will be provided by an external IT company specialized in security of IT systems.

After confirming security of the product, it will be tested by the external IT in a working environment if all functionalities contracted are available and active. After that the service will start for public use. The application will not be publicly available for download from mobile application shops (installation on devices will be based on the APK installation package provided). The users of the application will have to have an account within the Transport Platform, to which they will log in during the activation of the application.

The IT application enables searching for the fastest connections taking into account changes between different means of transport.

The application will function in so "mobile first" approach what means that the main emphasis when designing such an interface is placed on satisfying the users of mobile devices. All elements in the interface designed in this approach should comply with the following principles:

- an appropriate size (with minimum dimensions of 44 pt x 44 pt),

- they are located in areas easily accessible by thumb,

- they are at sufficiently large distances from each other.

Taking into account the Act of 4 April 2019 on digital accessibility of websites and mobile applications, the publicly accessible part of the application is implemented in the WCAG 2.1 standard.

A Google Maps mechanism is implemented, allowing to determine the position of a bus stop on the basis of a satellite image. Stops coming from the RJA system will be imported. As part of the application, a tool for moderation of newly added stops is developed. A parameter "Bus stop administrator" is introduced, which will indicate the administrative manager of the bus stop in reality and will allow this manager to modify the name of the bus stop or to move its position (if it is necessary to create a temporary bus stop).

The Contractor guarantees a technical support for three years from the date of launching. The warranty includes removing of all failures, multifunction, defects and dysfunctions in the IT application. Critical failures have to be removed till 8 hours from the moment of notification. Other failures have to be removed till maximal 4 days from the moment of notification. Due to the fact that possible sensitive data is stored on servers, the guarantor ensures that, in case of hard disc failure, the hard discs are replaced, leaving the broken components at the customer's premises.

In the future, a ticket purchase functionality or a card as an e-wallet could be embedded within this IT application. The implementation of ticket purchase could be based on existing operator services, which would be extended with the necessary communication API. For smaller carriers who do not have an on-line ticket purchasing system, such a system should be implemented. Thanks to such a function, after searching for a connection taking into account transfers, the user could purchase a ticket for all the means of transport included in it. In this application it would be possible to create a functionality related to counting the number of passengers, or more precisely, how many passengers got on and off the train at a given station.

3.5. Changes

Two main problems influenced realisation of the pilot action:

- problems connected with the Covid-19,
- difficulties to find a contractor willing to create the complex application in a relatively short time for the salary reserved in the project's budget.

Therefor creation of the IT application started with a six-month delay as planned and the product will be obtained in May 2022. Thus, the evaluation of the pilot action can be done in June 2022. Fortunately the Management Institution of the Interreg Central Europe Programme accepted application of the Lead Partner to extend duration of the RegiaMobil for three months.

Due to the growing inflation and a limited project's budget the UMWW decided to resign to order following parts of the IT application:

- a module with a form allowing to submit complaints and requests from passengers directly via the application,
- a functionality to collect information on all PT vehicles registered, in particular: the history of events, vehicle photos or description of the current situation of the vehicle and performed inspections
- a functionality to schedule of performing inspections in the future, and to forecast their costs.

To conclude there is small range of changes in relation to primary plans of the UMWW during the RegiaMobil project realisation. The introduced changes do not influence on the goals described in the Application Form. The principal functionality of the IT application will be preserved.

4. Evaluation

Evaluation of the pilot will start in June 2022 after the IT application will be working with all functionalities.

The following KPIs which will represent the performance of the demonstration ought to foremost be present:

- Output indicators will be amounts of the product users at the beginning of the performance (number of passengers, amount of public transport providers or organizers) and then after one month, 90 days, 180 days etc.
- The impact indicators:
- Length and % of transport network in the region covered by website offering traffic the travel information
- Number and % of public transport stop in the rural territories of the region for which dynamic traveller information is made available to the public.
- The quantity indicators:
- Number of individual users.
- Number of trips planned.

5. Lessons learned

Recent events, related to the COVID-19 outbreak, have shown how essential IT systems are nowadays. They not only make it possible to move work from the office to the home, but above all to react quickly in such crisis situations. The epidemic caused the majority of official matters to take much longer, because letters had to be quarantined. Remote work of UMWW employees also proved to be a problem, as without such tools they could not carry out their work at home exactly as it would be done in the office buildings. In the case of such an important element as public transport, which is used by tens of thousands of passengers every day, it is necessary to take all possible measures so that in the event of another outbreak the UMWW is fully prepared for it.

The biggest challenge was to find an external IT expert who is a key actor to obtain a high quality and functional service. After several probes the external experts were found via a public procurement process which was rather long due to inner procedures and the CoV situation. Additional problem was a growing price of external service in the field of IT technologies. It means that in the range of the Interreg Central Europe Program budget less ambitious goals regarding the IT projects can be achieved if there is no substantial support from other sources. There is also not a big spectrum of IT companies on the local or even national market which are experienced in work for solutions in public transport.

It is difficult to predict if the external administrator of the base of personal data can really ensure no leaks of the data in the time some quite big and renewed banks have from time-to-time problems with it. So, the strategy of the UMWW is to be the only owner of the data and to have a full control on the collection and processing of the big data. The UMWW is again under control of Polish governmental institutions which were established just to be on guard of data exploitation.

The learning from another partner's projects was also very valuable. It shows that institutions in the Central Europe have different views on how to make the public transport smart enough to get more users of it. The idea of the UMWW was focused on the organizing of the public transport on different levels in the region and giving the passengers in the rural territories the best transport connections and information about it. We focus on the two main means of public transport in the region: trains and buses. The IT platform created by the UMWW is designed as a source of data for other systems. Its main task is to aggregate this data, process it and make it available in an appropriate format. On 29 June 2021 the Workshop entitled "Digitalization applied to Public Transport in rural regions: MaaS and other IT solutions" was held online. The workshop has been organized from UMWW and aMo, supported by BME and T Bridge, with promoters of MaaS4EU and other relevant research projects to exchange about innovative IT tools and interfaces to offer seamless journey planning in rural regions. The final considerations that can be made after this Workshop are that in order for rural areas not to become more and more depopulated, so that those who live there do not have to face increasing difficulties in his mobility, it is essential to recur to the use of new technologies such as MaaS that allow to optimize resources already available and able to create a balance between the economic resources invested to establish services and the number of citizens who can use them. The IT technologies have come out of a purely experimental phase while public transport is entering a situation in which they are rapidly maturing with the perspective of becoming ordinary in the short term. This process has been achieved above all thanks to EU funding which has given impetus to the development of smart solutions.

6. Annexes

6.1. Concept of software development of the Transport Department of the Wielkopolskie Voivodeship

During pilot activities a separate document was formulated with the following chapters:

- Presentation of the current state
- Analysis of the solutions developed as part of the pilot programme for Wągrowiec and Wągrowiec district
- The presentation of concepts for the development of software or the creation of new software
- Examples of IT solutions for public transport based on other public local government units in Poland and in other countries
- Recommended development modules for IT systems used by TD
- Description of the features of recommended software modules
- Hardware infrastructure
- Final conclusions

Language: English.

Length: 49 pages.

Available upon request at: Piotr.Kupczyk@umww.pl