Higher Diploma in Science in Web Technologies

Project Proposal

The Book Boutique

Student Name: Antonijo Galic
Student Number: 17157757
Email address: x17157757@student.ncirl.ie
Specialisation: Web Technologies

05. 10. 2018.

Contents

1. Objectives

The general goal of the project is to create a web application to function as an online e-commerce shopping site for selling books called The Book Boutique. In order to develop an e-commerce shopping site that allows fluid and fast environment of the application, the main technologies what will be used are:

- Node.js – as an asynchronous vent driven JavaScript runtime, Node is designed to build scalable network applications,
- Express – is a minimal and flexible Node.js web application framework that provides a robust set of features for web and mobile applications,
- MongoDB – stores data in flexible, JSON-like documents, meaning fields can vary from document to document and data structure can be changed over time,
- Stripe – software allows individuals and businesses to receive payments over the Internet. Stripe provides the technical, fraud prevention, and banking infrastructure required to operate online payment systems.

The completed web application will be designed to be fully responsive and it will automatically adapt to suit all screen resolutions and devices (desktop, laptop, tablet and phone).

The web application has to accomplish a few missions:

- introduce the site visitor to the site and it will give an overview of the products,
- display a sample product visually with a view to keep user interest and motivate them to buy a product(s),
- allow the user to register/login to interact with the application:
    - to buy a product,
    - to leave a review,
    - to add a book to wishlist,
    - to add a book on the reading list,
    - to view orders
- admin will have the ability to:
    - add, edit and delete products,
    - add, edit and delete users

The software project involves a number of skills ranging from independent learning, problem-solving, coding & debugging, critical thinking, to time management and presentation.

2. Background

An online bookstore is a form of e-commerce and book sales industry in one form, it has many advantages, such as bookstore size is relatively small, cost savings, transaction activities can be anytime, anywhere, improve service efficiency. (Liu, 2015) Online bookstore system is the main function of the trading platform for the site, consumers can connect to the Internet through the computer into the online bookstore and then check the book information, if you need to purchase should be registered landing, select their own books, submit orders and pay to complete the entire book ordering process, to achieve online transactions (Zhai and Lu, 2017).

In July 1995, Amazon, the first online bookstore, launched a new business model by selling books online. This event-initiated competition between online bookstores and physical (brick-and-mortar) bookstores. Now, Amazon has grown to become the largest online bookstore in the world. Amazon's success leads to the popularity of online bookstores.

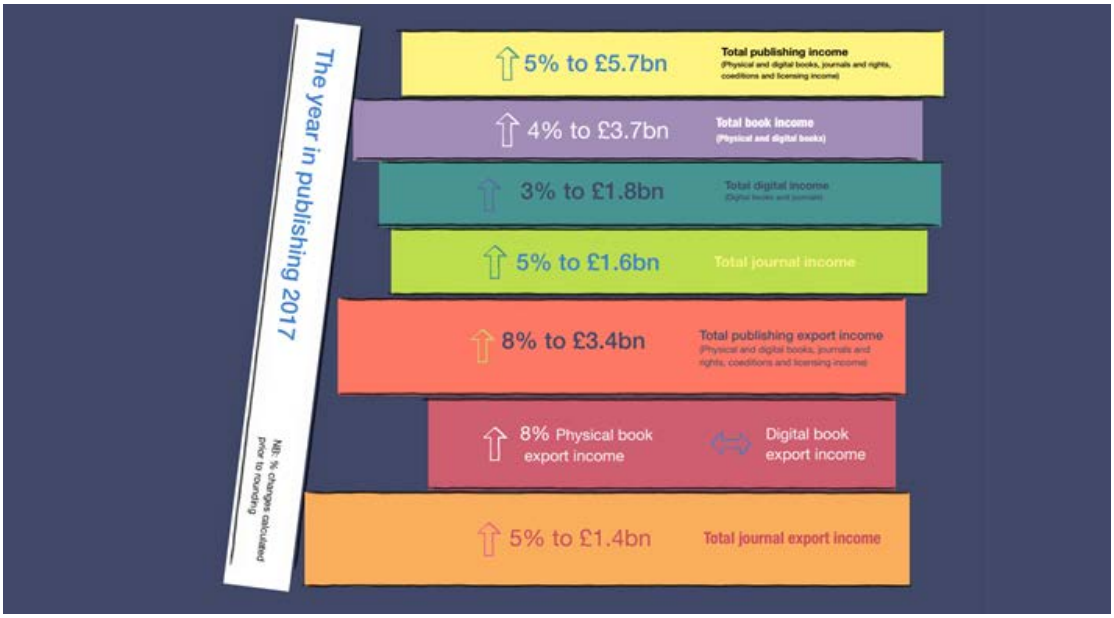


Figure 1. The Year in Publishing 2017. Publishers Association, UK (Anderson, 2018)

Another sign to take before developing an online bookstore is the size of the publishing industry. The book publishing industry is a billion-dollar industry (on the image above numbers about UK publishing industry). According to statista.com (2018), the revenue from the global book publishing market is forecast to slightly increase in the coming years, growing from around 113 billion U.S. dollars in 2015 to about 123 billion U.S. dollars by 2020. British company Pearson is the largest publishing house in the world as of 2015. Besides Pearson, Thomson Reuters, RELX Group, Wolters Kluwer and Penguin Random House are also leading book publishers in the world.

Based on this information, selling books online has a big potential.

3. Technical Approach

Considering the background of this project, an online bookstore system is the main function that needs to be achieved. To accomplish that functionality user should be able to register/login into the system, add book(s) to cart and enter card details during checkout operation.

Separately from main functionality user will be able to add a book to wish list. Also, the user will have the possibility to leave a review for each book or rate book. Research phase shows that a lot online bookstore doesn't have the functionality to list the book on reading list so a user can track books in own collection in that way.

Like mentioned in Objectives of this document the implementation will be made using Node.js, Express, MongoDB and Stripe to create a RESTful web application. Node.js will run our server together with Express what is Node framework. The server will store data in the MongoDB database and will be hosted at mlab.com. Mongoose is the ODM (Object Document Mapper) which will be used to communicate with our MongoDB database.

To dynamically generate HTML page, it will be used Handlebars logic-less templating engine. Handlebars weren't the first choice but after researching what is in trend (which you can see in the picture below) the application will use handlebars instead of the pug(jade). The web application will be designed to be fully responsive using Bootstrap framework which is based on flexbox layout.

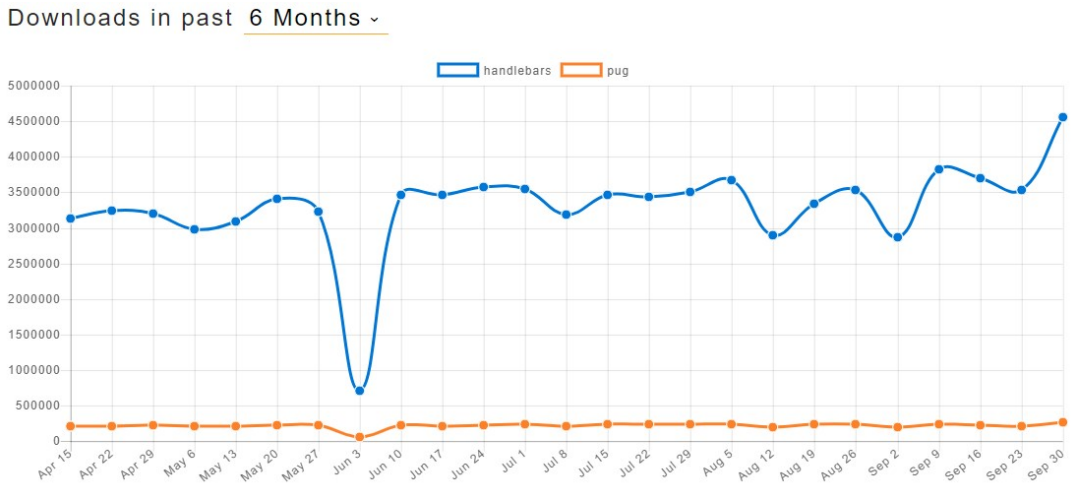


Figure 2. Handlebars vs Pug, npmtrends.com (Unknown, 2018)

Sensible data will be encrypted with bcrypt and it will be authenticated with passport.js. For validation and charging credit cards, and available payment process it will be implemented Stripe.

4. Project Plan

Task Name	Duration	Start	Finish
Software Development	**68 days?**	**Sun 23/09/18**	**Sat 15/12/18**
Initialization	**11 days**	**Sun 23/09/18**	**Fri 05/10/18**
Determine Project Scope	3 days	Mon 24/09/18	Wed 26/09/18
Define Technology Stack	6 days	Tue 25/09/18	Tue 02/10/18
Project Proposal	6 days	Thu 27/09/18	Thu 04/10/18
Upload Documents	1 day	Fri 05/10/18	Fri 05/10/18
Analysis/Software Requirements	**19 days**	**Sat 06/10/18**	**Fri 26/10/18**
Project Requirements Specification	9 days	Mon 08/10/18	Wed 17/10/18
Review Requirements Specifications	16 hrs	Thu 18/10/18	Fri 19/10/18
Upload Project Requirements	1 day	Fri 19/10/18	Fri 19/10/18
Project Analysis & Design Documentation	7 days	Thu 18/10/18	Thu 25/10/18
Interim Progress Report	7 days	Thu 18/10/18	Thu 25/10/18
Upload Required Project Documentation	4 hrs	Fri 26/10/18	Fri 26/10/18
Design	**6 days**	**Sat 06/10/18**	**Thu 11/10/18**
Develop Design	3 days	Sat 06/10/18	Mon 08/10/18
Review Design	1 day	Wed 10/10/18	Wed 10/10/18
Fix Design If Needed	4 hrs	Thu 11/10/18	Thu 11/10/18
Design complete	0 days	Thu 11/10/18	Thu 11/10/18
Development	**44 days**	**Sat 13/10/18**	**Fri 07/12/18**
Prepare Environment	1 day	Sat 13/10/18	Sat 13/10/18
Create CRUD Functionality	1 day	Sat 20/10/18	Sat 20/10/18
Create Cart	5 days	Sat 20/10/18	Thu 25/10/18
Create User Profile	6 days	Fri 26/10/18	Fri 02/11/18
Connect App With Stripe	4 days	Fri 02/11/18	Wed 07/11/18
Implement Feedback Functionality	4 days	Wed 07/11/18	Mon 12/11/18
Implement Wish List	5 days	Tue 13/11/18	Sat 17/11/18
Implement Reading List	5 days	Sat 17/11/18	Thu 22/11/18
Developer testing (primary debugging)	41 days	Sat 13/10/18	Tue 04/12/18
Testing	4 days	Tue 04/12/18	Fri 07/12/18
Submit Code	0 days	Fri 07/12/18	Fri 07/12/18
Post Implementation	**8 days**	**Fri 07/12/18**	**Sat 15/12/18**
Project Final Report	11 days	Sun 25/11/18	Fri 07/12/18
Declaration Cover Sheet	1 day	Fri 07/12/18	Fri 07/12/18
Video Of Final Project	4 days	Fri 07/12/18	Tue 11/12/18
Project Presentation	3 days	Wed 12/12/18	Fri 14/12/18
Presentation of complete project	1 day	Sat 15/12/18	Sat 15/12/18

5. Technical Details

As mentioned in the Technical Approach of this document, the development platform will be developed with Node.js using JavaScript language. For creating an application skeleton, Express application generator will be used. The server will store data in the MongoDB database and will be hosted at mlab.com. To communicate will MongoDB database application will use mongoose.

Some of the main npm modules that will be used in the application are:

- bcrypt-nodejs – helps to encrypt passwords
- body-parser – allow the application to manipulate data in the application (create, delete, update)
- connect-mongoose – a MongoDB session store backed by mongoose
- cookie-parser – passing a secret string, which assigns req.secret so it may be used by other middleware
- csurf - node.js CSRF(Cross-site request forgery) protection middleware
- express – fast, minimalist, web framework for node
- express-handlebars – a Handlebars view engine for Express
- express-session – create a session middleware with the given options
- hbs – express.js view engine for handlebars.js
- mongoose – elegant MongoDB object modelling for node.js
- passport – express-compatible authentication middleware for Node.js
- stripe – the Stripe Node library provides convenient access to the Stripe API from applications written in server-side JavaScript

On frontend side the application will be used next libraries(frameworks):

- handlebars – logic-less templating engine
- bootstrap – frontend framework for designing websites and web applications
- jQuery – is a fast, small, and feature-rich JavaScript library
- font awesome – is a most popular font and icon toolkit

The coding part of the application will be done by using Cloud9 IDE. Cloud9 IDE is an online integrated development environment. During the development phase, the code will be pushed to GitHub using git version control to prevent loss of data, to have time track about the project and to easy manipulate with the project, especially during the testing phase.

6. Evaluation

Testing is an important practice in software development to improve software quality. There are many forms of testing and many ways to do them. For purpose of this project during the testing phase, Mocha and Chai will be used.

Mocha is a feature-rich JavaScript test framework running on Node.js and in the browser, making asynchronous testing simple and fun. Mocha tests run serially, allowing for flexible and accurate reporting while mapping uncaught exceptions to the correct test cases (mochajs.org, 2018). Let's say it provides the environment in which we can use our favourite assertion libraries to test the code. Mocha comes with a lot of features, some of which are:

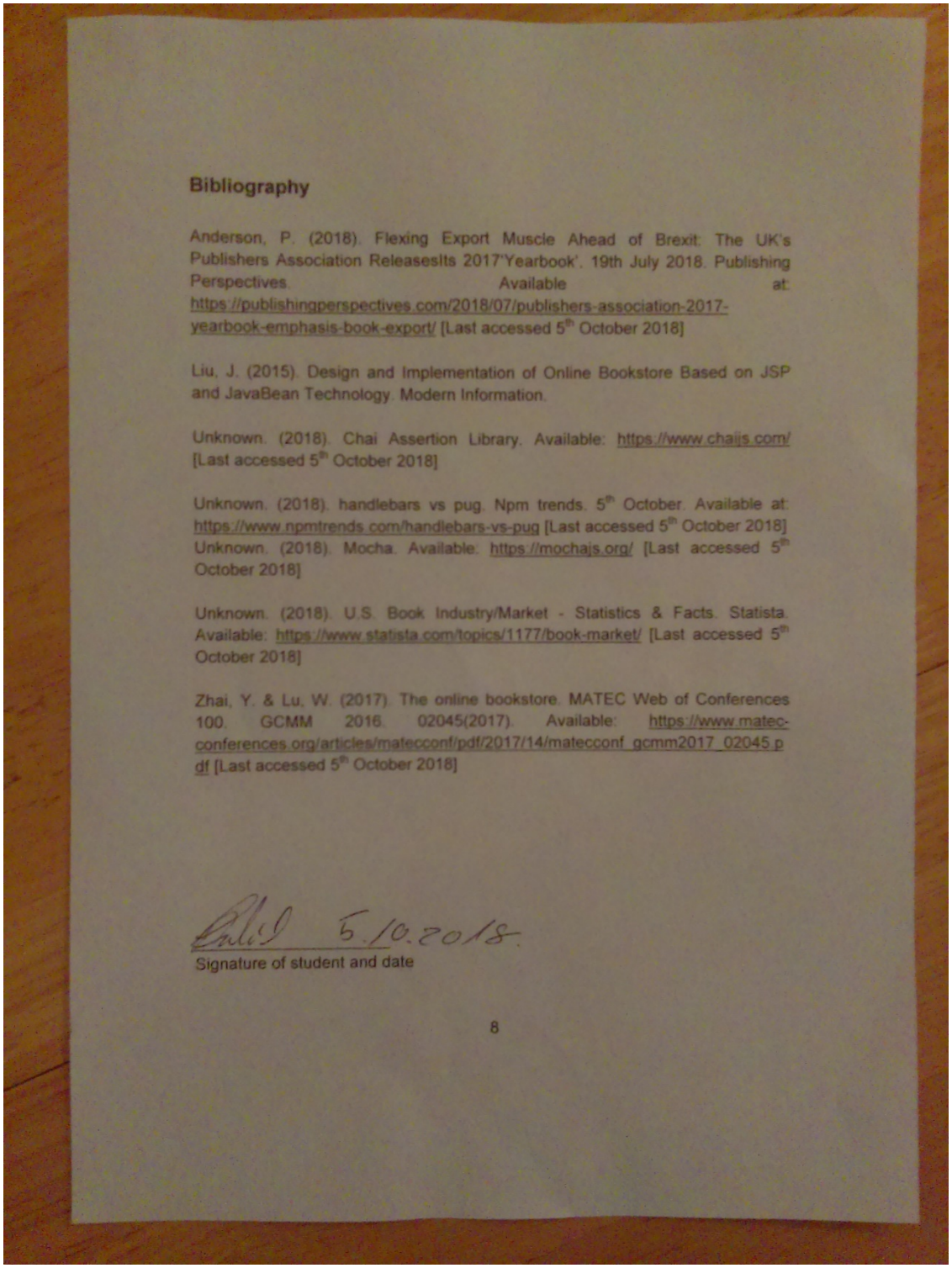
- simple async support, including promises,
- async test timeout support,
- use any assertion library (Chai in this case).

With Mocha we actually have the environment for making our tests but to do a test on HTTP calls we need an assertion library, that’s why Mocha is not enough and Chai will be used. Chai is a BDD / TDD (Behaviour Driven Development/Test Driven Development) assertion library for node and the browser that can be delightfully paired with any JavaScript testing framework. Chai has several interfaces that allow the developer to choose the most comfortable. The chain-capable BDD styles provide an expressive language & readable style, while the TDD assert style provides a more classical feel (chaijs.com, 2018).

Chai comes with three different assertion flavours. It has the should style, the expected style and the assert style. They all get the job done and choosing one is just a matter of preference in how the language of testing should be read.

Payment process testing will be done with Stripe platform which has implemented mode for testing.

Bibliography



Bibliography

Anderson, P. (2018). Flexing Export Muscle Ahead of Brexit: The UK's Publishers Association ReleasesIts 2017'Yearbook'. 19th July 2018. Publishing Perspectives. Available at: https://publishingperspectives.com/2018/07/publishers-association-2017-yearbook-emphasis-book-export/ [Last accessed 5th October 2018]

Liu, J. (2015). Design and Implementation of Online Bookstore Based on JSP and JavaBean Technology. Modern Information.

Unknown. (2018). Chai Assertion Library. Available: https://www.chaijs.com/ [Last accessed 5th October 2018]

Unknown. (2018). handlebars vs pug. Npm trends. 5th October. Available at: https://www.npmtrends.com/handlebars-vs-pug [Last accessed 5th October 2018]
Unknown. (2018). Mocha. Available: https://mochajs.org/ [Last accessed 5th October 2018]

Unknown. (2018). U.S. Book Industry/Market - Statistics & Facts. Statista. Available: https://www.statista.com/topics/1177/book-market/ [Last accessed 5th October 2018]

Zhai, Y. & Lu, W. (2017). The online bookstore. MATEC Web of Conferences 100. GCMM 2016. 02045(2017). Available: https://www.matec-conferences.org/articles/matecconf/pdf/2017/14/matecconf_gcmm2017_02045.pdf [Last accessed 5th October 2018]

5.10.2018.

Signature of student and date

8