



simpli-city

The Road User Information System Of The Future

WP 2 – Vision and Requirements

D2.4.1: State of the Art Wiki Setup and Initiation

Deliverable Lead: TU Darmstadt

Contributing Partners: TUV, TIE, IBM, FGM, TALK

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This document describes the setup and initiation of SIMPLI-CITY's State of the Art content repository and its functionalities. The repository will be 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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Project Partners



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WIEN
Vienna University of Technology

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Austria



Ascora GmbH, Germany



TIE Nederlands B.V., The Netherlands



Technische Universität Darmstadt, Germany



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Tempos 21, Spain



CENTRO
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Centro Ricerche FIAT, Italy



SRM – Reti e Mobilità, Italy

Executive Summary

The purpose of this deliverable is to describe how the SIMPLI-CITY consortium initiated a State of the Art Wiki and how it plans to move forward regarding media collection during the project. It further explains why the Wiki was extended to a more powerful repository. This media repository is intended to contain a set of relevant bibliography items (including books, conference and journal articles and videos). It is further intended to utilize classification and tagging of items to allow an easy navigation. The repository will be updated continuously during the course of SIMPLI-CITY in order to cope with the fast changing nature of involved methodologies and technologies. It will be provided through the SIMPLI-CITY homepage to the general public. This allows researchers and practitioners to use the findings made within SIMPLI-CITY in this context.

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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) is 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.

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 modeled, 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>.

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1.2 Deliverable Purpose, Scope and Context

This document describes the reasoning behind the setup and initiation of a particular way of dealing with the collection and provision of SOTA in SIMPLI-CITY.

1.3 Document Status and Target Audience

This document is listed in the DoW as “public” as the State of the Art Wiki allows keeping track with current developments and technologies that tackle similar challenges as SIMPLI-CITY. Furthermore, the corresponding findings should be provided as well to an interested external audience, like researchers or practitioners active in the same domain. This deliverable is to be used by all participating project members. It will help them to keep track of current methodologies and technologies that might be applied during the SIMPLI-CITY project. Furthermore, the State of the Art repository will provide external parties insights into the foundations and technologies that SIMPLI-CITY is based on and allows them to benefit and contribute to the media library.

1.4 Abbreviations and General Terms

A definition of general, 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 General Terms” 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 why the basic Wiki idea was extended towards a more powerful solution that saves time and efforts for consortium members and interested third parties in browsing and extending the provided SOTA findings. Section 3 deals with the structure of the SOTA repository and gives initial statistics about its current contents. Section 4 concludes this deliverable with a short summary.

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2 State of the Art Repository

The SOTA repository is 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 as a means to allow the consortium members to actively share and discuss media.

2.1 State of the Art Wiki

As stated in the description of work package 2 within the DoW, the first approach towards a SOTA repository was based on a Wiki. A Wiki is a means to easily allow people to collaborate on simple webpages. Instead of utilizing a graphical editor, a Wiki typically relies on entering simple mark-up in a text box. This simplicity is generally considered to foster collaboration between people.

A Wiki has been initiated in the very beginning of the project. However, by using a Wiki the following challenges have been identified:

- People will hesitate to use the Wiki, as literature is typically held in programs, respectively formats, like Endnote (for Microsoft Word users) or BibTeX (for LaTeX users). Against this background, adding to the Wiki will be basically a one way dump in consequence.
- The Wiki will be inconsistent as people will use email to exchange and refine literature references, and will miss to update the Wiki.
- Allowing for different orthogonal ways of structuring literature (classification, tags) will be difficult.

In order to improve upon these weaknesses, an extension towards a more powerful solution was necessary.

2.2 Advanced State of the Art Repository

The following shortcomings of the Wiki had to be solved:

- Bibliography entries typically consist of lots of structured information. A Wiki usually applies a free form method of entering text, which is not well suited for entering such information. This can lead to inconsistent entries.
- As bibliographies are typically managed through specialized software (BibTeX, Endnote), interoperability through the Wiki is bad for all parties, because the text has to be extracted for the Wiki and inserted into these systems manually.
- People use Google Scholar, ACM or IEEE digital libraries, or Amazon to search for literature, not a Wiki.

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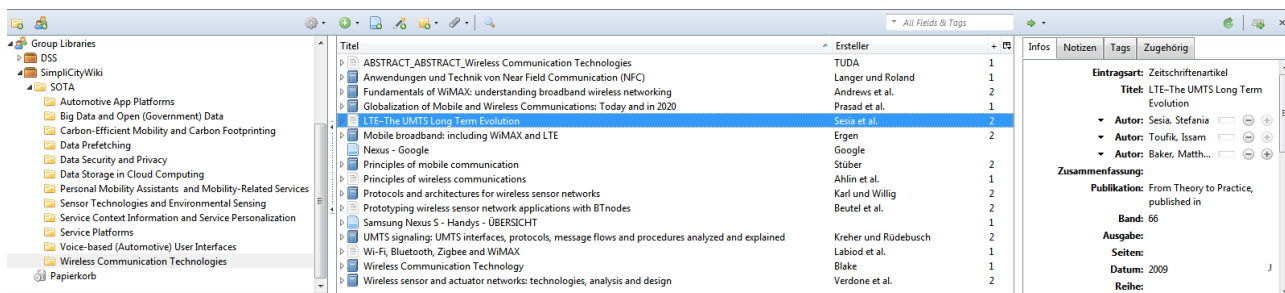


Figure 1: Zotero Interface

Consequently, Zotero¹ [1] (cf. Figure 1) has been selected to realize SIMPLI-CITY’s SOTA repository. 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 can be used or a standalone client or just the web browser. Additionally, there are several plugins available to use Zotero with other browsers and with add-ins use of the reference library within several office software products can be made. This tool already has a good reputation and solves most of the abovementioned problems by providing a form for structured data entry, allowing for shared groups, supporting Microsoft Word as well as LaTeX, and by allowing for easy collection, structuring, tagging of and commenting on all kinds of media. It can extract bibliographic data from Google Scholar, ACM and IEEE digital libraries, Amazon and many other sites and databases.

In order to make SIMPLI-CITY’s Zotero repository and the resources and findings gathered within the repository easily and conveniently accessible not only to the project partners, but as well to interested third parties, it is integrated in the official SIMPLI-CITY webpage (<http://www.simpli-city.eu/sota/index.php>). 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.

The SIMPLI-CITY Zotero group is also publicly available on a page on the Zotero homepage: <https://www.zotero.org/groups/148877>. This has the following benefits:

- The SIMPLI-CITY SOTA is available to interested third parties in a structured way.
- The SIMPLI-CITY SOTA is indexed by Google Scholar and similar tools, thus increasing the visibility of SIMPLI-CITY.
- The page provides a feed covering recent additions and updates (cf. Figure 2).

The SOTA repository will be used by all consortium members, but external parties will be able to benefit from it as well. This can happen in two ways: on the one hand, externals are able to access the shared Zotero library (as it is a public library) as well as the exported entries through the SOTA repository’s homepages. On the other hand, externals can be granted the right to enhance the shared Zotero library, enabling them to contribute their own resources which will ultimately be available through the SOTA repository’s homepages, as well. So, the basic Wiki idea still exists, but has been transformed into an ever expanding source for general SIMPLI-CITY terms, topics and definitions and corresponding related work as a sound and encompassing basis for an up-to-date SOTA overview.

¹ Available online at <http://www.zotero.org>; last access on 20.03.2013

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[Home](#) > [Groups](#) > SimpliCityWiki

SimpliCityWiki

[Group Settings](#)

Recently Added Items

Title	Added By	Updated On
A survey on context-aware web service systems	bonoamt	25.03.2013 14:10:14
COmunication Network VEhicle Road Global Extension	TUDA	25.03.2013 09:38:37
CONVERGE — Website	TUDA	25.03.2013 09:38:03
Nexus - Google	TUDA	21.03.2013 13:18:28
Globalization of Mobile and Wireless Communications: Today and in 2020	TUDA	21.03.2013 13:17:27
Principles of mobile communication	TUDA	21.03.2013 13:17:27
UMTS signaling: UMTS interfaces, protocols, message flows and procedures analyzed and explained	TUDA	21.03.2013 13:15:46
LTE-The UMTS Long Term Evolution	TUDA	21.03.2013 13:11:02
Fundamentals of WiMAX: understanding broadband wireless networking	TUDA	21.03.2013 13:10:41
Principles of wireless communications	TUDA	21.03.2013 13:09:50

See all 135 items for this group in the [Group Library](#).



Simpli-CITY

State of the Art (SOTA)

<http://simpli-city.eu/>

- Owner: [TUDA](#)
- Registered: 2013-02-17
- Type: Public
- Membership: Closed

Members (11)



Figure 2: 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 120 references. The amount of references regarding each topic is denoted in brackets behind the respective title.

- Sensor Technologies and Environmental Sensing: (5)
- Carbon-Efficient Mobility and Carbon Footprinting: (8)
- Big Data and Open (Government) Data: (7)
- Voice-based (Automotive) User Interfaces: (9)
- Wireless Communication Technologies: (15)
- Automotive App Platforms: (14)
- Data Prefetching: (5)
- Data Security and Privacy: (11)
- Personal Mobility Assistants and Mobility-Related Services: (23)
- Service Platforms: (9)
- Data Storage in Cloud Computing: (3)
- Service Context Information and Service Personalization: (18)

Furthermore, the literature was tagged to allow for better navigation and is also visualized in Figure 3.

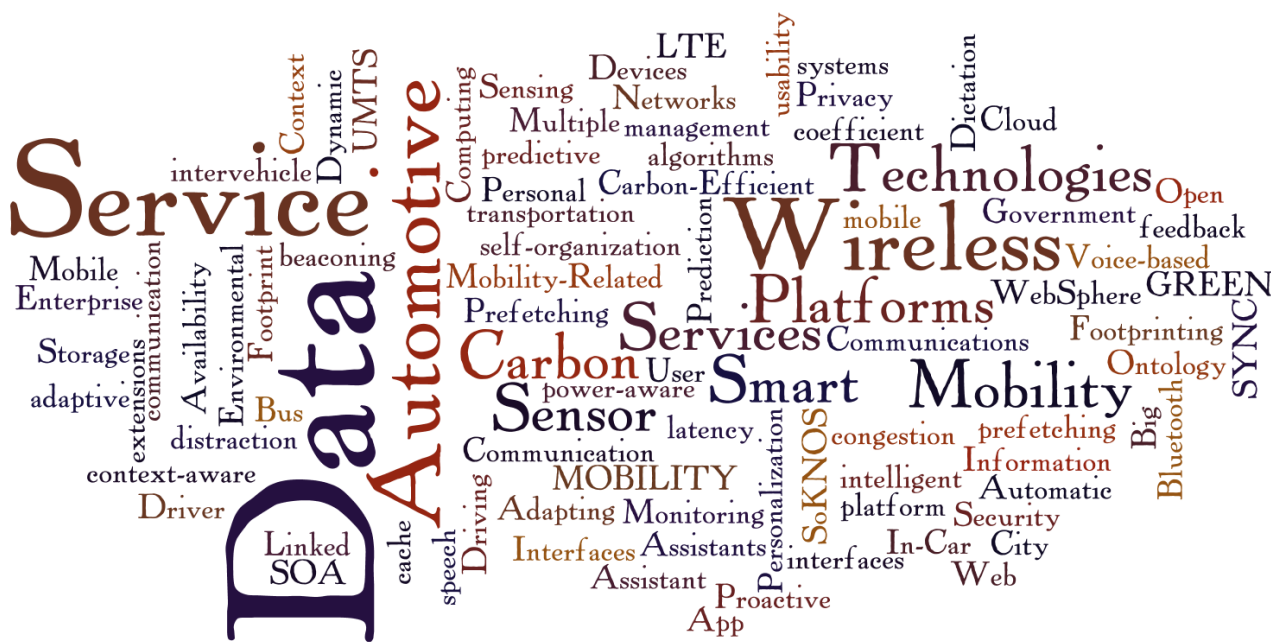
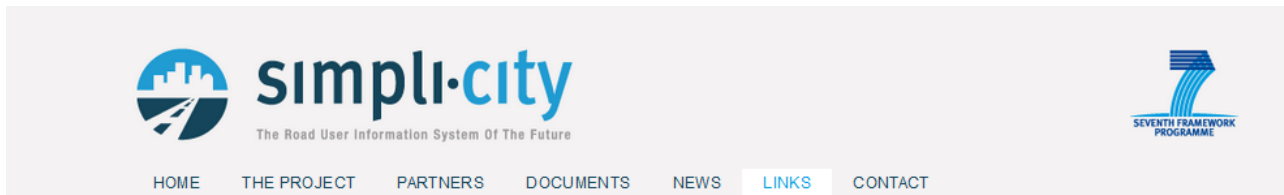


Figure 3: Tag Word Cloud

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 4 shows the generated SOTA entry on the SIMPLI-CITY home page for the topic 'Big Data and Open (Government) Data' with the introduction text and the first five references as an example.

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State of the Art

Big Data and Open (Government) Data

Providing the road user information system of the future requires access to a large amount of heterogeneous data through different service providers. Since more and more organisations and public authorities provide open data, big data is an important dimension to be considered. On the one hand, data from different sources can be harnessed to augment the quality of information provided to users (and especially drivers within SIMPLI-CITY). On the other hand, open data highlights challenges in understanding different levels of data format, e.g., non-textual such as shape files.

Cities generate very large volumes of data centred around the interactions of its citizens within the city environment. Some of this data is generated by the local and government authorities and is considered as open, some of it is generated by private companies delivering services in the city (taxis, weather conditions, historical traffic conditions), and more is generated by the residents of the city (social media feeds, car incidents, road congestions, entertainment events). Within such an open and heterogeneous environment, there are opportunities for better services, less waste, and new opportunities for people to interact with the city – whether it be how to navigate the public transport networks or in predicting and explaining anomalies in traffic conditions. Dublinked and other initiatives (Data.gov,2013)(Data.Gov.UK, 2013)(Data.Gouv.FR, 2013)(Spaghetti, 2013)(Dublinked, 2013) have been created to harness this rich resource of information.

Collection, aggregation, organisation, tracking and synchronisation of different data types, i.e., static and dynamic data (through streams) and from various sources, i.e., social and sensor data, are all key challenges that need to be highly considered. Accessing and managing heterogeneous data, together with maintaining a coherent, robust, optimal and up-to-date view is a complex task [(Auer et al., 2007),(Bizer, Heath & Berners-Lee, 2009)] mainly due to the large amount of data that needs to be exploited.

[1] Data.Gouv.FR, “Données publiques / Open Data,” 2013. [Online]. Available: <http://www.data.gouv.fr/>. [Accessed: 07-Mar-2013].

[2] Spaghetti Opendata, “Spaghetti Opendata | Italiane e italiani che fanno cose con i dati,” 2013. [Online]. Available: <http://www.spaghettiopendata.org/en>. [Accessed: 07-Mar-2013].

[3] Data.Gov.UK, “home | data.gov.uk,” 2013. [Online]. Available: <http://data.gov.uk/>. [Accessed: 07-Mar-2013].

[4] Data.Gov, “Home | Data.gov,” 2013. [Online]. Available: <http://www.data.gov/>. [Accessed: 07-Mar-2013].

[5] Dublinked, “Welcome to Dublinked,” 2013. [Online]. Available: <http://dublinked.ie/>. [Accessed: 07-Mar-2013].

Figure 4: SOTA page for the topic ‘Big Data and Open (Government) Data’

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4 Summary

This document described how a suitable solution for managing the State of the Art within the SIMPLI-CITY project has been realized. The solution proved to be very convenient, for academic as well as more practitioner-focused consortium members. The applied solution is currently also used to manage and display papers written by SIMPLI-CITY consortium members within the project.

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