NEWJAISA QUALITY CHECK AUTOMATION

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into the company's website, specifically the

User Acceptance Testing (UAT)

Abstract:

The NJQCA (New Jaisa Quality Check Automation) project aims to develop an automated system to collect, monitor, and update detailed hardware configuration data of devices, enhancing the accuracy and efficiency of quality checks. This system will gather a comprehensive range of information, including hard disk specifications, storage details, motherboard data, Wi-Fi and LAN port configuration, RAM details, camera specifications, display information, battery status, USB and audio port configuration, and essential identifiers such as serial numbers, brand names, models, and manufacturing details.

The automation of these data collection and testing processes for laptop components aims to ensure that all pertinent hardware details are continuously monitored and kept up to date. By integrating this data directly

environment at Autumn, the project seeks to provide real-time updates and easy access for stakeholders. This integration is intended to streamline the quality assurance processes, providing a centralized platform where all relevant hardware information can be accessed, analyzed, and verified without manual intervention.

The expected outcome is a significant reduction in the time and effort required for quality checks, as well as an improvement in the overall reliability and accuracy of the

collected data. Through the implementation of NJQCA, the company anticipates not only enhancing its operational efficiency but also revolutionizing the process of quality assurance. By automating hardware configuration data collection.

Keywords: Performance Checking, OS Booting, Parts Configuration, Quality Analysis.

Introduction:

The NJQCA (New Jaisa Quality Check Automation) project is a state-of-the-art initiative focused on automating the collection, monitoring, and testing of various laptops' detailed hardware configurations and functionalities. This comprehensive project will gather an extensive range of hardware information, including hard disk details, storage capacity, motherboard specifications, Wi-Fi information, LAN port configuration details, camera specifications, display information, battery status, USB port details, audio port information, and crucial identifiers such as serial numbers, brand names, models, and manufacturing details.

Additionally, the NJQCA project will encompass functional testing processes, such as battery charging and discharging tests, Wi-Fi card performance evaluations through file downloads, LAN port functionality tests via file transfers, and USB port checks by sending and receiving files. This holistic approach ensures that not only the static hardware configurations are monitored but also the dynamic performance aspects are rigorously tested. The automation of these processes is designed to ensure continuous, real-time monitoring and updating of all pertinent hardware and functional information. By integrating this data into the company's website, specifically the User Acceptance Test (UAT) environment at uatnewjaisa.biz, the project aims to provide an up-to-date platform for stakeholders to access, analyze, and verify hardware details and performance metrics. This integration will significantly streamline the quality assurance processes, reducing the manual effort and time required for thorough quality checks.

The NJQCA project represents a significant step forward in leveraging automation for enhanced data management and operational efficiency. It aims to provide accurate and reliable information, ensuring that any hardware issues are promptly identified and addressed. The result is expected to be a marked improvement in the reliability and accuracy of the quality check processes, contributing to higher standards of quality across all devices. This project underscores the company's commitment to maintaining excellence through innovation.

Literature Survey:

The NJQCA (New Jaisa Quality Check Automation) project is underpinned by robust system architecture designed to automate the quality assurance process for laptops. The core of the system is a C++ application running on the Ubuntu operating system. The choice of C++ as the programming language is due to its efficient performance and close-to-hardware capabilities, making it ideal for the system-level operations required in hardware testing and data retrieval.

The application communicates with the system terminal to fetch detailed configuration data, such as hard disk information, storage capacity, motherboard specifications, Wi-Fi module details, LAN port functionality, RAM size, camera capability, display configuration, battery health, USB port functionality, audio port configuration, serial number, brand, model, and make of the laptop. System data is temporarily stored in an SQLite 3 database, which offers a lightweight yet powerful storage solution, ensuring quick access and manipulation of the collected data.

The system architecture also includes automated testing routines. For instance, battery testing involves monitoring charging and discharging cycles to assess battery health and performance. Wi-Fi and LAN ports are tested by downloading and uploading files, ensuring network components function correctly. USB ports are tested by sending and receiving files through connected devices, verifying their data transfer capabilities. These automated tests are crucial for identifying hardware issues early in the production process, thereby ensuring product reliability and quality.

Methodology:

The NJQCA (New Jaisa Quality Check Automation) project utilizes a systematic approach to automate the quality check process for laptop hardware components. This methodology ensures that the collection, monitoring, and testing of hardware configurations are performed efficiently and accurately, minimizing human error and maximizing productivity. The first phase of the NJQCA project involved detailed planning and requirements analysis. The key objective was to automate the quality check process, which was previously done manually.

System Design: The NJQCA system is designed with a robust client-server architecture, where the client-side application runs directly on the laptops being tested, while the server-side components manage data storage, processing, and web interface functionalities. This design ensures efficient data collection, seamless interaction, and real-time updates, providing a comprehensive solution for laptop quality checks. Below is an in-depth description of the system components and their interactions.
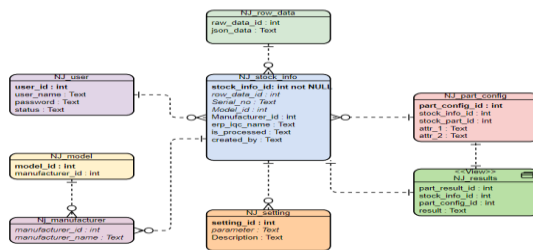
Client-side Components:

Ubuntu OS Dongle: A USB dongle preconfigured with Ubuntu OS and the NJQCA application is used to boot the laptops. This setup ensures a consistent environment for testing across different laptop models and configurations.

NJQCA Application: This is the main application that performs various hardware tests, collects data, and interacts with the user for functional checks. It executes tests on components such as the battery, USB ports, LAN and Wi-Fi connectivity, camera, display, and audio ports. The application prompts users for specific actions, such as inserting or removing cables and devices, to complete the tests.

SQLite 3 Database: A local temporary storage solution for configuration and test results. This database stores test data before it is uploaded to the server and acts as a backup if the system is unable to upload the data immediately. It ensures that no data is lost during the testing process.

Server-side Components:

Web Server: Hosts the company website and handles incoming data uploads from the NJQCA application. It ensures that the test results are available for real-time viewing and analysis.

Database Servers: Store all collected test data in a centralized database for further analysis and reporting. This centralized storage allows for comprehensive data management and historical tracking of quality checks.

API Services: Facilitate communication between the NJQCA application and the web server. These services ensure real-time data uploads and provide interaction points for the NJQCA application to update the server with

Implementation:

The NJQCA application is developed using C++, designed to interact with the system terminal and efficiently process data. It performs automated hardware tests, such as checking battery performance, USB port functionality, and network connectivity. During these tests, it prompts the user to perform specific actions, ensuring thorough and accurate testing. The collected data is temporarily stored in a local SQLite 3 database before being uploaded to the company's web server for centralized storage and report generation.

During implementation, the application is packaged with an Ubuntu OS dongle, which is used to boot the laptops and run the NJQCA application. This approach ensures that the testing environment is consistent across all devices. The NJQCA application controls the user interface and guides employees through the testing process, prompting them to interact with the system by performing actions such as inserting and removing power cables and USB devices. The application reports the results of these tests and generates detailed reports, including the time taken to complete the testing process, which can be accessed on the company's website.

This user-centric design ensures that the testing process is both efficient and user-friendly, significantly reducing the time and effort required for manual testing. By automating the quality check process, the NJQCA application enhances productivity and accuracy, providing reliable data for quality assurance.

Testing:

The software testing phase of the NJQCA (New Jaisa Quality Check Automation) project is crucial to ensure the reliability, accuracy, and efficiency of the application in automating the quality assurance process for laptop hardware. Given the complexity and critical nature of the tasks performed by NJQCA, rigorous testing is conducted to validate the functionality and performance of the application across various scenarios and hardware configurations. The comprehensive testing process covers several stages, including unit testing, integration testing, system testing, and user acceptance testing (UAT). Each stage is meticulously designed to identify and address any issues or bugs, ensuring that the application meets all specified requirements and performs as expected in real-world conditions.

Result:

Hardware   Parts Testing

The NJQCA (New Jaisa Quality Check Automation) project has yielded significant results, demonstrating the effectiveness of automating the quality assurance process for laptop hardware. By implementing this system, we have streamlined the testing procedures, increased accuracy, and reduced the time required for quality checks. The results of the project can be categorized into several key areas, including system performance, user experience, and overall impact on productivity and efficiency.

Data Synced to Website

Conclusion:

The NJQCA (New Jaisa Quality Check Automation) project represents a transformative approach to automating the quality assurance processes for laptop hardware, significantly enhancing efficiency, accuracy, and productivity. The comprehensive development and implementation of this system underscore the critical importance of automation in modern quality control practices. By leveraging advanced programming, robust database management, and intuitive user interfaces, NJQCA sets a new standard in the quality assurance domain.

The NJQCA project has reached several significant milestones that collectively advance its goal of automating the quality assurance process for laptop components. These achievements have brought about enhanced efficiency, improved accuracy and consistency, comprehensive data management, and a user-friendly interface, all while ensuring scalability and flexibility, secure data handling, and thorough reporting and analysis.

Integrating the dance analytics in artificial intelligence our capabilities can further enhance the effectiveness of the system predictive analytics can identify potential issues before they occur

and improve decision making continuous improvement of the user interfacing user experiences essential to maintain high levels of user satisfaction in efficiency. user feedback can be systematically collected and analyzed to identify areas for improvement in implementing changes accordingly.

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