

DEVELOPMENT AND TECHNICAL ANALYSIS OF
**A1 Fence Cost Estimator: A Component-Based Estimating
Web Application**

A CASE STUDY SUBMITTED TO
A-1 LAUNCHPAD: FINAL-YEAR ENGINEERING CHALLENGE FOR
INNOVATIVE SOLUTIONS

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WEBSITE:

https://vardhanpro.github.io/A-1_Launchpad/

GitHub REPOSITORY:

https://github.com/VardhanPro/A-1_Launchpad

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Fence Cost Estimator: A Component-Based Estimating Web Application

1 Abstract

The use of HTML, CSS, and JavaScript in web design provides an opportunity to design web pages that are highly interactive. The web application was created in order to help in easily determining an estimation of the cost of erecting 1 km of a fence with a breakdown of the essential segments, their weight, cost and quantity. Incorporating responsive designs, and self-contained scripts to implement core operations. Other aspects include the use of media queries for loading different layouts on different pages and devices and input limits to eradicate errors and instantaneous summation of flowers along tax additions.

This case study underscores the programming techniques used to create a functional and scalable e-commerce platform, emphasizing the significance of efficient coding in the web development.

2 Introduction

The A1 Fence Products website is used as a digital storefront of the company's different fence products including the accessories used in building the fence providing user capabilities with an online shopping. The site is an easy-to-use front-end development that integrates HTML, CSS, JavaScript to form a rich interactive user interface. This case study also examines the technical aspects of the abovementioned website, with an emphasis on the programming tools used in this process.

3 Key Features and Technical Examination

3.1 Responsive Design with Media Queries

The site applies CSS media queries so that a responsive design is implemented, creating an alteration in the structure of the product grid, based on the screen dimensions. This is particularly true on the #product-list section where the grid structure changes from one column on smaller devices to 2 on medium devices and lastly to 3 on larger devices.

Technical Advantage:

This upgrade improves the level of interaction that the site visitors have with the site by allowing the site to be truly functional on all the devices, including smartphones and desktop computers. It also shows appreciation of the principles of responsive web design since the site shall be good looking and easy to use no matter the gadget used to log in to the site.

3.2 JavaScript for Dynamic Content Management

The website is dependent on dynamic content management on an effective user interface made up of JavaScript, particularly in the area of product description, shopping cart, and user activity. The **viewDetails()** is one of the functions of the system. Each time a user presses a button that contains a certain product, this function looks for a certain product in the products object and inserts the data about this product (image, name, description and price) into a modal.

Technical Advantage:

Such an approach to the treatment of the product pieces makes it possible to have a clear distinction between the product information and its appearance conforming to the model view controller (MVC) style.

3.3 Quantity Management with Input Validation

The shopping cart on the site has a quantity selection option for every item available for purchase. More than anything, the **changeQuantity()** function is quite remarkable as it restricts the quantity decreasing further below than 1, so that the user cannot make a mistake of ordering non-positive quantity of a product.

3.4 Real-Time Price Calculation

Once users add products to the cart, the cart total, which includes GST – Goods and Services Tax, is determined right away rather than waiting until checkout. The **addToCart()** function controls the action of adding products to the cart, and the **updateTotal()** function summarizes the provision, GST, and gross whenever any new product is added to the cart.

Technical Advantage:

The mechanism of real time updating of cart proves management of dynamic content through use of java script, an important contribution to modern web applications.

3.5 Cross-Browser Compatibility

The CSS contains some styles which are added to ensure uniformity in functionality across different browsers. For instance, styles such as **input::-webkit-outer-spin-button** and **input::-webkit-inner-spin-button** are intended to hide the default spin buttons used in number input fields in webkit browsers such as Chrome and Safari.

Technical Advantage:

Cross-browser compatibility is important especially with the aim of giving all users the same experience irrespective of whatever browser one chooses.

4 Conclusion

This website's technical strengths include user interaction management, content management as well as compliance with the contemporary requirements of web development. Such attributes allow the site to function not just as an estimator site but also as an example of front end development's best practices.

Although the present state of the website is more concerned with its front-end features, quite a lot can still be done to improve the backend in order to make the system stronger and more scalable. Such a backend incorporation with the database would facilitate dynamic storage and retrieval of forms, products, user contact information, transaction details, etc.

Moreover, developing backend systems for payment processing, inventory control and reporting would contribute positively in extending the functionality and the business value of the website.