

# Evolution of Semantic Web

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# Research, development and standardization

- Human focussed web 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% academia and 21% from industry

# Contd...

- 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
- 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
- As users of the Web never experience the Semantic Web directly
- Gives long term gain for developers ( when data and services need to reused and re-purposed)

# Contd...

- Semantic Web suffers from the *fax-effect* (*initial* price of technological investment very high, for adoption need investment in learning)
- Adopters should provide data in interoperable semantic formats
- Semantic Web more difficult, is an additional cost factor
- Often a little semantics is enough to solve important tasks
- 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
- personal publishing expanded to densely interconnected social network

# Contd...

- **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

# Contd...

- 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



# Contd...

- 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> <a href="http://guptapromoters.com/">Gupta Promoters</a>  
</address>`
- By adding hCard to such existing semantic XHTML, you can explicitly indicate the name of the person, their URL, etc.
- `<address class="vcard"> <a class="fn url" href="http://tantek.com/">Tantek  
Çelik</a> </address>`

# Contd...

- 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*