Exploring Developers' Approach for Dealing with Non-Functional Requirements

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Objective: The primary goal of this survey is to gain an understanding of your experiences and strategies when dealing with Non-Functional Requirements (NFRs) and engaging in discussions related to this kind of requirement during software development. By NFR, we refer to aspects of a software system that go beyond its primary functionalities. These requirements define how the system should behave in terms of performance, security, robustness, and other qualities essential for overall effectiveness and to ensure the system's longevity. By sharing your insights, you will contribute to enhancing the awareness and practices surrounding NFRs, ultimately aiding the development of tools and best practices that benefit the software development community. Your participation will help shed light on the significance of NFR discussions and their impact on project outcomes.

Consent to Participation

1. I declare that I am over 18 years old and agree to participate in non-invasive studies conducted by researcher Anderson José Silva de Oliveira under the coordination of Prof Dr. Alessandro Garcia and Prof. Dr. Juliana Alves Pereira as part of the research carried out by the OPUS Research Group, belonging to PUC-Rio. This study aims to understand how developers deal with NFR discussions on their systems.

2. I understand that all responses are personal and based on my experience.

3. All information collected in this study is confidential. I understand that my name will not be identified at any time. There will be no attempt to identify who you are, and your details will be reported in a non-identifying form.

4. You may withdraw from participating in the research and withdraw your consent at any time.

For questions, doubts or complaints about the study, you can contact **Anderson Oliveira: anderson.jose.so@gmail.com**

* Indica uma pergunta obrigatória

1. Thanks in advance! Do you want to participate in this survey? *

   Marcar apenas uma oval.

   ◯ Yes   *Pular para a pergunta 2*

   ◯ No

   Characterization

2. Age *

   _____

3. Gender *

   Marcar apenas uma oval.

   ◯ Male

   ◯ Female

   ◯ Other

   ◯ Prefer not to say

4. Higher academic degree *

   Marcar apenas uma oval.

   ◯ High School

   ◯ Bachelor

   ◯ MBA

   ◯ MSc.

   ◯ PhD/DSc.

   ◯ Outro: _____

5. Years of experience in software development *

   _____

6. Number of software development projects participated *

_____

7. In your opinion, what is your experience level with software development?

Marcar apenas uma oval.

◯ Very Low

◯ Low

◯ High

◯ Very High

8. Current role in your company: *

Marcar apenas uma oval.

◯ Software Developer

◯ Software Engineer

◯ Software Architect

◯ Software Testing

◯ Project Management

◯ Requirement Analysis

◯ Interface Design

◯ Outro: _____

9. Programming languages that you are proficient in *

Marque todas que se aplicam.

- [ ] Java
- [ ] Python
- [ ] C
- [ ] C#
- [ ] C++
- [ ] JavaScript
- [ ] Outro: _____

NFR Practices

10. 2.1 Please describe occasions in which you were involved in discussions about Non-Functional Requirements (NFRs) in software projects *

_____

_____

_____

_____

_____

11. 2.2 What triggers you to actively collaborate with NFR-related discussions in your projects? (Select all that apply)

Marque todas que se aplicam.

- [ ] Relevance to your area of expertise
- [ ] Impact on software quality that you use
- [ ] Alignment with project goals
- [ ] Potential risks of NFRs are not addressed
- [ ] Learning opportunity
- [ ] Outro: _____

12. 2.3 Which NFR types do you typically discuss during software development *

Marque todas que se aplicam.

- [ ] Performance: Speed, responsiveness, and efficiency of the software.
- [ ] Scalability: Ability to handle increased workload or user traffic.
- [ ] Robustness: Ability of the software to recover in various conditions.
- [ ] Availability: System uptime and accessibility for users.
- [ ] Security: Measures to protect data and prevent unauthorized access.
- [ ] Usability: User-friendliness and ease of interaction.
- [ ] Maintainability: Ease of making updates and changes to the software.
- [ ] Outro: _____

13. 2.4 What is your level of contribution to the NFRs elicitation and specification?

Marcar apenas uma oval.

- ( ) Very Low
- ( ) Low
- ( ) High
- ( ) Very High

14. 2.5 When dealing with problems related to NFRs, how do you access the *
information necessary? (Select all that apply)

Marque todas que se aplicam.

- [ ] Requirements documentation
- [ ] Chat platforms with the team (e.g., Teams, Slack, Discord)
- [ ] Code comments
- [ ] Discussions on version control platforms (e.g., issues and pull requests)
- [ ] Meetings
- [ ] With other (more experienced) colleagues
- [ ] E-mail
- [ ] Outro: _____

15. 2.6 According to my experience, Non-Functional Requirements (NFRs) are crucial for the success of software projects. *

Marcar apenas uma oval.

- ( ) Strongly Disagree
- ( ) Disagree
- ( ) Agree
- ( ) Strongly Agree

16. 2.7 In which phase of software development have you observed discussions of NFRs? *

Marque todas que se aplicam.

- [ ] Early phase (e.g., design phase)
- [ ] Development phase
- [ ] Testing phase
- [ ] Deployment phase
- [ ] Maintenance phase
- [ ] Iteratively during the software's whole life cycle
- [ ] Outro: _____

17. 2.8 Were there specialists dedicated to dealing with Non-Functional Requirements (NFRs) issues in the software projects you participated in? If so, did they have a distinct role within the system? Please detail. *

_____

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_____

_____

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Strategies for Addressing NFRs

18. 3.1 Based on your software development experience, which strategies do you *
    and your pairs follow to ensure that NFRs are properly addressed during the
    development? (Select all that apply).

    Marque todas que se aplicam.

    ☐ Reviewing and refining NFR definitions early in the development process
    ☐ Collaborating with other team members to gather insights
    ☐ Conducting code reviews focused on NFRs
    ☐ Employing specific tools or frameworks for NFR evaluation
    ☐ Integrating NFR testing in the continuous integration pipeline
    ☐ Outro: _____

19. 3.1.1 Explain how and when it happens: *

    _____

    _____

    _____

    _____

    _____

20. 3.2 Which challenges did you face while dealing with NFR in open-source   *
    software systems (Select all that apply)

    Marque todas que se aplicam.

    ☐ Lack of clear documentation for non-functional requirements in the open-source
    system
    ☐ Inadequate communication among team members about non-functional
    requirements
    ☐ Insufficient tooling or frameworks for testing and verifying non-functional aspects
    ☐ Handling trade-offs between different non-functional requirements
    ☐ Ambiguity in defining and articulating NFRs clearly
    ☐ Limited understanding of technical implications of NFRs
    ☐ None
    ☐ Outro: _____

Learning and Improvement when Dealing with NFRs

21. 4.1 Have you received/given useful suggestions from/to your pairs to deal with * NFRs in software projects? Please describe how this happened and how it influenced your approach to addressing NFRs.

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Section 5: Contact Information (Optional)

22. Please provide your email address if you want to receive updates about the research findings or be contacted for follow-up questions.

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Google Formulários