ORGANISATIONAL DESIGN OF SYSTEMS FOR METROLOGICAL SUPPORT OF DIGITAL IT PROJECTS

Vitalii Yarovyi, Oksana Andriienko

Military Institute of Telecommunications and
Informatisation named, after the Heroes of Kruty,
Ukraine.

E-mail: vitalii.yarovyi@viti.edu.ua
oksana.andriienko@viti.edu.ua

Abstract

This paper focuses on digital projects, which aim to create software tools as the basis for modern IT products. The main focus of the study is on projections that describe various aspects of the ecosystem within which the key processes of software creation and development are implemented. These projections form the basis of the information and analytical environment that shapes and provides optimal conditions for the implementation of the key process – the process of developing high-quality software (SW) and its further development during implementation in the sphere of practical use.

Metrological support for digital projects, as a relatively new branch of knowledge in the subject area of 'Metrology', is a specific specialisation of this subject area through the application of its basic concepts and principles to one of the domains of the subject area.

'Software engineering', in turn, this domain reflects the field of software engineering knowledge regarding one of the key objects of software engineering – digital projects.

The purpose of the report is to find a relevant form of organisational design for the metrological support system for digital projects (DP).

The objects of the study were the organisational forms of metrological support for digital IT projects designed to create a unified information and analytical platform for continuous monitoring of software quality. The subject of the study was the processes of selecting and implementing metrics and means of measuring software quality in the context of using DevOps/DataOps pipelines for one of the key processes of digital projects – metrological support (MS).

The role of ML processes in the structure of information and analytical support for CP is constantly growing, especially with the transition to the principles and means of modern data-driven technologies. As is well known, for such CP, key decisions regarding software properties are made on the basis of analytics data, which is continuously collected during the software development and improvement process. In turn, the quality of such data, its completeness, reliability and relevance significantly depend on the correct selection and application of key metrics and measurements, both for the declared properties of the software and for the factors influencing the external and internal environments of digital projects. Therefore, a properly structured system of metrological support for CP is an integral part and an important task of CP management.

An analysis of current software engineering practices shows that the following five models are possible options for the organisational design of a metrology support system for digital projects:

1. Centralised metrology centre
2. Federated model (hub-and-spoke)
3. Model integrated into the DevOps/DataOps team
4. Platform/service model (Metering as a Service)
5. Community of Practice model

The results of a comparative analysis of these models are presented in Table 1.

Table 1. Comparative analysis of organisational design models

for metrological support of digital projects

Goals and objectives	Centralised metrology centre	Federal model	Built into DevOps/DataOps	Platform (Metering as a Service)	Community of practice
Definition and standardisation of metrics	+			+	
Integrating metric collection into the pipeline			+	+	
Calibration and validation of instruments	+	+			
Verification and audit of measurement quality	+	+			
Error analysis and process adaptation		+	+		
Ensuring reproducibility and traceability			+	+	
Support for decision-making and risk management	+			+	
Continuous improvement		+			+

When creating a unified information and analytical system for digital projects, option 4 – Platform/service model (Metering as a Service) – is the most suitable organisational form of metrological support. This form of organisational design provides the highest level of integration, unification and scalability within a unified information and analytical system for digital projects.

Literature

1. Law of Ukraine "On Metrology and Metrological Activity" [Electronic resource] / Verkhovna Rada of Ukraine. – Information from the Verkhovna Rada of Ukraine. – 2003. – No. 27. – Art. 190. – Access mode: https://zakon.rada.gov.ua/laws/show/1314-18 (date of access: 07.11.2025).
2. Yarovyi, V., Andriienko, O., & Hudyma, V. Selection of Organizational Forms for Metrological Support of Digital IT Projects. Social Development and Security, 15(4), 133-142. . **DOI**: https://doi.org/10.33445/sds.2025.15.4.13
3. ISO/IEC 25023:2016 Systems and software engineering – Systems and software Quality Requirements and Evaluation (SQuaRE) – Measurement of system and software product quality [Електронний ресурс]. – Geneva : International Organization for Standardization, 2016. – 62 p. – Access mode: https://www.iso.org/standard/35746.html (date of access: 07.11.2025).