

CONCEPT TO REALITY

What the emerging Semantic Web mean to your Business

Presented by: Kevin Tsang

*"Where is the Life we have lost in living?
Where is the wisdom we have lost in knowledge?
Where is the knowledge we have lost in information?"*
- T.S. Eliot

Introduction

- ◆ **Tim Berners-Lee**, the creator for the first web browser and web server, first described the Semantic Web in 1998
- ◆ The past eight years of Internet development:
 - ❖ Connecting computers into collaborative networks
 - ❖ Posting of various types of resources online
- ◆ A major problem:
 - ❖ Computers **cannot** look at a Web page, document, or file type and **understand its meaning**
- ◆ Solution from Semantic Web:
 - ❖ Computers can exchange, lookup, and agree upon the meaning of words

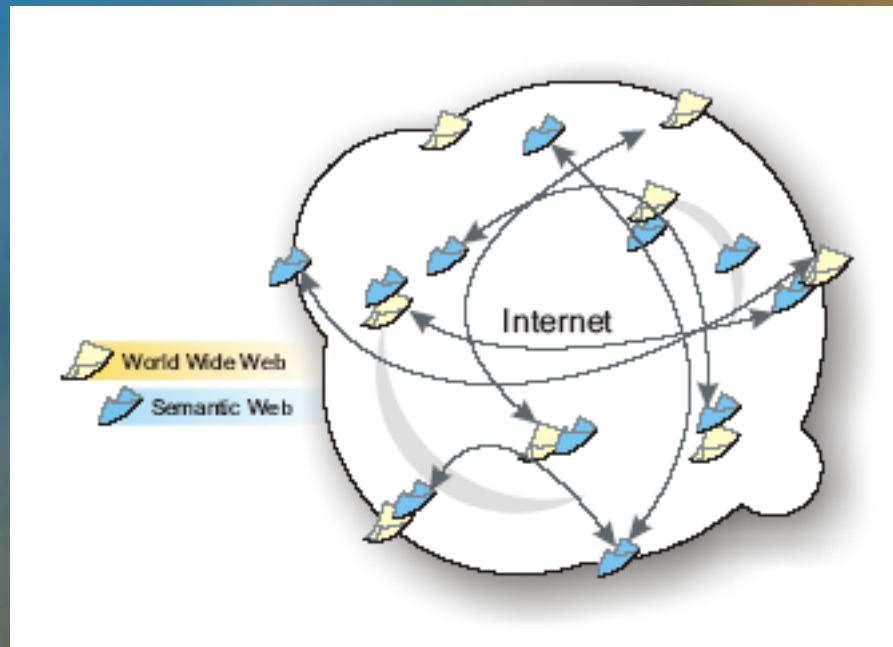
What is the Semantic Web?

- ◆ Semantic Web is **invisible** to average user...
- ◆ Semantic Web is a **collection of information about information** (collection of metadata)
- ◆ **Metadata** describe existing documents, Web pages, databases and even concepts on the Internet so that software applications can understanding what the content means
- ◆ Our brain also store metadata
- ◆ Sequence of neurons firing generates information about information to **describe a unique object or concept**
- ◆ Human are able to communicate because the **sharing of understanding** about a unique object or concept



What is the Semantic Web?

- ◆ Although semantic is invisible to average user, it is **not separate** from **existing World Wide Web**
- ◆ Semantic Web is an **extension** of the current Web and lives on the same hardware as Web pages or other “dynamic documents”

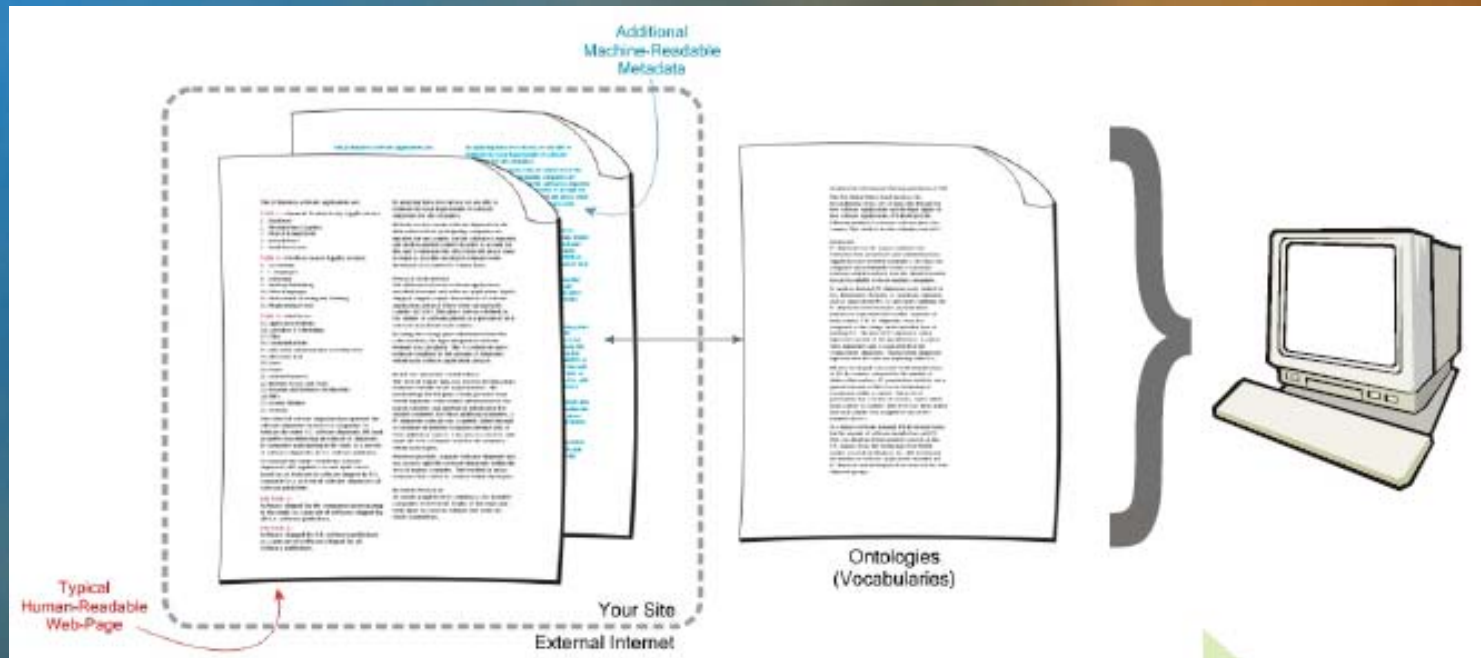


How Semantic Technology Works?

- ◆ Two distinct components to Semantic Web:
 - ❖ Effort to **link** existing content **to semantic “meaning”**
 - ❖ **Set of applications** that make use of this newly-created metadata
- ◆ **Resource Description Framework (RDF)** is a standard framework for describing information
- ◆ This framework allows developers to link the resources in their website, documents, and databases to **decentralized vocabularies** which define the meaning of those resources
- ◆ Decentralized vocabularies are the **heart of Semantic Web** and are referred to as **ontologies**

How Semantic Technology Works?

- ◆ In AI, Ontology is:
 - ❖ Specification of conceptualization
 - ❖ Provide a abstract, simplified view of the world
 - ❖ Specific restrictions on the meaning of a particular word or concept
- ◆ Ontology written in **Web Ontology Language (OWL)** can be distributed and extended by anyone else



How Will the Semantic Web Evolve?

- ◆ The Semantic Web, like Rome, will not be built in one day!
- ◆ Classic chicken and egg argument:
 - ❖ Without applications using semantics no one will build semantic content...
 - ❖ Without semantics content no one build applications...
- ◆ Same argument was made for the original World Wide Web!
- ◆ In local intranets, semantic content and applications can be built simultaneously and provide a **significant benefit to business**

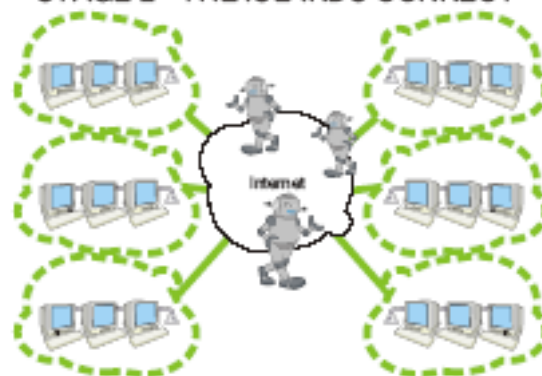
How Will the Semantic Web Evolve?

- ◆ **Stage 1: Semantic Islands** (currently)
 - ❖ Islands of semantic content and applications are developed within corporate intranets or across business partners (in B2B scenario)
- ◆ **Stage 2: The Islands Connect**
 - ❖ The number of islands will grow exponentially and have cross reference to each other
- ◆ **Stage 3: Artificial Intelligence** (distant)
 - ❖ Advances in artificial intelligence for the creation and use of massive collection of metadata to produce true intelligence

STAGE 1 - SEMANTIC ISLANDS



STAGE 2 - THE ISLANDS CONNECT



STAGE 3 - ARTIFICIAL INTELLIGENCE



● Area of Semantic Application Usage

What the Semantic Web can do for your business?

- ◆ Many business applications that would benefit from semantic technologies
- ◆ Any application that transmits data on the Internet would benefit in some way by incorporating semantics
- ◆ First set of applications: **applying meaning to documents and data**
- ◆ Knowledge Management System
 - ❖ Currently rely on statistical analysis of words or links within documents
 - ❖ Incorporating semantic can increase revenue by providing **fast and accurate search research**
 - ❖ It can **decrease effort and expense** at time of **categorizing documents**, with data relationships pre-defined, only link into the “web of meaning” at one location

What the Semantic Web can do for your business?

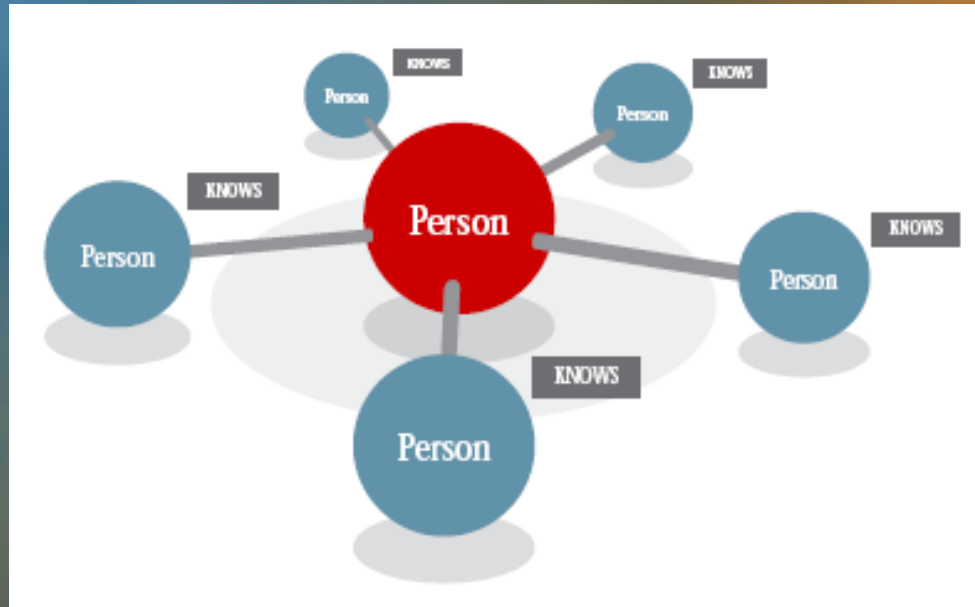
- ◆ Second set of applications: **storage and exchange of data**
- ◆ As number of devices and data formats increase, interoperability solution must be found
- ◆ **Proprietary solution** is used to store data
 - ❖ one-to-one conversion software must be built between different applications or devices
 - ❖ Number of different devices wishing to communicate increases, number of **conversion programs grows exponentially**
 - ❖ XML data storage and database are proprietary solution
- ◆ **Semantic Web** offers a solution by allowing developers to define data storage formats by linking them to decentralized vocabularies (Web Ontologies) so that data can be queried globally

SOCIAL NETWORKING

Utilizing the Intelligent Internet

Presented by: Kevin Tsang

“It’s not what you know, but who you know.”

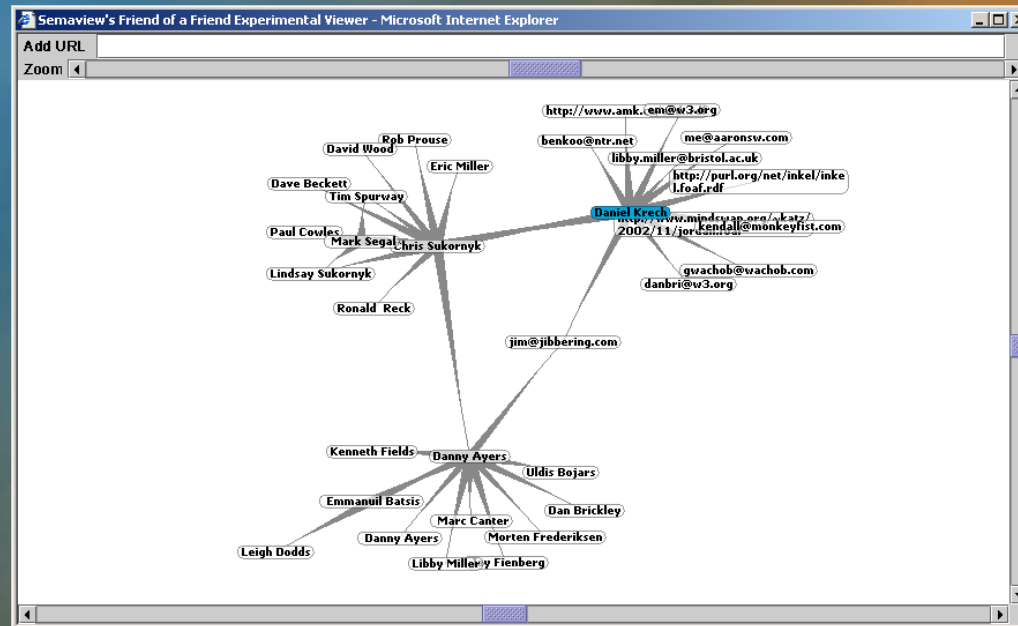


Overview

- ◆ With the advent of the Internet and other communication technologies, **social networks** have **expanded** and **fundamentally changed**.
- ◆ In information age, access to labor and information is the key to success
- ◆ Emerging **Semantic Web** can be used to facilitate the **inspection** and **utilization** of **existing social networks**
- ◆ Applications of the technology include employee management, sales networking, customer relationship management (CRM) and more!

Overview

- ◆ Semaview's Friend of a Friend (FOAF) Browser is a graphical representation of **six degrees of separation**
- ◆ It is a java applet that harvests posted FOAF documents and allows the visualization of the existing social connections
- ◆ It uses decentralized machine understandable data



How is this made possible?

- ◆ Friend of a Friend (FOAF) Browser uses **machine understandable documents** that have been uploaded to different web servers around the world
- ◆ These documents are called FOAF files
- ◆ **FOAF files** is written using the Resource Description Framework (RDF), not simple HTML
- ◆ Anyone can create a FOAF file and include any number of details within the document
- ◆ FOAF document adheres to well defined structures, called Schemas (Ontologies)
- ◆ A starting point (FOAF file) must be provided from which the user can branch out and explore connections

What does a machine understandable file look like?

- ◆ FOAF file define the **details of a person**
- ◆ It is represented as an XML document, which utilizes the Resource Description Framework (RDF)

LET'S LOOK AT A SEGMENT OF A FOAF FILE:

```
<foaf:Person>
  <foaf:name>Chris Sukornyk</foaf:name>
  <foaf:firstName>Chris</foaf:firstName>
  <foaf:surname>Sukornyk</foaf:surname>
  <foaf:knows>
    <foaf:Person>
      <foaf:name>Paul Cowles</foaf:name>
      <rdfs:seeAlso rdf:resource="http://www.semaview.com
        /foaf/paul.rdf"/>
    </foaf:Person>
  </foaf:knows>
</foaf:Person>
```

ⓧ Indicates line break

The Value: Potential Business Applications?

- ◆ Employees within organizations are constantly using **invisible social networks**
- ◆ By traverse visible social networks, employees can better understand who their co-workers know, and perhaps who they should know
- ◆ **ECADEMY** – excellent **case study** for social networking with FOAF
 - ❖ It build the **world's premier trusted network**, connecting business people to share knowledge, contacts and transactions
 - ❖ It has developed a range of **Network Relationship Management (NRM) solutions** for individuals, corporates, brands and localities

References

- ◆ This presentation based on the articles published from Semaview Inc. (A company based on Semantic Web Technologies)
- ◆ From Concept to Reality: What the emerging Semantic Web means to your business
http://www.semaview.com/resources/whitepaper_concepttoreality.html
- ◆ Social Networking utilizing the Intelligent Internet
http://www.semaview.com/resources/whitepaper_socialnetworking.html
- ◆ The Semantic Web Explained
http://www.semaview.com/resources/ataglance_semanticweb.html
- ◆ My Social Network at AMD Lab
<http://kevintsang.homeip.net/socialNet/>