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METHODOLOGICAL PRINCIPLES FOR ORGANIZING TESTING AND SYSTEMS ANALYSIS OF THE VERIFICATION OF ITS RESULTS IN THE STUDY OF MANAGEMENT SYSTEMS

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Abstract: From the standpoint of systems analysis and psychodiagnostics, the article examines the process of testing organization within management systems. Methodological principles of evaluation, recognition, and conceptualization of managerial problems are considered. The authors propose a rigorous mathematical and statistical apparatus for verifying measurement tools, including Pearson's criterion validity, Lawshe's content validity (CVR), and Cronbach's Alpha reliability coefficients. The procedural stages of testing, from establishing rapport to monitoring environmental conditions, are systematized, and the deontological boundaries of using respondents' cognitive profiles are defined.

Keywords: management systems, psychodiagnostics, criterion validity, content validity, test reliability, Cronbach's alpha, Lawshe's coefficient, rapport, confidentiality.

In the modern theory and practice of studying management systems, the verification of performance parameters regarding the interaction between the controlling and controlled subsystems requires the implementation of objective, valid, and reliable diagnostic tools. By its very nature, a management system is a dynamic combination of two interconnected components, the overall performance of which is determined by the extent to which the organization's strategic goals are achieved. The process of identifying dysfunctions, hidden barriers, and the determinants of interpersonal relationships within this structure cannot be carried out without the use of testing methods [5].

When organizing psychological and organizational testing, a researcher must rely on three fundamental methodological principles: the principle of the problem (examining latent managerial contradictions that initially manifest as illogical or abstract behavioral anomalies), the principle of comprehensive assessment (analyzing phenomena based on criteria of objectivity, relevance, and systemic interrelation), and the principle of recognition (identifying and comparing the properties of the phenomenon under study to ensure its precise typologization).

The effectiveness of applied testing is determined by two key psychometric parameters: validity and reliability. The validity of a test addresses the conceptual question of whether the chosen methodology actually measures the specific property or function for which it was originally

designed. In the context of management and personnel selection, validity is differentiated into two levels: criterion-related validity and content validity. To mathematically demonstrate criterion-related validity, it is necessary to correlate the scores obtained by employees during testing (X) with an objective external criterion of their actual performance in the workplace (Y). This is done by calculating the Pearson product-moment correlation coefficient. (r_{xy}):

$$r_{xy} = \frac{\sum (X_i - X)(Y_i - \overline{Y}}{\sqrt{\sum (X_i - X)^2 \sum (Y_i - \overline{Y})^2}}$$

Where X_i — score of a specific *i-th* respondent based on test results ; Y_i — an indicator (criterion) of the same respondent's actual performance ; $\overline{X}$ and $\overline{Y}$ — the arithmetic mean values of the test results and the external criterion for the entire sample, respectively. The presence of a statistically significant positive correlation ($r_{xv} > 0.4 \; at \; p < 0.05$) ...demonstrates the high predictive value of the test. To verify content validity and confirm that the test items representatively reflect the structure of the actual job, an expert assessment method is employed, involving the calculation of Lawshe's Content Validity Ratio (CVR) for each question:

$$CVR = \frac{n_{e-\frac{Ne}{2}}}{\frac{Ne}{2}}$$

Where n_e — the number of experts who deemed this test task "critically important" for assessing the target skill ; N_e — ...the total number of experts involved in the evaluation process. Items with a low CVR (Content Validity Ratio) are excluded from the assessment system as irrelevant. The reliability of a test refers to the stability and consistency of the results obtained by the same respondent when completing equivalent diagnostic forms on different occasions. Cronbach's alpha coefficient is used to assess the internal consistency and reliability of the measurement instruments. (α):

$$\alpha = \frac{N}{N-1}\left(1 - \frac{\sum_{i=1}^{N} \sigma_{Y_i}^2}{\sigma_X^2}\right)$$

Where N — number of tasks in the testing system;σ_X^2— the total variance of the scores across the entire test; σYi2 — the variance of the scores for each individual i-th item. A value of α ≥ 0.8 indicates high reliability and internal consistency of the developed system.

The testing process within management systems is a strictly regulated sequence of stages, determined by the specific areas of application, as well as the goals and objectives of the research.

The initial stage involves establishing rapport—a set of professional actions by the researcher designed to foster intrinsic motivation, trust, and a willingness to cooperate openly among respondents. This minimizes the activation of psychological defense mechanisms and the intentional distortion of data. The next step consists of providing instructions and facilitating adaptation; this includes explaining the research objectives, the expected duration, the procedures

for completing forms or interacting with a digital interface, and the ethical safeguards in place. At this stage, a professional administrator should ideally have taken the test themselves beforehand to proactively identify any cognitive barriers within the instructions. During the actual testing phase, the administrator monitors the completion of tasks, ensures adherence to time limits, observes behavioral responses (such as non-verbal markers of fatigue or anxiety), and maintains standardized environmental conditions.

The use of testing methodologies in management practice imposes strict deontological (moral and ethical) obligations on the researcher. The entire process of data collection and processing must adhere to three fundamental principles. First is the principle of professional competence: testing must be conducted with the direct involvement or under the supervision of a qualified psychodiagnostics specialist. Second is the principle of voluntariness and informed consent: conducting an assessment against a respondent's will or through deception is impermissible; furthermore, the subject has the right to know the research objectives, how the results will be used, and what their own final scores are. Third is the principle of confidentiality, which guarantees that an employee's personal cognitive profile is protected from unauthorized access by third parties. An analysis of management practices shows that disregarding validity parameters and ethical standards turns the assessment of capabilities into a destructive tool, which fuels organizational stress and diminishes staff loyalty [4]. The organization, administration, and subsequent analysis of test results constitute a sophisticated, science-based process that serves as a foundation for strategic decision-making within management systems. In the context of an increasingly digital society, the primary developmental trajectory for diagnostic systems involves integrating verified psychometric algorithms into intelligent, digital platforms for adaptive assessment.

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