
WikiNext, a JavaScript wiki with semantic features

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Abstract

WikiNext¹, is a semantic wiki prototype written in JavaScript, from database to server and client code. It is not in competition with wikis like Semantic Media Wiki, but more a test bed for new ideas. Every wiki page is an application that keeps a Web Socket open with the server, enabling incremental saves or collaborative editions using Google wave like algorithms. Using JavaScript on the whole chain of operations avoids data transformation from/to different formats like in traditional approaches (Objects, JSON/XML, and SQL). WikiNext uses JavaScript distributed objects and includes an IDE to write JS applications within wiki pages.

Keywords

JavaScript, NodeJS, Wiki, MongoDB, Semantic Web, RDF, HTML5, Web Socket, Linked Open Data

ACM Classification Keywords

K.4.3 [**Organizational Impacts**]: Computer-supported collaborative work.

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CHI 2010, April 10–15, 2010, Atlanta, Georgia, USA.

ACM 978-1-60558-930-5/10/04.

¹ Demo of the WikiNext prototype is available at <http://wikinext.herokuapp.com/>

Overview

This research work is about “a semantic application wiki” for writing documents that embed metadata (both local and from the Linked Open Data) and applications for manipulating/visualizing them. Distributed, shared JavaScript objects and remote method calls (from clients to server, over HTML5 Web Sockets) are the core technologies used behind the hood. The Wiki uses an HTML5 WYSIWYG in place editor as well as an embedded JavaScript IDE for writing applications within the wiki. It also uses the VIE2 framework [3] for handling RDFa metadata and the KGRAM/CORESE RDF engine on the server side as well as the MongoDB database for persistence.

The PhD started 15 months ago and WikiNext is still a prototype for testing new Ideas.

In the past many semantic wikis have been initiated (see [4] for an overview), most popular ones are Semantic Media Wiki [5] or IkeWiki/Kiwi [6], [7]. Our research group developed SweetWiki [8] that was from the first generation of semantic wikis (2005-2008), written from scratch in Java, and since 2008 SweetDeki [9], based on an open source industrial wiki engine named Mindtouch Core. Most semantic wiki engines had to deal with storage and handling of both semantic data and classic wiki data together. With WikiNext, we started again from scratch, trying to take into account emergent technologies and tools that appeared recently in the web development landscape, including HTML5 and micro web servers (lightweight web servers dedicated to a single application). (1) On the client side, HTML5 proposes new tags for creating web pages, but it also comes with many new JavaScript APIs that increases the momentum already existing around this

language. For example, APIs like WebSockets² for synchronous communication between web browsers and servers are very appealing for implementing some features in a collaborative edition platform, such as notifications or collaborative synchronous edition. Around HTML5 and JavaScript, interesting applications appeared like IDEs written in JavaScript, enabling development and testing of JavaScript code directly in the browser, like jsbin.com, jsfiddle.net or Cloud9IDE.com, this latter enabling the development of JavaScript code both for the client side but also for the server side. (2) Another trend is server side JavaScript; indeed, the CommonJS³ specification allows developers to create different applications that run in JavaScript interpreters like the V8 engine (from Google) or SpiderMonkey/TraceMonkey (from Mozilla).

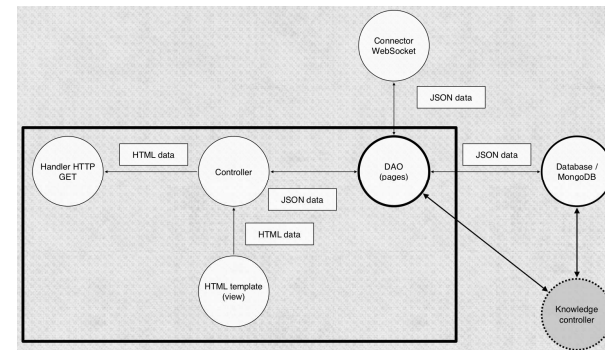


Figure 1: WikiNext Back end architecture

² Even if not officially part of the HTML5 standard, see <http://en.wikipedia.org/wiki/WebSocket>.

³ <http://www.commonjs.org/>

Biographical Sketch

My name is Pavel Arapov, I'm Russian, aged 28. I got a master degree in applied mathematics and computer engineering at Nizhny Novgorod State University in 2006, worked as a startup creator and game developer for a few years and then came to France where I got another master degree in 2010, this time both in computer engineering (specialty; web technologies and applications) and project management. I have a long experience in game programming (both for mobile and web applications) and I'm still the CEO of GEXSoft.com, a 12 employees company and creator of icedland.ru, a successful online game, popular in Russia. I was always attracted by scientific research, especially in Web Science. Wikis, collaborative tools always attracted me as well as my interest for new technology trends (HTML5, server side JavaScript, etc.) grew. I worked for six months in a research lab during my last year of master, on the SweetDeki semantic wiki based on Mindtouch Core. I found semantic technologies hard to use and thought that a wiki that could embed an IDE and APIs/Connectors for writing small applications within wiki pages could be an interesting "casual" approach to writing applications that deal with semantic metadata.

My company in Russia was going well on its own so I started the PhD with Michel Buffa right after the end of this first experience.

My Advisor

Michel Buffa is an Associate Professor at the computer engineering department of the University of Nice/France. He is a member of the Wimmics (<http://wimmics.inria.fr/>) research group from INRIA

and the I3S Laboratory at Sophia-Antipolis, France. His current research activities are focused on the social semantic web (semantic social network analysis, adding semantics to social tagging, etc.) and on semantic tools for improving software application development with the semantic web technologies (semantic application wikis, etc.) He is the author of the semantic wiki SweetWiki, and was in charge of another semantic wiki, SweetDeki, based on Mindtouch Core, that is used in the French project ISICIL⁴, financed by the National Agency for Research, in France.

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Publications during my Phd

I'm just starting my second year. So far here are my publications: [1] and [2] in the list of references.

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Up-to-date curriculum vita

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<p>Professional experience</p>	
<p><i>Dec 2010 -> today</i></p>	<p><i>CNRS , Phd thesis on a "semantic application wiki"</i></p>
<p><i>August 2011 - present</i></p>	<ul style="list-style-type: none"> • GEXSoft - development of social games on the web (Facebook games). I designed and implemented the core of our first games and set up a team of developers managers for launching and maintaining the games. Languages used in the design: AS3, Java, HTML / JavaScript, MySQL. Apache / Nginx.Jira - project management. CEO of the company.
<p><i>Sept 2005 – Jan 2009</i></p>	<p><u>On-line Role Play Game www.icedland.ru.</u> <i>Design, implementation and Project Management (8 people working in the project I lead)</i> <i>Result:</i></p> <ul style="list-style-type: none"> • 4 servers: 1 front-end, 2 back-end, 1 data base • >3000 visitors per dat, >200.000 registrered customers <p><i>Principles:</i></p> <ul style="list-style-type: none"> • SQL database optimisation, 240 tables, 10Gb data
<p><i>Feb 2007 – Jan 2009</i></p>	<p><u>Système B2B "Prosto"</u> Merge databases from several sources :</p>

	<p>www.parkovka-nn.ru; www.pro-nn.ru; www.poseti-nn.ru...</p> <p><i>Design, implementation, project management</i></p>
<p><i>Dec. 2003 – Sept 2005</i></p>	<p>MERA Company / Nortel Networks www.meranetworks.com</p> <p>Operation Maintenance Center Platform – Radio Part (OMC-R) / R&D / Configuration Managements</p> <p>Software Development for mobile phone operators.</p>