ISSN 3060-4567

LEVELS AND STRUCTURE OF SOFTWARE REQUIREMENTS

Kholmurodov Fazliddin Nemat ugli,
Qarshi State Technical University,
Student of the Department of Telecommunication Technologies

Abstract*. Software requirements serve as the foundation for successful software development, ensuring alignment between stakeholders' needs and system functionality. This paper explores the different levels of software requirements, including business, user, and system requirements, as well as their hierarchical structure. It also discusses best practices for requirement elicitation, specification, and validation to enhance software quality and project success.*

Keywords: *Software Requirements, Requirement Levels, Business Requirements, User Requirements, System Requirements, Requirement Engineering, Software Development, Requirement Validation, Functional Requirements, Non-Functional Requirements.*

Software development projects rely on well-defined requirements to ensure that the final product meets user expectations and business goals. Requirements exist at multiple levels, ranging from high-level business needs to detailed system specifications. Understanding these levels and their interactions is crucial for effective software engineering.

Levels of Software Requirements.

Business Requirements. Business requirements define the high-level objectives and expected outcomes of a software project. They describe why the system is needed and align with strategic goals.

User Requirements. User requirements specify the functionalities and interactions that end users expect from the system. These are often represented as user stories, use cases, or personas.

ISSN 3060-4567

System Requirements. System requirements provide detailed technical specifications that define how the software should function. These are categorized into functional and non-functional requirements:

- **Functional Requirements:** Define specific behaviors, features, and capabilities of the system.
- **Non-Functional Requirements:** Include performance, security, usability, and scalability constraints.

Structure of Software Requirements.

Requirement Hierarchy. Requirements follow a hierarchical structure, starting from high-level business needs and breaking down into detailed system specifications.

Requirement Traceability. Traceability ensures that each requirement is linked to its origin and can be tracked throughout the development lifecycle. Traceability matrices help manage changes and maintain consistency.

Requirement Specification Standards. Standardized requirement documentation, such as IEEE 830, enhances clarity and reduces ambiguity in software development projects.

Challenges in Managing Software Requirements.

Ambiguity and Incompleteness. Poorly defined requirements lead to misunderstandings, scope creep, and project delays. Clear communication and iterative refinement help mitigate these risks.

Changing Requirements. Evolving business needs often lead to requirement modifications. Agile methodologies and flexible requirement management frameworks support adaptability.

Requirement Validation and Verification. Ensuring that requirements accurately reflect stakeholder needs involves validation techniques such as prototyping, stakeholder reviews, and automated testing.

Future Trends in Requirement Engineering. Advancements in AI, natural language processing, and automated requirement analysis tools are transforming

software requirement engineering. Future research should focus on improving requirement modeling and adaptive documentation techniques.

Understanding the levels and structure of software requirements is essential for successful software development. By following best practices in requirement elicitation, specification, and validation, development teams can enhance software quality and ensure project success.

REFERENCES:

1. Маматмурадова, М. У., Бозорова, И. Ж., & Кодиров, Ф. Э. (2019). СОЗДАНИЕ И ЭФФЕКТИВНОЕ ИСПОЛЬЗОВАНИЕ ИННОВАЦИОННЫХ ТЕХНОЛОГИЙ И РЕСУРСОВ ЭЛЕКТРОННОГО ОБУЧЕНИЯ В НЕПРЕРЫВНОМ ОБРАЗОВАНИИ. In *Инновации в технологиях и образовании* (pp. 301-303).

2. Bozorova, I. J., Sh, M. F., & Rustamov, M. A. (2020). NEURAL NETWORKS. NEURAL NETWORKS: TYPES, PRINCIPLE OF OPERATION AND FIELDS OF APPLICATION. *РОЛЬ ИННОВАЦИЙ В ТРАНСФОРМАЦИИ И УСТОЙЧИВОМ РАЗВИТИИ СОВРЕМЕННОЙ*, 130.

3. Ergash o'g'li, Q. F., & Jumanazarovna, B. I. (2020). METHODS OF DISPLAYING MAIN MEMORY ON CACHE. *Ответственный редактор*, 6.

4. Daminova, B. E., Bozorova, I. J., Badritdinova, F. T., & Sattorov Sh, Q. (2024). METHODOLOGICAL ASPECTS OF THE USE OF INTERACTIVE DIGITAL TECHNOLOGIES IN TEACHING A FOREIGN LANGUAGE. *Экономика и социум*, (5-1 (120)), 237-240.

5. Бозорова, И. Ж. (2024). ИНФОРМАЦИОННО-КОММУНИКАЦИОННЫЕ ТЕХНОЛОГИИ КАК ФАКТОР СОВЕРШЕНСТВОВАНИЯ ЭКОНОМИКИ В УСЛОВИЯХ ИНФОРМАЦИОННОГО ОБЩЕСТВА. *Indexing*, *1*(1).

6. Jumanazarovna, B. I., & O'G'Li, K. F. E. (2020). Principle of electrocardiographic work and its role in modern medicine. *Вопросы науки и образования*, (15 (99)), 31-36.

7. Бозорова, И. (2024). Сущность, содержание и значение категории “цифровая экономика”. *YASHIL IQTISODIYOT VA TARAQQIYOT*, *2*(9).

8. Bozorova, I. J. (2020). Methods of processing and analysis of bio signals in electrocardiography. *проблемы современных интеграционных процессов и поиск инновационных решений*, 97-99.

9. Bozorova, I. J., Turdiyeva, M. A., Orziqulov, J. R., & Shoniyozova, Y. Q. (2020). COMPUTER VISION AND PATTERN RECOGNITION. *СОВРЕМЕННЫЕ ПРОБЛЕМЫ И ПЕРСПЕКТИВНЫЕ НАПРАВЛЕНИЯ*, 23.

10. Bozorova, I. J., & Karayeva, D. M. (2020). Modern programming technologies and their role. In *интеллектуальный капитал xxi века* (pp. 19-21).

11. Маматмурадова М. У., Бозорова И. Ж., Кодиров Ф. Э. Проблемы современных программных и компьютерно-инженерных технологий и современные технологии создания программного обеспечения //Инновации в технологиях и образовании. – 2019. – С. 294-297.

12. Bozorova I. J., Zoxidov J. B., Turdiyeva M. A. Storage of biomedical signals and formats of biosignals //Совершенствование методологии и организации научных. – 2020. – Т. 116.

13. Якубов С. Х., Бозорова И. Ж. Математическая модель оптимизации формы трехшарнирных арок при сложных условиях загружении //The Scientific Heritage. – 2022. – №. 82-1. – С. 71-73.

14. Ачилова Ф. К., Бозорова И. Ж., Маматмурадова М. У. ИНФОРМАЦИОННЫЕ СИСТЕМЫ И ТЕХНОЛОГИИ В ОБРАЗОВАНИИ //Актуальные проблемы инфотелекоммуникаций в науке и образовании (АПИНО 2019). – 2019. – С. 574-577.

15. Зохидов Ж. Б. и др. ОБЗОР ОПТИЧЕСКИХ ПЕРЕКЛЮЧАТЕЛЕЙ И ЕГО ВИДЫ //ИНТЕЛЛЕКТУАЛЬНЫЙ ПОТЕНЦИАЛ ОБЩЕСТВА КАК ДРАЙВЕР ИННОВАЦИОННОГО РАЗВИТИЯ НАУКИ. – 2019. – С. 24-26.

ISSN 3060-4567

16. Бозорова И. Ж. и др. Создание программного обеспечения электронной библиотечной системы на основе QR-кодовой технологии //Теория и практика современной науки. – 2020. – С. 26-28.