

DIRECTIONS FOR DIGITALIZING INTERNAL AUDIT OF BUDGETARY FUNDS UTILIZATION

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Abstract

The digital transformation of public financial management is changing not only how budgetary funds are spent but also how their use can be audited. When budget execution is carried out through treasury information systems, public procurement is conducted on electronic platforms and invoices are issued electronically, almost every operation with budgetary funds leaves a digital trace. For internal audit, this creates an unprecedented opportunity: instead of examining a small sample of paper documents months after transactions have occurred, internal auditors can analyze entire populations of transactions almost in real time. Uzbekistan's national strategy "Digital Uzbekistan – 2030" provides a policy framework for such a transition by setting objectives for the development of e-government and interagency data exchange [2].

Nevertheless, the digitalization of internal audit in budgetary organizations is progressing more slowly than the digitalization of the processes being audited. The main reasons are the lack of a structured approach, limited access of internal auditors to electronic data, insufficient digital skills and the absence of methodological guidance. As a result, organizations often perceive digitalization narrowly, as the purchase of software or the conversion of paper reports into electronic form, without changing the audit approach itself. To overcome this problem, we propose to consider the digitalization of internal audit as a staged process described by a digital maturity model and supported by a set of enabling conditions.

The proposed digital maturity model of internal audit of budgetary funds consists of five levels. At the first level, "manual audit", audit procedures are carried out on paper documents, samples are selected judgmentally and working papers are kept on paper. At the second level, "computer-assisted audit", auditors use spreadsheets and basic software to recalculate data,

select samples and prepare working papers, but data are obtained from the audited unit on request. At the third level, "data analytics audit", internal audit has direct read-only access to the organization's information systems and applies analytical tests to full populations of transactions, using a library of risk indicators ("red flags"). At the fourth level, "continuous auditing and monitoring", analytical tests are automated and run periodically, generating alerts that are promptly examined by auditors; the concept of continuous auditing, first formulated by M. Vasarhelyi and F. Halper, becomes a practical reality [5]. At the fifth level, "predictive and intelligent audit", machine learning methods are used to detect anomalies, forecast risks and analyze unstructured data such as contracts and reports.

The model makes it possible to diagnose the current state of internal audit in a particular organization and to plan the transition to the next level. According to our assessment, most budgetary organizations are at the first or second level today, which means that the priority is not artificial intelligence but the creation of basic conditions for data analytics.

Moving up the maturity levels requires a set of enabling conditions, which we group into five directions.

The first direction is the regulatory and organizational framework. The internal audit charter should explicitly guarantee internal auditors read-only access to all information systems relevant to the use of budgetary funds, including treasury, procurement, payroll and asset accounting systems. At the same time, rules for protecting personal data and information security must be defined. At the level of the central harmonization body, methodological guidelines on the use of data analytics in internal audit should be developed.

The second direction is data governance. The value of digital audit depends on the quality and comparability of data. Budgetary organizations should ensure uniform reference data (classifiers of suppliers, employees, budget items), the integrity of transaction records and the ability to link data from different systems through common identifiers, such as taxpayer identification numbers. Before performing analytical tests, internal auditors should assess the completeness and reliability of the data, since conclusions drawn from poor-quality data can be misleading.

The third direction is audit analytics tools and a library of tests. Internal audit units should develop and maintain a standardized library of analytical tests reflecting typical risks in the use of budgetary funds. Examples include identification of split purchases below procurement thresholds, comparison of purchase prices with average prices on the procurement platform, detection of duplicate payments, matching employee and supplier bank details, identification of payments to employees who have been dismissed, and analysis of assets that have not been used for a long time. Sharing such libraries among organizations within a sector reduces development costs and ensures a consistent approach.

The fourth direction is digital competencies. Internal auditors should acquire skills in working with databases, using data analysis and visualization tools, and evaluating information technology controls. Professional development programs should include modules on data analytics and IT audit, and large organizations should employ at least one internal auditor specializing in information systems. An important element is also a change in professional culture: auditors should learn to formulate hypotheses about risks and test them with data, rather than simply checking documents.

The fifth direction is integration of digital tools into the audit cycle. Digital technologies should be used at every stage of the internal audit process: in risk assessment and planning (analysis of indicators across the audit universe), in fieldwork (testing of full populations), in reporting (interactive dashboards for management) and in follow-up (automated tracking of recommendations). An electronic audit management system that brings all these stages together ensures transparency and continuity of work and allows the parent body to aggregate results across the sector.

Digitalization also creates new risks that should be managed. Excessive reliance on automated alerts may lead to false conclusions if alerts are not verified with additional evidence; algorithms may reflect biases in historical data; and the concentration of sensitive data increases information security risks. Moreover, if continuous monitoring is carried out by internal audit instead of management, the independence of internal audit may be compromised. Therefore, a clear division of responsibilities is essential: management should own continuous monitoring of daily operations, while

internal audit evaluates the effectiveness of monitoring and examines high-risk cases.

To evaluate the progress of digitalization, we propose using a small set of indicators: the share of audit engagements in which data analytics was applied; the share of transactions covered by analytical tests; the average time between the occurrence of a transaction and the detection of a related deficiency; the share of alerts confirmed as actual deficiencies; and the financial effect of deficiencies detected through digital tools. The dynamics of these indicators show whether digitalization actually improves the quality and timeliness of internal audit or remains a formal exercise.

In conclusion, the digitalization of internal audit of budgetary funds utilization should be approached as a staged transition along a five-level digital maturity model, from manual audit to predictive and intelligent audit. This transition requires simultaneous progress in five directions: the regulatory and organizational framework, data governance, audit analytics tools, digital competencies and the integration of digital tools into the audit cycle. Such an approach will allow internal audit in budgetary organizations to expand its coverage, detect deficiencies earlier and contribute more effectively to the efficient use of public funds.

References

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