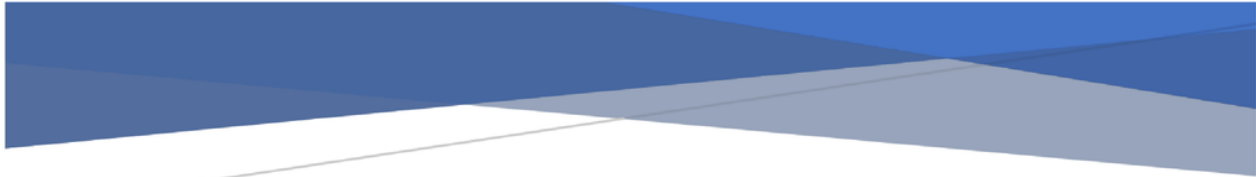


Assessment 1

by Gareth Thomas

FILE	12687_GARETH_THOMAS_ASSESSMENT_1_178152_1200597653.DOCX (108.33K)		
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INVESTIGATING EMERGING WEB TECHNOLOGIES

Emerging Web Technologies

Gareth Thomas

Contents

Introduction	2
Web Technology	2
Bootstrap	2
NoSQL Database Approach	3
MongoDB	3
NoSQL and SQL Databases	3
Bibliography	4

Introduction

This report will attempt to explain a web technology that will have the greatest potential impact on future web development. Bootstrap has been chosen as a potential web development and will be discussed in this report. An explanation will be provided to describe how bootstrap can help web developers create web applications and web sites. Furthermore, a NoSQL database approach called MongoDB will be evaluated; examples will be provided of the database approach and of Bootstrap.

Web Technology

Bootstrap

Bootstrap is a free open-source JavaScript framework, developed by Twitter, used to help the design of user interfaces of websites and web applications. It has quickly become a widely used technology and can be found in many websites. It combines a set of CSS classes and JavaScript components into one cohesive system. Bootstrap is a front-end framework that acts as an interface between the client and the server. Bootstrap helps with the development of responsive, mobile-first web sites and applications. Mainly used to create responsive designs; bootstrap includes a number of templates and classes such as forms, buttons, navigation, dialogs and other components. JavaScript is an optional extension to the framework. The JavaScript segments are implemented as jQuery plugins. They provide additional interface components such as dialog boxes and tool tips. JavaScript will also provide additional features such as an auto-complete feature, popovers, buttons, collapse and much more.

Bootstrap allows developers without any web design experience create good looking applications without too much effort. Bootstrap offers some basic designs for websites; implementing these designs is easily done. Only a few lines of CSS and JavaScript can create a good-looking website using Bootstrap. Bootstrap is commonly used and can be found on many popular sites such as Indeed, Lyft and Walmart. Bootstrap is very customisable and can be adapted to serve any projects or any application. Developers may pick and choose any features used within Bootstrap.

Due to the widespread adoption of bootstrap, it is slowly becoming the de facto standard when it comes to the user interface design of websites. This may help other web developers develop some transferrable skills to other projects as each website design will be similar in design and code. Any team projects can use similar codes and designs to ensure everyone is on the same page during the development. However, due to the templates available on bootstrap and how it is getting popular online; websites starting to look very similar in design. Less websites are looking unique and eye catching, meaning users are less likely to stay on the websites or lose interest.

As the framework is continually growing and is becoming more popular, support for the framework is becoming more widespread. The framework is open source and currently maintained on GitHub. The community that uses this framework can work together to implement improvements and fix any bugs. Any inquiries by developers can be solved by other members of the community. The community can help keep the framework updated thus keeping it relevant in web development. New technologies and tools must be implemented to keep bootstrap a popular framework.

Bootstrap 4 was released in January 2018, which included support for modern internet browsers and implemented support for Flexbox. Flex box aims to provide a more efficient way to align and distribute space within a container. It allows the option to alter the width and height of items within a container. It will help accommodate each display size by filling the free space or by shrinking items to prevent any overflow [1]. This update was considered a huge milestone for Bootstrap as the

release provided major changes and got rid of bugs within the framework. Bootstrap 4 improved the grid system to a 5-tier grid system. The new grid tier 'xl' will extend the media range down to 544px. The next major update plans to remove jQuery as a dependency and will be replaced with vanilla JavaScript [2]. Once the version has been released, developers may still be able to use the framework plugin even if jQuery is detected.



NoSQL Database Approach

MongoDB

MongoDB is a non-relational database that stores data as documents in a binary representation called BSON also called Binary JSON. MongoDB uses the NoSQL document store model instead of the traditional relational database model using columns and rows. It is an object oriented, dynamic and scalable NoSQL database [3]. A record is a document that is the data structure of field and value pairs. MongoDB offers support for a wide range of data types due to the implementation of BSON. Fields are the equivalent of columns in relational databases and values are the data types; this could include arrays, arrays of documents and other documents. Documents are similar to relational databases; they require primary keys to act as a unique identifier. Collections are a set of documents and functions which are equivalent to tables in databases. Data within a collection cannot be shared across different databases.

MongoDB offers the flexibility to create any number of fields within a document and doesn't require any predefined schemas allowing MongoDB to store any type of data. This is making it easier for MongoDB to remain highly scalable when compared with relational databases. Mongo shell acts as a JavaScript interface for MongoDB which allows user to ability to update and query data and allows administrative operations. The shell is used by users to run their MongoDB instances.

MongoDB blends seamlessly with other programming languages such as Ruby, JavaScript and Python; this seamless blending conveys high coding velocity [4]. It can effectively deal with Big Data as large volumes of unstructured data can be stored and be quickly called upon within an application. By keeping related data within documents; any queries can be quickly completed compared to a relational database. MongoDB offers the same features as a relational database such as dynamic queries and easy aggregation but provides these features with added flexibility and scalability [5].

NoSQL and SQL Databases

NoSQL is a non-relational DMS that does not require the use of fixed schemas, avoids joins and is very scalable. It provides an easier experience in the creation of real time web application and big data applications as NoSQL can handle a vast amount of data. NoSQL databases are non-relational and store data within documents, graph databases, key value pairs or wide column stores. Documents can be created without defining their structures and be edited later in the development of the application [6].

SQL databases use structured query languages such as SQL to define and manipulate data. SQL databases are primarily called relational databases (RDBMS). SQL uses table-based databases which makes SQL a better option when applications require multi-row transactions such as accounting systems, stores and legacy systems [5]. SQL databases are best suited for heavy duty transactional applications, as it is more stable and ensures the integrity of data. To ensure this SQL follows the ACID properties (Atomicity, Consistency, Isolation and Durability) whereas, NoSQL follows the Brewers CAP properties (Consistency, Availability and Partition tolerance).

NoSQL databases are more suited for hierarchal data storage as it uses key value pairs to store similar data to JSON data. This can make NoSQL more desirable when dealing with larger data sets, for example Big Data. Compared to SQL, the databases are stored horizontally scalable; this means additional servers could be implemented to allow the database handle larger traffic more effectively. SQL uses vertical scaling; if the load needed to be increased, the solution will be improving the hardware on the servers such as increasing CPU power.

A drawback of NoSQL are the limitations on the queries that can be used. Complex queries do not perform as well compared to SQL. NoSQL does not have any standard interface available to perform these complex queries. Using SQL is a better choice when **complex queries are required in an application**. Although SQL is versatile and offers support for complex queries, it can become restrictive in some applications. SQL requires developers to use predefined schemas to determine the overall structure of the data. All data within the application must follow the same schema.

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Assessment 1

GRADEMARK REPORT

FINAL GRADE

41 / 100

GENERAL COMMENTS

Instructor

Eval emergent tech (20) 16

Eval of NoSQL (30) 25

Typescript application (20)

REST web service (20)

Tech demo (10)

The emergent technology that you chose was Bootstrap. Although you have discussed the release Bootstrap 4, you make an interesting point out that websites are becoming too similar because of its usage. Will this not hamper its future growth?

The NoSQL database you chose was MongoDB. Good detailed discussion. However, the evaluation at the end of this section became a bit rushed.

No code provided.

PAGE 1

PAGE 2

PAGE 3

PAGE 4



Comment 1

is **not** detected?

PAGE 5



Comment 2

Such as?