simpli·city

The Road User Information System Of The Future

WP 2 – Vision and Requirements

D2.4.4: State of the Art Wiki Update

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This document describes the final status of SIMPLI-CITY's State of the Art Wiki and its functionalities. The repository was updated continuously in order to ensure that all SIMPLI-CITY partners are well aware of the latest methodologies and technologies in fields relevant for SIMPLI-CITY. Furthermore, it is publically available so that other researchers in this field can benefit from the findings of the SIMPLI-CITY consortium in this context.

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Executive Summary

The purpose of this deliverable is to describe the final status of the State of the Art Wiki constituted by the SIMPLI-CITY consortium. The powerful repository is briefly described and an explanation how the consortium moved forward regarding media collection during the project is given. This content repository was intended to contain a set of relevant bibliography items (including books, conference and journal articles, websites, and videos). It was utilized for classification and tagging of items to allow an easy navigation. The repository was updated continuously during the course of SIMPLI-CITY in order to cope with the fast changing nature of involved methodologies and technologies. It is also provided by means of the SIMPLI-CITY homepage to the general public. This allows researchers and practitioners to use the findings made within SIMPLI-CITY.

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1 Introduction

SIMPLI-CITY – The Road User Information System of the Future – is a project funded by the Seventh Framework Programme of the European Commission under Grant Agreement No. 318201. It provides the technological foundation for bringing the “App Revolution” to road users by facilitating data integration, service development, and end user interaction.

Within this deliverable, a description is given, how the State of the Art (SOTA) investigation was handled within the project. After a short project overview, the used SOTA repository and structure is explained and the way of collaborative interaction between the project partners is illustrated. Furthermore an overview is given how the SOTA repository has grown during the first 30 months of the project.

1.1 SIMPLI-CITY Project Overview

Analogously to the “App Revolution”, SIMPLI-CITY adds a “software layer” to the hardware-driven “product” mobility. SIMPLI-CITY will take advantage of the great success of mobile apps that are currently being provided for systems such as Android, iOS, or Windows Phone. These apps have created new opportunities and even business models by making it possible for developers to produce new applications on top of the mobile device infrastructure. Many of the most advanced and innovative apps have been developed by players formerly not involved in the mobile software market. Hence, SIMPLI-CITY will support third party developers to efficiently realise and sell their mobility-related service and app ideas by a range of methods and tools, including the Mobility Services and Application Marketplaces.

In order to foster the wide usage of those services, a holistic framework is needed which structures and bundles potential services that could deliver data from various sources to road user information systems. SIMPLI-CITY will provide such a framework by facilitating the following main project results:

- Mobility Service Framework: A next-generation European Wide Service Platform (EWSP) allowing the creation of mobility-related services as well as the creation of corresponding apps. This will enable third party providers to produce a wide range of interoperable, value-added services, and apps for drivers and other road users.
- Mobility-related Data as a Service: The integration of various, heterogeneous data sources like sensors, cooperative systems, telematics, open data repositories, people-centric sensing, and media data streams, which can be modelled, accessed, and integrated in a unified way.
- Personal Mobility Assistant: An end user assistant that allows road users to make use of the information provided by apps and to interact with them in a non-distracting way – based on a speech recognition approach. New apps can be integrated into the Personal Mobility Assistant in order to extend its functionalities for individual needs.

To achieve its goals, SIMPLI-CITY conducts original research and applies technologies from the fields of Ubiquitous Computing, Big Data, Media Streaming, the Semantic Web, the Internet of Things, the Internet of Services, and Human-Computer Interaction. For more information, please refer to the project Website at http://www.simpli-city.eu.

1.2 Deliverable Purpose, Scope and Context

The purpose of this deliverable is to summarize the current status of the SOTA repository used in the project. For the sake of completeness the used repository platform is briefly described. This document highlights the current state of the SOTA Wiki repository and how the repository has grown during the first 30 months of the project.

1.3 Document Status and Target Audience

This document is listed in the Description of Work as “public” as the State of the Art Wiki allows keeping track with current developments and technologies that tackle similar challenges as SIMPLI-CITY. This deliverable is used by all participating project members. It helps them to keep track of current methodologies and technologies that are applied during the SIMPLI-CITY project. Furthermore, the State of the Art Wiki provides external parties, like researchers or practitioners in the same domain, insights into the foundations and technologies that SIMPLI-CITY is based on and allows them to benefit from and to contribute to the media library.

1.4 Abbreviations and Glossary

A definition of common terms and roles related to the realization of SIMPLI-CITY as well as a list of abbreviations is available in the supplementary document “Supplement: Abbreviations and Glossary”, which is provided in addition to this deliverable.

Further information can be found at http://www.simpli-city.eu.

1.5 Document Structure

This deliverable is broken down into the following sections: Section 1 deals with the background of the SIMPLI-CITY project and this deliverable, while Section 2 describes the SOTA repository and explains it from a technical perspective. Section 3 deals with the structure of the SOTA repository and provides numbers about its current contents. The growth of the SOTA repository is described by basic statistics in Section 4 and finally Section 5 concludes this deliverable with a short summary.

2 State of the Art Repository

The SOTA repository was intended to serve the following purposes:

- Allow SIMPLI-CITY members to share literature (or more generic: media) and thoughts about media in their respective fields of expertise relevant for the project.
- Allow SIMPLI-CITY members to use this media as a basis for writing deliverables, technical reports, and scientific papers.
- Allow SIMPLI-CITY members to classify and tag media. The idea is to create a living repository, which exists not only as means to statically store literature, but also as a mean to allow the consortium members to actively share and discuss media.
- Provide the technical infrastructure for the State of the Art Wiki.

2.1 State of the Art Wiki

As stated in deliverable D2.4.1, the SIMPLI-CITY SOTA Wiki is based on the open source media management solution Zotero[1]. Zotero is a Cloud-based open source solution for media management, which has been built and maintained by the "Centre of History and New Media" of the George Mason University. Zotero provides a central Cloud storage and a group concept, which allows working cooperatively together on a reference library. To access and edit the group library, a plugin for Firefox (see Figure 1), a standalone client (see Figure 2) or the web based user interface can be used. Additionally, there are several plugins available to use Zotero with other browsers. This tool already has a good reputation and solves many problems related to cooperative development of reference libraries by providing document sharing, allowing for shared groups, supporting Microsoft Word as well as LaTeX. The tool further enables the easy collection, structuring, tagging of and commenting on all kinds of media. In addition, it can extract bibliographic data from Google Scholar, ACM and IEEE digital libraries, Amazon and many other sites and databases.

The SIMPLI-CITY Zotero repository is integrated in the official SIMPLI-CITY webpage[2] to make the gathered resources and findings easily and conveniently accessible not only to the project partners, but also interested third parties. Consequently, an automatic nightly export of the SIMPLI-CITY Zotero repository has been realized, which is directly linked to the SIMPLI-CITY homepage to keep the SIMPLI-CITY SOTA repository up-to-date.

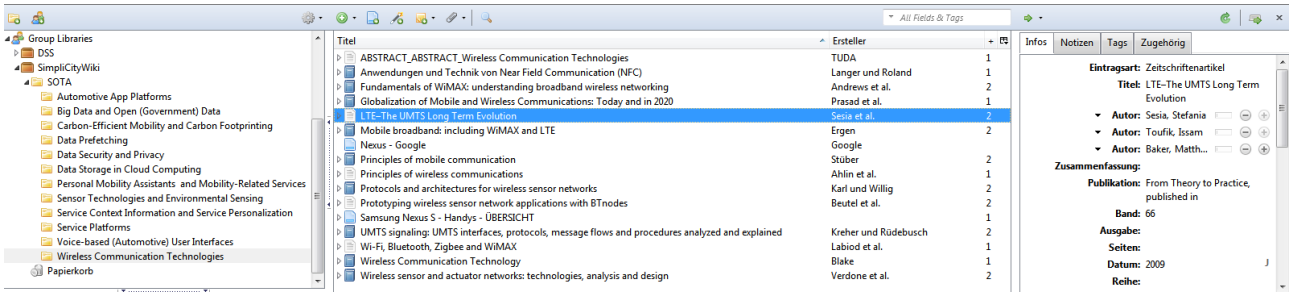

Figure 1: Zotero Interface

[1] Available online at http://www.zotero.org; last access on 18.03.2015

[2] http://www.simpli-city.eu/state-art

The SIMPLI-CITY Zotero group is also publicly available on the Zotero homepage[3]: https://www.zotero.org/groups/148877. This leads to the following benefits:

- The SIMPLI-CITY SOTA is available to interested third parties in a structured way.
- Google Scholar and similar tools index the SIMPLI-CITY SOTA, thus increasing the visibility of SIMPLI-CITY.
- The page provides a feed covering recent additions and updates (see Figure 3).

All consortium members use the SOTA repository, but external parties are also able to benefit from it as well. This can happen in two ways: First, externals are able to access the shared Zotero library (since it is a public library) as well as the exported entries through the SOTA repository's homepages. Secondly, externals can be granted the permissions to enhance the shared Zotero library, enabling them to contribute their own resources that will be available through the SOTA repository's homepages. In conclusion, the basic Wiki idea still exists, but it has been transformed into an ever-expanding source for general SIMPLI-CITY terms, topics, definitions, and corresponding related work as a sound and encompassing basis for an up-to-date SOTA overview.

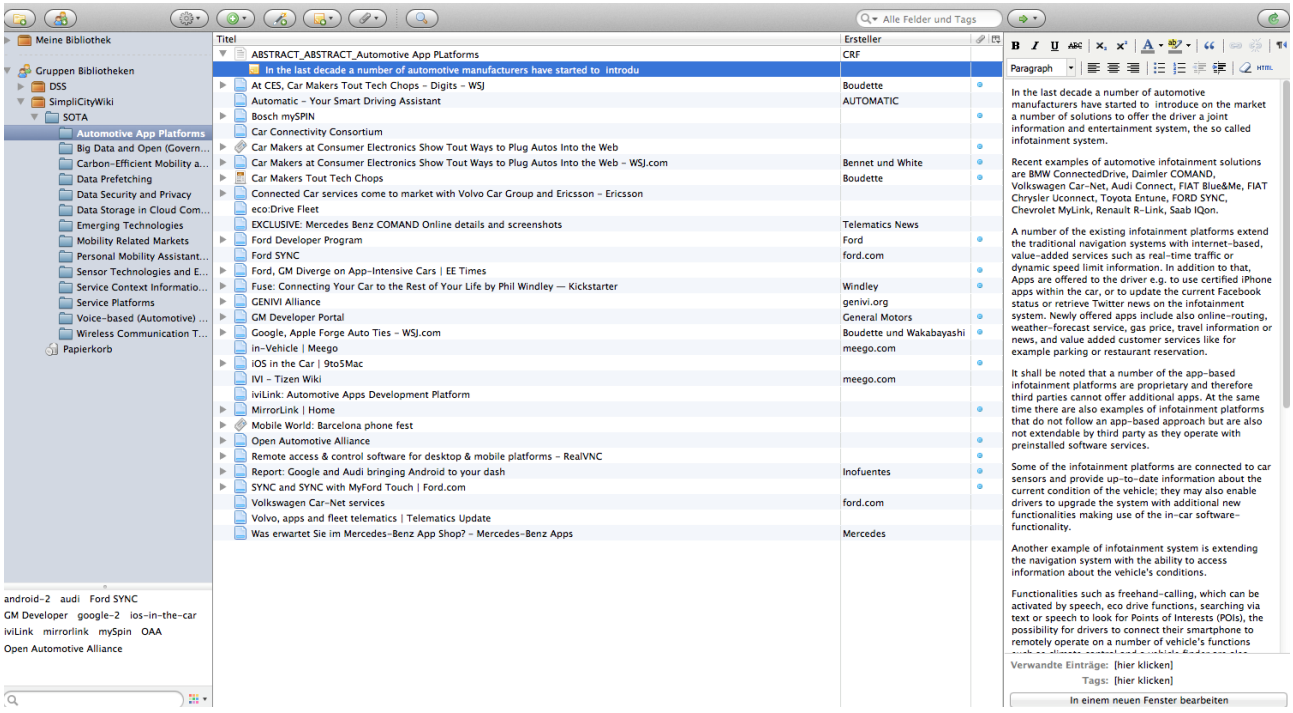

Figure 2: Zotero Standalone Client

[3] https://www.zotero.org/groups/148877

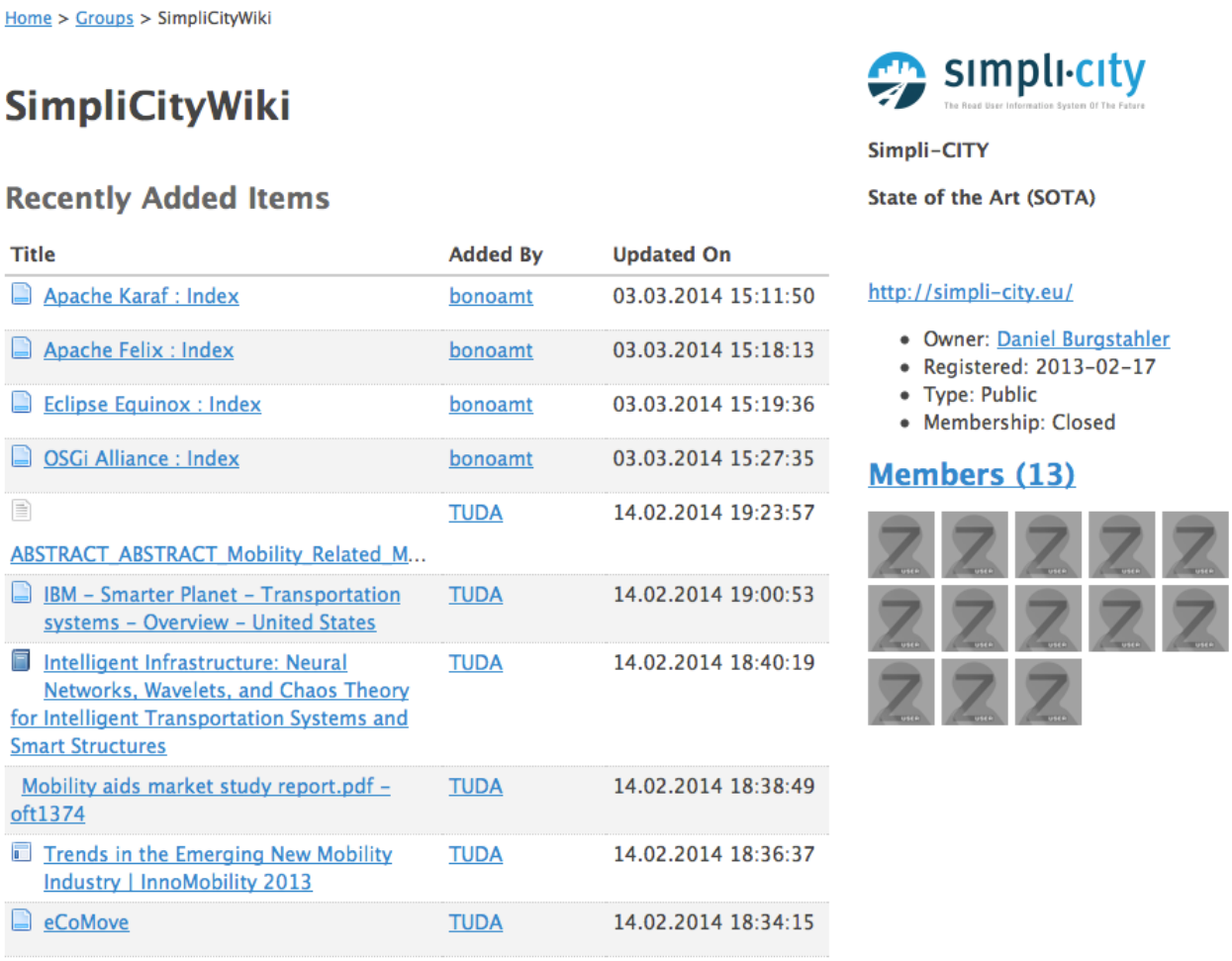

Figure 3: SIMPLI-CITY Zotero Group

3 State of the Art Structure

The entries in the SOTA repository are classified into the following categories which originate from general topics relevant to SIMPLI-CITY, which have been conjointly identified by the SIMPLI-CITY consortium. Currently, the repository includes 363 references. The amount of references regarding each topic is denoted in brackets behind the respective title. The stated numbers denote the amount of references after the last SOTA Wiki update in D2.4.3 and the growth to the total number of references corresponding to the respective topic today.

- Mobility Related Markets (35->45)
- Emerging Technologies (31->38)
- Sensor Technologies and Environmental Sensing: (24->25)
- Carbon-Efficient Mobility and Carbon Foot-Printing: (13->23)
- Big Data and Open (Government) Data: (11->14)
- Voice-based (Automotive) User Interfaces: (18-> 20)
- Wireless Communication Technologies: (21->26)
- Automotive App Platforms: (33->42)
- Data Prefetching: (11->13)
- Data Security and Privacy: (17->20)
- Personal Mobility Assistants and Mobility-Related Services: (34->37)
- Service Platforms: (14->20)
- Data Storage in Cloud Computing: (16->19)
- Related Projects (0->21)
- Service Context Information and Service Personalization: (27->27)

Furthermore, the literature was tagged to allow for better navigation and is also visualized in Figure 4.

Figure 4: Tag Word Cloud

Each topic is presented on a separate webpage that starts with an introductory and explanatory text followed by the respective state of the art references to the topic. Figure 5 shows the generated SOTA entry on the SIMPLI-CITY home page for the topic *'Voice-based (Automotive) User Interfaces'* as an example.

Figure 5: SOTA Page for the Topic 'Voice-based (Automotive) User Interfaces

4 SOTA Repository Update

After its initial setup in project month 6, the SIMPLI-CITY SOTA Repository has been continuously updated. Shortly after the initial setup the repository consisted of 120 references in 8 topics. Until March 2015 the repository has grown to 15 topics with a total of 363 references. Furthermore the content of the description texts corresponding to each topic have been updated with a special focus on the technology forecast and the resulting impact to the SIMPLI-CITY project. Figure 6 gives an indication about the growth of the repository since its initiation.

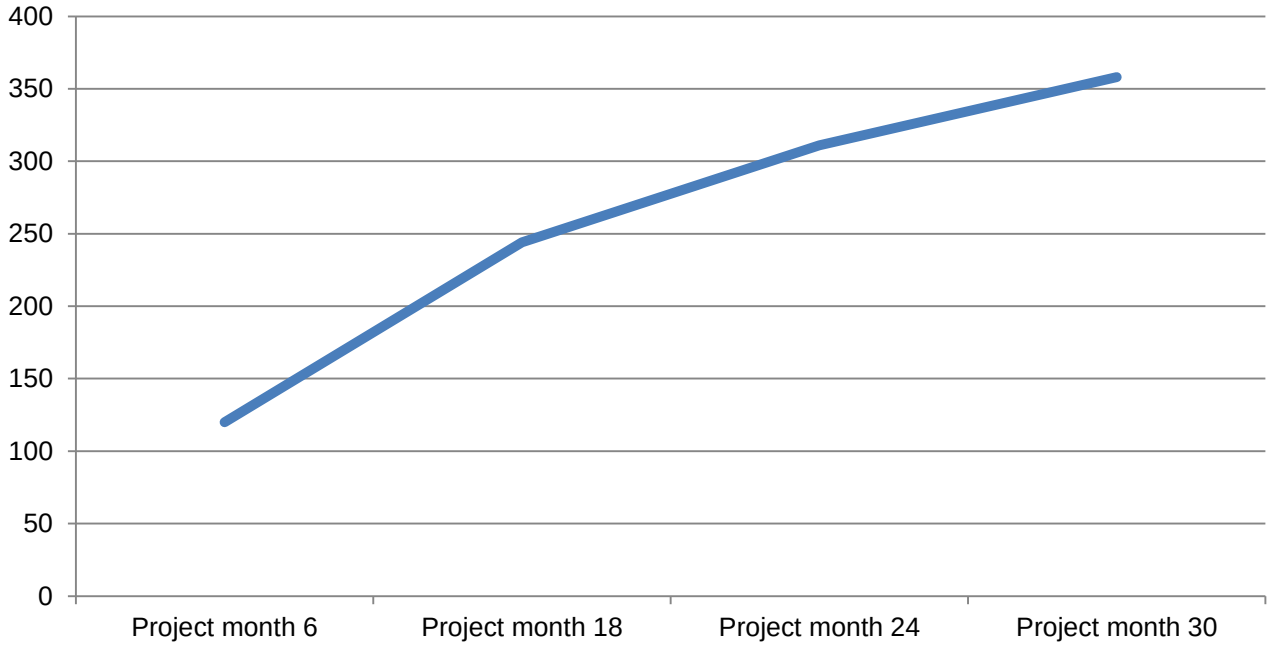

Figure 6: Number of Entries in the SOTA Repository

5 Summary

This document describes the functionality and the principle of the SIMPLI-CITY SOTA Wiki repository and how it has been updated. The first approach towards a SOTA repository was based on a Wiki, which was initially populated with literature. However, after its initiation a few challenges arose. These were mainly concerning with people's hesitation to fill the Wiki due to the fact that traditionally literature references are maintained with the help of citation library tools. These challenges have been successfully solved by the change to the Zotero repository system. Since its initiation, the SIMPLI-CITY consortium members have continuously updated the SOTA repository. New updates in the repository are automatically inserted into the web page[4] on the SIMPLI-CITY home page on a daily bases. The used solution has been proved to be very convenient for academic as well as more practitioner-focused consortium members.

[4] http://simpli-city.eu/state-art