Digital Public Sector Auditing: a look into the future

Tatiana ANTIPOVA*

ICS Rusia, Rusia

Abstract

This paper considers future features for public sector auditing. Digital Public Sector auditing provides a window to view trends, issues, and relationships across a wider expanse of data, and provide more meaningful and insightful observations to Public Sector leaders and stakeholders for improving Public Sector performance. Auditor highlighted the top transformative changes of Public Sector Auditing and based on this changes builds a logical scheme of digitalization with look in the future. The use of digital technologies in Public Sector auditing will help to analyze the result of budgetary funds using of audittee, find ways to solve the problem of rational use of budget resources and optimize fiscal relations in each Public Sector unit. In author's opinion digitalization's framework consists of three blocks: Standardization, HR Management, Data Management. During future auditing procedures public sector auditors must use modern digital technologies; strengthen investigative powers; encourage more professional designation; support the international transparency. In addition, using day-to-day digital technologies is a perfect way to prevent any kind of fraud with budget money.

Keywords: Public Sector auditing system; Supreme audit institutions; control procedure; digitalization; digital technologies; digital auditing.

1. Introduction

Nowadays, with globalization of the economy, good governance of public finance is of fundamental importance for all countries to ensure the sustainability of the national budget and financial systems, as well as mutual financial security and sustainable economic growth. The public sector of many economies has been subject to dramatic change and auditing is a major mechanism by which many of these changes have been enacted. Effective budget implementation is an important factor in influencing the volume and quality of public services. Furthermore, it is important to bear in mind that leakage of resources through poor accounting directly threatens fiscal stability since it requires more resources than should be necessary to achieve any given result. Public Sector auditing provides independent assessments of that information for the benefit of those charged with oversight and for the public. When public are confident that the information they receive is relevant, reliable, understandable, consistent and comparable, it creates trust. Transparency and public accountability further engender trust in a representative democracy. Working together, these factors lead to greater citizen satisfaction and better access to capital at a lower cost. As long as budget resources come from the public in the form of taxes, every citizen demands greater understanding of where their tax money goes and how it is spent and control (Antipova, 2016). To understand this control mechanism it is necessary to know the structure of the Public Sector. The most common public sector comprises General Government and Public Corporations. Government-owned enterprises, such as the central bank, post office, or railroad are often referred to Public Corporations. General Government usually consists of three levels: Central Government, State or Regional Government, and Local Government. Public Corporations are divided on Nonfinancial (e.g. post office) and Financial (e.g. Central Bank).

Public Sector auditing focuses attention on how budget resources are spent. Assessment procedures of Public Sector auditing serve to avoid misrepresentation and fraud in public sector financial statements. Since the public sector financial statements are placed on the Internet, any citizen can get acquainted with this reporting. And citizens can trust the information set in these financial statements if auditors verify it properly. Public Sector Auditors should assess fair

* Corresponding author. Tel.: +7-912-982-4618.
E-mail address: antipovatatianav@gmail.com.

presentation of public sector financial statements. When financial statements "furnished by a state agency are in fact reliable, citizens' trust should be increased by auditors. When, on the other hand the information is significantly unreliable, auditors should reveal that and consequently decrease citizens' trust" (Budding & Grossi, 2014).

Improving access to public sector information provides numerous benefits, particularly as increased transparency and efficiency within Public Sector (both state and local) can be quite advantageous. During audits, Supreme Audit Institutions (SAI)s often accumulate and process potentially useful information for various stakeholders, but this information is not readily accessible. To enhance information accessibility, these initial information files could be made public if they do not contain classified or personal information. Auditing every audittee would be daunting and resource intensive. However, it is important to spread audit findings and best possible. While press conferences, seminars and webinars present traditional channels for disseminating information, it is also possible to actively engage local Public Sectors in assessing their own situation (Antipova, 2017). We are in a "wired world" with information of all shapes and sizes available 24/7. All levels of Public Sector have substantially invested in modernizing information technology (IT) systems and service delivery models to take advantage of dramatic IT advances (Lewis et al., 2014) but the basic methodology for auditing hasn't changed significantly in decades (McCollum, 2017).

2. Public Sector Auditing digitalisation

As point A. Lewis (Lewis et al, 2014), the benefits to modernizing the Public Sector audit approach for both the auditors and audittee are: enhanced effectiveness, additional business insights, greater efficiency, better detection of fraud, waste, and abuse. Public Sector Auditing digitalization advanced continuous monitoring and continuous auditing programs, expanded forensic and recovery auditing capabilities, and sophisticated data analytics and business intelligence efforts. A natural first step in implementing data-driven digital techniques is to determine to appropriate transactions in the context of an audittee's day-to-day life. Because these guidelines vary by agency and program, it is important for agency administrators and subject-matter experts to collectively brainstorm the common-sense ways that online operation may be used, as well as the ways they should not be used (Antipova, 2017).

To manage Public Sector auditing results we need to use of modern digital technologies but digital Public Sector auditing is not just a technology-based effort. It involves changing the expectations of what is included within an audit, and adjusting auditors' knowledge, skills and abilities (Lewis et al., 2014). This is especially true in terms of implementation of results-based budgeting, as well as openness and transparency in the sphere of Public Sector auditing (state financial control) (Antipova, 2016). The formation of an information portal in the field of Public Sector auditing will allow for the recording, monitoring and analysis of inefficiencies and take measures to optimize budget expenditures. The Internet portal will provide the opportunity to hold videoconferences, implement electronic document management, work with documents, create and use an electronic library, conduct training, store information of the Supreme Audit Institutions and other control and accounting agencies and implement other services. It would be great if the results of Public Sector auditing were taken into account when budgeting for the next period. In the future, it is possible to link the definition of the size of the budget subsidy to the results of the Public Sector auditing while ensuring the transparency of the results of control through digital information technologies and the standardization of Public Sector auditing. The use of digital technologies in Public Sector auditing will help to analyze the result of budgetary funds using of audittee, find ways to solve the problem of rational use of budget resources and optimize fiscal relations in Public Sector unit, see Fig 1.

As wrote Farr L. (Farr L., 2017), auditor highlighted the top five transformative changes that are driven by modern information technology (IT): 1. Governance complexities; 2. Cyber everything; 3. Full transparency; 4. Reporting on steroids; 5. Skill set shortages.

1. Governance complexities. In many organizations, cybersecurity is "owned" by the IT function, which is tasked to implement, supervise, and maintain new systems and applications. Today, cybersecurity must be owned by the entity itself, because the location, accuracy, and security of a company's data, and the resiliency of its network to withstand cyberattacks, represent a business and compliance issue of importance to senior executives and board members. Cybersecurity involves more than just technology networks and systems, given the people and processes that may inadvertently make an organization susceptible to a cyber-attack. Cross-collaboration across the enterprise is essential.

2. Cyber everything. Technology is embedded deeply across every company today, producing a fast-changing array of cybersecurity risks. "Cyber is in everything," Katcher said. "Although technology itself is becoming more secure, the weakest link remains people, followed by inferior processes for attack detection, system recovery, and crisis management." Here, there, and everywhere data. Every company has what IT professionals call its "crown jewels"—highly sensitive customer data such as credit card numbers or proprietary business information. Unfortunately, many businesses have not identified their crown jewels, much less who is allowed to access these data and on which types of devices. "If you don't know where the critical information is, how can you secure it?" Katcher said.

According to B. Bebre (Bebre, 2018) there are three way to cibersecure: (a) data protection; (b) cybersecurity considerations; (c) staff training.

(a) designe to protect data. Examples of this work include reports on the National Cyber Security Program and Protecting Information Across Public Sector. Both reports document the difficulties involved in protecting information while redesigning public services and introducing necessary technology to support them.

(b) cybersecurity considerations are increasingly featured in a wide range of projects and initiatives, from digital transport schemes to smart energy meters and secure online financial transactions. The NAO noted in its report on Online Fraud that the internet is changing the nature of crime, and law enforcement responses are struggling to keep up. As more and more public services are delivered online and internet connectivity is steadily becoming a feature of everything—from military equipment to medical technology—considering cyber elements is likely to become a bigger part of audit work.

(c) training staff to help auditors think about cyber issues they may face. Cybersecurity is a fast-paced area, and Supreme Audit Institutions should continue to learn about technical and policy developments. Spreading good practice and awareness can help auditors adapt. For example, during the annual training and development week, Public Sector and industry representatives, addressed Supreme Audit Institutions staff and provided them with the latest developments.

3. Full transparency. The transparency of cybersecurity risk management is important for the good governance of all business entities. Corporate leadership seeks transparency into business and market data to increase the speed of operational decision-making. And boards of directors expect accurate reporting on the security of the organizations they serve.

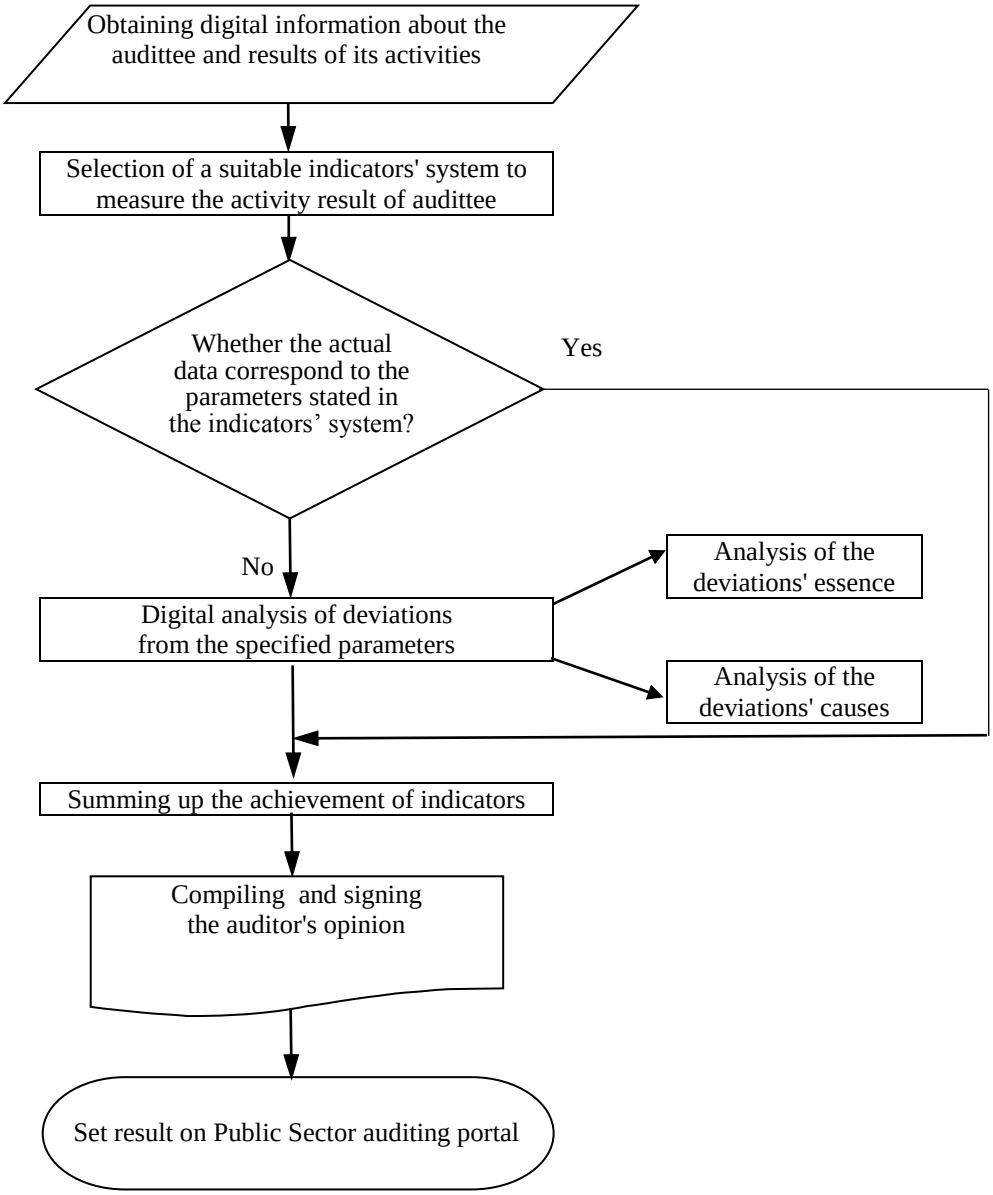

Fig. 1. Block-scheme for using digital technology in Public Sector auditing (author's elaboration).

4. Reporting on steroids. Reporting used to entail an analysis of the financials and the application of judgment. Today, accurate reporting depends upon how the data are input, processed, and stored, and the security risks presented in each scenario. "Simply stating information and reporting that the data is accurate no longer is enough," Katcher said. "CPA firms must provide evidence demonstrating that a client's data is complete, accurate, valid, and secure."

5. Skill set shortages. With technology increasingly driving how business is conducted, the tasks traditionally performed in the work environment are rapidly changing. Augmented intelligence, machine learning, robotics, and other transformative technologies are combining in unique ways to replace some jobs, augment others, and demand the development of new skills. The challenge for many organizations is the dearth of talent to fill these roles.

These transformative changes cause to Public Sector audit digitalization. And digitalization's framework consists of three blocks:

A. *Standardization*
B. *HR Management*
C. *Data Management*

A. Standardizations

To unify verification procedure Blockchain Data must be standardized. Standardization can help to maximize compatibility, interoperability, safety, repeatability, or quality. It can also facilitate commoditization of formerly custom processes. The idea of standardization is close to the solution for a coordination problem, a situation in which all parties can realize mutual gains, but only by making mutually consistent decisions. In the context of supply chain management and materials management, standardization covers the process of specification and use of any item the company must buy in or make, allowable substitutions, and build or buy decisions.

B. HR Management

It is well known that "cadres decide everything." In the face of global competition can not continue to base education on the use of cheap labor. Principles of formation and staffing of personnel policy are determined by the new requirements of the Public Sector auditing body in terms of improving the quality of the training process and scientific research, its results and the reflection in Public Sector auditing. To achieve quality auditing, it is necessary to develop and effectively implement operations throughout the value chain organization, and this will require the development of knowledge, skills and abilities of auditors. It is advisable to develop a scheme for premium pay for auditing services, depending on their quality, meeting deadlines. There is no need for initiatives to award or the number of procedures performed. There should be rewarded for results. There is another issue in designing the reward - is the choice of the number of criteria. Indicators formulated in accordance with auditing strategy should be consistent with two or three strategic areas (such as more efficient use of assets).

In auditing, the priority is given to auditors, who can draw a general picture of the cause-and- effect relationships that unite the various factors to achieve results. Activated involvement in auditing activities related to the priority areas, increasing the number of scientists and adviser is changing the structure of the load in the direction of its greater focus on research.

The effectiveness of human resource management can also help and a clear allocation of responsibilities and accountability. In addition, the leadership of the Public Sector auditing body needs to keep track of the passage of the regular training of the teaching staff. It is also very important to include measures to reduce the potential for conflict of interest in the audittee environment. This is important for the creation of a positive atmosphere in the team with the approved policies and procedures. In addition, with a more educated and specialist workforce, Public Sector audit bodies are now taking on managerial and policy roles that previously may have been the domain of generalist civil servants. In turn, this gives Public Sector auditing work greater credibility and a more informed approach.

C. Data Management

Data Management means the need to implement it on all the major management activities: counting and regulating the number, registration, identification of management unit opportunities, planning, evaluation, promotion of affairs unit, etc. Managing of the connection base and works, is a traditional works management process, and should be carried out by the executors of these works.

3. Future of Public Sector auditing

Over the past six years, the author has led the Public Sector auditing for more than 60 of Federal agencies/entities and private firms. Analyzing as a scientist the results of numerous audits' results, the author singled out the main directions on which it is desirable to develop Public Sector auditing.

Existing manuals/instrudtions of Public Sector auditing aimed at identifying violations after the fact, studying financial statements, when nothing can be corrected. Comply with current guidelines, Public Sector auditors/inspectors can only led follow-up control. Future technologies should be aimed at preventing the misuse/violation of budget spending, when it is possible to stop the suspicious transactions, using information obtained from scanning banking operations of the observed audittee.

Analising past practical experience, author reached to conclusion that trends in Public Sector auditing in the future may include four main blocks that have shown on Fig.2.

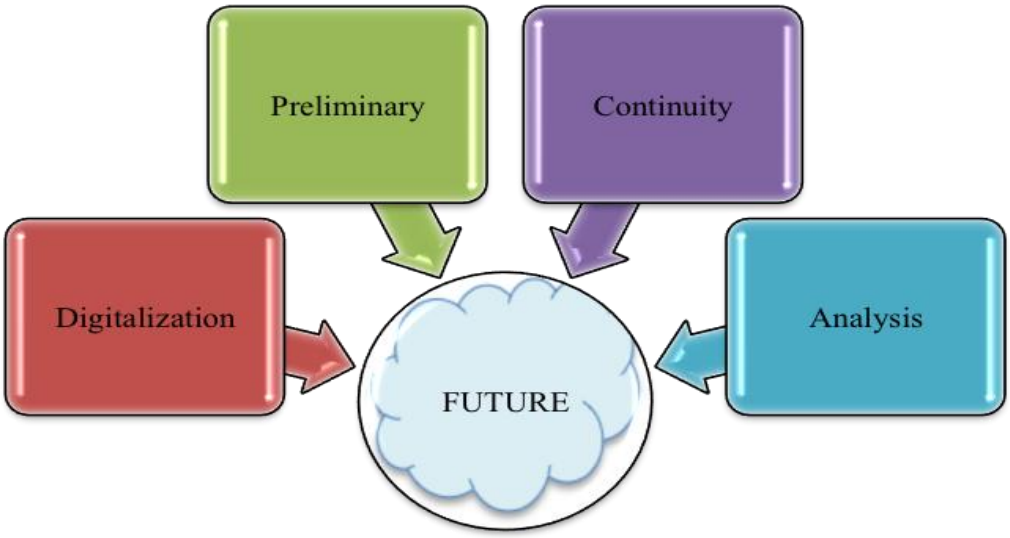

Fig. 2. Look in the future of Public Sector auditing (author's elaboration).

Fig.2 shows four main component of the future trend of Public Sector auditing: Digitalization; Preliminary; Continuity; Analysis.

Digitalization. Computerization has covered all aspects of our life and, naturally, this has not bypassed the scope of Public Sector auditing. Nowadays it is unthinkable to led auditing without using of modern digital technologies. For example, audits are more effective when auditors have online access to the movement of the funds of the inspected object on bank accounts opened with the Treasury bodies. Agencies looking for more out-of-the-box solutions might find audit-specific tools, referred to as computer-aided audit technology, more effective. The key for the future is learning to communicate and work virtually with audittee. Being familiar with this technology positions auditors/inspectors for the audit of the future. A digital audit turns the practice on its head: The work that's usually done in the field is done virtually in the office, and the wrapup phase, which is normally done in the office, is done in the field. Rather than traveling to audittee offices, the auditors perform the routine work of examining the client's documents in the auditors' office using information uploaded to a secure portal. Once the routine tasks are completed, engagement leaders visit the client for the wrapup phase. In the audit of the future, with artificial intelligence and analytics, many of these bindings will be executed virtually. For more details, see the previous section.

Preliminary. Public Sector auditors must ensure reasonable confidence in preventing or detecting suspicious acquisitions in a timely manner at the expense of budgetary funds. To enable predictive modeling, data sets must comprise transactions considered suspicious and the outcomes of investigations. Combining observations and their outcomes allows supervisors to begin to build the link needed to predict future occurrences of purchase misuse. While rule violations are not always indicative of misuse, they are an effective and simple way to alert program administrators to aberrant behavior. Whether a public sector transaction supervision system is automated or manual, supervisors should explore ways to integrate business rules and rule violations into the Public Sector audit process. Wherein an effective notification system operates over the Treasury central server, delivers event messaging to predefined employees in "real time," as the event occurs, and is sent directly to the employees and their smart devices. This level of event notification ensures that the people who need to know about an incident are made aware in a timely manner and fosters immediate and unified response as required (Antipova, 2017).

Continuity. Continuous auditing involves frequent monitoring throughout the year to ensure that transactions are captured properly and are flowing correctly to the income statement. During Digital Budgetary Transactions Surfing flows of transactions are continuously monitored, identifying transactions that match certain pre-determined integrity constraints and, in the event of a constrain violation, alert the Public Sector auditor and copy the transaction data to a file. A natural first step in implementing data-driven techniques is to determine to appropriate transactions in the context of an agency's day-to-day life. Digital audit techniques can be combined with this.

Analysis. Data analytics will be the foundation of Public Sector auditing in the future. Exploratory analysis and trending allow program administrators to identify patterns and detect anomalous behavior. Basic statistics like mean, standard deviation and skew, along with commonly accepted "tests," help identify transactions that are unusual. Such outliers and anomalies should raise red flags with supervisors and indicate the need for further investigation. Using existing technology, auditors examine a audittee transactions to spot trends. For example, a customer whose previous ontime payment suddenly slows to 10 days late may signal a risk of default.

If machine learning algorithms become too smart, can they be controlled? Domingos says there are ways to control machine learning algorithms, most notably by raising or lowering their ability to fit the data such as through limiting the amount of computation, using statistical significance tests, and penalizing the complexity of the model.

He says one big misconception about AI is that algorithms are smarter than they actually are. "Machine learn- ing systems are not very smart when they are making important decisions," he says. Because they lack common sense, they can make mistakes that people can't make. And it's difficult to know from looking at the model where the potential for error is. His solution is making algorithms more transparent and making them smarter. "The risk is not from malevolence. It's from incompetence," he says. "To reduce the risk from AI, what we need to do is make the computer smarter. The big risk is dumb computers doing dumb things." (McCollum, 2017)

4. Conclusions

Introducing new approaches and techniques in Public Sector auditing has been a challenging yet immensely rewarding process. By improving the impact of audits, Public Sector audit Institutions' can steadily move closer to better public governance. Embracing digital Public Sector auditing is a necessary investment to move auditors to new and evolving techniques that modernize Public Sector auditing by making gull use of current and emerging technologies. We are in an information age and the exponential growth of data brings both challenges and opportunities to overhaul traditional sampling-based auditing approaches and fully leverage technology (Lewis et al, 2014). Digital Public Sector auditing provides a window to view trends, issues, and relationships across a wider expanse of data, and provide more meaningful and insightful observations to Public Sector leaders and stakeholders for improving Public Sector performance. During future auditing procedures public sector auditors must use modern digital technologies; strengthen investigative powers; encourage more professional designation; support the international transparency. In addition, using day-to-day digital technologies is a perfect way to prevent any kind of fraud with budget money.

In Public Sector auditing digitalization we will enable Public Sector auditors' professionalism to move into the future and add even greater value to managing the cost of Public Sector and providing the highest levels of accountability and transparency to the civil public.

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