This 'Paper' is a Demo

Sarven Capadisli[1,2(✉)], Sören Auer[2], and Reinhard Riedl[1]

[1] E-Government-Institute, Bern University of Applied Sciences, Bern, Switzerland
info@csarven.ca, reinhard.riedl@bfh.ch
[2] Enterprise Information Systems Department, University of Bonn, Bonn, Germany
auer@cs.uni-bonn.de

Abstract. This 'paper', when viewed on the Web, is the demo itself, since the interactive and semantic features can be directly observed while reading and consuming. The demo showcases, how scholarly communication can adapt to the audience, whether the content is read on a screen or printed on paper, listen with a screen reader, watched as a movie, shown as a presentation, or even interacted with in the document. To experience the described features please open this document in your Web browser under its canonical URI: http://csarven.ca/this-paper-is-a-demo.

Keywords: Knowledge acquisition · Linked data · Semantic publishing · Technology demonstration

1 Introduction

One of the most widely debated questions in the scientific community is the impact of digitization on the scholarly communication and knowledge exchange. In this demo, we present a way how scholarly communication can truly digitize by means of living, interactive publications. Despite advances such as open and digital access to publications few has been changed yet with regard to the digitization of scientific publishing. Scientists still write static documents, which do not use the possibilities of digitization, such as interactivity, multimodality or semantic content annotation and representation.

In this demo, we present our linked scientific publication approach based on native Web technologies i.e., HTML, CSS, JavaScript, and RDFa for authoring and representing scholarly content. We demonstrate how multimodal content such as video and audio can be embedded. Especially for computer science, code examples are an important type of content, which can be integrated with these publications. We showcase, how different views of the content can be rendered for different devices (e.g. screen, print, mobile) or audiences (e.g. slideshows). A particular strength of our approach is the integration and linking of data, which can automatically update tables and diagrams when the underlying data changes. Also, all content can be annotated and represented using semantic knowledge representation formalisms to facilitate better search, exploration and retrieval of scholarly content. In the following subsections we explain and demonstrate each of these features.

F. Gandon et al. (Eds.): ESWC 2015, LNCS 9341, pp. 26–30, 2015.
DOI: 10.1007/978-3-319-25639-9_5

2 Technology and Design

Our work is called **Linked Research** as discussed in Enabling Accessible Knowledge [1]. There is a single template using the HTML 5 Polyglot markup. Different CSS are used to present the information for different media e.g., academic paper layouts following the ACM and LNCS authoring style guidelines, slideshow styles, or even as a W3C "Recommendation" (to only demonstrate the flexibility of semantic markup). JavaScript is applied to the document to *progressively enhance* the informations interactive components. In a nutshell, the minimum viable product encloses the following:

- Documents are human and machine-*friendly*.
- Using the *plain old semantic HTML* marking process, with further semantic annotations using microformats and RDF.
- No server required. Works on local machine.
- No installation. No account creation.
- No out-of-band tooling. A Web browser is the only requirement, whether it is a Line Mode Browser, or Firefox Nightly.
- Licenses and rights: Apache License and CC0.

The code for Linked Research is publicly available along with a demo site, with sample peer-reviewed and published 'paper'. Well-known LNCS and ACM authoring guidelines themselves are also available as examples. The ACM guidelines can be viewed or printed using LNCS, and vice-versa.

2.1 Structure and Semantics

Underneath the user interface, simple and flexible HTML patterns are used to encapsulate sectioning content. Listing 1 shows a common design pattern.

```
1 <section>
2     <h2>
3     <div>
```

Listing 1. `h2` is an example heading used here for `section` titles, `div` as a typical wrapper for descriptions, as well as to contain further sub-sectioned content.

The available RDF and microformats of this 'paper' can be consumed using e.g., Linked Data URI Burner or RDFa 1.1 Distiller and Parser. Linked Research documents may typically include the following vocabularies: SKOS, FOAF, DC Terms, SIO, SPAR, PROV-O, OPMW, RO, Disco, QB, SIOC.

2.2 Presentation

The CSS are primarily tested using the Gecko browser engine e.g., Firefox, as it provides a more comprehensive and consistent CSS screen and print media support. The views are also tested for in other engines e.g., WebKit, and Trident. The single HTML is flexible such that it can presented in different ways (a CSS Zen Garden), using the browser or document options.

2.3 Interaction

Screen devices with interactive abilities can use the following:

- In browser editing without having to hand-code HTML or RDF syntaxes - partial support at the moment - and, sorting sections through table of contents.
- Embed data in HTML: Turtle and JSON-LD.
- Visible identifiers for sections and other important enough declared concepts. Fosters sharing and cross-linking of concepts, arguments, workflows etc.
- Document metadata for authors.
- Exporting to HTML. A (La)TeX export is planned.
- Local Storage (in the browser) for offline editing. Auto-save is available.
- View switching e.g., ACM, LNCS, W3C-REC, Slideshow, Native.

3 Multimedia Interactions

Different representations of this 'paper' and interactions are demonstrated:

3.1 Print

The view e.g., LNCS, in which the audience is experiencing this 'paper' is one of many. This document can be printed by inputting (typically keyboard or equivalent voice command): Ctrl + P or File -> Print.

3.2 Slideshow

This 'paper' can also be viewed as a slideshow.

3.3 Audio

An audio recording and its spectrogram of this 'paper' is available for supporting media. Otherwise, a complimentary spectrogram of the recording is visible in Fig. 1:

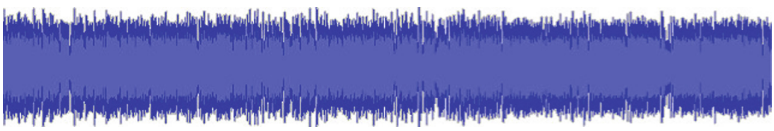
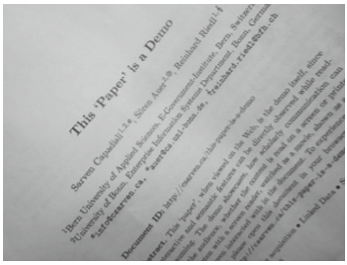


Fig. 1. Spectrogram of the audio recording of this paper.

3.4 Video

A video with captions of this 'paper' is available for supporting media. Otherwise, a screenshot or in audio only.



3.5 Statistical Displays

Inline-charts or sparkline are word-sized graphic with typographic resolution. For example, the GDP of Canada ⁓. This brief demonstration of Linked Statistical Data Sparkline, (1) compliments the supporting text without breaking the readers flow, and (2) provides an opportunity for the reader to investigate further by clicking on the data-line to access the source. It is an SVG file which uses JavaScript to request data from a SPARQL Endpoint to build the datapoints and behaviour.

3.6 Linked Statistical Data Cube Designer

LSD (Linked Statistical Data) Cube Designer is a Web service with an user-interface for researchers to design their own statistical data cubes. It offers a way to search for dimensions (e.g., "`reference`"), measures (e.g., "`value`"), and attributes (e.g.,"`status`") for their data structure and components, and then export the cubes structural information (in RDF Turtle). Figure 2 is this interactive remote application.

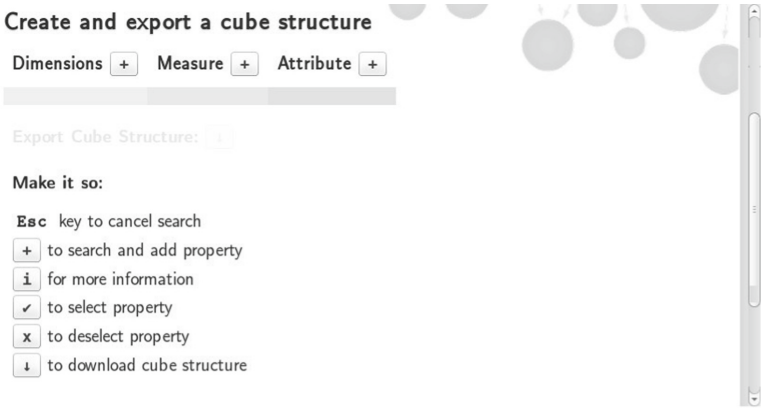


Fig. 2. Linked statistical data cube designer.

3.7 Executable Code

Web Science 'papers' can be far more engaging and useful to the community if we merely embrace what the Web offers. Figure 3 demonstrates the Yet Another SPARQL GUI application embedded to this document. For instance, the research paper itself creates an executable paper environment where some code can be rerun or observe the effects of changing parameters.

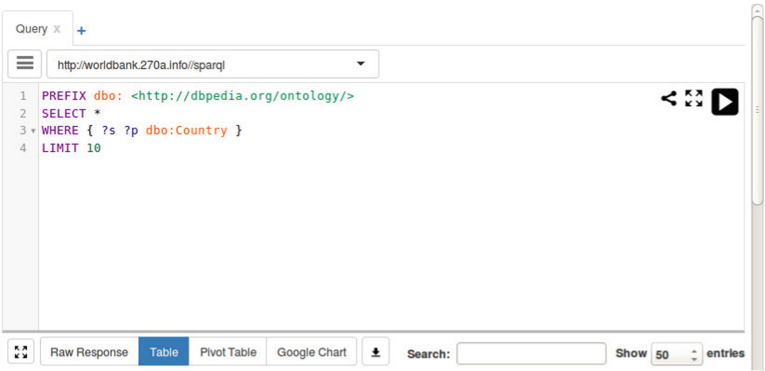


Fig. 3. Yet another SPARQL GUI

4 Conclusions

Our intentions with this 'paper' is primarily to emphasize the flexibility of native Web technologies for scientific publishing and communication. A comprehensive demonstration for what lies ahead naturally can not fit within an arbitrary (5) page limit. To get the most out of research communication in Web Science, it is only sensible to break-free from the archaic limitations of the print world. After all, as we have demonstrated, a PDF or print representation of this 'paper' can always be achieved. In the spirit of *open science* and to embrace the Webs values, all feedback are welcome at the canonical URL.

Reference

1. Capadisli, S., Riedl, R., Auer, S.: Enabling Accessible Knowledge, CeDEM (2015). http://csarven.ca/enabling-accessible-knowledge