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Investigation into progressive web applications for the purpose of e-commerce

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1 - Introduction

The value in a progressive web application is the provision of cost-effective development and deployment for multi-platform installation in one. This study proposes that PWA's can be the solution for e-commerce multi-platform coverage downloadable on any device to serve all user demographics.

The purpose of this study is to discover if progressive web applications are cable for the purpose of e-commerce by developing a MERN stack e-commerce progressive web application to be evaluated by google lighthouse and users.

2 - Aim & Objectives

Aim:
Investigate, develop, and analyse the capabilities of progressive web applications for the purpose of e-commerce.

Objectives:
- Research and Analyse progressive web applications used for e-commerce.
- Systematically assess current guidelines and best practices for e-commerce.
- Develop a proof-of-concept e-commerce progressive web application for evaluation against current guidelines.
- Evaluate the progressive web application using appropriate tools, for example Google lighthouse.

3 - Research

Progressive Web Applications
An upcoming development trend attempting to bridge the gap between native application development and web development, through the use of service workers and web manifest files to provide installability, offline functionality and other native features such as notifications.

E-Commerce
Web atmospherics covert conventional retail techniques to online retail through use of virtual layout and design, virtual atmospherics, virtual theatrics and virtual social presence. These techniques put the customer in a more likely state of buying a product.

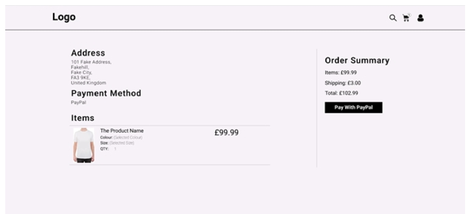
4 - Methodology

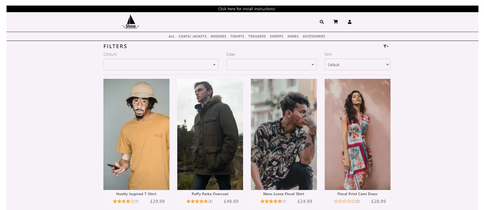
Using a section from the agile methodology, the feature driven methodology was chosen in order to design and develop the e-commerce progressive web application. Combined with the testing methodology of acceptance testing in order to design the feature from the perspective of the customer to give a polished feature designed for the customer to be used by the customer.

5 - Design & Implementation

Preliminary design survey was carried out to inform the design requirements for the project. The survey confirmed obvious features and added insight on other main features such as searching and filtering, etc.

Figma was used to create software prototypes to be developed as per the feature driven methodology with the inclusion of acceptance tests within the design

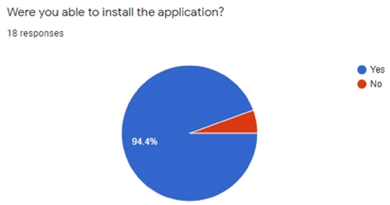


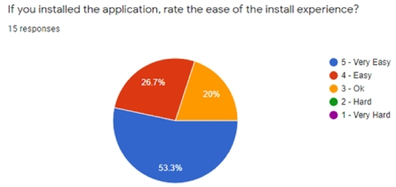


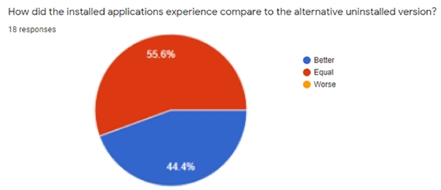
Using MongoDB, Express, React and NodeJS the e-commerce progressive web application was developed, shown on the left, with the inclusion of all the features designed for.

6- Results

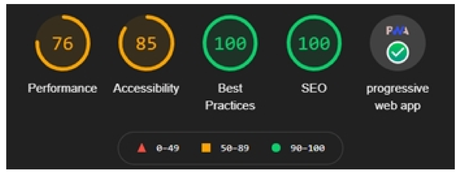
The results showed that 94% of users were able to install the application, with 53% of the users finding it a very easy task to complete and 26% finding it easy to do.







The major finding in the results was that the users found the experience of the installed e-commerce progressive web application equal or better than the uninstalled version. Proving that progressive web applications are capable for the purpose of e-commerce.



The lighthouse findings were positive and showed important areas of improvement such as in performance. This can be achieved through a bundle compression library to lower the react bundle sizes and increase overall performance.

7 - Conclusion & Future Work

Conclusion
Overall the project was a success with the aim and objectives being met through the in-depth research into progressive web applications and e-commerce. The design and implementation of the proposed e-commerce progressive web application, supported by results using google lighthouse and user experience survey.

Future Work
- Use SQL.
- Implementation of Stripe.
- Add product carousel.
- React Typescript.
- Use bundle library to increase performance

Scan for Website