

A conceptual applicative solution for helping people with reduced mobility

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Abstract—Information and communication system and the current application solutions to help people with reduced mobility in everyday life situations covers a wide range of services that have resulted in the integration of users in the local community and society at large. The objective of the proposed applicative solution is to provide a fully functional service providing assistance in situations where others need help, regardless of the level of needs and types of assistance to the end user. The paper will suggest the possibility of development the application solution that would be part of a system that connects volunteers (provider of aid) and people with reduced mobility (blind and visually impaired, the disabled, the elderly and the infirm, etc.).

Keywords—assistive technology, reduced mobility, location based services, information and communication services

I. INTRODUCTION

With the development of information and communication services to assist people with reduced mobility in everyday situations aims to help to raise collaboration in the community, promote collective action in society and build social relationships. The above services raises the dimension of human tolerance, understanding, solidarity and cooperation, and increases the quality of everyday life for people of reduced mobility through possible greater mobility or awareness of it.

Previous studies that have resulted in a solutions from the segment of assistive technology issues to help people with reduced mobility did not discussed situations in which users of these technological solutions need help in everyday situations and, through these technologies, would receive solidarity among the fellow citizens [1] [2] [3]. Research from this area include the design, development and implementation of a physical aids from the segment of assistive technology issues, however, does not consider the situation in which these devices are not sufficient or fail during use. Situations where, for example, a blind person is lost during transport network movement are areas where this presented paper gets full meaning [4] [5]. This paper presents the procedures, scientific methodology and technology used in the function of information and communication systems and supporting services to increase the mobility of people with reduced mobility.

The subject of studies during development of application for helping people with reduced mobility is the level of development of such application and the range of services as

products of the same. A model that would provide a service to help among civil solidarity does not exist within the framework of the Republic of Croatia (RH), and therefore represents an interesting area for future research work.

The research problem is reflected in insufficient level of development of infrastructure in RH (lack of custom software solutions and related services), which would have the task of improving the level of quality of life for people with reduced mobility.

In addition to that problem there is also a sociological problem, which results in a lack of sensitivity of citizens of RH towards fellow citizens who are in need of some kind of help with daily and often hopeless situations. The development of a model that would offer exactly services based on civil helping supported by information and communication services should solve a good part of this research problem.

II. IMPROVING MOBILITY AND REDUCING DISABILITY

Development of the applicative solution is aimed at empowering people with disabilities and to increase accountability of society towards this social group. The expected contribution to the above system is self-confidence, personal satisfaction and independence of people with disabilities. With the volunteer users (users who provide assistance) some of the sociological benefits of using this system certainly would feel a high level of personal satisfaction, opportunities for new friendships and fulfilment fact of committing a good deed.

For people with reduced mobility (users who need some form of assistance) carrying out everyday tasks would be much easier by providing the required assistance in overcoming some obstacles in everyday life. Through social interaction is expected to raise awareness and change the perception of the society towards people with reduced mobility. An important module system for providing services to help people with reduced mobility is also an application solution for mobile terminal devices, which is imagined as a direct interface between people in need and people willing to assist (volunteers).

A guideline of development of this model is greater social integration of people with reduced mobility, and the possibility of independent functioning and equality in the community and more effective involvement and participation in the society. The proposed system includes a wider range of services and

coverage of community and society as a whole. Our wish is to enable each person in need of help providing the same, or to each person give help if as needing it and unbound form of assistance. The aim is to raise the level of cooperation in the community and building interpersonal relationships to promote joint activities in the society.

Application solution is a direct link between the user and the system that is all of those who use the services provided by this system. It is primarily a system designed modelled for people with reduced mobility, however, because of generic base model the same could be expanded to include additional functionality in terms of the provided services. The system allows users to seek help if they need it, in a simple, fast and efficient way. At the same time, each user who is willing to assist can in a simple way come into possession of information where, when, how and where the help is needed. Among the human helpfulness, and cooperation, through the use of applications, it has been provided a possible solution to some of the challenges in everyday life.

When we first start the application solution through predefined questionnaire user chooses how to use the app:

- a) as people in need / or people with reduced mobility
- b) as a volunteer / or the person who will provide assistance.

The model of system is based on the platform of cloud computing and location based services (LBS). The database is located in the cloud and can achieve broader access to and integration of other potential sources of information (Emergency, Croatian Automobile Club, various civic associations, weather information, etc..) as a wider approach to the development of application solutions which will result in broader base of users [6] [7] [8]. Determining location is controlled by the integrated GNSS (Global Navigation Satellite System) hardware within the user mobile terminal device. One of the goals is to develop an application solution that will be clear and simple for optimal use including adjustment of visually impaired users (blind and visually impaired) [9] [10] [11]. Integration with cartographic services providers (Google Maps, Microsoft Bing Maps, etc.) enables the provision of information about locations and also provides a service to the volunteer assistance in finding the person of need [12].

III. PROCESSES OF SYSTEM OPERATION

When the user first start the application solution on a mobile terminal device through a questionnaire the user defines a user interface for requesting help, or receive notification of the required forms of assistance:

- a) People with reduced mobility and some sort of difficulties through the questionnaire define a sort of disability and the type of help they need so the initial screen for that person can be generated. This screen will contain interface with predefined options by which a person will have the opportunity to seek forms of assistance on the form of disability or the type of assistance required. It is possible to send a predefined SMS (Short Message Service) messages,

- b) Volunteers through the mentioned questionnaire define their abilities, desires and capabilities as well as the area in which they have been able to provide assistance. When crossing from one predefined area to another the application informs the volunteers and asks whether there is a desire to be available in the new area. In this way, the initial screen will be generated where it will be notified of the required forms of assistance related to defined areas of activity. The volunteer receives requests for a predefined area.

During each subsequent start-up of the application solution the home screen will be opened with predefined options for people with reduced mobility. Volunteers will have the option of choosing between multiple profiles or creating a new one. Mode system integrates providers and help those who need help through the previously mentioned technology in several steps (figure 1):

- a) The user who seeks help - when a person with reduced mobility (PwRM) send the request to a predetermined form of help, a notification of the form of help and the position are forwarded to the volunteer. A person receives notice of the time interval until the arrival of volunteer. If there are no volunteer with the ability to provide the requested aid people with reduced mobility will receive notification of inability to get services through volunteers. The application in this case offers the possibility of sending a predefined text message, with the possibility of editing or the ability to call an expert agency or one of the predefined contacts (eg. Police, ambulance, 112/911, etc.),
- b) The user who provides help - after receiving a notice that contains the location of a person with reduced mobility, indicated by some cartographic service, and the form of help, the volunteer is able to positively or negatively respond to the request. In case of a positive response, people with reduced mobility receive notifications about the help along the way and the approximate time interval until the arrival of volunteers. It is enabling to volunteer to easily find people who seek assistance. In the case of a negative response, the notice shall be forwarded to the next volunteer.

Applicative solution is a link between people who want to help and the people who need help. Applied technology makes it possible without the mediation of various organizations and associations and strengthens a sense of community and trust of the common good. Consolidation of the geo-location services is adapted and the use of logic is implemented for every user, regardless of the level of expertise of the user. It will allow the sending of pre-defined text messages with the possibility of editing or autodial predefined services and professional services and organizations. For simple examples; crossing the intersection, passing along a rough footpath or when entering a means of public transport, it is evident how much these applications mean to people who want to help. Within the application solution it is expected that implementation of instructions for users, which would in addition to basic information also relates to the use of the

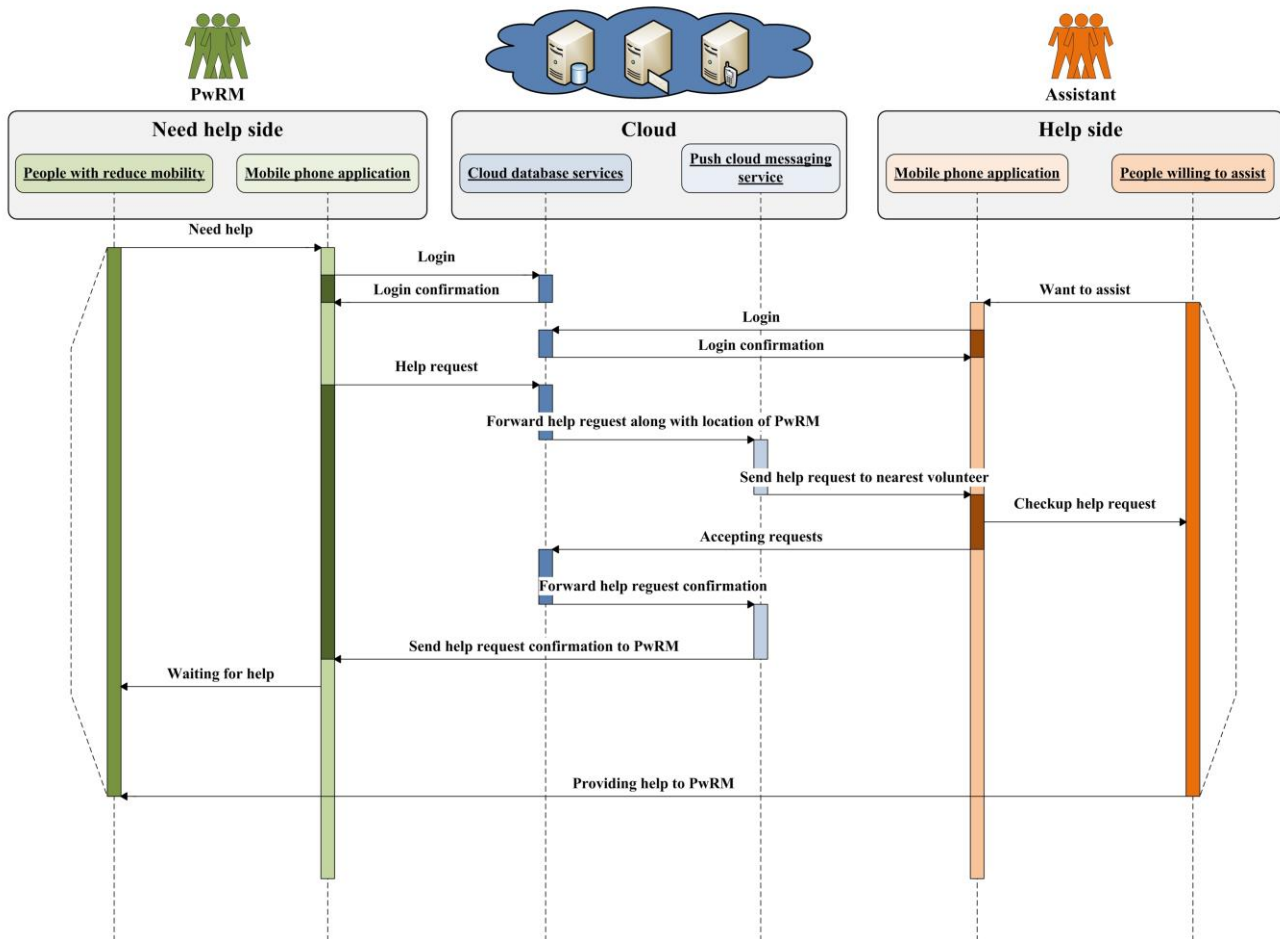


Figure 1. Presentation of a requesting for the assistance services

application, also comprised a list of frequently asked questions (FAQ). Field FAQ is designed in the form of useful tips and is intended primarily for users who are logged into the system on a voluntary basis, i.e. providers of assistance. Since the users of the system voluntarily approach to use the same (proposed system is not a professional service emergency response), it is anticipated that these users (volunteers) are mostly amateurs in need of the application solution to implement this kind of content. In particular, within the FAQ there would be steps for accessing and helping people who need help (for example, visually impaired people, people in wheelchairs, deaf people, elderly and disabled people, etc.), within the context of everyday situations in which these users require some form of assistance.

This model uniquely offers a possible solution to cope with the large number of traffic situations and everyday obstacles in the functioning of people with reduced mobility. A special focus is placed on the social component and further spontaneous development system to the widest range of services and forms of assistance. Ultimately, it is possible to connect with some of the existing social networks and the spread of connectivity.

As the model of the application was developed by generic contemplation in relation to the above described initial functionality it has been considered the continued development

resulting in the expansion of services, regardless of users side (between people with reduced mobility and people willing to help as well as professional services and organizations). We consider the providing services of seeking assistance to each person, organization or professional service and receive the same by any person, organization or professional services.

IV. CONCLUSION

Very often, people with reduced mobility or people with disabilities are being classified into a specific group of people whom the recognition of the inherent dignity, with the enjoyment of equal and inalienable rights as members of the human community, is mentioned only on paper. Taking into account the specific needs of disabled people the leading idea is to facilitate the practical implementation of basic human rights such as the dignity of the individual, equality, non-discrimination, personal freedom, freedom of movement, respect for difference and acceptance of disability as part of human diversity and humanity.

The idea is that applications enable people with reduced mobility to the certain level of easier existence and functioning in the society as well as to help in coping with everyday tasks. The direction of further development of community and break down prejudices covered by any person, organization or professional service whether that person needs help or is able

and has the desire to provide assistance. The current development was offering the basic functionality of registration, login and possibilities to send and receive the necessary assistance required. There are numerous contacts achieved with specific associations and professional services aimed at further development of predefined functionality to the point of implementation to maintain the ease of use and visibility by enabling interface. Quality information and action in further development is planned to develop user-friendly applications tailored to each person.

One of the objectives is the understanding of each individual how little time is required to provide, and how little may help a person with reduced mobility to provide a more equal participation in the community. Emphasis will be on social interaction integration through voluntary contribution in creating a world of equal opportunities for people with different abilities. As for example, people with disabilities and volunteers will provide another dimension in human relations through new friendships and unselfish help.

Information and communication service that aims to help people in need in everyday situations will increase sociological awareness among the citizens of RH through the civil solidarity. Because the application is in the conceptual stage of development, and as such has not yet come to life the final check would be qualified after the system is operable and used by end users for a specified period of time.

ACKNOWLEDGMENT

This research has been carried out as part of the project "Research of Possibilities on Applying the IoT Concept to Improve the Safety Movement of Blind and Visually Impaired Persons along the Traffic Network". The project is funded as part of the program "Short-term Financial Support of Research", University of Zagreb, 2014.

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