

Dissertation Proposal: An E-Commerce Website for the Future

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I. INTRODUCTION

The following proposal details an investigation into the future of technology within e-commerce and how these technologies can be incorporated into an e-commerce front-end.

Topic of Study:

Over the past few decades society has seen an unprecedented era of technological advancement. At present, the internet is one of the most rapidly developing environments for technological advances and information exchange. There isn't an industry in the world that would not benefit from the global reach the internet can provide for it.

However, all these industries would not benefit nearly as much without web applications. In 1990 HTML was invented which became the building block for website development, this was followed by JavaScript in 1995 and CSS in 1996, which have contributed to the evolution of dynamic websites, that provide a tailored user experience based on information about the user. Recently, web development frameworks have been created that provide web developers with standardised building blocks to build and deploy web applications.

As a result of these developing technologies, the aim of this investigation is to determine how the future technologies of e-commerce can be incorporated into a website front-end. To determine this, the investigation will research; what awaits the future of e-commerce, the tools used to develop e-commerce front-ends, and the design guidelines used to develop e-commerce front-ends. A product will then be developed in the form of an e-commerce front-end that includes capability for the researched future technologies.

Rationale:

In 2017, sales from worldwide e-commerce amounted to 2.3 trillion US dollars^[01]. In the US, e-commerce already accounts for more than 10% of all retail sales, and in China it accounts for more than 20%^[02]. How we discover, purchase, and interact with goods is now a 24/7 process, with customer journeys now merging between online and in-store.

Amazon is the largest internet retailer in the world by revenue, making more than 232 billion US dollars in 2018^[03]. It ships to almost every country in the world and hosts multiple different retail brands, such as, Sears, Marks and Spencer, and Lacoste to name a few. Amazon employs the use of artificial intelligence in order to provide real-time product recommendations to potential customers browsing their site^[04].

ASOS, similarly to Amazon, is also an internet retailer, however, specializes in the fashion industry. It ships to all 196 countries in the world and sells over 850 brands as well as its own range of clothing^[05]. ASOS has recently 'cracked down'^[06] on serial returners, who buy clothing from their site, wear said clothes, and then return them within the 28-day return period. This behaviour muddies the revenue stream and is unsustainable from a business and environmental perspective.

Lancome is a luxury perfumes and cosmetics retailer that distributes its products through, brick and mortar distributors, and also, its own e-commerce site. In 2017, Lancome rebuilt their e-commerce site as a progressive web app (PWA), it uses modern web capabilities to deliver an app-like experience to all users regardless of browser choice or form factor^[07]. The rebuild was spurred due to the low conversion rates Lancome was experiencing from mobile users to their site, and building an app only made sense for regularly visiting customers^[07].

The above examples provide a few different types of business-to-consumer e-commerce companies, they all require a way for consumers to purchase products or services from their website. The possibility for future technology to help these types of sites improve the problems they are facing or simply increase sales would be welcome in such a profitable market.

The investigation aims to determine how best to incorporate future technological advancements into an e-commerce website and how the website will be designed. Due to the vast amount of e-commerce websites, it is important to conduct research towards previously successful e-commerce website design. As a result, this investigation will provide information to help design and develop e-commerce website front-ends with future technological capabilities.

Requested Supervisor:

A supervisor with good knowledge of web development and/or familiar with e-commerce would be beneficial. Additionally, a supervisor familiar with the proposed thesis format and research methodologies would be able to aid areas of personal development.

II. PRELIMINARY LITERATURE REVIEW

Background to Subject of Study

A. Front-End Web Development

This section will cover the basis of front-end web development, and the distinction between front-end and back-end development. Worth noting is the authors previous experience of web development in previous education, however, further research will provide a well-rounded understanding of the broader subject.

Front-end web development is the practice of producing HTML, CSS, and JavaScript that converts data to a graphical interface on a website so that a user can see and interact with it directly. One of the challenges with front-end development is the constant changes to tools and techniques used to create sites, this requires the front-end developer to always be aware of how the industry is developing^[08, 10].

One of the main objectives for a front-end developer is to ensure that users can open a website and see the information in a format that is relevant and easy to read. This may sound straightforward; however, complications arise from the fact that users use a large variety of devices to access websites. These devices can have varying screen sizes and aspect ratios that a front-end developer must consider when planning and developing the site^[08, 09, 11].

In order to have a versatile understanding of front-end development, knowledge of what defines back-end development and the distinction between both forms of development would be an ideal asset. Front-end can also be defined as client-side programming, it is everything the user can see and interact with on a website^[12]. Whereas the back-end can be defined as server-side programming, these are the tools and frameworks that work behind the scenes to give users the ability to interact with the client-side^[12].

B. Future of E-Commerce

During the search for academic papers relating to the future of e-commerce, it became apparent that search results represented too broad of a definition of e-commerce that had too small of a relation to the subject matter attempting to be researched. Therefore, online articles were utilised to provide insight into the trends and technologies likely to be implemented in e-commerce in the future.

“One of the biggest global trends in eCommerce will be product visualization”^[13]. In e-commerce, product

visualisation refers to how a product is displayed to the user, this is usually through multiple images from different perspectives with the ability to zoom into finer details, if applicable. However, advances in augmented and virtual reality are poised to change the way products will be visualised in the future^[14]. For instance, virtual dressing rooms allow customers to try-on their potential purchases before committing to buying, this eliminates the need for in-store visits and abandoned carts from indecisiveness^[14]. And, it is not only the fashion industry that can benefit from this technology, “Companies like Ikea and Audi have utilized augmented reality glasses so that users can design their own kitchens and check out cars”^[15].

“Product customization will grow from recommended items and remarketing ads to truly personalized offerings”^[13]. Automation is changing the way products and services can be customised, for example, Spotify^[16] can provide users with a weekly music playlist of recommendations based on songs and artists which users have previously listened to. This same process can be used across many industries such as clothing, entertainment, and homeware. Every time a customer uses the service, the offerings can become more personalised.

There are many developing areas of AI that can be utilised by e-commerce. For instance, the emergence of intelligent ‘chatbots’, also known as a conversational agent. This is a virtual support service that can be utilised by e-commerce sites to imitate real human interaction in a written or spoken way^[15]. This technology can save time and expenses on customer support by automating the process.

Another area is voice assistance, voice search is widely used in services like Google Now, Siri, Cortana, and especially regarding e-commerce, there is Amazon’s Alexa. This technology can be used to order products directly from the Amazon site by using voice commands. These voice assistants can also recommend commonly requested items^[15].

“eCommerce global trends indicate that mobile devices will become the central piece of technology used to discover, research, and purchase goods and services”^[13]. It is of high importance that e-commerce companies can adapt to mobile in order to preserve their presence through this technological shift, however, merely the presence of a website or mobile app does not guarantee success in the relative sector^[15]. Client engagement, retention, ease-of-use, and versatility are all key indicators to make sure that what is developed is the best online shopping experience.

Businesses have been aware of the need to target customers on mobile devices for some time, and the main vehicle used to execute this in recent times was the mobile app, these apps provide the finest user experience, however, they are limited to certain devices and require unique downloads, “[this generates] considerable buy-in from consumers first and losing the benefit of impulse behaviour”^[17]. A future mobile solution is the PWA

(Progressive Web App), which is a mobile app-like experience delivered through the web that does not require the need to download from an app store^[17]. PWAs provide users with an on-demand and accessible experience, more efficient than a native app, without taking up memory or data on a smartphone.

From the investigated articles, the listed technologies below were identified as potential areas for further research. By specifying each technology within e-commerce, better quality and more appropriate search results were obtained from academic papers. These papers can be used for a more in-depth literature review of each area within e-commerce.

1. Virtual Product Visualisation
2. Chatbot / Virtual Support Service
3. Progressive Web App

III. OUTLINE OF PROPOSAL

Aims: An investigation will be conducted into the future of technology within e-commerce. The aim of this investigation is to discover possible technological advancements that can be incorporated into an ecommerce front-end. An investigation into programming languages and frameworks used to develop e-commerce front-ends will be undertaken in order to assess a suitable solution for the development of the proposed e-commerce front-end. An investigation will also be performed into design guidelines used in developing e-commerce front-ends.

Research Objectives:

1. Research what awaits the future of e-commerce.
2. Research the tools used to develop e-commerce front-ends.
3. Research successful web design of e-commerce front-ends.
4. Develop an e-commerce front-end that includes capability for the researched future technologies.

Research Questions:

1. What future technologies will be employed in e-commerce?
2. How can these technologies be incorporated into an e-commerce front-end?
3. What programming languages and frameworks are used to create an e-commerce front-end?
4. Which programming language and frameworks are most suited for this task?
5. What do current successful e-commerce websites look like?
6. What will future successful e-commerce websites look like?

Research Methodology:

This investigation will take the form of inductive research, where an empirical study will take place to analyse

the different aspects involved in developing an e-commerce website for the future, these aspects have been set out in the research objectives above. This inductive research will employ qualitative data analysis and the following investigations will take place as follows:

Research into the future of e-commerce – Secondary data documentary analysis will take place of selected academic papers, journals, and online articles. Sources will be selected based on their futurology aspects and the content will be analysed for correlating and consistent themes and ideas. Due to the broad nature of the investigations question, it will be necessary for further research to take place of the discovered areas of future e-commerce, in order to fulfil the research objectives.

Research the programming languages and frameworks used to develop an e-commerce front-end – Secondary data analysis will take place of website case studies. Sources will be selected based on availability and relevancy to the subject matter and the content will be analysed for the programming languages and frameworks used. Programming languages and frameworks will then be decided for the development of the proposed e-commerce front-end based on their commonality and relevant features.

Research successful e-commerce front-end design - Secondary data analysis will take place of website case studies. Sources will be selected based on availability and relevancy to the subject matter and the content will be analysed for the front-end design. The front-end design will then be developed based on the relevant features from the selected sources and general web design guidelines.

The analysis of these investigations will lead to the development of an e-commerce website for the future. The study will incorporate empirical research that aims to discover an appropriate front-end blueprint for e-commerce websites in the future. Employing an inductive approach is necessary in order to generate an appropriate theory from the conducted research, as opposed to conducting deductive research, since there is no initial theory that can be tested against.

Ethical Considerations:

There will be no human participants involved in the research or study and no confidential data will be stored or accessed. The development of the e-commerce site will be completely the authors own work and any sourced material will be credited.

Plan and Timetable:

The study will begin at the end of May and reach completion by the middle of August. The investigation has been divided into sections which have been sub-divided into tasks as can be seen in figure 1. Each task has been allocated a duration time to ensure that the study is completed by the submission deadline. Due to the development of an artefact

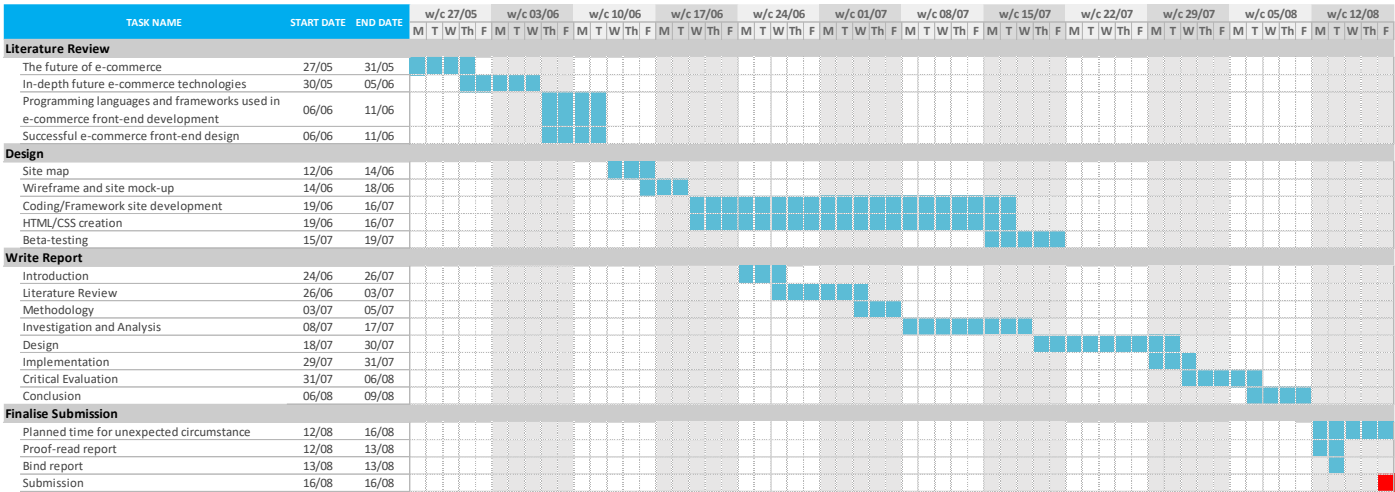


Figure 1: Timetable

following the proposed research, the findings and results will be completed in-line with the development of the site. To allow for possible issues and unforeseen circumstances a period of time before the submission deadline has been left unallocated.

Limitations and Scope:

The investigation will focus on the front-end website development. Therefore, the back-end development will be handled by WordPress or a similar content management system, and navigation may be limited to presenting the front-end design and future technologies, as opposed to a full e-commerce site experience. Along similar lines, the development of future technology within the front-end will, more than likely, not yet have any or at the least very limited framework or coding capabilities. As well as this, the expertise required to develop all functionality is not possible within the given timeframe, therefore, some future technology aspects may be purely mock-up design without functionality.

E-Commerce will be limited to B2C websites as this is the largest area of the market with the biggest scope for technological advancement and increases to sales and problem solving. It is also the area of the market with greatest exposure to the general consumer.

Personal Development Requirements:

A literature review will be conducted using the University Library, journals, and Internet resources to increase knowledge of the research area. The literature review to be conducted will focus on the following areas:

- E-Commerce
- Future technologies within e-commerce
- Front-end programming languages
- Front-end programming frameworks
- E-Commerce web design guidelines

Resource Requirements:

In order to conduct the study outlined for this investigation, the following hardware and software requirements will need to be met:

- 1x Laptop or desktop PC
- Internet access
- Integrated development environment

Additional requirements in order to conduct the investigation include the following:

- Microsoft Word
- Microsoft Excel
- Web hosting service
- Possible web development frameworks prior to research
- Time management tool

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