PC Configuration Website

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Abstract- The PC Configuration website provides an easy-to-use platform for users to design and customize desktop computers according to their specific needs. It enables users to choose individual components such as the processor, motherboard, graphics card, memory, and storage while ensuring compatibility between selected parts. The platform also offers real-time calculations for estimated power consumption and total build cost. Additionally, users can access detailed specifications for each component and compare options to make well-informed decisions.

Besides custom builds, the website offers a range of pre-built PCs and laptops for users seeking ready-made solutions. It allows users to create and manage a wishlist, enabling them to save, access, and delete custom configurations effortlessly. The platform enhances the PC-building experience by providing useful features such as component comparisons and price estimation, helping users make well-informed purchasing decisions.

Index Terms - Custom PC Build, Estimated Power Consumption, Detailed Specifications, Pre-Built PCs, Custom Configurations, Price Estimation.

I. INTRODUCTION

The rapid evolution of technology has driven a growing demand for personalized computing solutions. Custom-built PCs provide users with the flexibility to design systems suited to their specific requirements, whether for gaming, professional tasks, or daily use. However, selecting compatible components and optimizing performance can be a complex challenge for many. To simplify this process, online platforms have emerged, enabling users to choose and configure individual components—such as processors, graphics cards, storage, and memory—while ensuring compatibility and seamless integration. This paper examines the features, advantages, and user experience of a Custom PC Build website, a platform designed to help users create personalized desktop computers. By incorporating real-time power consumption calculations, price estimations, detailed component specifications, and an intuitive interface for selecting compatible parts, the website simplifies the building process and aids users in making informed choices. Additionally, it offers an option to explore pre-built PCs and laptops, providing a convenient alternative for those who prefer ready-made solutions.

This research aims to explore how these platforms improve the accessibility of custom PC building and enhance the overall user experience. Additionally, it examines the impact of key features such as component comparisons, wishlist functionalities, and pricing transparency in enabling users to maximize the value of their investments.

II. LITERATURE REVIEW

The literature on custom-built PC solutions covers diverse approaches designed to accommodate both novice and expert users, with the goal of simplifying the intricate process of assembling a personalized computer.

Gerard Romero Bujalance (2021) focuses on the challenge faced by first-time buyers who lack expertise in selecting compatible computer components. His project highlights an essential contribution to this problem by introducing automatic compatibility checks, which filter and display only compatible parts. This system reduces the difficulty of building a custom PC and makes the process more accessible to users who may otherwise avoid it.

Similarly, Alena Respopa (2021) presents a web-based application that enables users to search for PCs or laptops tailored to their specific needs. By leveraging existing e-commerce platforms like Amazon and eBay, her solution not only facilitates finding the right components but also helps users save money by comparing prices across different vendors.

Mohd Shahrizan Bin Sabli (2015) addresses the fragmentation of custom PC-related services by proposing a comprehensive web platform, which

combines multiple functionalities in one place. This includes hardware identification, guidance on assembling components, and a planner that allows users to design their own PCs according to their preferences. Additionally, it integrates online sales services, offering a seamless experience for users who are interested in building a custom PC but may lack the necessary knowledge. His study also includes a survey showing that while many people are interested in custom PCs, they often lack sufficient knowledge about hardware components and assembly, making an easy-to-use, informative platform crucial.

In contrast, Sameer Khursheed et al. (2022) address the challenges faced by users in Pakistan, where the COVID-19 pandemic disrupted international shipments, leaving a gap in the availability of custom PC components. Their solution, the Nice PC Maker (NPM) platform, facilitates local users by offering an e-store where they can purchase both pre-built systems and individual components for custom PC assembly. This initiative highlights the importance of creating localized solutions for regions where international e-commerce may be unreliable.

Finally, the research on applying genetic algorithms to PC configuration problems (Singapore, 2021) focuses on a sophisticated, data-driven approach to addressing the complexity of selecting optimal hardware combinations for specific use cases. The authors propose a flexible framework that utilizes heuristic search methods to solve discrete optimization problems related to PC configuration. This framework can be customized by users to reflect their unique preferences, such as budget constraints or desired performance specifications. The study suggests that incorporating machine learning techniques, such as the ID3 algorithm, could further improve the optimization process by learning from previous configurations to guide future selections. Together, these efforts help create tailored, user-friendly platforms that streamline custom PC building while providing affordable, localized, and optimized solutions for a wide variety of users. Together, these efforts help create tailored, user-friendly platforms that streamline custom PC building while providing affordable, localized, and optimized solutions for a wide variety of users.

III. SOFTWARE AND TOOLS USED FOR PC CONFIGURATION WEBSITE

In my research paper, I developed a custom PC build platform using various software tools and technologies to enhance efficiency, scalability, and user experience. The primary framework utilized was ASP.NET Core MVC, a robust, cross-platform framework for building dynamic web applications. By adhering to the Model-View-Controller (MVC) architecture, it ensures a clear separation of concerns, making maintenance and scalability more manageable. To simplify development, I integrated Razor Pages, a feature of ASP.NET Core that streamlines the creation of dynamic, page-based applications. Razor Pages facilitates easier front-end interactions, such as component selection and compatibility checks, without requiring extensive controller logic. For data management, I employed Entity Framework Core (EF Core), an Object-Relational Mapper (ORM) that bridges the application and database, enabling smooth CRUD (Create, Read, Update, Delete) operations using C#. The platform's database is powered by Microsoft SQL Server, a reliable and secure relational database management system (RDBMS) that stores key data, including user profiles, component details, and custom PC configurations. Collectively, these technologies form the foundation of the platform, ensuring seamless user interactions, real-time updates, and secure, scalable data storage.

IV. SYSTEM DESIGN

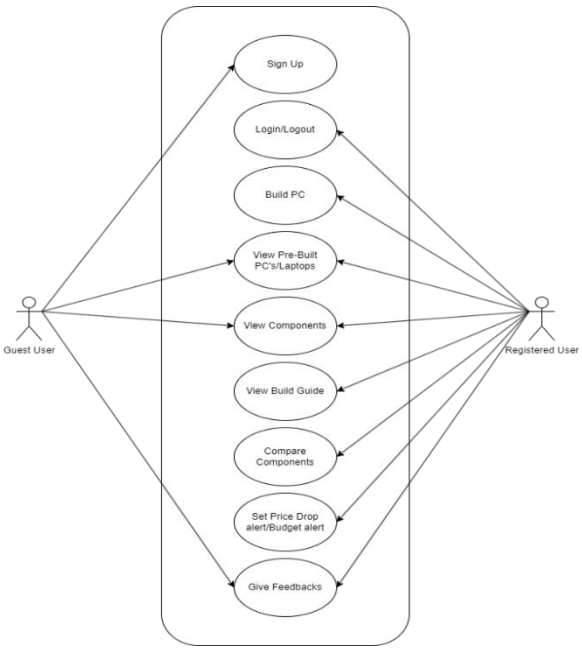


Fig 1. Use Case Diagram

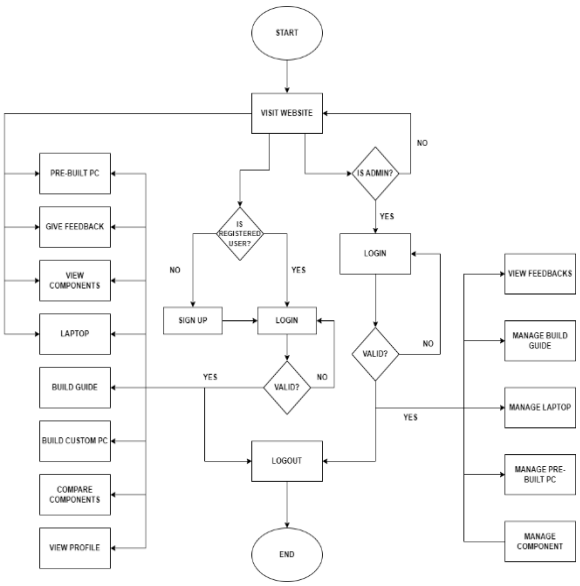


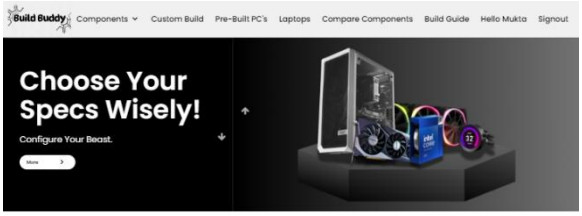
Fig 2. Flow Diagram

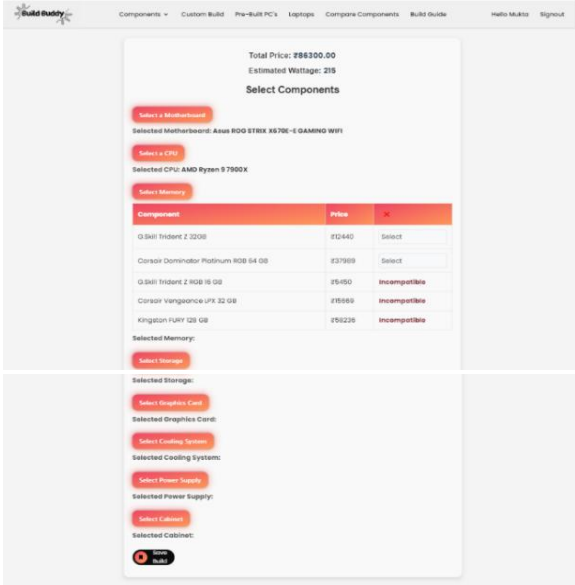
V. RESULT DISCUSSION

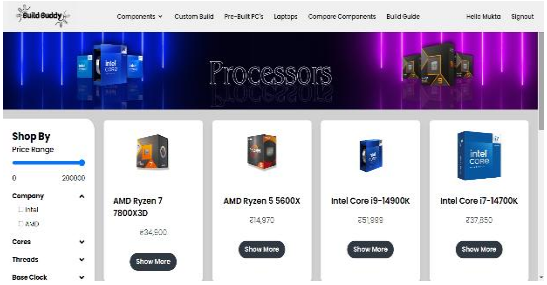
The Custom PC Build website delivers a seamless user experience, beginning with the Home Page, which features an intuitive layout for easy navigation. The Components Page presents detailed specifications for each part, enabling users to make well-informed choices. On the Custom Build Page, users can handpick components while ensuring compatibility, with real-time calculations for power consumption and pricing to keep them updated on system performance and cost.

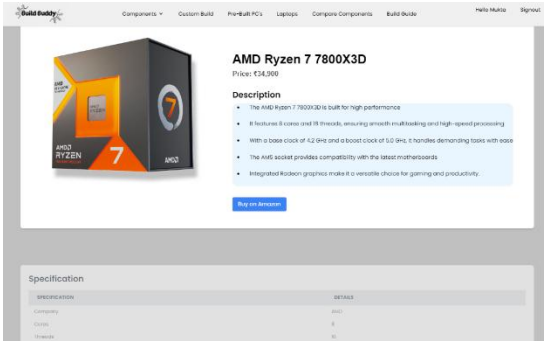
For those who prefer ready-made options, the Pre-Built PC Page features a selection of curated desktop PCs, while the Laptop Page showcases various laptops with detailed specifications. The Compare Page enables users to evaluate components side by side, simplifying decision-making. Additionally, the Build Guide Page provides step-by-step assembly instructions, making it especially helpful for beginners.

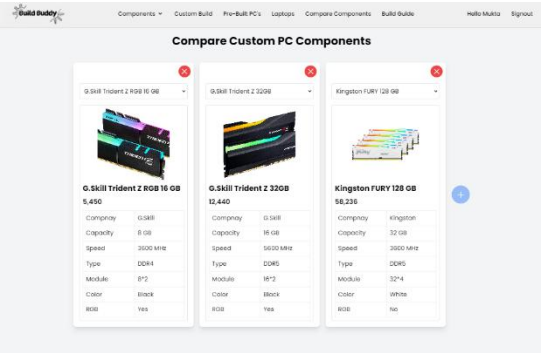
The Profile Page allows users to manage and delete their custom builds through a wishlist, ensuring a well-organized experience. Overall, the website's design supports users at every step, from customizing builds to purchasing pre-built solutions, providing a seamless and informative journey.











VI. CONCLUSION

In summary, the online PC building configuration website offers a comprehensive and user-friendly platform for individuals looking to customize and assemble their ideal computer systems. Its intuitive interface and extensive component database enable users to explore a wide range of options, including the latest hardware. Real-time compatibility checks help prevent errors, ensuring a smooth building experience. Additionally, integrated pricing from multiple vendors allows users to make informed, budget-friendly decisions without compromising quality. Overall, the website simplifies the PC building process, equipping both beginners and experienced users with the necessary tools to create high-performance, customized systems.

VII. REFERENCE

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