

Social project “YourWay”

Navigation system
for people with disabilities



Description of the project.

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Proposed logos of the project

1. About the existing problem.

According to Eurostat data for 2017, at the moment in European Union live more than 19 million people with various disabilities of the musculoskeletal system. Of these, about 5 million people are constantly using a wheelchair to move around.

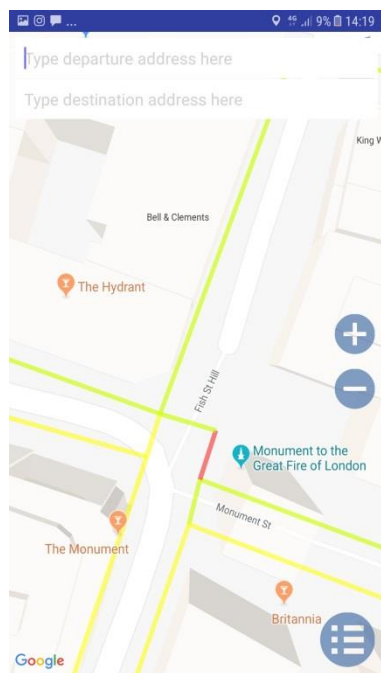
Most European cities are just starting their way to the ubiquitous availability of urban infrastructure. The creation of an accessible urban environment has already been incorporated in many long-term development plans. Unfortunately, the implementation of these plans does not always happen quickly enough and qualitatively. Going to the street, a person with a disability cannot be sure that the necessary route is sufficiently well adapted to his needs. Disabled elevators, low-quality slides, ramps built in violation of sanitary norms - all this makes the route difficult, and often impossible for walking.

The problem of poor accessibility of urban routes concerns not only people using wheelchairs, but also people with other types of diseases of the musculoskeletal system, as well as the cardiovascular system. Stairs, underground and overhead crossings, steep ascents and descents can be, if not insurmountable, then exactly serious obstacles on the road.

Fortunately, in most cases, a route containing such complexities can be circumvented. It is possible to find another way, passing along one of the neighboring streets with equipped sidewalks. It is possible to find a public transport route that will help overcome a difficult climb or steep gradient. It is possible to reach another transition with working elevators or high-quality ramps.

2. What is YourWay?

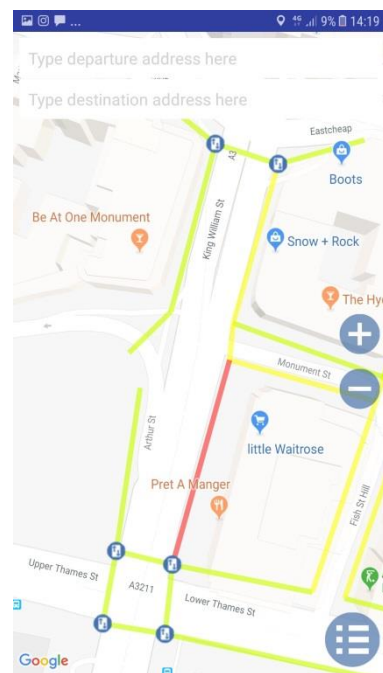
YourWay is the world's first navigation system for people with disabilities.



Test app for the Android app home page

On the left: an example of a partially filled map showing the available sidewalks.

On the right: an example of displaying an out-of-band transition.



Pic.1

Pic.2

The main functions of the system are:

The construction of routes around the city, taking into account the features of the user's movement. When using the application, the user can choose one of four types of route:

- route for a person using a regular wheelchair
- route for a person using an electric wheelchair
- route for a person using crutches or walking sticks
- route for a regular pedestrian

So, for the user of a regular wheelchair, the system will avoid steep and steep gradients in the route or uncomfortable elevators for the user of the electric chair.

Informing the user about the availability of public transport. In the application, the user can learn about the presence of low-floor transport on the route, learn about the quality of the lifts in the high-floor transport, learn about the presence of elevators at metro stations or high-speed trams.

The application will contain information about the accessibility of organizations for visits by people with disabilities. The user will be able to find out from the application if the organization is equipped with a ramp, an elevator, or the entrance to it is on the same level with the sidewalk, is there enough passageways inside the premises of the organization, is there an equipped toilet etc.

With the built-in editor, any user can instantly report changes in the urban environment. Thus, the YourWay database will contain up-to-date information on the quality of sidewalks, repairs of slides, failures in the operation of elevators. The application will be able to inform users of the relevant changes.

YourWay can solve the problem of insufficient awareness of people with disabilities about accessible city routes throughout Europe. Thanks to the application, the user can go to an unfamiliar area or an unfamiliar city, find a route for a walk, visit a remote shopping center, check availability around the place of work when finding employment without thinking about the difficulties of walking around the city - all the necessary information will be contained in his smartphone.

The user will be able to access the system using an application on Android or iOS, as well as using a version for the web browser.

3. A clear example of a solution to a problem

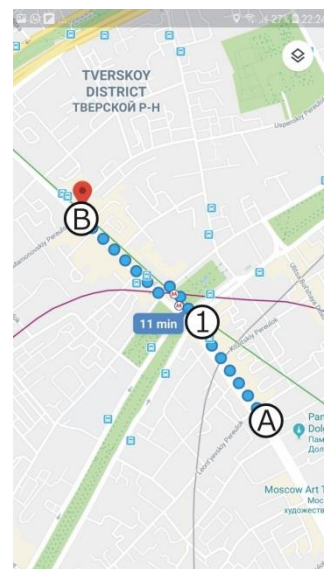
Suppose a person with a disability needs to walk along Tverskaya Street from point A to point B. Most of the navigation services will offer him a direct route, indicated in picture 4.

Only after reaching the intersection of Tverskaya Street and the Boulevard Ring (point 1), he will find that the constructed route passes through an underground passage that is not equipped for the people with disabilities.

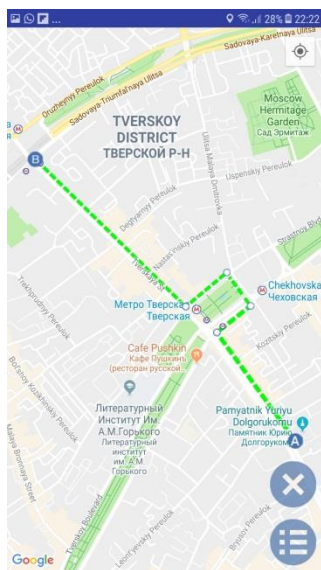
The database YourWay already contains information about the bypass of this underground passage through ground crossings on Pushkin Square. Thus, in this case the system will build a route taking into account the available data (pictures 5, 6, 7), and also warn the user about a gradient upwards in the southern part of Tverskaya Street.



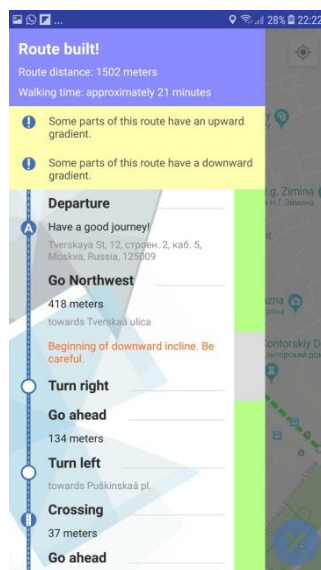
Pic.3



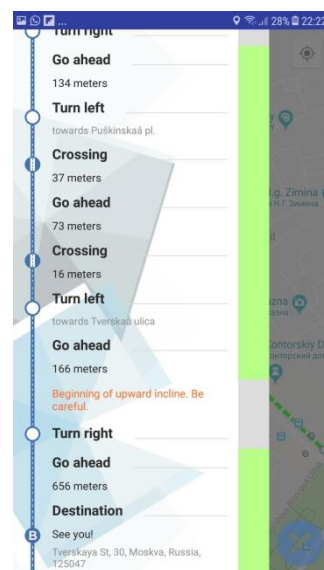
Pic.4



Pic.5



Pic.6



Pic.7

4. Current market situation.

By 2018, several projects have been created in the world, partially solving the existing problem. Among the largest projects:



Map of Accessibility (Russia)



WheelLog (China)



AccessMap (United States)



DisabledGo (United Kingdom)

Unfortunately, in none of the existing, both European and foreign projects at the moment hasn't been created the opportunity of constructing routes taking into account the features of the user's movement. There is no way to know about the availability of the object for different users - because, for example, an object can be accessible for an electric chair and can be not accessible for the regular one. There is no function to save a card to a smartphone or computer for use without an Internet connection.

Based on the experience of predecessors, YourWay should become an application that quickly adapts to the needs of the user, becoming the most convenient for him.

5. Development strategy

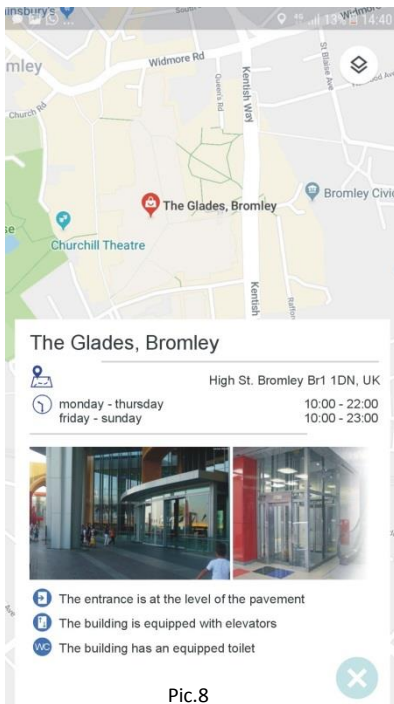
At the moment, an unique algorithm for searching pedestrian routes around the city in the beta version of the Android application has been developed, as well as a built-in editor that allows adding new objects to the map, a feedback form, and a server part with a database.

On the technical side it is planned to implement:

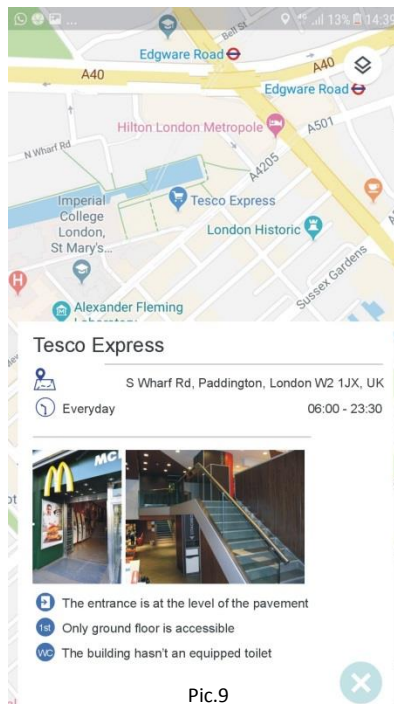
- Adding and removing public transport facilities. Implementation of pages with information on the operation of public transport routes.
- Editing information about organizations. Implementation of pages with information on the availability of public enterprises.
- Save and edit previously found routes.
- Voice navigation of the user.
- Voice control of the application.
- Adapting an existing version of the Android application to tablet computers.
- The same version of the application for the operating system iOS and the version for the browser.

The tasks of YourWay from the organizational side:

- Search for funding for the project. Establishment of contacts with funds, participation in competitions, participation in social projects support programs.
- Filling the database. Establishing contacts with volunteer organizations, social services, architectural bureaus, common work to add and edit objects on the map.



Pic.8

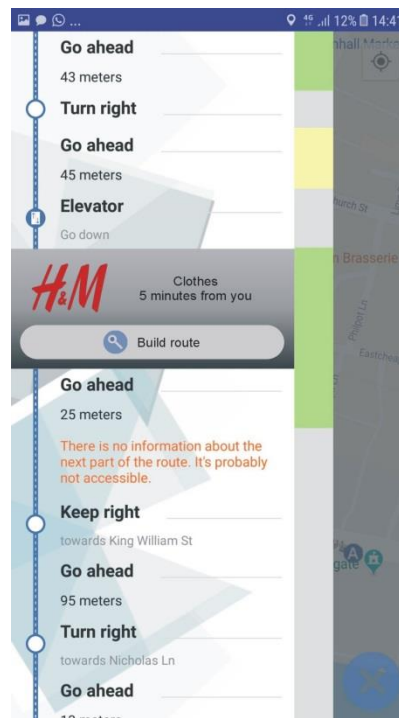


Pic.9

Sketches of pages with information about organizations

6. Monetization

To cover the costs (possibly partial) of application development and marketing, this method of monetization is possible, such as placing advertisements of public enterprises that are close to the user's route in the list of steps of the constructed path. In pic. 10, 11, one of the ways of such placement is presented.



Pic.10



Pic.11

7. Marketing

The attraction of new users is planned using several tools.

- Promotion of the application through contextual and targeted advertising on the Internet. This item includes showing the user relevant ads when searching for products and services of a similar theme, such as "medical equipment", "social services", "urban infrastructure", etc.

- Advertising in social networks. This placement of advertisements in communities and on pages also related to the topic of disability or urban infrastructure.
- Cooperation with societies of people with disabilities. This item implies offline advertising, in particular, the placement of stands with information about the application in the offices of societies.
- Collaboration with bloggers, online and offline magazines, private journalists. Publication of descriptions and reviews of the application both on a paid and on a free basis.

8. Need for investment and timeframe

Below follows the approximate cost of developing certain features of the release-version of the system in euros.

Release #	Feature	PP	BA	Des	Dev	Backend	QA	PM	Total, h	Cost
1	Screens									
1.1	Loading screen and onboarding			8	8		2	4	22	
1.2	Homepage			8	32		10	8	58	
1.3	Sidebar			4	4		2	2	12	
1.4	Screen "write to us"			2	8		2	2	14	
1.5	Screen "about us"			2	2		0	0	4	
1.6	Editor			32	48		14	16	110	
1.7	Adding and removing of public transport facilities	2	4	12			4	4	26	
1.8	Screen with information about the work of public transport	2	12	24			8	8	54	
1.9	Editing of information about organizations	2	4	12			4	4	26	
1.10	Screen with information on the availability of public enterprises	2	12	24			8	8	54	
1.11	Saving and editing of user previously found routes	2	4	16			4	4	30	
1.12	Voice navigation along the route	2	2	60			18	12	94	
1.14	Adaptation for the tablets	2	16	16			4	6	44	
Result		14	110	266		0	80	78	548	
	Total:									
		Roles	Hours	Rates			Total			
		Project Manager	76	13			988			
		Analyst	14	13			182			
		Art Director	24	21			504			
		Designer iOS	110	13			1430			
		Designer Android	46	13			598			
		Designer Web	78	13			1014			
		Tech Lead / Architect	68	21			1428			
		iOS	266	15			3990			
		Android	156	15			2340			
		Web	266	18			4788			
		Backend		21			0			
		QA Lead	16	13			208			
		QA Engineer	80	10			800			
			1200				18 270			

Also, in order to support the working capacity of the technical side of the project, the main expense items are:

Payment for hosting and computing power. At the moment YourWay is hosted by Vscale.io and uses the minimum tariff plan at a cost of 5 euros per month. With the increase in the number of users and the size of the database, there will be a need to use more expensive tariff plans.

Payment for the domain name of the project site, which is 20 euros per year. At the moment, a contract is concluded with the registrar of the domain names GoDaddy.com.

Paid requests to Google Maps Geocoding API and Google Directions API when exceeding the free threshold of 2500 requests per day. If the cost of using this API exceeds US \$ 0.50 for every additional 1000 requests.

Thus, with an investment of 18 thousands 270 euros, the project can be prepared for release within 5 months. The total cost of development and marketing will be 25 thousands euros.

9. Main indicators of the project.

To assess the social value of the project in the future will be possible with three indicators.

The first indicator is the number of objects added to a card for a certain fixed period of time by different categories of users, estimated based on the internal statistics of the database of the system. Thus, by this parameter it will be possible to estimate the efficiency of the built-in editor and the effectiveness of attracting those or other organizations to edit the map. Based on changes in this parameter, it is possible to calculate the rate of growth of the database and the required computing power, and, accordingly, prepare to expand or reduce the server part of the system.

The second metric is the average time spent by the user in the app, estimated using the Google Play and App Store development tools. By this parameter it will be possible to determine the interest in using the application and evaluate the effectiveness of various functions.

The third indicator is the number of uses of different versions of the application for a certain period of time, estimated using the Google Play and App Store development console tools, as well as the system's internal statistics. On this parameter, one can judge the effectiveness of advertising on various advertising platforms, track the dynamics of growth in the number of users, evaluate the user's response to the introduction of new opportunities.

10. Conclusion

YourWay is a project that can greatly alleviate the lives of people with diseases of the musculoskeletal and cardiovascular systems, increase their social activity, and also contribute to the social adaptation of the injured for the first time.

YourWay has great prospects for further development. With the necessary support, YourWay will become a full and universal reference book for people with disabilities along city routes. Each user can know in advance about the availability of a particular city enterprise, to know how to reach it without resorting to outside help, but only using equipped sidewalks and public transport.

YourWay needs funding and support from experienced professionals. Search team members and sponsors - the main tasks of the project for the near future.

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Link to the project website::

<http://accesspassed.com>

Link to the Google Play app page:

<https://play.google.com/store/apps/details?id=com.serafimdmritrievstudio.yourway>