Compat Check

Software Requirement Specifications

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Session 2022-2026

1. Introduction

With the rapid expansion of cross-platform applications and diverse system configurations, users frequently struggle to determine whether specific software is compatible with their devices. Mismatches between system specifications and software requirements can lead to failed installations, system crashes, or performance bottlenecks. Despite the presence of various tools, most fall short in providing a complete compatibility analysis tailored to individual systems.

Popular platforms like **Can You Run It?** limit their checks to gaming software on Windows systems, offering binary outcomes without performance insights (System Requirements Lab, 2023). Similarly, **PCPartPicker** focuses solely on hardware compatibility for custom builds and does not consider software requirements (PCPartPicker, 2023). Tools like **MacUpdate**, while useful for macOS users, exclude support for Windows or Linux, reducing accessibility for a wider audience (MacUpdate, 2023).

To resolve these limitations, the proposed **CompatCheck Website** will serve as a unified solution that performs intelligent compatibility checks across **Windows, macOS, and Linux**. The system will combine real-time system detection, manual configuration entry, and a dynamic software database to evaluate compatibility at multiple levels, including minimum, recommended, and optimal performance tiers. It will further assist users with upgrade paths, alternative software options, and version-specific compatibility alerts, offering a comprehensive and future-ready approach to software selection and system optimization.

1.1 Purpose

Our Compat Check Website is gonna make life super easy for anyone wondering if their computer can run a specific software. No more guessing or digging through confusing specs! This document lays out everything we need to build this cool tool, based on our project proposal (March 28, 2025).

1.2 Scope

The Compat Check Website is designed to help users check if their system is ready for any software they want, whether it's for gaming, work, or any other purpose. It's gonna be a game-changer for everyone! Unlike PCPartPicker, which only cares about hardware, or Can You Run It?, which is just for games, our website will handle all kinds of software and make things way simpler.

The system has various modules:

- **User Authentication Module**: Handles user signup, login, and secure access to the website.

- **System Detection Module**: Finds out the user's hardware and operating system details.

- **Software Search Module**: Lets users find software that works with their computer.

- **Smart Upgrade Advisor Module**: Gives solutions if a user's system can't run certain software.

- **Compatibility Updates Module**: Notifies users about software version changes.

- **Multi-OS Support Module**: Ensures the website works for Windows, macOS, and Linux users.

- **Energy Efficiency Mode Module**: Recommends software that saves battery for laptops.

- **Legacy System Support Module**: Helps users with older systems run modern software.

1.3 Definitions, Acronyms, and Abbreviations

Term/Abbreviation	Description
Compat Check	Website for checking software compatibility
SRS	Software Requirements Specification
OS	Operating System (e.g., Windows, macOS, Linux)
CPU	Central Processing Unit
GPU	Graphics Processing Unit
RAM	Random Access Memory
JWT	JSON Web Token for secure login

1.4 References

Persons Involved

Dr. Furqan Shahid

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Websites Reference Ideas

- PCPartPicker.

- Can You Run It?.

- UserBenchmark.

- Speccy.

- IEEE Std 830-1998, Software Requirements Specifications.

1.5 System Main Features

- User Authentication Module

- System Detection Module

- Software Search Module

- Smart Upgrade Advisor Module

- Compatibility Updates Module

- Multi-OS Support Module

- Energy Efficiency Mode Module

- Legacy System Support Module

2. Functional Requirements

2.1 User Authentication Module.

2.1.1 Login/Signup

SRS-1	The user will enter the system by entering email, user_type, and password.
SRS-2	The system will verify the email.
SRS-3	The user will be authenticated from the database and given access to the system according to their type.

2.1.2 Change Password

SRS-4	The user will enter their email and current password.
SRS-5	The user will enter a new password and confirm password.
	The password will be updated in the Database.

2.1.3 Forget Password

SRS-6	The user will select the forget password option and enter its email address
SRS-7	The user will enter the OTP received in the provided email address.
SRS-8	The user will enter a new password and confirm password.
SRS-9	The password will be recovered.

2.2 System Detection Module

2.2.1 Manual System Detection

SRS-10	Users shall manually enter OS, CPU, RAM, GPU, and storage details; the system shall ensure correct formats
SRS-11	Manual entries shall be saved in user profiles for later use

2.2.2 Automatic System Detection

SRS-12	The system shall automatically detect CPU (model, cores), GPU (type, VRAM), RAM (size), storage (type, capacity), and OS (version) using browser tools
SRS-13	If automatic detection fails, the system shall offer manual input with helpful presets

2.2.3 System Upgrade Assistance

SRS-14	The system shall suggest upgrades for components that don't meet software needs

2.3 Software Search Module

2.3.1 Filter by Category

SRS-15	Users shall filter software by categories (e.g., Gaming, Productivity) with instant updates
SRS-16	Category selection filters the software list dynamically.

2.3.2 Filter by Price

SRS-17	Users shall filter by license (Free, Open-Source, Paid) and see clear pricing details
SRS-18	Software shall show minimum and recommended system requirements with performance levels (Minimum, Smooth, Best)
SRS-19	The system shall warn about known issues, like software not working with certain hardware

2.4 Smart Upgrade Advisor Module

2.4.1 Suggest Upgrade

SRS-20	The system shall identify components that don't meet software requirements
SRS-21	The system shall recommend upgrades that improve performance for specific software

2.4.2 New System Purchase

SRS-22	If upgrades aren't possible, the system shall suggest pre-built computers with details and store links

SRS-23	The system shall offer alternative software that requires less powerful hardware

2.5 Compatibility Updates Module

2.5.1 Track New Software Versions

SRS-24	The system shall check for new software versions using vendor information and warn about compatibility issues

2.5.2 Subscription Alerts

SRS-25	Users who subscribe shall get email or in-app alerts about software updates
SRS-26	The system shall save a history of alerts for users to review
SRS-27	The system shall suggest older software versions if new ones cause problems

2.6 Multi-OS Support Module

2.6.1 Windows, macOS, and Linux Compatibility

SRS-28	The system shall support compatibility checks for Windows, macOS, and Linux systems
SRS-29	Software shall list requirements specific to each OS and show compatibility results
SRS-30	The system shall suggest alternatives or tools like Wine if the software doesn't work on a user's OS.

2.7 Energy Efficiency Mode Module

2.7.1 Battery Impact Ratings

SRS-31	Software shall include battery impact ratings (Low, Medium, High)

2.7.2 Low-Power Alternatives

SRS-32	The system shall flag software that uses a lot of battery power
SRS-33	The system shall suggest software that uses less power

2.8 Legacy System Support Module

2.8.1 Older Software Versions

SRS-34	The system shall find software that works on older OS versions

SRS-35	The system shall suggest virtual machines (e.g., VirtualBox) for incompatible software
SRS-36	The system shall warn users about the risks of using outdated systems

3. Non-Functional Requirements

3.1 Security

- The system shall use strong encryption (bcrypt) for passwords and secure login (JWT).

- Only authorized users shall access features like user or software management.

- User data shall follow GDPR rules for privacy and safety.

3.2 Usability

- The system shall have a simple, easy-to-use interface for all users.

- Tasks like checking compatibility or searching for software shall be quick and clear.

3.3 Reliability

- The system shall be available most of the time for smooth use.

- Data like compatibility results shall always be accurate and current.

- Errors shall show clear messages to help users fix problems.

3.4 Scalability

- The system shall handle many users and a large software database as it grows.

4. Performance

To ensure optimal functioning of the system, it is essential to understand the hardware and software requirements. Table 4.1 below outlines the minimum and recommended system configurations needed for smooth operation.

Table 4.1: Minimum and Recommended System Configuration

Resource Required	Minimum	Recommended

Processor	Single-core processor (1 GHz)	Dual-core processor (2 GHz+)
RAM	2 GB	4 GB
Storage	Enough for the browser cache	Expandable as per user data
Browser	Modern browser (e.g., Chrome, Firefox)	Latest browser version

5. External Interface Requirements

5.1 User Interfaces

- Dashboard: Shows system details, software suggestions, and alerts.

- Search Page: Offers filters for software categories, licenses, and performance.

- Profile Page: Let users edit system details and view alerts.

- Admin Panel: Manages software data and user accounts.

5.2 Hardware Interfaces

- The system shall use browser tools to detect CPU, GPU, RAM, and storage.

- It shall work on desktops and laptops with standard hardware.

5.3 Software Interfaces

The development of this system involves the use of multiple tools, technologies, and programming languages. These components play a vital role in frontend development, backend logic, database management, and system communication. The following table 5.3 Software Interfaces lists the tools and languages that will be used, along with their purpose and version details.

Table 5.3: Tools and Technologies Used for System Development

Software	Use	Version
React.js	Frontend for a user-friendly interface	Latest
Django	Backend for system logic and security	Latest
MySQL	Database to store user and software information	Latest

RESTful APIs	System communication and vendor updates	N/A

6. Design Constraints

- The system shall use Agile development for flexible progress.

- The system shall be built with React.js, Django, and MySQL/PostgreSQL, so developers must know these tools.

7. User Help/Manuals

The Compat Check Website user manual provides step-by-step instructions for users to check software compatibility, including how to enter system details manually or use automatic detection, search for software, and view upgrade suggestions. It also guides admins on managing user accounts and software data through the admin panel.

8. Licensing Requirements

The Compat Check Website will be developed as a free-to-use tool for individual users to check software compatibility. Any commercial use or integration with third-party platforms will require a separate licensing agreement.