Evolution of Semantic Web

Research, development and standardization

- Vision of Human focussed web to machine processable description of web content formulated by Tim Berners – Lee in 1996 and promoted by W3C
- Field of knowledge representation, Reasoning are core and developed using Logic based languages
- AI such as NLP and Information Retrieval is applied to acquire knowledge from web
- Semantic web community published many papers 79% academicia and 21% from industry after 2004

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- Languages that describe knowledge as standalone expert system are made as open distributed on web
- For interoperability of tools and services languages are standardized by W3C – exchange of knowledge in standard language
- Interoperability of tools necessitates mediation between various developer and user communities e.g. SPARQL

Technology Adoption

- Initially, semantic web envisioned as collaborative effort by the users of the Web
- Later found unrealistic as difficult to master for the average person contributing content to the Web
- Alternate view, Semantic Web as a “web of data” operated by data and service providers not by users
- Bootstrapping Problem- users of the Web never experience the Semantic Web directly- difficult to convey to stake holders
- Only gives long term gain for developers (when data and services need to reused and re-purposed)

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- Semantic Web suffers from e *fax-effect* *(initial* price of technological investment very high, for adoption need investment in learning)
- Also, ddopters should provide data in interoperable semantic formats
- Semantic Web more difficult due to additional cost factor – need less semantics to adopt
- But formal representation (e.g. if A is true, B should follow) captures smaller intended meaning and needs an external shared knowledge

Emergence of Social Web

- Passive attitude of Web 1.0 broken by Web 2.0
- Development of online social network serves as a platform for intense communication and social interaction
- First socialization of web are blogs, wikis and other web based communication, collaboration
- lower adding content to Web, not require knowledge of HTML
- Later, personal publishing expanded to densely interconnected social network

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- **Wikipedia** is a free online encyclopaedia that aims to allow anyone to edit any article and create them
- It enforces a sense of community for discussions over shared content
- Instant messaging (ICQ) the ability to see who is online rather posting info’
- First online social network Friendster
- Differs from web pages - central point access, structuring the process of personal information sharing and online socialization

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- Other social web sites:
- Flickr – is an image hosting and video hosting website and web services
- **Folksonomies** - collaborative annotation *to connect users to relevant content and other users interested in* similar things
- **Digg** - operates a website that enables its users to find, read, and share the most interesting and talked about stories on the internet
- del.icio.us - **social bookmarking site**. With it you can save, manage and share pages in a centralized source.
- 43Things - is a social networking site for people who have goals in their life and want to see those goals through

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- Web applications development evolved to give better user experience of interacting with the Web
- Rely on new ways of applying pre-existent technologies e.g. AJAX
- Easy to use format, protocols and languages – JSON, REST, aids rapid prototyping
- Small website expose data using light weight API, Content providers using RSS Feeds
- combinations of technologies called *mashups, websites based on combinations* of data and services provided by others

Web 2.0 + Semantic Web = Web 3.0?

- Web 2.0 based on how user interacts with web - Web3.0 aids web developers in combining data and services from different sources
- Web 2.0 - *users are willing to provide content as well as metadata, e.g. flickr, microformats (*way to publish and share information on **the web)**
- *Example of microformat:*
- <address> Gupta Promoters </address>
- By adding hCard to such existing semantic XHTML, you can explicitly indicate the name of the person, their URL, etc.
- <address class="vcard"> Tantek Çelik </address>

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- Semantic Web originally expected users annotating Web resources, describing their home pages and multimedia content
- Embedding RDF into HTML difficult for users to get expertise
- Extensive collaborations online applications have *access to significantly more metadata about the users*
- *Such metadata is used in matching similar interests*
- *Recommendation based on socio-semantic system outperforms* traditional network-based trust recommender systems