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REPORT ON IMPLEMENTATION OF PILOT ACTION IN HU: ONLINE SERVICE TO COMPARE THE TRIPS

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Content

1. Executive Summary

The pilot action of BME concentrates on information providing and conscious mode choice decisions for their colleagues and citizens of Budapest generally. An online tool was implemented to compare different transportation modes of home-work trips made by employees. The comparison includes several indicators related to travel time, cost, emission and healthiness. By showing the estimated CO2 usages, the application promotes sustainable commuting modes, and therefore helps decreasing CO2 emissions. The online tool was very positively accepted, several feedback and extension requests arrived, however the tool was not used by specific age groups. Most feedbacks commended the integrative way of the application, how innovatively it compares transport modes. Other users highlighted the visualization, since the user interface of the application is very trendy and eye-catching. The application provides travel data for Budapest and its functional urban area, but the methodology can be easily transferred to any other region. Using the online service is a cost-effective approach to show sustainable opportunities and encourage change of travel behaviour.

2. The pilot action

During our pilot action a new online service was introduced to compare different transportation modes of home-work trips made by employees. The comparison includes several indicators related to travel time, cost, emission and healthiness. The specific routes between work and home are shown on a map with indicators. The employees can set the indicators, how important travel time, cost, emission and healthiness is on the specific day, and the online service shows routes with different transportation modes (car, public transport, bike, walk) and a comparison of the routes is presented in a graphical form (e.g. chart) as well as in a table. The users could state, which transportation mode they would choose after knowing the results and comparison. Using the online service is a cost-effective approach to show sustainable opportunities and encourage change of travel behaviour.

Budapest University of Technology and Economics (BME) is responsible for the implementation and dissemination of the online tool, which is a soft measure. The primary target group was the employees and partially students of BME Faculty of Transportation Engineering and Vehicle Engineering. The number of employees is around 200. Most employees are commuting either by public transport or by private car. Pedestrians and cyclists do not make 15%. Since the institution does not provide a company car, private car users are commuting on their own costs. At the same time flexible working hours make it possible to avoid congestion at the city center and the parking situation is acceptable. With increasing commuting distance, individual traffic has an increasing share, while walking and cycling completely disappear. It would be desirable to reduce the use of individual vehicles in commuting shorter than 2 km. Over 10 km commuting distance the share of public transport drastically decreases, which is the distance of the border between the city and the functional urban area.

The employees of BKK Centre for Budapest Transport, as an associated partner, had also the chance to try the online tool. The approach and the methodology are transferable and can be used for international dissemination. Since the application uses public transport data of Budapest, the necessary datasets have to be collected from the implementation area.

The timeframe of the implementation was the following:

- 2018. June: signing the agreement, planning the functions
- 2018. July: creating the framework, developing the functions
- 2018. September: internal testing, fine tuning of the functions
- 2018. November: starting the pilot with the working online service

3. The aim of the pilot action

As the university wants to be a leader in sustainable mobility, BME was looking for a powerful and innovative way to help its colleagues and all citizens of Budapest to travel in a more sustainable way.

How it can be powerful? Commuting to the workplace and back home has the highest share of urban trips. Thus, if travellers can change the way they commute, it will have a strong effect not just on their daily trips, but in general on the quality of urban life in Budapest.

How can it be innovative? In most cases commuters are not aware of all factors connected to their mobility and thus do not see the whole picture. In order to support conscious travel choices, a new online service was introduced. The tool collects travel information, shows every aspect of the travel: travel time, travel costs, healthiness and environmental effects and provides the best choice. The application concentrates on the long-term decisions with the goal to promote the usage of sustainable transportation modes, such as public transport, walking or cycling.

The pilot action does not have an institutional limitation, but a geographical, since the software behind the tool is based on Budapest related travel databases. However, the goal was that this online tool shall be as universal as it can be.

4. Implementation of the pilot action

The selection of this pilot was based on the following considerations. In the Workplace Mobility Plan of BME several measures were defined. We wanted to create such a pilot, which is useful and scalable. The idea was to support the decision-making process of the employees, which can be best realized by showing the potential options and the benefits of each transportation mode.

From May to November the project partners and various stakeholders had meetings to discuss the idea, the goals, the methodology, and in the final stages the actual solutions of the application. During the discussions several requests were formed and changes were made to support the development of the online tool. The stakeholders were involved in the development process to achieve a final solution, which is easy-to-understand and informative.

During stakeholder meetings, the idea and the original goal were successfully preserved, whereas the methodologies and solutions changed a lot. The application needed good balance, as if the application is too simplistic, the results are not reliable. Also, if the application is too complex, users will turn away. As a final solution, the application provides pre-settings for parameters, and lets the users (who are interested) to fine tune the parameters.

After three stakeholder input meetings and several other meetings, conversations and brain-storming, the application was implemented, and ready to spread amongst colleagues. The application is hoped to be a very useful tool in the future also for citizens in Budapest and its functional urban area.

The application has a strong visual identity to grab users' attention. The specific routes between work and home are shown on a map with indicators. The users can to set the indicators with sliders, how important travel time, cost, emission and healthiness is for them, and the online service shows the routes of different transportation modes with different colours and numbers both on a map, and in a table view, where the calculated values of the parameters are also presented.

The following technical parameters describes the online tool:

• front end components (HTML, CSS, JavaScript)

• server components (Java, REST, JSON)

• database components (MySQL)

5. Monitoring of the pilot action

The following indicators describe the performance of the online tool:

- Number of users: 56
- Number of trip searches: 147
- Total distance planned: 4800 km/workday
- Number of sustainable travel mode choice: 41 (27,8%)
- Travel time reduction (per user): -4.5 min/workday
- CO2 reduction (total): 32,4 kg/workday

In total 56 users have tried the online tool, who searched for 147 routes, so almost 3 trips were planned in average by the users. Out of these trips 41 stated feedback was saved, 48% chose public transport, 37% choose bicycle and 15% chose walking. It was assumed, that a stated feedback expresses a trip in one direction during one workday. Based on the stated feedback of mode choice the travel time and CO2 reduction were calculated. The original transportation mode was assumed to be car, if the user has one, and it was public transport, if the user does not own a car. The chosen transportation mode for the calculation was the stated one. Travel time reduction was calculated per user for a trip during one workday can be a negative number (which means more travel time than the original mode), since sometimes sustainable modes take longer. However, mode choice is a complex process and several parameters (not only travel time) have to be taken into account, which affects the decision of the user. Furthermore, sustainable mode choice means using more active modes (cycling or walking), which is one of the main aims of the project. CO2 reduction was calculated as an aggregated number for all users for a trip during one workday.

The pilot cost was 12.580 Euro, which was implemented by an external software developer. The cost-benefit ratio was not calculated directly, since the benefits can only be deducted from stated preferences, and thus are hardly to monetarize. Generally, the ratio can be high, if users really change travel behaviour based on the suggestion of the online tool.

The online tool provides such information, which is important for users to make decisions about daily trips. It includes parameters that are hard to calculate, such as healthiness or environment friendliness of a route, but it also calculates with values, which are realistic, but people usually forget to count with, such as costs of owning and using a car, or the time of parking a car. More importantly the CO2 emission is calculated as a separate parameter based on the distance, mode of transport and type of vehicle (in case of car usage). With these concerns by showing the estimated CO2 usages, the application promotes sustainable commuting modes, and therefore helps decreasing CO2 emissions.

Although the pilot has been ended in February 2019, based on the feedback of the users, the online tool will be further developed and maintained at least until the end of the project. Thus it can serve as an efficient tool for demonstrating sustainable mode choice not only for the original target group, but also for a wider audience.

6. Conclusions

Most feedbacks commended the integrative way of the application, how innovatively it compares transport modes. Other users highlighted the visualization, since the user interface of the application is very trendy and eye-catching. The most important lesson was derived during the stakeholder involvement process, when it was decided not to cope with real-time data and short-term decisions, but focus on long-term decisions and generalized results. The best practice of this pilot action is to focus on the effectiveness of a tool: it was on purpose to develop an online tool to support travel behaviour change by showing the transportation options in a very clear and efficient way.

The online tool was very positively accepted, several feedback and extension requests arrived, however the tool was not used by specific age groups (mostly elderly colleagues). Since the technical implementation was an external task, BME had the chance to focus on its own professional sections, e.g. handling objective (time, distance) and subjective (weights, preferences) parameters at the same time.

The methodology and the tool itself can be easily transferred to any other region in Central Europe, only the data for route planning need to be specified, otherwise it is well applicable and useful in other areas.

The pilot action has the following SWOT analysis:

- strengths: easy-to-use, integrated travel information, promoting sustainable modes;
- weaknesses: soft measure, hard to follow-up the effects;
- opportunities: easily transferable to other regions, extension to other user groups;
- threats: invisible without campaign.