



**CITYSPIN**

**Cyber-Physical Social Systems for  
City-wide Infrastructures**

## Deliverable 8.1: Dissemination Plan (V3)

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## History

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0.1		Initial draft	MS
0.2		Contributions by project partners	PS, TT, EK, JF, CdC
0.3		Revision and finalization	MS

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## Executive Summary

This deliverable sums up the dissemination results of the last 6 months in the project, and identifies concrete dissemination plans beyond the project duration.

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# 1 Introduction

Dissemination is an important part of CitySPIN. It is coordinated as part of WP8 and makes sure that results of all WPs are disseminated to the suitable stakeholders.

This deliverable sums up dissemination actions performed in the last 6 months of the project (Section 2) focusing on diverse stakeholders ranging from research communities, to related projects and company internal dissemination. We also identify concrete dissemination plans that go beyond the project duration (Section 3).

## 2 Project Wide Dissemination

### 2.1 Project Website

The project Website (<http://cityspin.net/>) was maintained up-to-date with project results (deliverables, papers) and news.

### 2.2 Scientific Dissemination - Publications

In the last 6 months the consortium focused its efforts primarily on finalizing the outstanding deliverables and therefore publication efforts were reduced. Nevertheless, the deliverables offer material to be published beyond the project duration.

A number of 6 papers were published/submitted by the academic partners involved in the project (TU/WU) based on work performed in CitySPIN, including 2 journal papers, 2 conference papers and 2 poster/workshop papers, as shown in the following table.

Paper Nr.	Reference	Type	Pub. Year	Partner
1	Amr Azzam, Javier D Fernández, Maribel Acosta, Martin Beno, Axel Polleres. <b>SMART-KG: Hybrid Shipping for SPARQL Querying on the Web</b> . Proceedings of The Web Conference 2020	conference	2020	WU
2	Amr Azzam. <b>Enabling Web-scale Knowledge Graphs Querying</b> . Proceedings of ESWC 2020	conference	2020	WU
3	Amr Azzam, Ruben Taelman, Axel Polleres. <b>Towards Cost-model-based Query Execution over Hybrid Linked Data Fragments Interfaces</b> . Proceedings of ESWC 2020.	Poster	2020	WU
4	Hernández-Illera, Antonio, Miguel A. Martínez-Prieto, and Javier D. Fernández. <b>RDF-TR: Exploiting structural redundancies to boost RDF compression</b> . Information	Journal	2020	WU

	Sciences 508 (2020): 234-259.			
5	Polyvyanyy, A.; Solti, A.; Weidlich, M.; Di Ciccio, C. and Mendling, J. <b>Monotone Precision and Recall Measures for Comparing Executions and Specifications of Dynamic Systems.</b> ACM Trans. Softw. Eng. Methodol., Association for Computing Machinery, 2020, 29.	Journal	2020	WU
6	Mühlberger, R.; Bachhofner, S.; Di Ciccio, C.; García-Bañuelos, L. and López-Pintado, O. Dijkman, R. M.; Di Francescomarino, C. & Zdun, U. (Eds.) <b>Extracting Event Logs for Process Mining from Data Stored on the Blockchain.</b> BPM Workshops, Springer, 2019, 362, 690-703.	Workshop	2019	WU

### 2.3 Scientific Dissemination - Teaching

CitySPIN related research was also disseminated among students as part of various teaching activities.

At TU Wien:

- CitySPIN PoCs were presented as examples of semantic systems as part of the Introduction to Semantic Systems lecture at TUWien
- CitySPIN PoCs as well as OBDI techniques were presented teaching material in the Semi-Automatic Information and Knowledge Systems (SAIKS) lecture at TUWien
- One Master thesis is adopting the findings in the area of data integration with OBDI to the tourism domain.

At WU Vienna:

- During the project, a student group developed a practical application related to the CitySPIN use cases for the course “Data Science Lab” of our SBWL Data Science for Bachelor students. Beyond the project duration, Wien Energie will also participate as a data coach in the upcoming iteration of the Data Science lab in the upcoming Winter Semester 2020; students will work on another use case in the context of district heating network data that came out of the project.
- A Bachelor thesis on log analysis for GDPR transparency and compliance (related to WP6) has been conducted.
- A Bachelor thesis that focused on open data integration and visualization, which can be used as input for our CitySPIN use cases, was completed.
- A Bachelor thesis that surveyed knowledge graphs in business applications (related to WP 4) was conducted.
- One Master thesis is being focused on the graphical interface for the mining of declarative process constraints (related to WP5).

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## 2.4 Scientific Dissemination - Collaboration with other Researchers and Projects

The CitySPIN consortium also engaged in intense dissemination by collaborating with researchers external to the project as well as national and international projects.

TU Wien performed the following dissemination of this kind:

- As part of WP2 work, our study raised the interest of Prof. Danny Weyns<sup>1</sup>, an internationally renowned expert in the software engineering of self-adaptive systems. In order to publish this study in a very high-ranking software engineering journal, he suggested re-running the study and broadening its scope. We followed his recommendation and involved four other experts (including Prof. Weyns) to run the study. None of these experts are paid from CitySPIN funds. During the study over 120 papers were collected and read, and currently the results are being written up.

WU Vienna

- As planned, we were working in close collaboration with the SPECIAL<sup>2</sup> EU H2020 project. In the context of WP6, we first analyzed and extended the SPECIAL policy language to fit CPSS scenarios and, in particular, our CitySPIN use cases. Thus, this extension would be reflected in future versions of the SPECIAL policy language. In turn, we plan to continue the adaptation of the SPECIAL policy log vocabulary in order to provide further GDPR-based transparency and compliance.
- We presented the CitySPIN project in the Dagstuhl-Seminar on Big Stream Processing Systems<sup>3</sup> where we established connections with important potential partners in the area. We are currently inspecting the use of existing Big Data frameworks, such as Flink, to support large-scale Linked Data scenarios (related to WP4).
- We worked in collaboration with Maribel Acosta from KIT to introduce a highly scalable SPARQL Web querying engine that serves, accessing and processing decentralized KGs.
- We worked in collaboration with Ruben Telman from Ghent University to enable Web-scale Knowledge Graphs Querying based on client-server cost models.

## 2.5 Company Specific Dissemination

In the course of the integration of the PoCs, SWC improved the knowledge and praxis of using PoolParty and UnifiedViews. So the implementation drove a cross-department discussion about needed additional features of the software.

WSTW identified several topics and internal projects where the dissemination of CitySPIN results should be performed. These include:

- First, there is the data privacy aspect which will be part of the studies and contribute to the GDPR mechanisms currently deployed within the company. There are currently several projects ongoing (Data-Governance as Part of a Master Data

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<sup>1</sup> Homepage Danny Weyns: <https://people.cs.kuleuven.be/~danny.weyns/>

<sup>2</sup> <https://www.specialprivacy.eu/>

<sup>3</sup> <https://www.dagstuhl.de/de/programm/kalender/semhp/?semnr=17441>

Management Program, One-Stop Shop, Multi-Channel/Multi-Utility Products, API-Management, etc.) which have many touchpoints with this topic.

- Second, findings in the field of Linked Data and the IT-infrastructure therefore needed will also deliver applicable knowledge in the Data-Driven Architecture (based on Lambda-Architecture Model) which is also currently being established at our IT-Service Provider Wien IT. This Architecture should deliver Lab- and Factory-Methods for our subsidiaries to support them in their data-science activities.
- Regarding the WE Use Case there will be future projects where the outcome and findings will be integrated. Especially one project, regarding power plant efficiency will profit in the optimization of service staff and the Fernwaerme-Grid. This will also have a positive effect on the predictive maintenance of GUF0 stations.
- Regarding the WL Use Case, it supports the standardisation of the planning activities in the future (for busses or trams, for example, which intervals will be used). The prototype clearly has the benefit of merging multiple data from different sources. Here we can compare the events with past ones which simplifies this know-how to the new events from the future. Furthermore, weather data can also be included, which is very valuable for outdoor events.

The activity of WL planners will also be influenced accordance to the success of the standardization of the prototype. If we see clear improvements in this area, there will be a follow-up project in which we will look at how this process can be further improved. With our planners, only a small percentage is concerned with events; in the future, this standardization could be extended to many more planning activities.

SWC has customers in both use-case fields: Energy Supply Management and Public Transport. CitySPIN played a substantial role in communicate the power of the solutions developed:

- Showcase how taxonomies can be built and integrated for the use in industrial environments.
- Showcase the toolset (including SWC PoolParty Suite) to customers in campaigns, fairs and exhibitions organized by the marketing department of the company
- Promote the partnership of CitySPIN as a reference of innovative institutions and companies in SWC's profile

## 2.6 Other Dissemination

**CitySPIN showcased to representatives of the City of Vienna:** On 13.13. 2019, the CitySPIN project and its results have been showcased to representatives of the Vienna City Administration. The meeting was organised by Ms. Brigitte Lutz, in her role as Data Governance Coordinator of the City of Vienna, responsible for [Open] Data and the ICT project portfolio management of the City of Vienna.

The goal of the meeting was to present the project as well as one of its proof-of-concept prototypes developed for the Wiener Linien mobility planners. During the meeting, it was discussed how CitySPIN contributed to test the visionary concept of Cyber-physical Social Systems within the concrete context of Wiener Stadtwerke, where representative use cases were distilled and concrete prototypes were developed for these use cases. In the meeting it was concluded, that the prototypes provide a valuable starting point for follow-up



projects and could support ongoing/future activities both within Wiener Stadtwerke and various departments of the City of Vienna which took part in the meeting.

Indeed, the participants to the meeting included the representatives of major departments in the City of Vienna, like the Office of the CIO, Vienna Digital, Urban Development and Planning, as well as Urban Innovation Vienna and Upstream Mobility.

### 3 Dissemination Plan per Project Partner

This section collects dissemination activities planned by each project partner beyond the project duration. Especially the academic partners, have reported the latest project results in various deliverables during the last 6 months of the project and would like to use that material for follow-up publications.

#### 3.1 TU Wien

TU's dissemination plan includes the following papers to address several of the communities of interest to CitySPIN.

<b>Paper Topic</b>	<b>Venue</b>	<b>Research Community</b>
CPSS Study (WP2)	Information and Software Technology (Journal)	Software Engineering
CPSS Architecture pattern	EUROPLOP'21	Software Engineering
Data Integration in city-wide infrastructures (Wiener Linien, Wien Energie use cases, LWP + UV, Vocabularies..?)	ISWC ( <b>in-use</b> , industry, research?)	Semantic Web
Survey of Vocabularies for CPSS/city-wide infrastructures	Workshop or journal	Smart City, Semantic Web?
LD-centric CPSS architecture	Semantics 2021?	Enterprise Information Systems
Declarative Process Ontology	Extended Semantic Web Conference	Semantic Web
Process mining on Linked Data	TBD	TBD - Process mining?
Process mining with SHACL (with WU Vienna)	Int. Conference on Advanced Information Systems Engineering	Process management

Additionally, we will further pursue dissemination through teaching as well as through collaboration with projects or researchers external to the project.

### 3.2 WU Vienna

Our dissemination plan at WU includes the following papers:

<b>Paper Topic</b>	<b>Venue</b>	<b>Research Community</b>
Online update of Declarative Process Ontology	International Conference on Business Process Management	Process Mining
Quality assessment of Data-Aware Declarative Processes	International Conference on Advanced Information Systems Engineering	Software Engineering
Policy Formalization	International Conference on Cyber-Physical Systems	Cyber Physical Systems
RDF store scalability	Web Conference	Semantic Web
Context in RDF stores	Extended Semantic Web Conference	Semantic Web
Policy and log formalization for transparency and compliance	Privacy and Security (TOPS), Journal	Privacy and Security

### 3.3 SWC

The learnings and achievements of the project now drives the development of more customer orientated storytelling and therefore sharpens the marketing message of SWC. CitySPIN results dissemination is an integral part of the messaging of SWC, when it comes to sensor driven, process orientated integrations in industry. So the dissemination of the project results will be integrated as a success story for our marketing communication in 2020 and 2021 for fairs, conferences and F2F.

### 3.4 WSTW

Dissemination activities will include WSTW-internal events and will be spread through diverse media-channels, such as 'Corporate TV' or 'Intranet Posts'. There is also an internal Company News-Platform/Newsletter where we published a feature about the CitySPIN project. This gave an insight about the collaboration with universities to our subsidiaries and promoted the ongoing digitization initiatives which are part of the company wide

IT-Strategy. It should also animate coworkers to spread their ideas in the existing company networks which have the purpose to drive innovation and new business models.

CitySPIN-News and Reports were presented on a regular basis in the quarterly event “Innovation Base Meeting”. A wider Dissemination potential is also seen in terms of input for the company-wide Data-Governance project in context of the WSTW Master Data Management Program.