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THE TWO-WAY ASSESSMENT APPROACH IN CONTEXT OF AGILE AND USABILITY SOFTWARE TESTING PRACTICES

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ABSTRACT

Software has now become an influencing force that affects the human civilization as high in quality and for that purpose user-friendly software is needed. By involving the client-side in decision-making process and getting feedback from the users, Agile Software Development model has grown its usage in software industry and has also reached to great heights. As agile software development principle emerged in the past years, an effective methodology has been developed to enhance the success rate of software development process. As a development methodology, agile development method emphasizes iterative and incremental iterations, adaptability, and rapid development cycles and importantly user-oriented development with usability as in User-Centered Design Model. Usability can be stated as an amount of human interaction with the human interface in a software or web product. It is required to perform a perfect testing to build perfect software system. A usability test can determine the level of usability of an interface by inviting expected users to contribute in testing. During a usability test process, a user or user group preform a sequence of tasks for using the system with or without assistance from software development team. User behaviors, emotional responses, and performance are recorded with each task performed by the user. A new development in the world of testing is the Two-Way Assessment Approach. The traditional testing examines the system from one angle i.e. user's perspective whereas the Two-way testing is a revolutionary expansion in testing in which users' viewpoints, managements', developers' and testers' viewpoints are also taken into consideration. The management's, developer's and testers' point of view might be different from the user's perspective therefore it highlights the importance of various attributes to measure the overall usability of the software. By comparing attributes constraints with each other and evaluating the most effective results, efficiency of system can be increased. Two-Way Assessment can be applied in order to determine what factors contributed most to the ideal scenario for the organization which benefits both from a developer's and stakeholder's perspective. The basis of any business organization is stability in the form of the delivery of reliable and user-friendly software products in a dynamic and competitive environment. Growth of quality software has become an expected constraint of any software industry. Enhancing usability testing efficiency will be one of the important aspects of producing high-quality software. In this way, organizations are obliged to incorporate the testing attributes for improved efficiency, and thus better reliability with a defect free system can be obtained. The Two-Way Assessment method ensures that software is stable and quality-oriented.

Keywords: *Agile Testing, Usability Testing, Two-Way Assessment, Decision Making Process, User-friendly Software.*

Introduction

Software has become an essential part of modern life, and it is crucial to ensure that it is high-quality and user-friendly. High-quality software means that it is reliable, robust, and free from errors or bugs that could cause problems or lead to data loss. User-friendly software should be easy to use and navigate, with clear instructions and intuitive interfaces.

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The Agile Software Development model emphasizes collaboration, flexibility, and iterative development of software products. It involves involving the client-side in the decision-making process and regularly collecting feedback from users. Agile methodologies are flexible and adaptable, allowing developers to respond to changes and updates in a dynamic environment. By involving the client and user feedback in the development process, developers can ensure that the software they are creating is meeting the needs and expectations of their clients and users.

User-Centered Design (UCD) is a design process that is often used in conjunction with Agile Software Development. UCD is a design philosophy that emphasizes designing products based on the needs, wants, and limitations of end-users. It involves gathering feedback from users throughout the design process, to ensure that the product being developed meets their needs and is easy to use.

Usability refers to the ease and efficiency with which users can interact with a software or web product. Usability testing is often used to evaluate how easy a product is to use. Usability testing involves observing users as they interact with the product, and collecting feedback on their experience. This feedback can then be used to identify areas where the product can be improved to make it more user-friendly.

Usability is an important factor in the success of a software or web product, as it can impact user satisfaction, adoption rates, and ultimately the success of the product. A product that is difficult to use or does not meet the needs of its users is unlikely to be successful, even if it has advanced features or technical capabilities.

The Agile Software Development methodology and User-Centered Design approach have been successful in enhancing the success rate of software development projects, by focusing on collaboration, user feedback, and iterative development cycles. By prioritizing user needs and usability, developers can create software that is not only technically sound, but also meets the needs of end-users and provides a positive user experience.

Objectives

Studying the **Two-Way Assessment Approach** in Agile and Usability testing is important for several reasons:

- **Agile Testing:** Agile methodologies emphasize continuous feedback, collaboration, and iteration, and the Two-Way Assessment Approach aligns well with these principles. Understanding this approach helps testers to effectively integrate usability testing into an Agile environment and work with development teams to make timely improvements to the software.
- **Usability Testing:** Usability testing is a critical component of software development, and the Two-Way Assessment Approach is an effective way to ensure that software is usable and meets the needs of users. Understanding this approach helps testers to conduct more comprehensive and effective usability testing, leading to a more successful product.
- **Stakeholder Satisfaction:** The Two-Way Assessment Approach helps ensure that the software meets the requirements of stakeholders, such as clients, customers, and end-users. By understanding and applying this approach, testers can work closely with stakeholders to identify usability issues and make iterative improvements to the software to ensure their satisfaction.
- **Reduced Costs:** By detecting issues early and making iterative improvements, the Two-Way Assessment Approach can help reduce the costs associated with fixing issues later in the development cycle. By studying and applying this approach, testers can help organizations to save time and resources while ensuring the software meets the desired standards.
- **Early Detection of Issues:** The approach involves formative testing, which is conducted early in the development cycle. This helps identify issues with the software as soon as possible, allowing for timely and effective corrective measures to be taken. By detecting issues early, developers can prevent them from becoming larger and more expensive problems down the road.
- **Iterative Improvements:** Formative testing involves iterative testing, where the software is repeatedly tested and improved until it meets the desired standards. This allows developers to make incremental improvements to the software, based on user feedback, rather than waiting until the end of the development cycle to make changes.
- **User-Centered Approach:** The Two-Way Assessment Approach involves summative testing with representative users, which helps ensure that the software is user-centered and meets the needs of the intended audience. By involving users in the testing process, developers can get valuable insights into how the software is being used and how it can be improved.

- **Improved Usability:** The approach helps ensure that the software is usable and meets the required usability standards. By conducting both formative and summative testing, developers can identify usability issues early and make iterative improvements to the software, resulting in a more usable product.
- **Career Advancement:** As organizations continue to emphasize Agile methodologies and usability testing, understanding and applying the Two-Way Assessment Approach can provide testers with a competitive advantage in the job market.

Studying the Two-Way Assessment Approach in Agile and Usability testing help in improvement in the quality of the software, ensure stakeholder satisfaction, and reduce the risk of issues arising in the final product. It also helps testers with the knowledge and skills necessary to be successful in their careers and contribute to the development of successful software products.

Methodology

A Two-Way Assessment Approach is a method of evaluating the performance of an individual or team based on both quantitative and qualitative measures. Here are the steps for a two-way assessment approach:

- **Identify the Criteria:** Determine the factors that are important for evaluating the performance of the individual or team. These could be quantitative factors such as sales numbers, production output, or customer satisfaction scores, or qualitative factors such as communication skills, teamwork, or problem-solving ability.
- **Set Targets:** Set specific targets for each criterion. These targets should be achievable but challenging, and should reflect the individual or team's performance expectations.
- **Monitor Performance:** Monitor performance regularly to assess progress towards achieving the targets. This can be done through regular check-ins, progress reports, or metrics tracking.
- **Provide Feedback:** Provide feedback to the individual or team on their progress towards the targets. This feedback should be specific, timely, and focused on both the quantitative and qualitative aspects of performance.
- **Adjust Targets and Criteria as Necessary:** As the individual or team's performance improves or changes, adjust the targets and criteria accordingly to ensure that they remain relevant and challenging.
- **Evaluate Overall Performance:** At the end of the assessment period, evaluate the individual or team's overall performance based on both the quantitative and qualitative measures. This evaluation should take into account both the achievement of the targets and the qualitative aspects of performance.
- **Identify Areas for Improvement:** Identify areas where the individual or team could improve their performance, and provide recommendations for how they can do so.

By following these steps, a Two-Way Assessment Approach can provide a comprehensive evaluation of an individual or team's performance that takes into account both quantitative and qualitative measures.

- The Two-Way Assessment Approach is a testing methodology that is commonly used in the context of Agile and usability software testing practices. This approach involves two distinct phases of testing: formative testing and summative testing.
- **Formative Testing** is an iterative testing process that takes place throughout the development cycle. The goal of formative testing is to identify usability issues early in the development process so they can be addressed before the final product is released. Formative testing typically involves testing with a small group of users who provide feedback on the usability of the product. This feedback is used to make iterative improvements to the product.
- **Summative Testing** is a testing process that takes place at the end of the development cycle. The goal of summative testing is to evaluate the overall usability of the product and to determine whether it meets the requirements of the stakeholders. Summative testing typically involves testing with a larger group of users who are representative of the target audience. The results of summative testing are used to make final improvements to the product before it is released.

In the context of Agile development, the Two-Way Assessment Approach is particularly useful because it allows developers to make iterative improvements to the product throughout the development process. By conducting formative testing early and often, developers can identify and address usability issues before they become major problems. In addition, the Two-Way Assessment Approach is well-suited to Usability testing in general because it allows developers to gather feedback from users at multiple points in the development cycle. This feedback can be used to make informed decisions about the design and functionality of the product, which can ultimately lead to a more usable and successful product.

The Two-Way Assessment Approach

The Two-Way Assessment Approach is a new development in software testing that takes into account multiple perspectives when evaluating the usability and overall quality of a software system.

Traditional testing methods often focus primarily on the user's perspective, and may not take into account the viewpoints of other stakeholders, such as developers, testers, and management. The Two-Way Assessment Approach, on the other hand, considers all of these perspectives, and aims to provide a more comprehensive evaluation of the software system.

By taking into account the perspectives of developers, testers, and management, the Two-Way Assessment Approach can help to identify issues and challenges that may not be immediately apparent from a user's perspective. For example, developers may be able to identify technical limitations or issues with the software architecture that could impact its usability or performance. Testers may be able to identify specific bugs or errors that could impact the user experience. And management may be able to provide insights into the overall goals and objectives of the software system, and how well it is meeting those objectives.

By considering all of these perspectives, the Two-Way Assessment Approach can provide a more holistic and nuanced evaluation of the software system, and can help to ensure that it meets the needs of all stakeholders, including users, developers, testers, and management. Ultimately, this can lead to a more effective and successful software system.

Why to Study Two-Way Assessment in Agile and Usability Testing

Studying the Two-Way Assessment Approach in Agile and usability testing is important for several reasons:

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- **Reduced Costs:** By detecting issues early and making iterative improvements, the Two-Way Assessment Approach can help reduce the costs associated with fixing issues later in the development cycle. By studying and applying this approach, testers can help organizations to save time and resources while ensuring the software meets the desired standards.
- **Career Advancement:** As organizations continue to emphasize Agile methodologies and usability testing, understanding and applying the Two-Way Assessment Approach can provide testers with a competitive advantage in the job market. Studying this approach can help testers enhance their skills and knowledge, leading to career advancement opportunities.

Studying the Two-Way Assessment Approach in Agile and usability testing can provide testers with the knowledge and skills necessary to be successful in their careers and contribute to the development of successful software products.

The statement you provided highlights the importance of delivering reliable and user-friendly software products in a dynamic and competitive environment. To achieve this, businesses must prioritize the quality of their software products, which can be enhanced by improving usability testing efficiency.

Usability testing is an essential part of the software development process that helps identify and resolve potential issues or defects in the software. By improving usability testing efficiency, organizations can ensure that their software products are stable and reliable, with minimal defects.

The Two-Way Assessment method is one approach that can be used to improve software testing efficiency. This method involves both subjective and objective evaluation of the software product. The subjective assessment involves evaluating the software from the user's perspective, while the objective assessment involves evaluating the software based on predetermined criteria or standards.

By incorporating the Two-Way Assessment method, organizations can ensure that their software products meet both user expectations and industry standards. This can lead to better customer satisfaction, increased reliability, and ultimately, improved business success.

Example of Two Way Assessment in Agile and Usability Testing

The Two-Way Assessment in agile and usability testing is used in usability testing to evaluate the usability of a product from two perspectives: the user's perspective and the evaluator's perspective. Here is an example of how two-way assessment can be used in usability testing:

- Suppose a software development company is developing a new mobile application and wants to test its usability. The company conducts agile and usability test with 10 participants and two evaluators.

  The following steps will be followed:

  - **Task Selection:** The Company selects a set of tasks that users would perform with the mobile application, such as creating an account, searching for a product, and making a purchase.
  - **Participant Testing:** Each participant is asked to complete the selected tasks while using the mobile application. The participant's actions, feedback, and errors are recorded by the evaluators.
  - **Evaluator Testing:** After each participant completes the tasks, the evaluators perform the same tasks using the mobile application. The evaluators record their observations and compare them with the user's actions and feedback.
  - **Debriefing:** After all participants have completed the tasks, the company debriefs the participants and evaluators. The participants provide feedback on their experience using the mobile application, and the evaluators provide feedback on the usability of the mobile application based on their observations.
  - **Analysis:** The Company analyzes the data collected from the usability test, including the participants' feedback and the evaluators' observations. The company can use this data to identify usability issues with the mobile application and to make improvements.

By using two-way assessment in agile and usability testing, the software development company is able to evaluate the usability of the mobile application from both the user's perspective and the evaluator's perspective. This allows the company to gain a more comprehensive understanding of the usability of the product and to make more informed design decisions.

Results and Findings

The Two-Way Assessment Approach in agile and usability testing is a method of evaluating the effectiveness of a product or software application by gathering feedback from both users and developers.

- With these two testing methods, the Two-Way Assessment Approach allows for a more comprehensive evaluation of the product or software application. It helps to identify usability issues early in the development process and provides opportunities for developers to make necessary changes and improvements before the final product is released.

Overall, the Two-Way Assessment Approach in agile and usability testing can help to create a higher quality product that meets the needs and expectations of users.

Conclusion

The benefits of the Two-Way Assessment Approach include:

- **Early Identification of Usability Issues:** Usability issues can be identified early in the development process, which helps to reduce the cost of fixing them later.
- **Continuous Improvement:** The iterative nature of agile testing allows for continuous improvement of the product or software application.
- **Collaboration between Developers and Users:** By involving both developers and users in the testing process, the Two-Way Assessment Approach promotes collaboration and a shared understanding of the product.
- **Enhanced User Experience:** By identifying and addressing usability issues, the Two-Way Assessment Approach helps to create a more effective and user-friendly product.

Overall, the Two-Way Assessment Approach in agile and usability testing can help to create a higher quality product that meets the needs and expectations of users.

Future of Two-Way Assessment Approach

The Two-Way Assessment Approach in agile and usability testing has a promising future as technology continues to advance and user experience becomes increasingly important for businesses. Here are some potential future developments in this area:

- **Increased Automation:** As automation technology improves, it may become possible to automate some of the testing and evaluation tasks in the two-way assessment approach. This could help to reduce the time and cost of testing, while still providing comprehensive feedback from both users and developers.
- **Integration with AI and Machine Learning:** The use of artificial intelligence and machine learning algorithms could help to analyze the data collected from the Two-Way Assessment Approach more effectively. This could lead to more accurate and actionable insights for developers to improve the product or software application.
- **Expansion to New Technologies:** As new technologies emerge, such as virtual and augmented reality, the Two-Way Assessment Approach could be adapted to test and evaluate these new platforms. This would help to ensure that these technologies are user-friendly and effective.
- **Integration with Agile Development Methodologies:** As agile development methodologies continue to evolve, the Two-Way Assessment Approach could be further integrated into these processes. This would help to ensure that testing and evaluation are an integral part of the development process, rather than an afterthought.
- **Increased Emphasis on User-Centric Design and HCI:** As the importance of user experience continues to grow, the Two-Way Assessment Approach could become even more central to the design and development process. This would help to ensure that products and software applications are designed with the user in mind, resulting in better user satisfaction and higher adoption rates.

Overall, the future of the Two-Way Assessment Approach in Agile and Usability Testing is bright, and it will likely continue to play an important role in the development of user-friendly and effective products and software applications.

Future Scope

This study provides preliminary evidence that Two-Way Assessment Approach can be helpful in Agile and Usability testing methods. There are several points that can be added to future research:

- Firstly **AHP (Analytic Hierarchy Process)** can be combined a long with Two-way Assessment because AHP involves breaking down a decision problem into hierarchical structure of criteria and alternative.
- Secondly, the new extension of AHP i.e. **FAHP (Fuzzy Analytic Hierarchy Process)** can also be and incorporated with testing rather than traditional AHP. FAHP allows the season makers to express their judgements in linguistic terms such as "somewhat important" or "very important" using fuzzy membership functions.

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