

City Eye: Accessibility for All

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ABSTRACT

In today's world, making a good travel plan is not an easy task for most people. However, the situation is even more complicated for people with disabilities. For them, even simple trips, such as travelling to visit a museum or an exposition, have become extremely difficult. A wide variety of travel planning needs to be made days or months in advance, such as where, when, and how to travel, as well as how to get around and how to choose a suitable means of transportation. As a response in this ongoing project, our intention is to apply our proposed solution of linked data technologies in the domains of tourism services and e-governance to build a smart city. In particular, we want to provide useful travel information to people with disabilities and to make their travelling easier.

CCS Concepts

• Information systems~Database management system engines
• Information systems~Information systems applications

Keywords

Linked Data; Semantic Web; Disabled Travel; Tourism Destination; Accessibility Information; e-Governance

1. INTRODUCTION

Information systems usually consist of multiple database systems with independent data stored on different computer systems and different data models. It is now very common to find that many of these databases contain overlapping and inconsistent data. Although there are many ways to make the data useful, the most fundamental way is to make it accessible for anyone to access and use without restrictions in formatting or licensing. Traditional web technologies do not allow people to get information easily from different databases, as the data are usually stored in various

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formats. In order to link the data and get useful information, users have to spend a lot of time collecting and comparing the adaptive information from different sources and databases to understand what the data refer to and how the information is inter-related. On the one hand, users need to collect more data to achieve their purpose. On the other hand, they fear that too much data will make their efforts too unwieldy. This dilemma is particularly common in the tourism domain.

Nowadays, having dinner with friends in a restaurant, going out for shopping, and travelling to visit a museum or an exposition should not require too much time for advanced planning. For most people, these outings are a part of their leisure life, time off, and personal preferences. However, simple trips can become extremely difficult for people with disabilities. For them, a wide variety of travel planning may be done days or months in advance.

In fact, the market for accessible tourism is huge. According to the World Health Organization [1], over a billion people, about 15% of the world's population, have some form of disability. In Switzerland, for example, the number of people with disabilities reached 780,000 in 2012 and about 40% can be considered severely disabled [2]. Disability limits people's long-term capacity to participate in daily life activities and limits the interaction between a disabled person (physical, sensory, or mental) and environmental factors (family, profession, schools, means of transport, etc.). The status of a disability in our society is subject to change as disabled people tend to build new competencies and reconstruct their connections with their environment and other people [3].

Linked data are data on the Internet that can be used to connect to related data. By giving identifiers (URIs) to a dataset, such as places, transportation, and geographic areas, we can apply linked data to individual data items and statistical observations. This extra context can drive further application behavior and finally benefit application users. Linked data, in this sense, aims at enabling the same kind of possibilities for data, as well as creating a universal medium for exchanging information based on the meaning of the content on the Web in a way that is usable directly by machines. These technologies could be ideally used to help people make their travel plans and establish the complementary services for the tourism business.

2. GOALS AND OBJECTIVES

The purpose of this research is to design and implement a visualized travel system by using linked data for people with disabilities. For this purpose, the perspectives of the adoption of semantic web technology innovation and ease of use will be considered. This system aims to combine many different available information sources, as well as unstructured and structured data. For this project, we intend to include points of view from people with different levels of disabilities within one platform. Thus, the map-based travel information will be valuable for the greatest number of people. This linked data-based innovation system will make the decision process easier and more spontaneous for people with disabilities. It will also make their transportation, visits, and leisure activities less difficult.

This paper presents an ongoing project, so here we intend to discuss and focus on our research methodologies and the potential significance of this study.

3. RESEARCH METHODOLOGY

This study aims to create new and innovative artifacts in the form of system applications on the web and mobile phones. The web application will be open to anyone. Alternatively, users can download a free mobile app from Google Play. In this system, semantic Web technologies are implemented to identify and integrate data from many different sources. In addition, the structured data will be interlinked and become more useful through semantic queries.

To build and evaluate the artifact, this study will follow the framework of information systems research presented by Hevner et al. [4] as illustrated in Figure 1. The business needs will be evaluated to ensure the applied relevance of the research. Then, the requirements from the disabled travelers will be examined to match the linked data-related technology environment of the research and to describe the research artifact through environmental field testing. In order to achieve rigor in this project, we intend to draw on existing theories and knowledge-based methods and then add newly generated knowledge to this base. The central design cycle focuses on the construction and evaluation of artifacts and processes by using qualitative and quantitative methods.

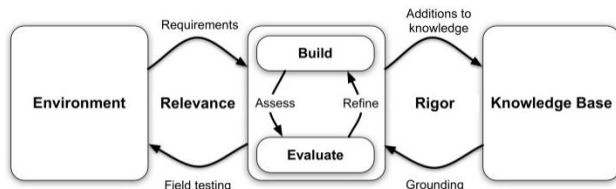


Figure 1. Information systems research framework (based on Hevner et al., 2004)

4. SIGNIFICANCE AND CONTRIBUTIONS

This study will make an impressive contribution to both the tourism industry and the scientific community.

For the perspective of tourism industry, this project will provide the opportunities related to the development of an accessible tourism strategy. This strategy could be used to increase competitiveness as this segment is constantly increasing due to the aging population [5]. Therefore, regions experiencing low tourism growth could benefit from investments in accessible tourism services and maintain and/or develop more activities. Moreover, the intensive analyses from this study will provide a comprehensive view of how the travelers with disabilities view their preferences regarding

products and services. This research can also help to understand potential tourists' decision making.

From a scientific point of view, we intend to fill an important gap in the literature on linked data-based technologies in tourism. To date, too little is known about tourism services and products for people with disabilities. By analyzing the special needs created by real disabled persons, our study can provide a better understanding in this regard. In addition, with our results, we expect to enhance our knowledge about how a tourism destination is perceived by current and potential disabled travelers. Such an understanding includes (1) measuring travel motivators and identifying the main determinants that influence travel decisions, (2) recognizing new opportunities by profiling growing areas of potential and market trends for people with disabilities, and (3) monitoring industry satisfaction about tourism activities.

5. CONCLUSION AND FUTURE RESEARCH

In this paper, we described a linked-data, technology-based solution to help the people with disabilities plan their travel destinations. The solution aims to collect and analyze the information from different available databases and sources, including unstructured and structured data, to help the tourists make their travel decisions. Most importantly, we present a designed science methodology that integrates this heterogeneous information. This methodology enables computers to identify potential conflicts and interdependencies in tourism services and allows automatic discovery and access to the useful and real-time information for the people with disabilities.

The next step for this study would be to implement our solution with real data from different organizations, enterprises, and government aspects, as well as data from the Web, in order to evaluate performance. In particular, we intend to implement our solution to evaluate our approach by accessing real databases with a large amount of accessible data in Switzerland. The expected tourism decision support system will help the tourism destination managers set up the tourism process and guide disabled tourists in a reasonable and reliable manner.

6. ACKNOWLEDGMENTS

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