Literature Survey

Introduction:

In this review, we delve into the world of software testing and automation for healthcare services, paying special attention to functionalities crucial for the CURA platform. By gathering insights from existing studies and real-world practices, we aim to build a robust and tailor-made testing strategy that meets the specific needs of CURA's healthcare service delivery. Ultimately, this knowledge will guide us in developing optimal testing methods, ensuring the CURA platform operates flawlessly and delivers on its promise of exceptional patient care.

**Automation Approaches in Software Testing**

*IRJMETS 2022*

*Adarsh Malik, Ashima Mehta*

* The paper discusses the importance of software testing in the development and security of software systems in the internet space. It highlights the complexities and challenges of testing, which have led to the adoption of test automation as a strategy to improve usability, security, efficiency, and reliability of software programs.
* NIST reports are referenced to emphasize the adverse consequences organizations face due to software errors and network testing bugs. The paper focuses on test automation, particularly in IT software testing, and explores various tools, literature reviews, and survey implications in the global landscape of IT and software testing, with a specific focus on the United States.
* The paper also mentions different approaches to automation testing, such as modular framework and data-driven framework. It highlights the advantages and disadvantages of each approach, including reduced test scripts, reusable tests, and the need for coding skills and test automation expertise. It also mentions the use of the Selenium web testing tool for automation testing.

**Decade of Intelligent Software Testing Research: A Bibliometric Analysis**

*Mdpi, 2023*

*Shanshan Li, Yan Lei, Zhouyang Jia, Mohamed Boukhlif, Mohamed Hanine, Nassim Kharmoum*

* The paper presents a bibliometric analysis of intelligent software testing research conducted between 2012 and 2022.
* The authors utilized the Web of Science database to gather bibliometric data and employed tools like Biblioshiny and VOSViewer for analysis.
* The study focuses on scientific progress and collaborative trends in scholarly research related to intelligent software testing.
* The analysis provides insights into authors, articles, journals, organizations, and countries publishing in the field of intelligent software testing.
* The paper aims to offer valuable insights to software engineers, architects, and researchers in the field, helping them understand the current state of research on the application of artificial intelligence in software testing.

**Testing Research Software: A Survey**

*2021 arXiv*

*Nasir Eisty and Jeffrey Carver.*

* The paper aims to understand current testing practices, challenges, and recommendations for improving the testing process for research software development.
* The authors surveyed members of the research software developer community to collect information about their knowledge and use of software testing in their projects.
* The analysis of 120 responses revealed that research software developers have an average level of knowledge about software testing but still find it difficult due to numerous challenges.
* The complexity of the underlying science, unknown results from scientific algorithms, and the culture of the research software community contribute to the difficulty in testing research software.
* The paper suggests that proper training and a culture change are needed to improve the testing process for research software and produce trustworthy results.

**The Journal of Systems & Software**

*2021, elsevier*

*Alireza Salahirad, Gregory Gay, Ehsan Mohammadi*

* The paper focuses on the field of software testing, which is rapidly evolving and growing.
* The authors aim to identify predominant research topics in software testing and understand their connections and evolution.
* They use co-word analysis to map the topology of testing research, where author-assigned keywords are connected based on co-occurrence in publications.
* The paper divides testing research into 16 high-level topics and 18 subtopics.
* Topics like creation guidance, automated test generation, evolution and maintenance, and test oracles have strong connections to other topics, highlighting their multidisciplinary nature.
* Emerging keywords and connections relate to web and mobile apps, machine learning, energy consumption, automated program repair, and test generation.
* The paper provides insights, advice, and a map of the field to offer a deeper understanding and inspire future research in software testing.

**A Comparative Study of Automation Testing Tools for Web Applications**

*2021 IEEE Explore*

*Elis Pelivani, Betim Cico*

* The paper focuses on the evaluation and comparison of automation testing tools used for web application testing, specifically the Katalon Studio and Selenium.
* It discusses the importance of software testing in the software development life cycle and the shift from manual testing to automated testing to reduce time and cost.
* The paper highlights the significant differences in architecture and methodology between Selenium and Katalon Studio and explores how they can be combined for the best automation test.
* It mentions different frameworks such as data-driven, hybrid, and keyword-driven frameworks, which provide reusable steps and improve the tester's ability to test the application.
* The paper also emphasizes the reporting advantages of Katalon Studio over Selenium, including detailed, user-friendly reports that can be exported into various formats without extra configuration.
* Overall, the paper aims to provide insights into the unique features and capabilities of the Katalon Studio and Selenium as automation testing tools for web applications.

# Software Testing in Healthcare Environments:

* 1. Context and Importance:

Healthcare platforms like CURA have become the backbone of modern healthcare, playing a pivotal role in managing patient data and interactions securely and efficiently. This crucial function emphasizes the paramount importance of reliable, secure, and high-performance software systems. Studies have consistently underscored the significant impact of robust testing processes in healthcare environments, where the potential consequences of errors can be profound. Best practices advocate for a harmonious blend of manual and automated testing, meticulously crafting test cases and embedding continuous testing throughout the entire software development life cycle (SDLC). This comprehensive approach ensures thorough verification of the platform's functionality and performance, safeguarding patients' trust and well-being.

Automation Testing and Tools in Healthcare:

* 1. Impact on Healthcare:

Studies have highlighted the substantial impact of automation testing in healthcare settings, enabling swift and efficient testing processes for repetitive tasks. This impact is especially crucial for accelerating software releases and ensuring proficient regression testing, significantly reducing the time and resources required to maintain the platform's stability and functionality. Understanding the nuances of implementing automation in healthcare is pivotal for optimizing the CURA project's impact, streamlining the development process, and ultimately delivering a reliable and efficient healthcare service platform.

* 1. Katalon Studio in Healthcare:

Exploration of automation tools reveals Katalon Studio as a preferred choice for healthcare environments, showcasing a profound impact on both testing efficiency and time-to-market reduction in healthcare service platforms. Its user-friendly interface and versatile scripting capabilities significantly contribute to the overall impact on healthcare software testing by empowering testers to quickly create and execute comprehensive test cases, analyze results promptly, and facilitate streamlined communication and collaboration within the development team. Katalon Studio's effectiveness in enabling rapid and efficient testing makes it a valuable asset for optimizing the CURA project and ensuring its timely delivery.

Continuous Integration in Healthcare Software Testing:

3.1 Jenkins' Impact on Healthcare:

Continuous integration (CI) emerges as a key component with a substantial impact on modern software development and testing in healthcare. Literature underscores Jenkins' impact in coordinating automated builds, integrating seamlessly with version control systems like Git, and streamlining continuous testing throughout the SDLC. This impact ensures early detection of defects, promotes rapid code integration, and optimizes the delivery pipeline in healthcare environments. By leveraging Jenkins' capabilities, the CURA project can ensure a more efficient and collaborative development process, minimizing errors and delivering a robust and reliable healthcare service platform to patients.

Cross-Browser Testing Best Practices in Healthcare:

4.1 Ensuring Compatibility Impact:

Ensuring compatibility through cross-browser testing has a profound impact on healthcare platforms like CURA, guaranteeing seamless access and functionality for users regardless of their preferred browser choice. Literature outlines impactful best practices utilizing tools like TestCloud, addressing challenges associated with diverse browser environments and operating systems. This ensures that CURA delivers a consistent and reliable user experience across different platforms, enhancing the overall impact on healthcare service delivery and accessibility.

User Authentication and Security Testing in Healthcare:

5.1 Enhancing User Authentication Security Impact:

The impact of robust user authentication and security testing is pivotal in healthcare platforms like CURA. Literature underscores the necessity for impactful authentication mechanisms to safeguard user accounts, sensitive patient data, and medical records. Implementing multi-factor authentication, secure session management, and regular vulnerability assessments are crucial aspects of ensuring CURA's integrity and protecting sensitive healthcare information. By prioritizing robust security testing, the CURA project can build trust with its users and stakeholders, establishing itself as a reliable and secure platform for healthcare delivery.

Reporting and Analysis in Healthcare Software Testing:

6.1 Impactful Reporting Mechanisms:

Literature on reporting and analysis in software testing emphasizes the impactful nature of clear, actionable reports. Implementing comprehensive reporting mechanisms and automated email notifications through tools like Katalon ensures prompt communication of impactful test execution results, facilitating informed decision-making throughout the development process. Comprehensive and timely reports not only enable developers to address issues swiftly but also empower project managers and stakeholders to make informed decisions about CURA's features and functionality, ultimately optimizing the platform's impact on healthcare delivery.

Conclusion:

In conclusion, the literature review provides insightful perspectives on the impactful nature of various software testing components within the context of healthcare, specifically tailored to optimize the CURA project. By leveraging impactful practices in healthcare testing, utilizing automation tools like Katalon Studio, embedding continuous integration with Jenkins, and addressing critical aspects such as cross-browser compatibility, user authentication security, and impactful reporting, the testing strategy for the CURA project can be refined to make a substantial impact on the quality, reliability, and accessibility of its healthcare service delivery.