Using MongoDB and Mongoose with a MEAN Stack Implementation of the NEXUS-PORTAL-DOORS System

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Introduction

For researchers, primary research is only the first stepping stone to proving or disproving a hypothesis. One successful experiment proves little to nothing in the grand scheme of the scientific community. However, the weakness of a single experiment is covered by the power of the meta-analysis, usually completed by a third party. Meta-analysis requires researchers to analyze results from muliple primary articles and assess whether or not the result is accurate, show if the hypothesis presented are proven or disproven, and provide a degree of error. However, despite the necessity of meta-analyses, it continues to be time consuming and ineffective at connecting with all points of data. The miniscule amount of secondary articles pale in comparison to the literal thousands of primary articles which are published each day. In order to take advantage of all the new information which is provided and to create more effective secondary analyses, a semantic web solution provides the necessary tools in order to take full statistical advantage that meta-analysis offers.

One such implementation of a meta-analysis system is the NEXUS-PORTAL-DOORS (NPD) system. In order to support PORTAL registries and DOORS directories, a database is necessary in order to support and store the data. In order to take full advantage of a tried and true framework, MEAN stack serves as the ideal system by thoroughly integrating client-side, server-side, and database processes.

Methods

For this new NEXUS-PORTAL-DOORS (NPD) system implementation, MEAN (MongoDB, Express, Angular, Node.js) stack is the most updated and contributed fullstack javascript framework. Both backend and front end will rely heavily on node.js, an open-source runtime environment which enables scalable web applications and servers. Used with Express and other packages, node.js enables the user to organize a web application into a MVC (model-view-controller) architecture. In accordance with the "M" from MEAN stack, MongoDB serves as the database for the NPD. However, MongoDB acts only as a database, offering a bare minimum in regards to complex and automated queries. Mongoose enables connection to a MongoDB database from javascript, allowing model abstraction, large scale queries, data validation, and more. It also creates an SQL style database through schemas, creating a structured system in a NoSQL database.

Timeline:

- Week 1-2: Create read/write MySQL database from MicrosoftSQL
- Week 3-4: Set up PORTAL system for database
- Week 5-6: Set up DOORS system for database
- Week 7-8: Connect with other modules
- Week 9-10: Test reliability, accuracy, full extent of analysis

August:

- Week 1: Set up template to work with Mongoose, XML/JSON files
- Week 2: Migrate data, collections, "tables" over from MSSQL
- Week 3: Bug fixes, issues with migration; begin to integrate database with frontend
- Week 4: Connect database to work with webcrawler, ontologies, and web application

Results

Discussion

discussion text here

Conclusion

conclusion text here

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References

1. Barrasa Rodriguez, J., Corcho, . and Gmez-Prez, A. R2O, an extensible and semantically based database-to-ontology mapping language Springer-Verlag, 2004

2. Berners-Lee, T., Hendler, J., Lassila, O. and others The semantic web Scientific american, New York, NY, USA:, 2001, Vol. 284(5), pp. 28-37

3. Dickey, J. Write modern web apps with the MEAN stack: Mongo, Express, AngularJS, and Node. js Pearson Education, 2014

4. MySQL, A. MySQL 2001

5. Pan, Z. and Heflin, J. Dldb: Extending relational databases to support semantic web queries DTIC Document, DTIC Document, 2004

6. Spanos, D.-E., Stavrou, P. and Mitrou, N. Bringing relational databases into the semantic web: A survey Semantic Web, IOS Press, 2012, Vol. 3(2), pp. 169-209

7. Stojanovic, L., Stojanovic, N. and Volz, R. Migrating data-intensive web sites into the semantic web Proceedings of the 2002 ACM symposium on Applied computing 2002, pp. 1100-1107

8. Suehring, S. MySQL bible John Wiley and Sons, Inc., 2002

9. Taswell, C. DOORS to the semantic web and grid with a PORTAL for biomedical computing IEEE Transactions on Information Technology in Biomedicine, IEEE, 2008, Vol. 12(2), pp. 191-204

10. Taswell, C. Portals and doors for the semantic web and grid Google Patents, 2010

11. Taswell, C. A distributed infrastructure for metadata about metadata: The HDMM architectural style and PORTAL-DOORS system Future Internet, Molecular Diversity Preservation International, 2010, Vol. 2(2), pp. 156-189

References

[1] Arthur Toga, editor. *Brain Warping*. Academic Press, 1988. Available at http://www.amazon.com/Brain-Warping-Arthur-W-Toga-ebook/dp/B0089NVYKK/ where only one review for 1 out of 5 stars with criticism: "This book doesn't seem to offer anything new. It reads just like a collection of journal papers with the amount of coherence between topics and the level of detail in the explanations that one might expect to find in a collection of journal papers. It seems more like a ploy to make money than to actually contribute something meaningful to the field. I would recommend saving you money and learning the material online.".