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DEFINING BASIC COMPONENTS OF WEB 3.0 APPLICATIONS

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Web 3.0 is a term proposed by John Markoff [3, 5] in which the idea of World Wide Web under present interpretation of Web 3.0 becomes more than a mere platform according to him. Although earlier versions of World Wide Web applications were performing as platforms but in time their capacity to federalize and decentralizing the powers has changed substantially. Nowadays a Web 3.0 application is set to control web operations through platforms which it owns.

Web 3.0 is characterized by the following features [1, 7, 9]:

- Enhanced connectivity involving transformation of the web encouraging participatory element among the online users;
- Conjoining various soloed applications translating it into an interoperable whole;
- Mobility supporting devices;
- Intensifying of sharing on the network, bespoke solutions by software-as-a-service business models, Web application services interoperability, distributed, grid and cloud computing;
- Open APIs and protocols, participatory data formats, open-source software platforms and open data;
- Semantic Web technologies characterized by RDF, OWL, SWRL, SPARQL, GRDDL, semantic application platforms, and statement-based data stores;
- Intelligent web applications, machine reasoning and autonomous agents.

Web 3.0 is an evolution of the social networking on the Web. The defining aspects of the Web 3.0 social experience may be as follows [1, 8]:

- Information comes to the user based on tags and search criteria;
- Information comes in packets of discrete units since there are no pages. The packets or units are merged into one entity;
- There are no Web sites. They act as indexes to the information, which is accessible via XML request;
- Creating information will be like writing an email or writing a document.

Web 3.0 relies on following basic foundations [2, 7, 9]:

- **Smart Internetworking** - Web-connected computers will be able to carry out complex tasks by communicating with other machines, reading and understanding their information, and sending filtered, useful information to users. Mechanical intelligence is the word which can be used for the term, network computing. It make web 3.0 falls into the category of semantic web concept. Feeding with certain mechanical laws, a web 3.0 application is reasoning software.

- **Seamless applications** - With so many layers of underlying data, communication will be imperative between Web 3.0 applications. As a continuation of current "open source" programs, all Web 3.0 applications will be able to exchange information, and provide a single point of reference for a large number of information sources.

- **Intelligent applications** - Web 3.0 is used to describe an evolutionary path for the Web that brings out results in a quasi-human fashion. Making predictions from mining information on web sites is one of the features which characterize web 3.0.

- **Distributed databases** -Web 3.0 will require a lot of storage space for extensive amounts of semantic data. In theory, this task will be handled by the World Wide Database, located on the hard drive of every computer connected to the Internet. In other words, all Internet users, to their mutual benefit, will share the information needed to run Web 3.0. Web 3.0 operates on the platform involving the maintenance of structured data records. They are published to be reused and open to remote manipulation. It is supported by XML, RDF, Website Parse Template and micro-formats. The recent trends show the growth of SPARQL technology. The technology provides a standardized query language. The API searches across distributed RDF databases on the Web. The Data Web enables an altogether different level of data integration and application interoperability which makes the data openly accessible and linkable as Web pages to the viewers. The Data Web is considered to be the first step towards the Semantic Web. Using RDF, the Data Web makes the structured data available.

The topology of Web 3.0 could be divided into following layers [6, 7, 9]:

- **API services** form the foundation layer. These are the raw hosted services that have powered Web 2.0 and will become the engines of Web 3.0 — Google’s and Amazon’s APIs, a vast set of miscellaneous RSS feeds, a multitude of functional services,.

- **Aggregation services** form the middle layer. These are the intermediaries that take some of the hassle out of locating all those raw API services by bundling them together in useful ways.

- **Application services** form the top layer, and this is where I believe the biggest, most durable profits will be found. These will not be like the established application categories, such as CRM, ERP or office, but a new class of composite applications that bring together functionality from multiple services to help users achieve their objectives in a flexible, intuitive and self-evident way.

- **Serviced clients** that represent users who will be maintained and managed on their behalf and who are supposed to be based on separate browser technologies

The most important Web 3.0 technologies are expected to fall in the following categories [4, 9]:

- **Web applications** – the use of web-based applications and services exploiting the web in this way is sometimes termed ‘cloud computing’ where all that is really needed for many activities is a computer with a web browser with local software applications used less widely;

- **Syndication** - increased incorporation of syndicated content and services from other sites or a network into a site;

- **Streamed video or IPTV** - increased use of streamed video from existing TV providers and user-generated content;

- **Virtual Worlds** - increased use of immersive virtual environments such as Second Life.

- **Personal data integration** - increased exchange of data between social networks fulfilling different needs;

- **The Semantic web** - increased use of semantic markup leading to the semantic web - it seems semantic markup will be needed to develop artificial intelligence applications which recommend content and services to web users without them actively having to seek them and apply their own rules as to the best products and brands. Main applications will be specialized sub-engines for search; social networks; online searchable, taggable and ordered by relevance

presence through voting and algorithms, increased micro blogging and more powerful widgets, increased integration between devices like cell phones and the web.

The Web 3.0 components that make it semantic in nature are as follows [1, 3, 8]:

- **XML** - Extensible Markup Language. As Web 3.0 is considered to be an intelligent web, its marking of information in proper sequence is supported by XML. The reason behind its naming as an extensible language is its users' ability to define their own elements. One of the primary functions of this web application protocol is its capacity to facilitate the sharing of structured data across different information systems, particularly via the Internet. The ultimate purpose of this activity is to encode documents and to serialize data in the defined manner by the user. The initial stages of XML were characterized by a simplified subset comprised of the Standard SGML (Generalized Markup Language). Later it can be added with semantic constraints and application languages that can be implemented in XML. It would thus translate into XHTML, RSS, MathML, GraphML, Scalable Vector Graphics, MusicXML, and thousands of others. XML is recommended by the World Wide Web Consortium (W3C) & is a fee-free open standard.

- **RDF** - Resource Description Framework (RDF) is a family of The World Wide Web Consortium. The initial stages of RDF took metadata data model into consideration as one of the specifications. Its evolution has resulted in using RDF as a general method of modeling information through a variety of syntax formats. The sole purpose of RDF is to encode the data by reading its source sequentially as coded by the user preventing human time and resources. The RDF metadata model is based upon the idea of making statements. The coding in RDF is conducted on a model called triples. Subject denoting the resource, and the predicate denoting traits or aspects of the resource. It is followed by establishing a relationship between the subject and the object.

- **OWL** - Web Ontology Language. It is a part of the family of knowledge representation languages for authoring ontologies, endorsed by the World Wide Web Consortium. This family of languages is based on two semantics: OWL DL and OWL Lite. OWL ontologies are used in serializing the content using RDF/XML syntax. OWL is considered one of the fundamental technologies underpinning the Semantic Web, and has attracted both academic and commercial interest.

- **SPARQL** - An official W3C recommendation, SPARQL is an RDF query language. Basically the application stands for SPARQL Protocol and RDF Query Language. The query entertained by SPARQL allows it to break into triple patterns, conjunctions, disjunctions, and optional patterns.

- **Micro-format** - Re-using existing XHTML and HTML tags to convey metadata and other related attributes makes a web approach named as micro-format. The general purpose is to enhance the speed and categorization of information to the end users usually in the form of contact information, geographic coordinates, calendar events, etc.

The classic Web 3.0 interface requires four essential application types [7, 9]:

- An application to configure your feeds using live examples. Saved searches should provide for previous results first. Results are otherwise ordered by interests. This application replaces existing search tools.

- An application to view feeds or search results, including anything tagged. This application replaces all current viewing applications, such as email, Web browser, and so on.

- One or more applications to write, edit pictures or documents, create spreadsheets, and so on. Some tags and permission are assigned automatically or by default. These applications are like today's word processing (including email), image processing, and other creative

applications. What matters here is that they all output tagged documents with settings to control publishing levels (public, private, tags, etc.).

- Any other secondary applications for viewing specialized data, such as a picture viewer, a music tuner, a game display, a video player, and so on.

Web 3.0 is much different from earlier web versions which were only confined to storing and retrieving information. It uses the information in the best possible manner and makes it end user friendly by codifying it in a web language that is universally understandable.

Web 3.0 applications will be governed by a mixture of innovation technologies, such as artificial intelligence, automated reasoning, cognitive architecture, composite applications, distributed computing, knowledge representation, ontology, recombinant text, scalable vector graphics, semantic Web, semantic Wiki, and software agents.

Web 3.0 application design will ultimately be seen as applications that are pieced together. There are a number of characteristics: the applications are relatively small, the data is in the cloud, the applications can run on any device, PC or mobile phone, the applications are very fast and customizable, and furthermore the applications are distributed.

The Web 3.0 platform adds the notions of subjects and perceptions about subjects as a new additional layer in the web stack. Subjects allow people to express explicitly what they are talking about and perceptions allow them to encode facts and opinion in a way that allows them to be compared to and combined with the facts and opinions provided by others. In this way the Web 3.0 platform enables new social networks to be built around subjects of common interest.

Literature

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