LEARNING FROM MOTIV

D.T2.1.6.

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1. Objectives of the project

The MoTiV project (financed by Horizon 2020 scheme) addressed the emerging perspectives on changing Value of Travel Time - VTT. Accordingly, it explores the dynamics of individual preferences, behaviours and lifestyles that influence travel and mobility choices. In other words, what does value of travel time mean for the end user's travel experience? Is it different for car driver and user of public transport or cyclists? In addition, the project focus on the productivity or "worthwhileness" during the travel. In other words, do we consider the travel as the waste of time or do we make something meaningful or productive?

The project goal focus on the perspective of a single individual with a unique combination of personality, preferences, needs and expectations, in contrast with the traditional viewpoint of the economic dimension (time and cost savings). MoTiV aims at achieving a broader and more interdisciplinary conceptualization and understanding of VTT by emphasizing its "behavioural" component. The evaluation of personal Value of Travel Time was conducted with the help of smartphone application Woorti. The data collection campaign was aiming the get valuable data sample of users who have actively used the app at least for 14 days. For this reason, the various separately campaigns have been running during the 2018-2019. During the data collection campaign, the sample size had been collected in order to answer question related to the various factors and parameters that are perceiving by individuals and affecting the modal choice. The data collection campaign ran in several European countries, but it was not limited to any country willing to use the app.

The collected data will be published in form of OPENDATA dataset available for everyone.

2. Pilot/project preparations

2.1. Stakeholder involvement

Till now it was the one of the probably biggest data collection campaign in European or maybe world context. The data collection was made with the help of smartphone as modern tool which allow engaging the potential users in the campaign. Because the goal of project was to attract at least 5000 users, the carefully planning and preparation had to be done. This was possible only with cooperation and participation of various stakeholders. The potential stakeholders have been contacted (emails, personal calls and meetings) in order to present the project goals and determine the role of stakeholders in the project. The stakeholders have been asked if they see the potential to cooperate in the project. For those, who agree, the cooperation plan and the stakeholders' engagement has been developed.

The stakeholders participated in the MoTiV data collection campaign have been primarily attracted from consortium members and so called third linked countries. The stakeholders have been grouped according the requirements considering the sample size criterions for each country as demography, rural versus urban areas, sex, age groups, etc. In this case, the most important were stakeholders that help to cover the rural areas in order to meet the goal of Regiamobil project. The total number of participating stakeholders of whole consortium ranged from 50 – 100 organisations and varies in each country. There were two basic groups of stakeholders. The promoters' role consisted in the promotion of the data collection campaign and the main idea of the project. Some of them help to create so called the network of collaborative organisations which have shared the idea and promotion of the projects. The second one, the active promoters run the own campaign together with consortium members in order to attract and engage the potential users in data collection campaign in particular country. They have been also responsible for engaging the users with support if any problems occurred.

The stakeholders were represented by:

- Nationwide, regional or local authorities as ministries or municipalities

- Public transport companies
- Universities and schools, research institutions

Nationwide or international organisations as cycling clubs, NGOs, etc. For instance, the ECF – European cyclist's federation. ECF is the umbrella cycling organisation covering the nationwide, regional and local cycling authorities and official cycling clubs in consortium member's countries. The core promotion of the campaigns was carried in the Bike to Work campaigns.

- Various media partners, webportals, etc.

In the case of Slovak Republic, the main stakeholders:

- Ministry of Transport and Regional development of Slovak republic – promoting the DCC among the Slovakia.
- Zilina self-government region – covers mainly area of Zilina region with accessing the rural villages and settlements helping to promote the DCC.
- Union of Slovak cities and towns
- City of Zilina, Trnava, Trenčín, Bratislava

The very important stakeholders' group was represented by public transport companies:

- ZSSK – national Slovak railway carrier- the role was the promotor of the campaign
- SAD ZILINA – regional stakeholder in Zilina region covering also the rural areas
- ARRIVA - regional stakeholder in Nitra and Trnava region covering also the rural areas
- Local public transport companies in various cities

NGOs and advocating groups:

- Local cycling advocacy groups in Zilina, Bratislava, Banská Bystrica, Sered', Galanta
- Nadacia Ekopolis, Students organisation IAESTE

Universities: University of Zilina, Economic University Bratislava, Technical University in Kosice.

2.2. Methods and technologies

In general, the methods used in the MoTiV project consisting of the approaches related to data collection methods. The overall process of data collection had been divided into several steps:

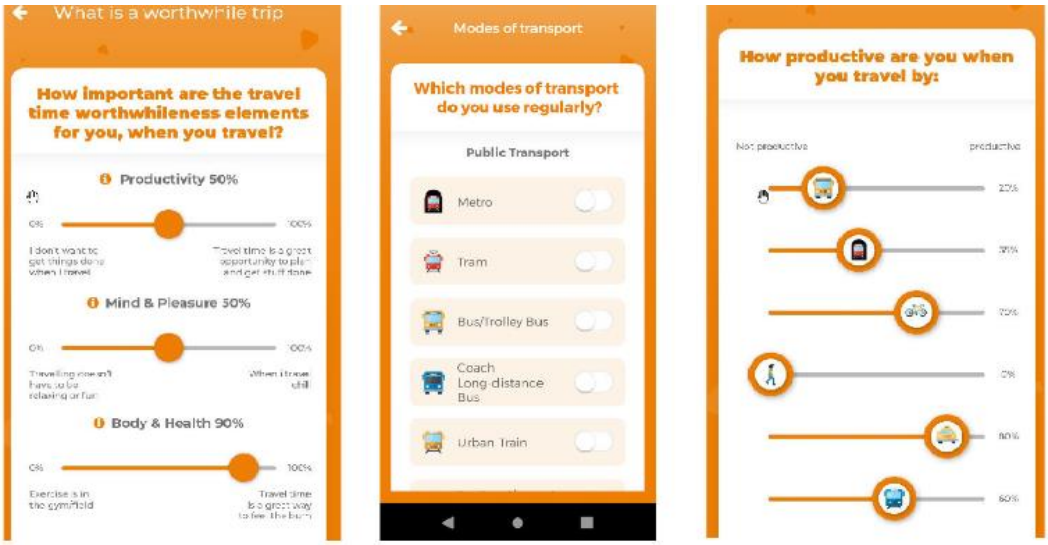
- Planning phase
- App developing phase
- Data collection phase
- Data analysis and results

In the planning phase all action related to the preparation of data collection campaign including the potential stakeholder's negotiation, development of country specific campaign plans had been developed. This includes for instance, how the particular country will meet the country specific sample size, with which promotion channels, events, etc. Each country should also develop the scenario how to minimize the potential problems of the data collection campaign and how to overcome them. During this phase the 19 hypotheses had been formulated.

In the app developing phase the MoTiV app called Woorti had been developed. This process included also pre-testing of the MoTiV app with (150+) test users who contributed to the detection and reporting of 'bugs', with the aim to make the app smoothly working. The project app Woorti was available on both iOS and Android platforms.

The used methods

In the project, the travel diary survey has been applied together with evaluation of each trip considering the travel time criterions. The travel diary was implemented with the help of Woorti app, which combined the GPS tracking with personal feedback and preferences of travellers. The user setup his/her own preferences and fill the basic information about the age, socio-demographic characteristics, etc. That means, the smartphone has tracked the trip or journey and the traveller has to confirm the trip purpose, the travel mode. Each trip was evaluated by the user from the perspective of Value of Travel Time and how it contributes to Productive, Relax or Health. The traveller also evaluates how the travel mode contributes to travel time and what kind of actions occurs during the travel time (for instance reading the book, doing paperwork or just sleep or relax…) and what are his/her preferences, see Fig.1.



1. Figure Travel mode preference in the Woorti app

The travellers also provided information about their mood or feeling, for instance while stacking in traffic jam. In addition, the app provided the feedback about the carbon footprint, burned calories, travel time and showing the trips on the map. There was also interesting feature, so called Mobility coach, aimed to help to actively engage users with small stories which displayed on the screen with interesting information. The allow the smooth handling with app, it was available in 12 different languages.

2.3. Risks and obstacles

Potential risk and obstacles in data collection campaign represented the various factors. This was represented by:

- Different approach in campaign promotion
- Data privacy
- Problems with app handling

Different approach in every country-based campaign resulted also in different results. Some countries (e.g. Slovakia, Belgium) decided to run the campaign nationwide in order to ensure the appropriate sample size. Other countries decided to run campaigns mainly in metropolitan areas (e.g. Italy, Spain, Finland, Norway). And there was also approached to get sample size from one single university campus in Lausanne (Switzerland). These different approaches led to the status when some of the partners had problems to meet the required samples size for instance the age, demographics or rural areas. There were also problems related to the entire consortium, when some countries dropped off before the campaign started (the case of Romania), then during campaign (Croatia and Switzerland). This status brought the call for substitution of old partners/countries by new one (France, Norway). The hardest part represented the various country level in success of users' recruitment.

Data privacy

Although there were the GDPR requirements, the consortium had to solve also the national requirements regarding the user privacy. The main risk was the underestimating of the willing to participate in such large-scale data collections. Because the core of the data collection was based on the smartphone tracking, the relevant question was how to ensure all potential users about the data privacy. Therefore, each country had to specify the Data protection manager.

Problems with app handling

Another important risk was caused by the state of art of app developing process. The programming and development of the app caused the slightly delay in campaign launching. This was mainly due to fixing of bugs and compatibility for IOS and Android versions.

Another problems and obstacles have been related to the technical limitations:

- Users have different hardware and software
- Internet connection cannot be guaranteed
- Battery consumption

Another issue is related to the requirement on the app. In the original idea, there was a plan to have in app a journey planner, which could give an advice in travel planning, but this feature was not embedded due to problems to gain data about the timetable from each country.

3. Pilot/project implementation

The beginning of the project: 11/2017

Preparation phase: 2017-2018

Data collection campaign: 5-11.2019

The official launch of MoTiV DCC took place on May 1st, 2019, what goes hand in hand with the releasing of the MoTiV app Woorti 1.0 on both iOS and Android platforms. This first phase lasted for three months until July 31st (August was set aside for summer holidays, although data collection did continue during this period but with limited software support). This first phase enrolled more than 800 active users and collected more than 15000 validated trips, therefore reaching approximately 20% of the MoTiV DCC overall goals. The second DCC phase also lasted for three months and took place from September 1st until November 30th, 2019, coinciding with the release of the MoTiV app Woorti 2.0 on Android platform and available for iOS platform from September 19th. The new software release included a number of necessary improvements regarding the stability of the app, the mode and trip detection accuracy, the release of the Dashboard feature, and more notably a comprehensive back-end campaign management system to support campaign managers in their work.

The project goal for each country was to reach 500 users and 7000 validated door-to-door trips. This was based on a key requirement that had been set at the planning phase: the need for participants to report trips over a period of 14 (not necessarily consecutive) days. Since it was established a participant would become 'activated' after one single validated trip, the minimum requirement was set to 14 validated trips per user (one validated trip per day over 14 days, also noting that each trip can include several 'trip legs' consisting of a portion of a trip on one single mode). A 'validated' trip required that the user reviewed an automatically detected trip and confirmed (or corrected) the individual legs composing a trip as well as their mode (also automatically detected based on sensor patterns, but only partially successful on most devices). This validation was then immediately followed by a series of survey screens regarding the experience of time during one selected trip leg - in terms of personal value, activities undertaken during the trip and factors influencing the quality of the trip. Overall, the requirements in terms of trips were met, however with less active users than was expected.

In practice the 14-day requirement proved a major challenge throughout: the initial dataset from the first DCC phase showed that most users would stop using the app after an average of 3 days, with only a fraction of participants lasting for the full expected period. This was despite a number of measures taken to 'motivate' participants, which included in-app notifications, reminders, and counters as well as incentives, close monitoring and direct communications from campaign managers. As an illustrative example, the table below summarises the overall drop-off rates, in time, for Slovakia during the DCC. It was also found that users on average would report 2 trips per day – independently of the number of days they were willing to use the app. Overall, we found that it was best to adjust the overall goal to the number of validated trips than to a total number of days. Campaign managers were given the option to adjust their communication and incentives accordingly (e.g. 'please try to report 2 trips per day for one full week' or similar), but in reality, changing communication strategy during the course of the campaign also proved difficult.

In the last phase, the data from the campaign have been analysed and investigated based on various scientific methods. The theoretical approach came from Maslow Hierarchy of needs which was adopted in the perception of the Personal Value of Travel Time.

This led to the formulation of results and insights considering the value of travel time. The new index had been introduced, the 'worthwhileness index' for each trip, which represents the default criterion for sorting travel options. Currently, there is still progress on the data analysing task.

Each country was responsible for a proper conducting of data collection campaign. In order to attract more potential user, the partners were free to use various promotional channels and incentives to attract the users. For instance, in Slovakia the users, who enrol in the DCC, received the power banks. This was done during the promotion of project in various events as the public transport days, European mobility week etc. There was also the drawing of 2 electric scooters from the sample of users who actively participated at least 14 days. There were also the incentives from public transport companies which provided the incentives in way of travel tickets. Another stakeholder, mainly cities provided the free entry to cultural or entertainment events.

Communication channels

Each partner prepared own DCC plan to implement data collection in particular country. As a project consortium we have promoted the campaign via social media (Twitter, Facebook), project website and via events as conferences, seminars, etc.

In addition, each partner was responsible for running own campaign and own promotion channels. In the case of Slovakia, we have focused carefully on the planning phase. That means before the data collection had started, we have promoted that such kind of European wide survey is planned, and we tried to get potential users on the contact or mailing list. Moreover, we have published call for volunteers from any Slovak city or region who could help us to get in touch with potential users. In this period, we have used mainly the personal or institutional network of contacts, promotion at various events, promotion via

website, social media etc. As the most efficient promotional channel was identified the face 2 face promotion, where we explained the survey. This was confirmed also in implementation phase, we could help to user to show how to handle with app, how to submit the trips, etc. Slovak team participated in more than 20 events (conference, seminars, workshops, etc.) where the team popularized the app and the DCC.

4. Results

Concluding, MoTiV DCC was probably the largest and most comprehensive initiative of smartphone-based collection of mobility behaviour with focus on the Value of Travel Time (VTT) in Europe, and probably in the world.

In practice, this proved to be challenging. Overall countries experienced a bias towards male population (55% vs 42%) and the overall sample is slightly skewed towards the 25-50 years old population. This was largely explained by the design of the campaign based on an app, which tended to be more appealing to these groups. This may also give credence to the gender mainstreaming that the app may have been more appealing to all genders had it been designed and developed by a more gender-balanced team. It is important to note that the collected sample did not aim at a strict statistical validity or population representatively.

The core of the data collection campaign has been running in 8 European countries: Belgium, Finland, France, Italy, Norway, Portugal, Slovakia, and Spain (in line with the MoTiV Grant Agreement update of November 2019). Reflecting to the area implementation, the main problems represent the covering the rural areas. Most of members focused only on the big cities and not the rural areas.

The process behind the preparation of the DCC plans followed the requirements and guidelines described in the MoTiV Grant Agreement. Project partners were asked to appoint a Campaign Manager for their country, as well as an Ethics and Data Protection Manager. Each campaign manager prepared a country-specific plan in which the campaign approach had been described. Each plan describes the overall strategy and related action plan in terms of stakeholders, promotion channels, outreach events, incentives, the use of allocated budget, plans to alleviate data collection risks, as well as considerations on the implementation of ethics and data protection requirements.

There was also mixed result from country to country. In terms of user recruitment, most countries primarily relied on the recruitment via social networks such as Facebook and Instagram or on the mail campaign. Other countries experimented with promoting the Woorti app via mailing lists, newsletters, posters, flyers and colourful Woorti cards, magazine articles, links on stakeholder websites, and in some cases paid advertisements. However, while this was perceived to positively raise awareness and promote the project, this ‘hands-off’ approach for recruiting new users was not very effective. The most effective way of reaching out to and recruiting new users were outreach events, which most country campaign managers organised, sometimes as joint events with stakeholders. This approach allowed close interaction with users and the possibility to help users through.

The MoTiV data collection campaign attracted 3229 active users (users who have submitted at least 1 trip), 790 users have been submitted the trip at least for 14 days. Totally more than seventy thousand trips were submitted.

The results have been grouped according the 3 main groups:

- Productivity
- Fitness
- Enjoyment

Moreover, the analysis included:

- the assessment of worthwhileness of Travel Time
- Valuable activities carried out on the move
- Factors contributing to Worthwhile Travel time Assessment

Currently, the preparation of releasing the OPEN DATA is ongoing.

5. Lessons learned

The presented project provided interesting insights and lesson learned in relation with the project RegiaMobil.

Moreover, there are significant factors considering by travellers during the journey planning that have been identified. This was done with analysing of various data, for instance from data of journey planner and combination with DCC data (which is still in progress). The travellers are considering the typical factors as total travel time, cost of the journey or number of stops to change the travel mode. But currently the data showed that travellers are also considering the environmental aspects (e.g. carbon footprint), experiences with particular public transport operator, comfort, etc. In the aspect of travel time, there are further considerations as the expectation of traveller according the arrival time, departure time or waiting time. There are also interesting insights regarding the length of trips, comparing the short distance and long-distance trips. While the short distance trips are characterising by more or less stabile mode choice or travel behaviour. The long-distance trips are affected by personal preference of travellers. Another aspect is comparison of the most affecting factors, in long distance trips is most relevant factor the price, second the travel time, while in short distance trips it is the travel time. Analysis of the trips related to the commuting from rural areas proved that in the case of public transport users, their trip has been more "worthwhilened" in comparison with car users. This was mainly due to more actions performed by travellers in public transport during the journey than in cars journeys. But in some regions, where the level of regional public transport was insufficient, the travellers preferred the commuting by cars.

Other interesting insights are related to the geographical or so-called languages preferences and the price or travel cost. The travellers have been classified according the price levels and compared with travel time. The English-, French-, Dutch speaking persons made journey with same duration, but the spending was much more lower by Dutch speaking travellers. Thea are also the most environmentally friendly in comparison with other travellers.

In travel time productivity comparison, the public transport offers much more space for other actions which are done during the travel. The active travel modes, e.g. cycling, walking offer the personal enjoyment without the specific purpose of trips, for instance the users are enjoying the time they are just riding or walking around.

Another issue what we have learned, was the whole process of data collection campaign. We have learned that the planning and stakeholder's negotiation should be prepared carefully in advance. The various sort of campaigns confirmed also that the level of attraction varies from one promotion channel to another. For instance, the most useful promotion channels represent the face to face events with explanation of issue how to work with app. Another point was to attract potential users with so called small incentives or benefits, represented by small takeaways (i.e. powerbanks, vouchers, etc.) which have been useful for potential users. Other aspect is related to the technological issue related to app development. The whole process of app development must be planned very carefully in order to reduce the risk of app failure during the data collection.