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„THE LAST MILE"

AIEST- CONTEST OF FRESH IDEAS

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1. Introduction

The Corona pandemic has been present for a year and every individual has to make restrictions in their daily life. Since it was not possible to travel far last year due to the Corona pandemic the number of day tourists in the Bavarian alps increased immediately. The situation in summer and autumn 2020 was characterized by high density of people, most of whom arrived by car. This led to overcrowded parking spaces and even meadows were full of cars. It is assumed that the phenomenon of many day tourists will not decrease but remain constant or even increase. Therefore, something must be done to prevent the dreadful effects on the environment and nature in the Bavarian Alps.[1]

But why is everyone driving by car to their destination? The answer to this question lies within the difficulty for hikers to find a good way to get to the starting point of their tour without having to use the car. Because public transportation often takes visitors only close to the starting point of the hiking tour but not directly to it. In that case they have to overcome a long distance before they can start the actual tour.[2] The DAV[3] has been aware of this problem for some time and has given it the name: "The Last Mile".

The authors created an app prototype that gives hikers alternatives to get to the starting point and back home without using the car.

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[1] BUND Naturschutz in Bayern e.V., https://www.bund-naturschutz.de/fileadmin/Bilder_und_Dokumente/Themen/Alpen/Tourismus/BN_Informiert_Tourismus_im_Alpenraum_07b_reduzierte_Gr%C3%B6%C3%9Fe.pdf, [28.01.2021]
[2] DAV Panorama, Die letzte Meile, [04/2020]
[3] Deutscher Alpen Verein, engl. German Alp Association

2. Importance of the Prototype

The largest part of the ecological footprint in mountain sports is the journey into the destination. The best way to bypass individual mobility is to use public transport. Traveling by train offers many advantages, such as traffic jam that can be avoided easily after a nice day of hiking. Best practice examples to overcome the "Last Mile" have already been compiled by the „DAV". These can be used to easily explain how this challenge can be solved.[4]

The most common and well-known alternative is the shuttle bus, which is already offered by many destinations. A shuttle bus makes a regular round trip from the train station to the popular hiking starts. In the Tegernsee-Schliersee region, the buses to the hiking areas have already been coordinated with the train arrivals. Another alternative is a special hiking bus line that operates during the peak holiday periods. Very good practical examples are the „Wendelstein-Ringlinie", the „Dorflinie" in Ruhpolding and Inzell, or the „Almerlebnisbus" in Ramsau. There are also individually orderable shuttle buses, which allow individual journeys outside the timetable. Examples are the "Rufbus" in Berchtesgadener Land or the "Wanderbus" in Bayrischzell.[5]

The alternatives for shuttle buses that are already used in practice are car-sharing services and rental bicycles. Car-sharing is definitely an option to reduce the high number of cars on site. Several parties can join together to drive in the same direction. However, it only partially solves the emerging problem of the high number of cars. The Tegernsee/Kreuth region has not adopted the car-sharing option because of too many emerging problems. Probably also because of the practical experience from Bad Tölz, where the traffic volume was still too high.

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[4] DAV Panorama, Die letzte Meile, [04/2020]
[5] ebenda

The more space-saving alternative is rental bicycles. The best practical example is the bike rental coverage in Berchtesgadener Land.[6]

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[6] DAV Panorama, Die letzte Meile, [04/2020]

3. Current starting position

The necessity of the app can be explained very well by current environmental problems due to high traffic volumes in the Bavarian Alps. Compared to the rest of Germany the Alpine region is burdened with three times more traffic (through local traffic, tourist traffic, and transit traffic). As a result, air pollutants accumulate in the valleys, and ozone pollution is higher: long gradients cause higher fuel consumption and thus also more exhaust fumes.[7]

In addition to the high environmental impact higher traffic volumes also increase noise pollution, intensified by the echo effect in the valley locations of the Alpine region.[8]

Another consequence of the high volume of traffic is the steadily increasing dissatisfaction of the locals in the destination areas. This dissatisfaction has already been expressed through demonstrations at the Eibsee on the Zugspitze and at the Walchensee. In both cases, the locals protested against the congestion of the parking areas due to the excessive volume of traffic.[9]

With the help of the prototype, the increasing need for recreation in intact landscapes and an increasingly individualized mountain holiday can be reconciled with a decreasing volume of traffic and less environmental damage. Thus, many aspects of sustainability are already covered.

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[7] BUND Naturschutz in Bayern e.V., https://www.bund-naturschutz.de/alpen/siedlung-verkehr-energie [28.01.2021]
[8] ebenda [28.01.2021]
[9] BUND Naturschutz in Bayern e.V., https://www.bund-naturschutz.de/fileadmin/Bilder_und_Dokumente/Themen/Alpen/Tourismus/BN_Informiert_Tourismus_im_Alpenraum_07b_reduzierte_Gr%C3%B6%C3%9Fe.pdf [28.01.2021]

4. Prototype

In solving the "Last Mile" problem, the authors have chosen a mobile app that shows users possible mobility options to reach their destination without having to use their car. The app was created with the program "Adobe XD".

The following explanations of the prototype will be shown more visually and detailed in the explanation video in the appendix of the sent e-mail.

4.1. Main Function

Since the "Last Mile" is a problem related to traffic, the authors used the app of the "Deutsche Bahn", the provider of public transportation in Germany, as a reference. The app or prototype has several features. First of all, a user profile must be set up, in which the name, an email address, bank details, and optionally a profile picture are added.

Of course, the main function of the app is for users to type in their starting location and the desired destination, preferably a valley location. Besides, a date and an arrival or departure time are also requested here. Once the users have entered all the required data, they can tap the "Search" button and will be redirected to their connection. Here the first thing they can see is a train connection between the specified starting point and the closest station to the tour start.

Below the train connection are various buttons that tell the user which form of transport they can use to cover the last mile, i.e., how to get from the train station to the starting point of their tour. Depending on which button they tap, the app shows how they can overcome their "Last Mile". The options are:

- **Bus**: The app shows the bus connection to the tours starting point.

- **Taxi or car-sharing**: The app shows the telephone and contact data of local taxi or car-sharing providers.

- **Bike**: The app provides access to contact details of bike rental companies near the station, and a map of how to reach them on foot from the station.

- **E-Scooter**: The app shows the location of the nearest E-Scooter.

- **Carpool**: The app helps users to contact each other through a chat function. Here they have the option of specifying whether they are providers or searchers of a ride.

There is also a button that gives the user information about a possible guest card, through which the public transport in the destination region perhaps can be used at a reduced rate or free of charge.

At the end, the app shows users how much time they saved by using public transport. Especially on weekends, traffic jams are inevitable on a day tour in the Alps and hikers have to reckon with considerable delays on their way there and back by car. This shows the passengers again directly what enormous advantage they have from using public transport and makes it more attractive to leave the car at home.

Last but not least, the users have the option to buy an online ticket for the train connection via the app. However, the prototype only contains one payment for the train ticket, since the payment for several combined services would turn the app into a digital tour operator. A combined digital payment is therefore considered as a possible extension of the prototype. Therefore, the app only gives information about the possible mobility alternatives or the guest card options but they must be paid on-site, for example in a taxi after the ride or at the local bicycle rental.

4.2. Additional Functions

In addition to showing the traveler suitable mobility options, the app also contains other useful functions.

On the app's starting page, the users are informed about how much CO2 they have already saved by repeatedly using the public transport options displayed in the app (used calculation: 95 grams CO2 per km)[10]. This allows users to see how many emissions they have saved by not using their car and acts as a small motivation or reward for using the app.

As a further motivational feature, the app offers the opportunity to collect points by saving CO2, which can be redeemed at local partners in the form of discounts. This means that the user is rewarded by local partners through the frequent use of the "Last Mile" alternatives and the resulting emission savings. These partners can be, for example, mountain cabins, wellness providers, local stores, etc. This way, the locals also have an advantage through the app and can reward the guests who did not come by car and thus become part of the solution to the local traffic problem. Of course, this requires finding partners from different destinations and entering into collaborations with them.

Finally, there is the function to access saved tours. The users have the option to save a selected connection and access it again at another time. Again, there is a button on the starting page that takes users to the "My Tours" section. Here they can access the saved tours. In addition, they can add a photo and a small description to the tours. This gives the function a photo book character and makes the process a bit more personal.

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[10] This number can be calculated by multiplying the distance that has to be covered by car to get the destination by the average CO2 emission of a car per driven kilometer, which amounts to approximately 95 grams per kilometer according to EU specifications for newly registered vehicles, cf. https://uba.co2-rechner.de/de_DE/, [27.01.2021].

4.3. Requirements

The most important requirement for offering the various functions of the app are partnerships.

To display the train connection, it is required to have cooperation with the "Deutsche Bahn". Besides that, a partnership that would also be interesting for the different mobility connections, would be the online tour planner "outdooractice.com" since this provides an already existing broad database of possible mobility connections.

Also, the "Last Mile" app must have an interface to the map data of Google Maps to find the destinations that users search for and, above all, to be able to locate a suitable train station. This connection is also necessary to calculate the travel time and any delays due to traffic jams to show the time savings and to calculate the saved CO_2 emission.

The information offered through these buttons require various partnerships as well. For the guest card information, cooperation must be formed with various destination management organizations, to have access to the various local bus or shuttle connections or to get them to expand the existing bus schedules on the one hand, and on the other hand, to be able to offer information about guest cards.

Additionally, cooperation with local taxi companies, bicycle rental companies, car-sharing providers, providers of e-scooters and local partners for the discounts are necessary.

The cost planning of an app depends on several decision-making premises that must be clarified for a concrete realization. These premises include, for example, the operating systems for which the app is to be programmed. It makes a big difference in terms of costs whether the app should only be available for IOS or

also for Android devices. Furthermore, there are decision variables such as the number of screens that need to be developed, the development quality, the security, the number of languages, the device type (only smartphone or smartphone and tablet), whether in-app purchases and push notifications should be possible, where the app should be distributed (app store) and last but not least, whether maps and databases need to be used. A rough idea of the cost structure is given by the online cost calculator "www.andreasley.ch", which gives an amount of about 88,000€ only for the development.[11] However, it can be assumed that the costs will be higher due to test runs and marketing. For the financing, Bavarian foreign trade associations, the German alpine association, and local tourism players must be brought on board.

5. Conclusion

With the help of the app "The Last Mile", one of the most fundamental sustainability problems in the Bavarian Alps can be solved. A reduced traffic volume promotes the reduction of pollution caused by excessive exhaust fumes. Additionally, it acts in the interest of locals by reducing high noise levels and overuse of parking facilities.

However, the app is not solely responsible for solving these problems. All stakeholders are jointly responsible and must always act in the interest of the environment and sustainability. Only by acting together can such profound problems be solved.

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[11] Cf. https://www.andreasley.ch/de/kostenrechner/ [28.01.2021]

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7. Picture Sources of the Prototype
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8. Appendix

Explanation Video (also see e-mail):