What is semantic web user interaction (SWUI) and why do we want to give it special attention in a journal? Since the first international SWUI workshop at the World Wide Web (WWW) conference in 2004, those of us drawn to this topic have been asking this question. In 2004, the description of the Semantic Web did not have an Interaction Layer on its stack. The concern of developing the Semantic Web seemed entirely on the back end. And yet, the motivating scenario for the Semantic Web postulated in the 2001 Scientific American article was based on what the approach would offer humans.

Some of us perceived a disconnect: from our own experience in interaction design, both in research and professional practice, we had seen repeatedly the problems of starting with the technology and assuming that the interaction would take care of itself. Part of our efforts in SWUI was to identify challenges and opportunities for interactions that the semantic web would afford. Consequently, the workshop has been held variously in conjunction with ACM’s Conference on Human Factors (CHI), the International Semantic Web Conference, the World Wide Web Conference, and on occasion, co-located between the US and EU.

By the third SWUI in 2006, as part of the International Semantic Web Conference, Tim Berners-Lee presented a revised Semantic Web Layer Cake diagram that was now topped with a User Interfaces layer. That was also the workshop where a first critique was presented of what many views onto the Semantic Web looked like at that time: Big Fat Graphs (BFG). The concern of that paper was that it was easy to throw a BFG onto RDF, but what problem did that solve for whom in trying to make use of and sense of information?

That question of interfaces to help make sense of semantic data became a theme for SWUI. A few of us looked at data integration challenges and explored what kind of UI paradigm would best enable exploration of the metadata associated with semantic web-based information. Tools like facet, Topia, mSpace, Haystack, Tabulator and semantic wikis have all been explored at SWUI. In each of these projects the concern has been to bring together multiple data sources in a way that lets users explore, query and represent that information to build new knowledge. An outstanding challenge that remained was how to afford these kinds of explorations over wild data on demand, rather than over well tamed, well curated, integrated heterogeneous data sets?

By 2008, this latter challenge was given greater impetus by the movement towards Open Data initiatives and the shift in the Semantic Web community towards Linked Data. The US government started the data.gov initiative to publicize government data; the UK followed suit with data.gov.uk Tim Berners–Lee’s first TED talk in Feb 2009 focused on the power of connecting data together, exhorting the audience to demand “raw data now.”

Co-incident with that cry was the call for this issue’s theme of “Exploring New Interaction Designs Made Possible by the Semantic Web”. This theme raises questions such as: Once we have even more data, coming from private, social and these new public sources, how are we supposed to make sense of it? What tools will we need to let us explore, integrate, query and present it? Does this flood of data mean new interaction paradigms or simply new tools to put this data to use in existing paradigms? Does doing so require new methods for design or evaluation?

The two papers from this theme that appear in this issue help to answer these questions. The paper “Evaluating the Usability of Natural Language Query Languages and Interfaces to Semantic Web Knowledge Bases” by Esther Kaufmann and Abraham Bernstein, shifts emphasis from the coldly measured accuracy of query-based retrieval to a focus on how well the user can form queries on the semantic web and processes their results. Not only is the evaluation technique user-oriented, so is the underlying motivation: usable natural language query interfaces help novice users explore new information domains, which places the semantic web concern of domain-independence in the context of usability.

In “From the Web of Data to a World of Action”, Alan Dix and his colleagues shift the emphasis from what data is and how it is linked to what distributed applications and their users do with data, and how they cooperate in doing it. This paper shows how several tools solve user interaction problems in ways that are specific not only to semantic web but also to the distinctly collaborative way the semantic web is intended to work. Here, we see not just how the semantic web changes the form of data itself, but also its impact on how we share and use data.

Managing this call has encouraged us to think about what a semantic web / user interaction paper might be, to act as guidance for future submissions in this area to this journal. To that end, we offer the following heuristics:

1) Components to enable interaction: SWUI papers are motivated by a clear and well-grounded usability problem for engaging with semantic web/linked data. A contribution to addressing that challenge does not need to produce a user interface. For instance, we know that there is a challenge for being able to bring together data sources about geographical domains. Data sets may use terms like boundaries, regions, postal codes or GPS latitude and longitude coordinates. In order for a person to be able to bring together, for instance hospital waiting times and police crime statistics for areas in the UK, each of which uses very different but overlapping boundaries, some mechanisms to identify these regions and then merge them need to be provided. Creating a solution to that problem is a SWUI contribution: it is an
enabling technology necessary for on demand, user-driven data integration. Some standard mechanism to demonstrate how the approach has been validated is also encouraged.

2) Novel interaction: A SWUI paper that develops a novel approach for interaction most often needs some form of credible user assessment. For instance, if one claims that their interaction is novel and enables people to carry out a new process, then evidence that people can carry out the process is usually necessary for that case to be made.

3) User-motivated systems or models: In any case, we would not want to hamstring the presentation of a great new approach that expresses clearly innovative new ideas for lack of a usability assessment. Systems papers that demonstrate back end to front end efforts are often hardest hit by these kinds of issues: the system has taken so much energy to develop to solve a particular problem that asking for the paper to also feature an evaluation seems overly taxing. In these cases, we suggest the usual research requirements apply to demonstrate novelty and contribution. Likewise, we encourage researchers to ground their innovation up front within at least a well-defined, validated user-oriented scenario. On other words, what problem is the system addressing for a citizen, and what research challenges are being addressed in the system to solve this issue?

Since the call for journal papers in this theme went out in 2009, open data and linked data have become increasingly common terms. There are interesting visualizations of some linked data sources associated with data.gov and data.gov.uk. There are data-oriented visualization tools like Microsoft’s Pivot and Seed’s Vizualising.org

And yet what we still see is largely Web 2.0 style mashups: the visualizations are largely hand crafted, and do not permit for citizens to add new data sources to them or to change the queries. One still needs to be a programmer to interact with integrating heterogeneous data sources.

We suggest that there is an increasing and profound need to focus on Citizen rather than Programmer requirements to make “raw data now” accessible, discoverable, usable, and queryable. From our own work, we know that the challenge of simply integrating two related but heterogeneous data sources is non-trivial. The data is messy and the field labels can be intractable. We need tools to make it easier for people to produce cleaner data for humans to read and machines to use. When we focus on the citizen who might want to access data sources to build up new knowledge, we can get a headache with how demanding the requirements are to create such tools. These challenges are also the gift of this new research area.

Guest editing for this theme in the journal has been another rewarding step in this endeavor. We thank all authors who submitted papers under this theme, for their effort, and for showing how others approach this topic. Special gratitude goes to the reviewers for these submissions, who exchanged insights into what is important and desired in this area. We look forward to more papers in this space coming into JWS and the field in general.

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