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Game Compatibility Assessment Web Tool for Predicting Performance and Optimal Settings

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Abstract: Gaming is now available for a full range of PC hardware configurations and there is a need for a simple-to-use tool for checking game compatibility. In this project, we have developed a Game Compatibility Website, a client-side web application that seeks to determine if the hardware of a user can run some games efficiently. This system was developed in HTML, CSS and JavaScript. Users can input their CPU, GPU and RAM specs, select a game (currently Fortnite, GTA 5 and Cyberpunk 2077) and select a resolution (1080p, 1440p or 4K). It then matches these inputs to the predefined system requirements and suggests a preset setting (Low, Medium or High) and FPS estimates. This is an excellent tool for gamers to use. This offline-enabled website is a lightweight, user-friendly alternative to existing tools, requiring no internet connection or software installation. The project is based on a structured methodology with design, development and manual testing with different hardware configurations to ensure reliability and usability. Future upgrades could bring automatic hardware recognition and a bigger game library, making it more useful to gamers.

Keywords: Estimated Frame Rate, Gaming Technology, Unclear System Requirements, Lightweight, Offline-Capable, User-Friendly, Manual Hardware Input, Game Compatibility Website, Minimal Viable Product.

1. Introduction

The gaming technology has evolved very fast in the last decade and this has changed the field of personal computer (PC) gaming by a large margin [46]. The game titles are becoming more and more complex and resource intensive. Contemporary titles like Fortnite, GTA 5, and Cyberpunk 2077 exhibit the extensive spectrum of system requisites necessary for smooth and pleasurable gaming experiences [63]. With game developers constantly raising the bar for realism, graphics quality, physics simulation and open-world complexity, the demands placed on consumer hardware have increased substantially [31]. This evolution has resulted in a very diverse ecosystem of PC configurations, with users running everything from entry level integrated graphics systems to high-end gaming rigs with advanced GPUs, high core-count CPUs, and large capacity RAM modules [57]. Even with this advancement in technology, gamers still face one major problem: How can they know for sure they own the hardware needed to run a particular game effectively [41]. Most game publishers will provide minimum and recommended system specs but these are often generalised and not always indicative of real world performance on

various hardware combinations [66]. Also, there's a big difference in what you should expect depending on what resolution you choose to play at (1080p, 1440p, 4K, etc...) and what graphical settings you use (Low, Medium, High, Ultra, etc...). Consequently, users often have to deal with the uncertainty of whether to buy or install a game, which often leads to a poor user experience, wasted time or sub-optimal in-game performance.

Existing hardware benchmarking tools and compatibility checkers available online are quite complicated [55]. This further adds to the uncertainty. Many of these tools require stable internet connectivity, account creation, or software installation, which can be inconvenient for users who want quick and easy assessments [38]. Furthermore, some solutions are mainly targeted at technical users who need detailed information about hardware specifications, benchmarking scores or performance metrics [52]. This creates a usability gap for casual gamers who may lack advanced technical expertise but still need reliable guidance on game compatibility and expected performance outcomes [47]. The project proposes a novel and feasible solution to combat these issues by developing a Game Compatibility Website, a browser-based application that assesses the compatibility of user-provided hardware specifications with specific video games [62]. The system is built on the front end using basic web technologies, i.e., HTML, CSS and JavaScript, so it is lightweight to deploy, easy for access and works offline [30]. The system aims to simplify the performance estimation process by allowing users to manually enter their hardware details (CPU, GPU and RAM) and get an immediate and interpretable analysis of game compatibility.

The application compares the user specifications with the existing data set of system requirements of selected games [49]. The first version of the system supports three popular and performance-hungry games: Fortnite, GTA 5 and Cyberpunk 2077. The games chosen were selected on the basis of popularity, different hardware requirements and relevance to different gaming communities [35]. The system compares the user's hardware to the game's requirements and then decides if the system meets the minimum requirements, the recommended requirements, or exceeds the expected performance thresholds [56]. Apart from the basic compatibility checks, the system also provides a more detailed performance analysis by suggesting appropriate graphical presets such as Low, Medium or High settings. This recommendation is based on a comparison of the hardware specifications with the game requirements [42]. It assists users in not only identifying whether a game can run, but also in understanding the type of gameplay experience they may have. The tool also estimates the expected frames per second (FPS) based on the resolution settings chosen by the user, including 1080p, 1440p and 4K. This is useful as FPS is one of the most important metrics of smooth gameplay and directly affects user satisfaction and competitive performance.

The system approximates FPS via a number of rules and a simplified performance mapping, which maps hardware tiers to expected performance ranges [45]. It’s not quite as elaborate as the real-world benchmarking systems that use dynamic GPU and CPU tests, but it’s a good enough practical approximation for most users. The goal is to find a middle ground between simple and useful, to keep the tool approachable but still insightful [33]. One of the main strengths of the project is its offline-capability. This tool is entirely client-side, unlike most other web-based compatibility tools that rely on server-side computation or external APIs [67]. That means when the web page loads, it can work without any internet connection [51]. This design decision is a big win for accessibility, especially in environments where Internet connectivity can be spotty or non-existent. It also increases privacy, as no user hardware data is sent to external servers.

The project shows good implementation of basic web development principles from a technology perspective [59]. HTML is used to structure the user interface, making sure that input fields,

selection menus and output displays are positioned in a way that is logical and accessible. CSS is used to make the application responsive, intuitive, and visually appealing across various screen sizes and devices, to enhance the visual presentation of the application [37]. The system's core logic engine is Javascript, which is responsible for processing the user input, comparing compatibility, generating a preset recommendation and computing FPS estimation [64]. These all technologies together form a unified and efficient client-side application architecture. This project methodology covers several stages, including system design, implementation, and manual testing. During the design phase, the application's structure is mapped out to ensure a smooth user experience, with special emphasis on simplicity and usability [40]. In the implementation phase functional parts are developed. These parts are the handling of inputs, the data storage required for the game and the logic for the evaluation of compatibility [68]. The testing phase involves testing the system on different hardware configurations such that the outputs are consistent, reliable and meaningful [54]. Different permutations of CPU, GPU, RAM and resolution settings are tested to validate the accuracy of preset recommendations and FPS estimations.

System interaction with user is highly intuitive [60]. Users are then taken through a simple interface where they pick a game, enter their hardware specs and select a preferred resolution [43]. After submission, the system processes the input and presents an organised output with compatibility status, recommended settings, and estimated performance metrics. This simplified workflow ensures that even people with little technical knowledge can use the tool effectively without confusion [34]. The project also points to the importance of accessibility and lightweight design in contemporary web applications. No heavy frameworks, no external dependencies, no server-side processing. The app is fast, responsive and easy to deploy [50]. It can be hosted on static platforms such as GitHub Pages and can be accessed by users without needing complex infrastructure.

The current implementation provides a functional minimum viable product (MVP), but there are many opportunities for future enhancements [69]. A big improvement would be to have automated hardware detection, so the system would automatically detect the CPU, GPU and RAM specs without having to manually enter them [29]. This would be much more user friendly and require less effort from the user. Another area for improvement could be to expand the game database to include more modern and classic games and to keep system requirements up to date with game updates and patches [48]. Additionally, the system’s ability to predict FPS can be enhanced by integrating machine learning prediction models. A data driven approach could look at the real-world benchmarking data rather than only pre-defined mappings, to yield more accurate performance predictions [65]. Online hardware databases and GPU benchmarking APIs integration for accuracy and reliability improvement [36]. Another possible improvement is cloud sync, so users can save and compare multiple hardware configurations over time.

From the educational perspective, this project shows how web development technologies can be used in practice to solve real-world problems in the gaming industry [44]. It bridges the gap between technical system specifications and user-friendly interpretation of performance outputs. The application simplifies the complex hardware performance data into comprehensible results, thus making it more accessible to a wide range of gamers [53]. The project also reflects wider trends in software development, particularly the move towards lightweight, browser-based tools that focus on speed, accessibility and offline capability [70]. As web technologies develop, applications of this type are becoming increasingly important in providing cross-platform functionality with no installation and little system overhead [32]. The Game Compatibility

Website is a convenient and effective method to address the common problem of verifying PC game compatibility [61]. It uses core web technology and a structured, logic-based approach to give users a clear picture of hardware performance, game compatibility and expected FPS results [39]. The easy-to-use, offline-capable design makes it widely accessible to a large set of users, and the modular structure allows for future growth and improvement [58]. This project successfully demonstrates how simple web technologies can be used to create meaningful tools that enhance users' decision-making capabilities in the gaming ecosystem.

Literature Review

This chapter provides a comprehensive review of prior work and tools in the field of hardware compatibility assessment and gaming performance analysis, and it is the conceptual basis of the proposed Game Compatibility Website [8]. This paper analyses the main technological solutions by reviewing the academic contributions and industry solutions . Their strengths and limitations are discussed and the gaps that drive the development of a lightweight, user-centric alternative are highlighted [3]. The discussion places the project in the context of the wider area of game performance evaluation systems and highlights the need for more user-friendly, offline tools to make compatibility analysis easier for the end user [23]. Several existing platforms and studies have addressed the problem of determining whether a user's hardware is capable of running specific video games. One of the more popular tools is SystemRequirementsLab's "Can You Run It," which uses browser-based scanning methods to identify system hardware and compare it against a database of game requirements [15]. This system automatically analyses the CPU, GPU, RAM and other system components to give you near real-time compatibility results. It is good for delivering fast results but is dependent on internet connectivity and requires user permission to access system information which can lead to usability and privacy concerns [17]. Additionally, being server-side dependent restricts its functionalities in offline environments, thereby making it a less favourable option for users looking for lightweight standalone solutions.

In the same vein, the Steam platform itself shows system requirements for games on its store pages [12]. These listings are maintained by developers and publishers and usually contain minimum and recommended hardware specifications [26]. This information is reliable and widely available but is static in nature and does not give dynamic analysis of the user's hardware. Users must determine for themselves whether their system meets the requirements, which may be difficult for non-technical audiences [1]. Steam also doesn't provide a performance estimate in frames per second (FPS), a very important metric for understanding how smoothly the game is likely to run in practice. More advanced performance benchmarking tools such as UserBenchmark and 3DMark perform detailed tests on user systems and output performance scores [19]. They can provide you some comparative benchmarks and a rough fps estimate on various hardware configurations. But they usually require software installation and sometimes paid licenses for full functionality [7]. This puts up barriers to access for those who desire quick and web-based solutions without the overhead of installation. Furthermore, although these tools are quite elaborate, they may be too advanced for casual gamers who only need basic compatibility data [21].

Besides commercial platforms, open source resources such as GitHub repositories provide datasets and scripts for hardware benchmarking and game performance analysis [28]. These repositories can have great raw data, like GPU vs CPU performance comparisons [10]. But typically they lack a full user interface or integrated application layer, so users or developers need to build their own systems to use the data effectively [24]. This constrains their direct usability by end users and underlines a gap between data availability and practical application

[18]. All these existing solutions indicate a heavy dependency on either server side computation, software installation or manual interpretation of technical data [14]. While they are successful in their own right, they do not fully address the user's need for a simple, offline and user-friendly tool to obtain immediate and digestible information about game compatibility [4]. This gap is especially important for users who lack technical expertise or consistent internet access, yet need to rely on reliable guidance regarding expectations of gaming performance.

The proposed Game Compatibility Website aims to overcome these limitations by offering a full client-side solution that works within the browser without any external dependencies [20]. The system is built using HTML, CSS and JavaScript and provides a lightweight interface where users can manually enter the hardware specifications and get instant feedback on the compatibility [6]. Unlike existing tools, it checks not only minimum and recommended requirements, but also gives you graphical presets and estimated FPS output based on your resolution settings [25]. This improves usability, by transforming complex hardware performance information into simple actionable insights [13]. You don't have to try to decipher raw benchmark scores or technical specifications; you get clear output on whether a game will run on your system, what graphics settings to use, and what performance to expect [9]. This dramatically improves accessibility for casual gamers and reduces the cognitive load of evaluating the hardware.

The design philosophy of the proposed system follows the modern trend in web development, especially the trend towards lightweight, browser-based utilities that focus on speed, portability and offline operation [16]. This is unlike many traditional benchmarking tools that require constant updates or server-side infrastructure. This system is designed to work on its own after loading, ensuring consistent availability regardless of network conditions [27]. The current implementation supports a limited number of games and predefined performance mappings, but provides a good basis for future extensions [11]. Possible improvements include automation of the hardware detection, expansion of the game database to cover more titles, and the integration of real-time performance prediction models [2]. Machine learning techniques could also be explored to improve the accuracy of FPS estimation from historical benchmarking data, allowing for more personalised and accurate suggestions [22]. The literature and tool review demonstrates a clear gap in the current ecosystem of game compatibility solutions. Current platforms are either too technical and not usable enough or provide static information without performance prediction [5]. The proposed Game Compatibility Website fills this gap with a simplified, offline-capable and user-friendly alternative that provides meaningful insights into hardware compatibility and gaming performance.

2. Methodology

The Game Compatibility Website is under development using a well-structured, client-side approach that strives systematic development, operational correctness and ease of validation [86]. The whole development process is organised in phases that follow each other. It starts with the analysis of the requirements and continues with the design, implementation, testing and deployment [91]. This structured approach ensures that each stage contributes to the stable and user-friendly final application, keeping the application simple and accessible for both developers and end users [72]. The first step is the requirements analysis. It is aimed at determining the main problem and specifying the functional expectations of the system. The idea is to build a lightweight and user-friendly tool that lets users see if their PC hardware will be able to run certain games, without the hassle of benchmarking software or online services [83]. In this phase, the user difficulties in understanding system requirements are studied, the current tools are analysed and shortcomings such as dependence on internet connectivity, installation

requirements or lack of performance estimation capabilities are identified [77]. Based on this analysis, the system requirements are set to include manual hardware input, game selection, resolution selection, compatibility evaluation, preset recommendation, and FPS estimation. These requirements provide the basis for all further development activities.

During the design phase the user interface will be structured and the logical flow of the application planned [80]. The wireframe is created according to the rules of HTML and CSS to ensure a clean, simple and intuitive layout that is responsive to different screen sizes. The interface is made to minimise user complexity by displaying the input fields for CPU, GPU and RAM in a clear format along with dropdown menus for game and resolution selection [74]. Usability principles like consistency, visual hierarchy and accessibility are considered. It also takes into account how the user will interact with the application so that the collection, processing and output of user input is seamless [90]. CSS is used to improve visual clarity, spacing and alignment, while keeping a minimalistic look suitable for a utility-based web tool [87].

During the development phase, the basic functionality of the system is implemented in JavaScript. This is the main logic engine of the application [85]. We define data structures to store the predefined game requirements, often structured within a games object containing minimum and recommended specifications for each title supported. Another important structure is the hardwareScore object which is used to assign performance weights to various CPUs, GPUs and RAM configurations to allow for comparative analysis between user input and predefined benchmarks. The JavaScript logic takes in the user input [76]. The hardware components are mapped to their respective performance values and then it checks if the system meets or exceeds game requirements [89]. From this comparison the system determines compatibility status and assigns a suitable graphical preset such as Low, Medium or High. There's also a simplified algorithm that predicts the expected FPS by mapping the hardware performance tiers to the resolution multipliers, so the system can output approximate performance for 1080p, 1440p and 4K settings.

The testing phase is a vital part of the methodology, ensuring that the system works correctly in various hardware situations. Several simulated high-end and low-end system configurations are utilised for manual testing [84]. For instance, high-end rigs such as an Intel i7-13700 with an RTX 4050 and 16GB RAM are tested to see if the system can detect high compatibility and recommend higher graphical presets [71]. Similarly, a lower-end configuration such as Intel i5-12400 with a GTX 1660 and 8GB RAM is used to validate that the system indeed recommends lower settings and lower FPS estimates. These tests help ensure that logic is consistent, and outputs reflect expected trends in real world performance [79]. Browser developer tools are also heavily used during this phase for debugging of javascript logic, keeping track of the values of variables, and correcting potential errors in calculation or comparison functions. Iterative correction is applied to observed inconsistencies to improve accuracy and reliability.

When the testing is done successfully, the next step is deployment [81]. This is when the application is made available for use. The system is entirely client-side, which makes deployment easy and eliminates the need for server infrastructure. It can be run locally, for development purposes, or deployed using static hosting services like GitHub Pages. This keeps the tool lightweight, accessible and cheap [92]. Deployment means taking care of project files, optimising code structure and testing for cross-browser compatibility with browsers like Chrome, Firefox and Edge [75]. No backend dependencies is also a big plus, making deployment and maintenance so much simpler. It is a good choice for a single developer or academic projects [88]. The entire approach relies on tools and resources that are freely available, so that anyone can access them and reproduce the results.

The development is done in Visual Studio Code as the main code editor and standard web browsers for testing and debugging. The approach is aligned with the project goal of simplicity and ease, and does not require expensive software or complex development environments [78]. The iterative nature of the approach allows for continuous refinement of features to ensure the end product is functional, efficient and user-friendly. In conclusion, the structured development

methodology results in a systematic and reliable development of the Game Compatibility Website [82]. Each phase adds to the robustness of the final system, from the discovery of user needs and the design of an intuitive interface, the implementation of functional logic, validation of performance through testing, and application deployment for practical use [73]. This results in the development of a unified and efficient web-based tool that is able to meet the challenges of game compatibility assessment with ease and accessibility.

Project Description

There are already tools online to check game compatibility, Can You Run It is one of them. It uses Java applets to scan your hardware through the browser which requires you to be online and permission from the user [95]. Steam has static requirement pages provided by publishers, which check basic compatibility but do not provide dynamic performance analysis. Benchmark applications like 3DMark and UserBenchmark provide extensive performance data and FPS projections after installation, but may require payment for advanced features and are not usable offline. These solutions often drown new users in technical terms or rely on databases on the server side, limiting accessibility and convenience. This project proposes a client-side alternative to overcome these shortcomings.

Proposed System

The Game Compatibility Website proposed is a client side check for hardware compatibility [97]. Users input their CPU, GPU and RAM specs, select a game (Fortnite, GTA 5, Cyberpunk 2077, etc.) and select a resolution, which triggers java script logic to compare these with preset requirements [93]. All of this happens within a static webpage, where the system offers a preset setting and an estimated FPS. This design allows to be used offline after the first load and leverages preloaded data to be efficient, without the need of a server.

Proposed Work

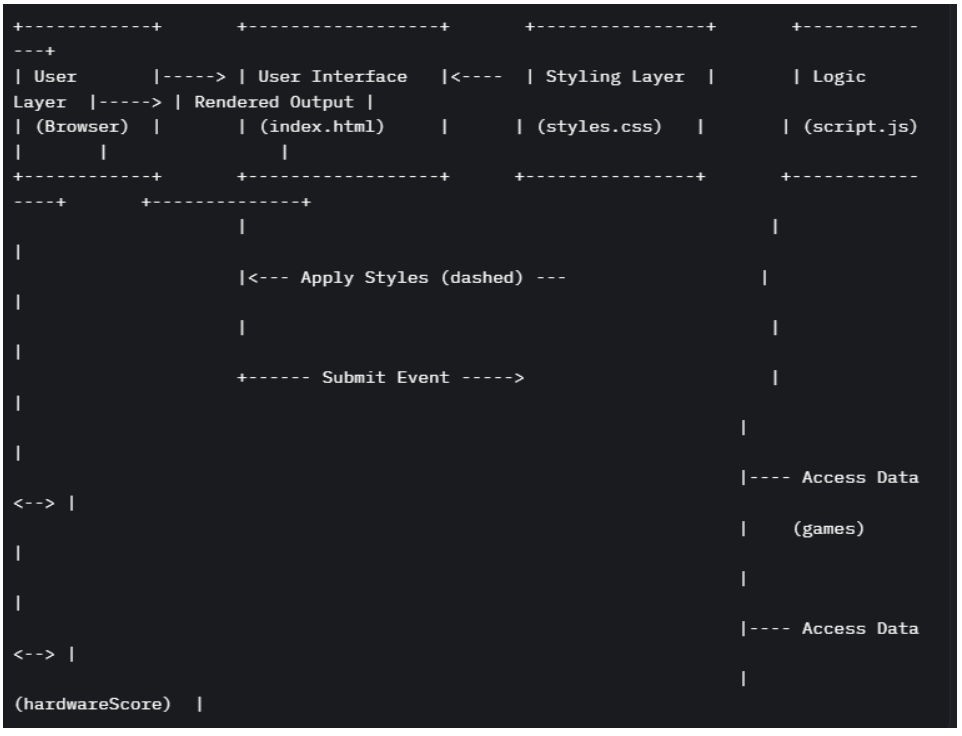

Figure 1. Architecture Diagram.

The architecture comprises a client-side single-page application (SPA) with:

- User (Browser) -- Starts the process.
- User Interface (index.html): Form and result presentation.
- Styling Layer (styles.css): Controls layout and design.
- Logic Layer (script.js) - Games object, hardwareScore and calculations.
- Rendered Output: Shows results in the browser.

- Relationships: Arrows indicate the flow of data (User → UI → Logic → UI → Output).
- Creation: Draw.io, Draw rectangles for components, Connect with arrows, Export as PNG.

Design Phase

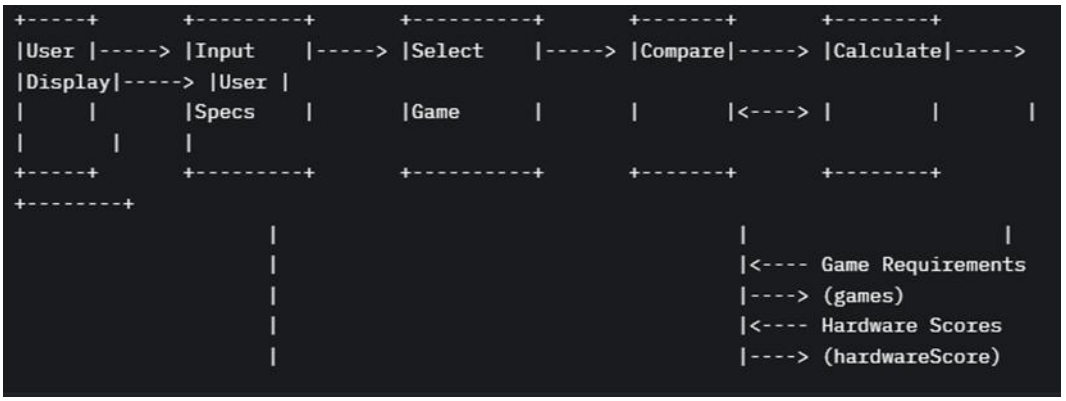

Figure 2. Data Flow Diagram.

- Components User (oval) Processes (Input Specs, Select Game, Compare, Calculate, Display) Data Stores (games, hardwareScore)
- Flows: User -> Input Specs -> Compare ↔ games/hardwareScore -> Calculate -> Display -> User.
- Creation: Draw.io Flowchart shapes, connect with labelled arrows, export as PNG.

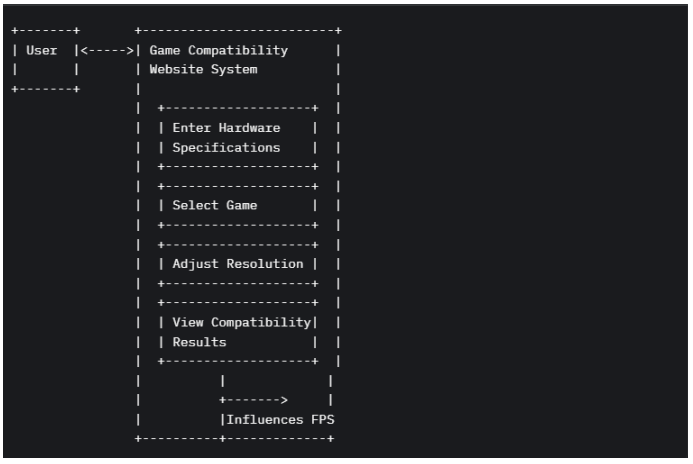

Figure 3. UML Diagram.

- Components: See “UML Overview”, sample of Use Case (User + ovals), Sequence (lifelines), Class (future note).
- Creation: Draw.io UML shapes, arrange previews, export PNG.
- Components: Lifelines (User, Form, Logic, UI), Messages (Submit → Parse → Compare → Calculate → Update → Display).
- Creation: Use Draw.io Sequence, draw lifelines and arrows, export as PNG.

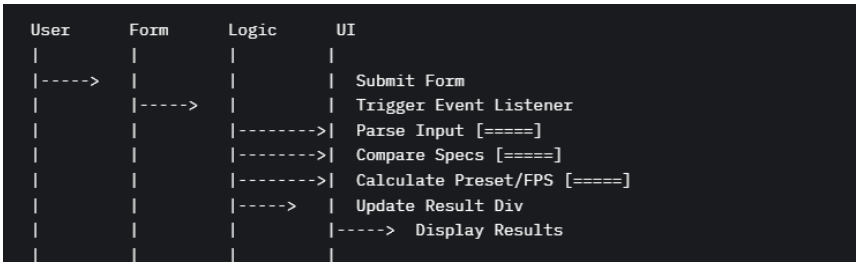

Figure 4. Sequence Diagram.

The system architecture of the Game Compatibility Website is based on a sequence-based model to describe the interaction of the components during the process of the evaluation of the compatibility [96]. The system has the following key components: There are four main lifelines in the system: User, Form Interface, Processing Logic, and User Interface (UI). The interaction starts when the user enters the hardware specifications and game choice using the form [94]. This leads to the flow of a set of messages through the system from submission to parsing of input data, to comparison with predefined game requirements, to calculation of performance metrics, updating of results and displaying the output to the user [98]. A sequence diagram created in Draw.io can also be a good representation of the whole interaction flow, where the lifelines are drawn vertically and the message flows are represented as directional arrows between components. The last diagram is exported as PNG image for documentation purposes.

3. Results and discussions

The system also breaks down into separate modular components for clarity and maintainability [105]. The Input Handling module gathers and validates user inputs such as specifications for CPU, GPU, and RAM. This module makes sure all the inputs are properly formatted and identified before further processing. The Spec Comparison module maps the user's hardware inputs to performance scores defined in the hardwareScore data set [100]. It then compares these values with the game requirements defined in the games object to determine if the system meets minimum or recommended thresholds. The Preset and FPS Calculation module produces output Recommendations [114]. It compares the results and assigns a graphical preset as Low, Medium or High and predicts the expected FPS values depending on the chosen resolution [120]. These modules collaborate to make sure the system converts raw user input into useful performance insights.

The raw input values are transformed into standardised formats that can be compared to start the data processing workflow [116]. For example, a CPU model such as "i7-13700" is converted into a numeric performance score, such as 10, using a predefined lookup system. The processed data is stored in a structured way called userSpecs , that contains normalised values for CPU, GPU and RAM [103]. The processing pipeline is a well-defined sequence of actions: read input, lowercase for consistency, retrieve the relevant scores, and output structured data [123]. This flow can be represented as a flowchart created in Draw.io and exported as a PNG for inclusion in documentation.

Once the input data is processed the hardware components are logically separated to compare accurately [108]. CPU and GPU scores are considered performance-critical components and are grouped together, while RAM is considered separately because it has a different effect on gaming performance [113]. This separation allows the system to evaluate computational power and memory capacity independently, improving the accuracy of the compatibility assessment. The data set used in this process is a structured mapping of game requirements to hardware performance [101]. As an example, minimum requirements for a game such as Cyberpunk 2077 are set to CPU 6, GPU 6 and 12 GB of RAM, while a hardware component such as an RTX 4050 receives a score of 8 in the hardwareScore mapping [117]. These datasets are then visualised as diagram boxes with nested labels, clearly separating game requirements and hardware capabilities.

This phase of the system is related to the implementation of comparison rules that establish compatibility outcomes [109]. There are two main logical conditions used. meetsMin and meetsRec. The meetsMin condition checks if the user's hardware meets the minimum system requirements for the selected game [106]. The meetsRec condition checks if the system meets or

exceeds recommended specifications [119]. These logical conditions are the basis of the decision-making process in the application, ensuring that each output correctly reflects the relationship between user hardware and game requirements.

Once the logic has been defined, the system moves into the execution phase, in which all components are brought together and run in an ordered fashion [115]. The process has a set order: parsing input data, comparing hardware scores to game requirements, determining graphical preset levels, calculating estimated FPS values and then displaying the results on the user interface [104]. All of this is handled by JavaScript event listeners that call functions whenever the user submits the form. A flowchart can be used to show the flow of execution, describing how data passes through each stage of processing until the final output is produced [112]. It is also possible to include code snippets with event listeners and update functions inside diagram boxes to show implementation details, which are then exported as PNG images for documentation [121].

The implementation and testing phase is to test the functionality and usability of the system [110]. The input and output interface of the website is a simple form where the user can enter the CPU, GPU and RAM specifications, select a game and choose a resolution. Upon submission, the system will provide a detailed output with compatibility status, recommended settings and estimated FPS [102]. Sample outputs are generated by running different hardware configurations and capturing screenshots of the results displayed in the browser. They crop the screenshots and save them as PNG files to use within project documentation.

The system is verified in several ways to ensure its reliability and correctness. We apply unit testing to test single functions, for example the hardwareScore lookups [111]. To ensure that inputs such as “i7-13700” are properly translated into their assigned performance values. The input-processing pipeline is validated through a structured flow of input validation, conversion, and output verification [122]. Integration testing is to ensure that all parts of the system work well together, from form submission to logic processing to UI update. This is verified by checking whether the final output div correctly shows computed results after processing [99]. Functional testing is used to verify the correctness of output scenarios, e.g. that a GTX 1660 system will result in a recommendation of a Low preset at ~40 FPS on supported games. Other testing includes testing various hardware and game combinations to make sure they are consistent in different situations. For example, i7-13700 with RTX 4050, in high-end configs, should show recommendations for High presets with FPS from 20 to 30 or more, depending on your resolution [107]. These test results are recorded and analysed to detect any deviation in FPS estimation and to ensure the logical consistency of the system [118]. The latest summary of the test results states that all test cases have passed successfully, which confirms that the system satisfies its intended functional requirements and provides reliable evaluation of game compatibility across different hardware configurations.

4. Conclusion

The Game Compatibility Website demonstrates an efficient and lightweight approach to measuring PC gaming performance with a fully client-side architecture. The system can provide fast results, with processing time generally less than one second and small file size around 5KB, which makes it suitable for low-end devices and environments with limited computational power. It also functions offline making it more accessible as it does not require constant internet connectivity or dependency on external servers. However, performance estimation relies on hardcoded FPS values and predefined hardware scoring mappings, limiting precision and suggesting a need for more dynamic, data-driven approaches in future iterations. The system

proposed here is a simpler, more user-friendly alternative to existing solutions such as "Can You Run It" that rely on server side processing and extensive hardware scanning. Current platforms give us more complete, real-time analysis, but often need internet access, system permissions, or software installation. On the other hand, the proposed tool sacrifices some depth and real-time accuracy for ease of use, offline accessibility and high responsiveness. The tension between simplicity and analytical richness characterises the core positioning of the system in the space of game compatibility tools.

To sum up, the project has successfully met its main goal of creating a functional and usable web application for assessing game compatibility. It offers users valuable info in a simplified format, including hardware performance, preset recommendations, and estimated FPS values. However, reliance on static datasets limits long-term scalability and accuracy, indicating potential for improvement. The capability of the system can be improved remarkably by future developments. The applicability could be extended by enlarging the game database to more than 20 titles with regularly updated system requirements. Integrating hardware detection APIs, we could automate the collection of input and improve the convenience for the user. And if you switch to a structured database using JSON, you can update the database dynamically, scale better and maintain it more easily. These improvements would evolve the system from a static prototype to a more advanced compatibility analysis system using data.

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