

WEB TECHNOLOGY KNOWLEDGE MANAGEMENT AND ITS PRIVACY AND SECURITY CHALLENGE

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Abstract- Web 2.0 covers a whole range of technology that can enable social networking and other activities across the developed nations and enable effective communication among the user group. The Web 2.0 is adopted by organizations in developed countries to enable IT functions, managing public relationship and human resource to enable interpersonal communication. The future framework around semantic technology and applying effective SOA will define the secure direction of social networking enabled through Web 3.0. The cloud computing evolution will help improve the knowledge management and able to handle big data for these social media platforms. The proposed Web framework will enable multiple content sources, integrate various applications, combine social networking content under highly secure environment and will turn Web 2.0 into a participatory web and making sharing of information and data secure under open source environment. It can provide a complete virtual architecture and will create a global delivery platform for the developed countries. The future framework around semantic technology and applying effective SOA will define the secure direction of social networking enabled through Web 3.0. The cloud computing evolution will help improve the knowledge management and able to handle big data for these social media platforms.

Keywords- Web 2.0, Web 3.0. Knowledge Management, Web Technology, Social Network

I. INTRODUCTION

The evolution of web-technology has emerged the wide spread usage of Web 2.0 systems across organizations in developed countries.

The Web 2.0 has provided exceptional set of transformational benefit and helped rise of social networking platform that lead to challenges with privacy and security.

The report primary objective is to propose future model to include that how web 2.0 can be made more secure for social media platforms and what role researchers can play during the evolution. The future roadmap to be around growth of semantic technology and cloud computing evolution to create a path of next level web development for developed countries.

The research proposal is intend to cover roadmap of research and development around comparing research gap of web technology in social media and also evaluating the future perspective of the service around web 2.0 and 3.0. The gaps will be identified from cross-domain area and also to assemble research facts to seek evolution of web 2.0 and 3.0 and different approach and view adopted by the researchers.

1.1. Web 2.0 Adoption

The developed countries swiftly adopted Web 2.0 since 2009 and that enabled productivity for them. The web 2.0 acted like a platform that enabled organizations to add new dimensions to manage their business through online sources. The recent development of social media platforms like Facebook, Twitter, and Myspace has added dimensions to way users interact.

Tabel 1.1 Web 2.0 Technology

Web 2.0 Technology	Details	Applicability
Data Sharing or Wiki Updates	Method of content sharing across geographies and enable participation	Across Geo Collaboration
Podcasts, Blogs and video casts	Individual communication method	Broader communication
Social Networking – Facebook, Twitter and other sources	Leveraging web 2.0 to establish connect with mass media	Social enabled communication
RSS tagging and tracking	Prioritizing important information	Creating Metadata

1.2. Privacy and Security Challenges

The major privacy and security challenges posed by use of Web 2.0 technology. The specific security challenges to Web 2.0 were primary due to challenges with adoption and integration. The Web 2.0 was able to mitigate few of the given threats due to adopting of following characteristics:

1. Moving away from traditional web filtering.
2. Using new protocol like AJAX, SAML and XML for detecting problems.
3. Using rich internet application and RSS feed.
4. Higher bandwidth to avoid any such threats.
5. More user generated content.

II. RESEARCH GAP ANALYSIS

2.1. Definition of Web 2.0 and Social Media

1. The Web 2.0 was defined and its relevance from social media perspective was defined by the researcher while its various technologies were also covered as part of research. The adoption of Web 2.0 by the organizations was primary done so as to manage its various functions.
2. The Web 2.0 has been defined from global perspective and its acceptance level in various developed countries. The social media sites like Facebook, LinkedIn, Ning are used or personalized learnings and its features to enable learning across countries.
3. The Web 2.0 has incorporated various new means of enabling communication like tagging, mashups, Wikis and all enabled through social media sites. The Web 2.0 has now evolved as read-write web and enabled range of activity including communication, data sharing, video sharing, live chats and enabling collective intelligence.
4. Web 2.0 has enabled virtual communities through social media platforms. These virtual communities now act as target customer for various e-commerce business sites.
5. The survey conducted by Prospero Technologies in 2007 reveal that more than sixty percent respondents feel that Web 2.0 has enabled social media performance and further created a market place for developed countries to target e-customers.

2.2. Scope Covered From Study Stand Point

1. There were identified gaps in the scope of the research while the analysis was purely based on survey done by Gartner and primarily evolved only around adoption of social media network and benefits to different type of network.
2. The scope and study of Web 2.0 well evaluated through using various literature and other research work done by scholars. The analysis was done around various social media and other platforms to enable user connectivity and collaboration.
3. The Web 2.0 evolution has also been significant due to technology advancement of devices like smart phones, iPads, iPhone, PDAs and android enables mobile phone devices to use internet while on the go and ease of use for various users.
4. The Web 2.0 has evolved more towards social interact than just providing information technology. The social networking sites are based on HTML web programming language to enable global connectivity.
5. There are three important dimensions of Web 2.0 and all directly or indirectly are related with social media platforms to enable conversation and participation through various applications and enabled technologies.

2.3. Privacy and Security Issues With Mitigations

1. Moving away from traditional web filtering, Using new protocol like AJAX, SAML and XML for detecting problems, Using rich internet application and RSS feed and Higher bandwidth to avoid any such threats.
2. The security and privacy was not covered much however another important aspect of Web 2.0 acceptance was evaluated through survey done and analyzed as descriptive statistics to identify usage pattern of Web 2.0 applications across major developed countries.
3. The 87% of survey users have concern with using social networking site while primarily concerns are around security and privacy issues. Wiki hosting can be done using open source software therefore making privacy a major concern since there is user information which can be edited by third party without taking consent of the related party.
4. The major privacy and security challenges need to be addressed from managing user account on social media while interactions with e-commerce. The major crime type for 2011 holds significant amount of cases of over payment fraud, non-delivery of merchandise and are related with e-commerce.
5. The major privacy and security challenges due to evolution of Web 2.0 and social network is in developed countries like US, China, Germany, Britain (total account to 43%). The more cyber-crime in these countries is due to high level of exposed services towards usage of Web 2.0.

2.4. Proposed Roadmap

1. The research work provides good in-sight to the best practices which can be incorporated to develop future road map. The major guideline includes policy creation, enforcement and alignment with operations.
2. There has been positive trend towards usage of social media therefore the broadband speed can play a significant role in further evolution of social media especially in the developed countries. There has been cultural acceptance of social media across developed countries therefore it is important to ensure that it provide ample secure environment and manage privacy of individual so as to further spread its usage.
3. Web 2.0 can be further used for managing educational activities like classroom training through virtual mode, video conferencing and enabling global classrooms.
4. Virtual integration between social networking and verified e-commerce platform for managing individual privacy and data, All necessary disclaimers to be made before enabling e-commerce marketing through social media network.

5. Using passive methods to collect data around Web 2.0 vulnerabilities and to propose various uses of intelligent tools, preading more user awareness around effectively use of social media to manage individual privacy and security against key threats.

III. FUTURE MODEL FOR WEB TECHNOLOGY

3.1 Future Model Methodology

The roadmap for web 2.0 to be created followed through following three step processes:

1. Identify needs and propose applicable solution: The first critical steps to identify the needs (this has been done through the gap analysis) and to provide applicable solution to design the future model (covering architecture of both services and software).
2. Identify and apply potential technologies and applications: Once solutions are identified then potential technology and applications are applied around semantic web solutions.
3. Evaluation and customization: the future model to be evaluated during various phases so that it can be further customized to meet the requirement and to fill the identified gaps.

3.2 Components of Future Model

The various critical components of future model for Web 2.0 to include:

1. Composite Content Networking: the content networking to enable location specific access to independent objectives so that it can establish complete chain of interaction and able to provide much more secure environment for content sharing and management.
2. Metadata access: enable representation of various types of content through social media platforms and able to establish connection between different media objectives so that data storage can be moved to internet "cloud" and can provide more data security and privacy of individual files.
3. Transformation: future Web 2.0 can enable transformation through social media platform so that it can manage individual content exposure, aggregation and able to manage sensitive financial, personal other content of individual users.
4. Message or data delivery infrastructure: The data or information can be encrypted and decrypted across platforms so that message delivery structure can be duly made secure to manage data privacy and security.

3.2.1 Secure Environment for Future Model

The future model to be made duly secure through taking following set of steps or proposed controls:

1. Setting up identity process to manage privacy and trust: setting up identity management on basis of URI / URL so as to manage resource as per their respective global location. Set up object identification process to identify authentic user profile. Adopting technologies like Microsoft CardSpace, OpenID or OAuth to establish authentication process. Using biometrics identification on new generation device or smart systems so that activities through Web 2.0 can be protected.
2. Establishing trusted network: designing 'human capital' interaction framework for social media platforms used through Web 2.0 so that only trusted sources or network can have the ability to establish authentic connection. This trusted environment can be built through public key infrastructure, XML digital signature or using secure mark-up language.
3. Web 2.0 services and applications: the internet services through Web 2.0 can provide next level high speed services in developed countries through "horizontal services" so as to establish service authentication and integration with various applications and platforms.

The above delivery platform for Web 2.0 enable web based services for managing social media network. The future internet to be based on trust, identity management, reliability and scalability:

1. Cloud Computing: it can help manage the scalability for the Web 2.0 especially in the developed countries. Web 2.0 can expand its services to social media platform through GSDP (Global service Delivery Platform). GSDP can provide QoS enabled secure integration platform to provide simulation and testing for the social media platforms.
2. Future governance: future governance can be introduced as per specific guidelines ICANN (Internet Corporation for assigned names and numbers). The Web 2.0 governance can be set around assigning secure IP address and domain names and to set up environment of self-governance.
3. Social-economic environment: enabling network of social economic environment so as to make future Web 2.0 more securely accessible. This can be done through effective collaboration between policy makers and technology experts.

3.3 SOA –State of Art

The proposed framework to incorporate enterprise SOA (State of Art) using classical model of SOAP-WSDL-UDDI triangle so as to meet enterprise need and able to generate large scale uptake to meet need

of developed countries. The semantic service specification will simplify annotations like OWL-S and WSMO so that it can introduce higher benefits in terms of mediation, service discovery, execution and composition.

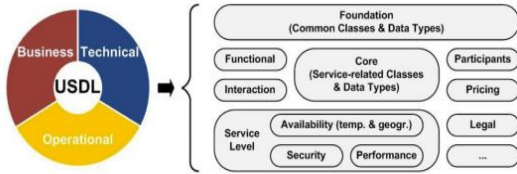


Figure 3.1 Incorporate Enterprise SOA Framework (vermesan, 2013)

The SOA to integrate using USDL through following models:

1. Open service delivery Platform: services to be evolved using semantically enabled dynamic process and offering enterprise services through open delivery platforms. The Web 2.0 SDF (Service delivery framework) to manage security and privacy beyond “firewalls” and to support re-design at global scale for developed countries.
2. Description language: To make Web 2.0 more secure, the service description language need to move away from generic to towards semantics or syntactic using USDL (unified service description language) to providing unified solution to the technical requirement.
3. Intellectual rights management: setting up intellectual rights management for various network infrastructures. The collaborative model to support data access policy and manage user’s individual privacy and data security.
4. Service Management Model: Applying service model to enable centralized services, distributed network and federated framework to manage legal requirement for data security and meeting individual privacy needs.
5. Introducing agile business process: The SOA model to incorporate flexible and agile business process to quick react with necessary changes and manage interoperability.

3.4 Deploying Semantic Web

The future model of Web 2.0 needs deployment of Semantic data (web of linked data) to enable future digital world. The approach will be to adopt linked service approach so that annotations can be easily achieved and reference vocabularies can be generated.

The state of art applied principles in the semantic deployment will be to. URI will be used to name the references, HTTP URIs is used so that user can reference the given names, Using standards like SPARQL or RDF so as to retrieve useful information through these URIs and Linking between URIs to establish connect and to discover important information.

The development would be around using an open and novel platform to annotate using platform known as iServe. This would be a simple Web 3.0 conceptual model to suit both machine and human consumption.

iServer will enable following semantic service:

1. Annotation of importing services to cover both WSDL and Web APIs.
2. Auto assign of published semantic means to resolve HTTP URI.
3. Able to manage negotiation of content for direct machine consumption through HTML or RDF.
4. Provide function to read / write REST API and to generate automatic links.
5. Creating Semantic web to link extensible and relations among library, image, document, person and place.
6. Generate auto links between original service description and published annotation.



Figure 3.2 Semantic Journey Through Web 3.0

3.5 Data mining and Cloud Computing – Knowledge Management

The future model for data mining which act as critical source for various social media platforms like Twitter, Google+, Facebook and LinkedIn store their data through various applications on cloud computing so as to manage and retain knowledge.

The cloud can enable acquisition of big data and enable software processing strategies. The future model will enable almost 90% of data to be stored on cloud computing and will be further used to develop a knowledge management framework. The cloud computing for data mining will bring the cost down for storing huge data and will enable hardware “pay as go” option. The future model solutions like Google Big Query can provide large scale solution to the big data requirement saving on cloud based platforms.

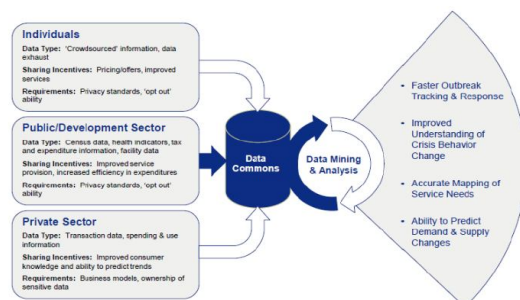


Figure 3.3 Data Mining and Analysis Framework

3.5.1 Cloud Computing KM services

The Cloud computing can enable software application for data mining through multi-layered infrastructure to help manage Knowledge management.

It includes:

1. SaaS (software as in service): cloud computing can help hosting of applications and enable web browsing through SaaS functionality to enable data retrieval used for learning at any given point of time.
2. PaaS (platform as a service): cloud computing enable various software platforms for the systems and software so that it can be easily integrated with any KM portal.
3. IaaS (Infrastructure as a service): cloud computing can enable virtual computing for managing storage and capability so that customer can deploy its own applications to develop a path for knowledge management.

Cloud computing has enabled big data storage and processing and also facilitated centralized control and provide great flexibility of ownership. The cloud computing can further develop open source algorithm based solutions to provide a comprehensive service oriented architecture.

Cloud computing will help manage or retrieve large data through web access. The future evolution or framework of cloud computing will be developed around KM applications like Google MapReduce, Hadoop, Twister and spark so as to provide highly integrated data warehouse facility to the community, local expert group and to virtual teams.

IV. SEMANTIC WEB

The future model around semantic web need to provide balance between data produces in respect to consumption of RDF data. The clustering test will be required to check three different RDF data sets. The CBD (concise bounded description) is an improvement used to achieve particular types of nodes through applying recursive algorithm for extracting.

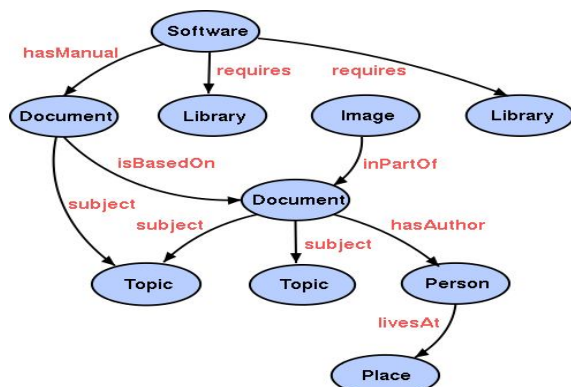


Figure 4.1 Semantic Web Network

4.1 Semantic Query Algorithm

Semantic query is enabled through OWL-S Query so as to take user input and define output.

The degree of match is defined between Semantic input and output so that future framework can work in accordanceSubClass and enable effective matchmaking. The Query Q can work on concrete XML message to retain plugin and subsumes.

4.2 Proposed Algorithm

The proposed algorithm for future models so as to enable bipartite graphs and matching so as to improve semantic performance through enable partition into two disjoint set through simplified algorithms.

1. Bipartite Graph: is a graph $G = (V, E)$ through which partition of vertex set can be done into two disjoint sets.
2. Matching: match the bipartite graph and do matching of vertex V.

The Modelling of semantic matchmaking to enable web can be done through defining various matching criteria bipartite graph and to further match query with output. The numerical weight is assigned to every edge $e = (a,b)$.

The Hungarian algorithm can help compute the optimal matching and to provide efficient solution to complex brute-force algorithm. Lemma technique can help manage the edge weight for computing the future model for web.

The implementation of algorithm can be done through Java to compare performance.

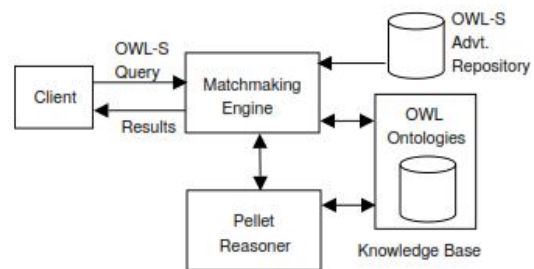


Figure 4.2 Algorithm Flow

V. DEPLOY FUTURE MODEL RECOMMENDATION

The Web 2.0 framework to evolve around defined set of principles so that semantic technology can be enabled as future model:

1. Decentralization to spread the risk all across.
2. Participation through input > mechanism > emergent output concept.
3. Setting up standards across social media network.
4. Enabling technologies through collaborative filtering.

5. Structuring of tools and syndication of RSS feed.
6. Enable modularity and manage user controls.

These set of recommendation can enable framework to be highly secure, can be managed through user driven content, enable privacy and usability for meaningful social community. The knowledge management of critical data of social networking site can be managed under virtual environment of cloud computing.

CONCLUSION

The Web 2.0 needs evolution so that it can meet the requirement of the developed countries and provide a complete new secure environment. It can introduce complete new level of standards, decentralized activities, openness and user control social networking.

The growing challenges with security and privacy were not completely addressed in previous research and therefore the need for new proposed framework was identified on basis of the given gaps.

The new framework will enable multiple content sources, integrate various applications, combine social networking content under highly secure environment and will turn Web 2.0 into a participatory web and making sharing of information and data secure under open source environment.

It can provide a complete virtual architecture and will create a global delivery platform for the developed countries. The future framework around semantic technology and applying effective SOA will define the secure direction of social networking enabled through Web 3.0.

The cloud computing evolution will help improve the knowledge management and able to handle big data for these social media platforms.

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