

WILL IT READ MY MIND AND COOK ME BREAKFAST?

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PREAMBLE

'What will the semantic web look like in 10 years from now' is an important question, prompting a longer term focus and helping to stretch the SW vision beyond the length of the average funding cycle.

What the SW will look like in 10 years from now depends very much on the choices currently being made, so the ideas sketched out in this abstract are based on the assumption that short-term gains and technocratic stunts will not be the sole drivers for SW research and development in the future, but that a more balanced set of stakeholders with diverse expectations will contribute to shape it.

SCOPE AND MOTIVATION

The web has changed the world for the better in a very short time. Early SW ideas and visions which as of today have not yet materialised, in this paper are projected into the not so distant future of 2022. Although web science and SW developments have been intended to be inclusive and 'for everyone' from inception, due to the nature of the research 'establishment' and funding, SW developments have been almost exclusively dominated by computer science academics, whose main interest is not necessarily to advance human progress. The opportunity to sit back, close eyes and dream realistically about the future of the SW from the 'other walks of life' perspective is welcome and one that should not be missed. A page worth writing, should be fun. Some of the ideas presented are tongue in cheek, and some other probably just wishful thinking, but that's what visions are for, to prompt and guide the flow of creative juices.

SW 2022, A VISION

1. The SW will be first and foremost online. Downloading dumps of static datasets to query meaningfully semantic data, will be frowned upon, and may even become illegal in 20 years or so.
2. The SW will consist of a rich set of architectural layers (not unlikely the semantic web stack today, but more evolved). Data, information and knowledge aligned, optimized and used in combination, will support human 'enlightenment' intended as the firing up of all the neurons (Gallagher 1997, Meulders 2010), and the reaching of the state of climax of human intelligence. It will also be possible to navigate each layer of the stack independently by single or aggregate agents, configured to carry out narrow, finite tasks.

3. SW applications will provide data validation and possibly fact-checking capabilities, and semantic data will be called as such only when validated against at least some minimal parameters. The notion of **semantic validity** will be better understood, and rely on multiple parameters, for example not just syntactic validity, but also extended logical validity and possibly more. Ideally, SW applications integrated with dynamic knowledge bases, will be capable of advanced intelligent functions, and will be capable of checking internal and external validity of propositions and assertions.

4. All major browsers will support by default the visualisation of SW datasets, and search engines will support the querying and navigation of SW data. (What methods are required to achieve that is beyond the scope of this position paper, but we know for a fact that something may already be in the works).

5. A new paradigm will have emerged from the convergence of natural language and structured data, close to the notion of structured language (Chelba) perhaps. Content management applications will support user adoption of knowledge schemas and structures.

6. In addition to infrastructural semantic web capabilities that may run at the back of the web, SW applications will be developed with a variety of uses and users in mind and SW scripts and algorithms wrapped in applications will have intuitive interfaces to enable their use by a variety of agents, some of which will be discerning and hopefully responsible humans.

7. The SW will develop around interoperable standards, so in addition to RDF and OWL and SPARQL, semantic capabilities will be achieved using diverse protocols, languages and representation mechanisms without anyone feeling offended. This is already happening in part via schema.org and JSON, but somewhat still behind the scenes. The diversity of SW languages and standards will be a point of pride for anyone promoting it and embracing it, in whole or any of its parts.

8. Existing SW standards will evolve to become leaner, more agile and new SW standards will be developed taking into account software and systems engineering good practices. Technical and mathematical elegance will be complemented and balanced by usefulness and socio-technical beauty.

9. Educational SW applications will augment human intelligence by extracting knowledge automatically from specialised corpora and presenting it into schematized, modular usable knowledge chunks, in support of learning and reuse. The SW will automatically detect the requirements for new applications and application domains, and will support socially innovative and useful practices and applications.

10. When browsing the web using SW applications, content will be enriched by hyperlinks to its etymology, translations in various languages, using different terms of references such as thesauri and encyclopedias, so that everyone using a word in any narrow sense of their choice, will also be aware that the same word can have meanings across a wide spectrum of domains. The SW will enable annotation to enrich the enriched resources, maybe iteratively until perfect knowledge (if any such thing exists) could be aimed for, and cognitive boundaries dissolved.

11. SW applications will facilitate the meshing and mixing of new knowledge by automatically supporting the convergence of different knowledge paradigms domains. The

Knowledge Layer, aka the knowledge level (Newell), will develop to be a cyber-cognitive super architecture, supporting the evolution of an extended brain, or global brain (Russell 1982, Heylighen Bollen 1996). It will also support the interaction of a Physical Layer, formed by sensor enabled physical (and non physical) ICT devices.

12. The SW will serve as an open, intelligent and responsive middleware for global consciousness to emerge, possibly able to synergetically respond to users and agents inputs more than today

13. The SW will be the dynamic, pervasive substrate for networks of things and people (Di Maio), where read-write sensor enabled plug and play devices will interface with the open web providing full sensorial remote interaction, where desired, and that will function as a pervasive, ever expanding, API for sensor enabled networks and their deployment and applications

14. Although priceless, it won't necessarily cost an eye and a leg to fund and maintain Sustainable and meaningful will be more fashionable than very costly, unfeasible and pointless.

15. The SW may well know 'everything' and maybe even read minds (Storm)

16. Not sure if the SW will eventually cook me breakfast, but hopefully a step closer to doing so.

LIMITATIONS

This short position paper seizes the opportunity to share openly and in broad terms a future vision for a semantic web designed to be widely understood, used and collectively shape. It does not discuss in detail the technical and scientific aspects of the vision proposed, nor the challenges and perils posed by the same. Hopefully the SW in ten years will be a lot more than what summarily envisioned here.

CONCLUSION

In the vision proposed in this paper, the SW ten years from now will exist in symbiosis with an open and distributed Artificial Intelligence (AI) layer, which will display general, distributed and adaptive features (Pennachin Goertzel). The realisation of such a vision is challenging, and not free from flaws and risks of all sorts. We may not know how things will happen exactly, but if there's a time for dreams and visions, it has always been 'now'.

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