# AUDIT DIGITALIZATION AND DATA MINING

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***Abstract:*** *In the context of continuous change and business transformation, the audit and financial team are in constant motion to best serve the tasks they have to perform, such as exploitation of recently created low cost, use of new and emerging technologies such as robotics and artificial intelligence, also changing applications and automating processes.In a fast-growing market as software development, open source applications are a growing trend by providing low costs and choices. The need for audit tools is important. This paper establishes the improvement of audit through digitalization which apply data mining technique to improve financial reporting requirements in the context of electronic data collection.Exploiting data helps organizations focus on the most important information and knowledge available in the entire database.All of these activitiesof data mining will help leading to efficiency and cost and also critically free up capacity and resources to provide more efficient data on management information and improved business decision supported by processed data.*

**Keywords:** *audit, digitalization, software, data mining, audit tools*

**JEL Codes:** M42, C55

## Introduction

Advancement in technology promises a very important change and has only benefits to offer to financial audit professionals and not only, which has been expected for a long time.

Such changes include the rapid increase in data volume, changes in business models, the shift to automation and the demand for a proactive and future-oriented approach to auditing. These developments require auditors to be technologically prepared to enable them to continue to run the business and perform a high quality audit.

In this article, data on data mining and its role were included. Not only can we extract various information from a very large database, but it ends up improving the quality of information and substantially reducing time than before.

With the reflection of digitalisation and its influence, auditing must be trained and prepared in order to meet all the challenges and possible benefits. These are related to audit quality, professional skills, efficiency, and most of these impacts are likely to require the application and specific understanding of complex technologies.

## Audit digitalization

In a study conducted by Forbes Insights in collaboration with KPMG, they showed that they are looking for auditors to analyze a greater variety of instances in documentation and to make more in-depth analyzes. Almost 45% of the respondents of the study say that it should be extended so as to cover a higher percentage in order to be able to catch audit identifications that include

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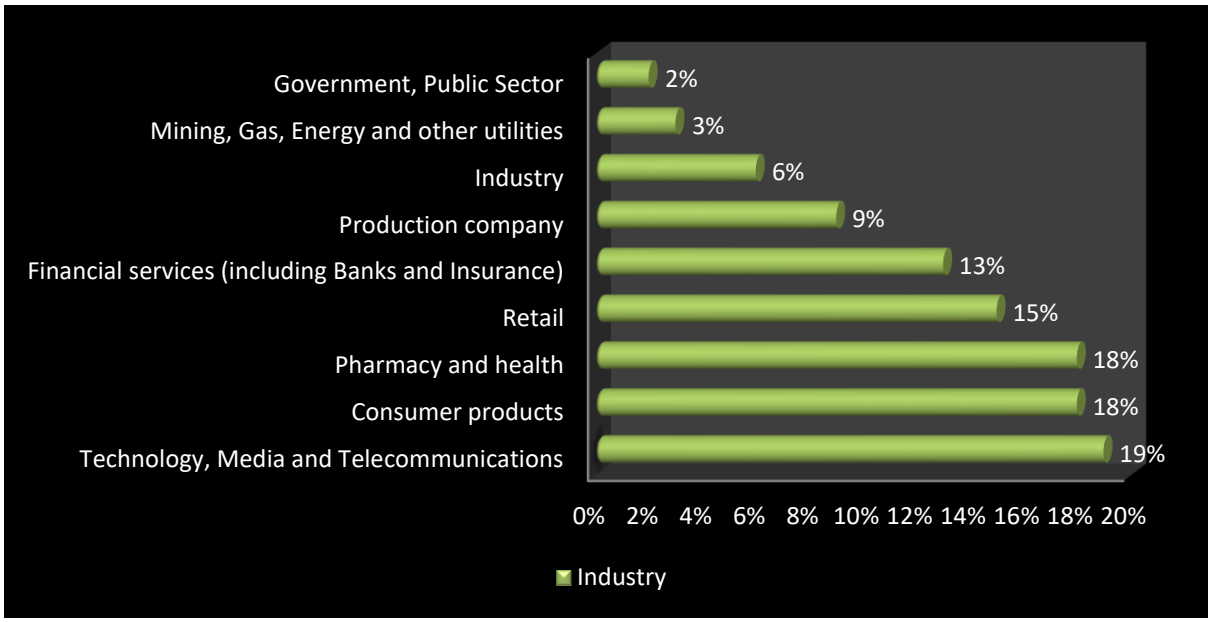
management risks, fraud. This audit should be focused in line with IT systems and other shareholder concerns. (Forbes Insights, 2017)

Their study (KPMG and Forbes Insights) had a total of 200 financial managers, audit managers, tax managers and other employees. Most seek to identify management risks, fraud protection and identify critical points for management. Almost 80% of them want their selections to be larger and to use more sophisticated technology for data collection and analysis in everyday life. Half of them would like the audit to do more in-depth analysis of what they are already testing, standard tests if so to speak, and two-thirds of those surveyed describe that auditing should improve their professional qualities, critical thinking and qualities in digital technology.


**Graphic no.1** - Titles of the interviewees for the study
*Source:*(Forbes Insights, 2017)

The study was conducted on databases from 2014 to 2016. As identifications of the latter are the following points below:

- Almost 80% of respondents believe that auditing should use larger selections in their daily work life;
- Almost two-thirds (62%) of respondents want auditors to develop as transparent a view as possible on the critical points identified. Some of them want to receive inclusive analyzes and further action points, and another part of 47% want to challenge constructively and give consultations to the client's management;
- 60% of respondents believe that auditing should help with risk assessment and management risk practices;
- Almost 47% want much more transparency when receiving the audit opinion, as well as what has been learned from it. 30% of them want more information than provided in the audit report, as well as the areas not covered by the audit;
- Most respondents believe that the biggest challenge to improve the impact of the audit are local regulations (66%), budgets (57%), litigation (55%), data security (55%);
- Customers also want to improve their technological skills (66%), communication (66%), critical thinking (65%) and improve their financial skills (59%);




**Graphic no.2** Respondent expertise industries
*Source:* (Forbes Insights, 2017)

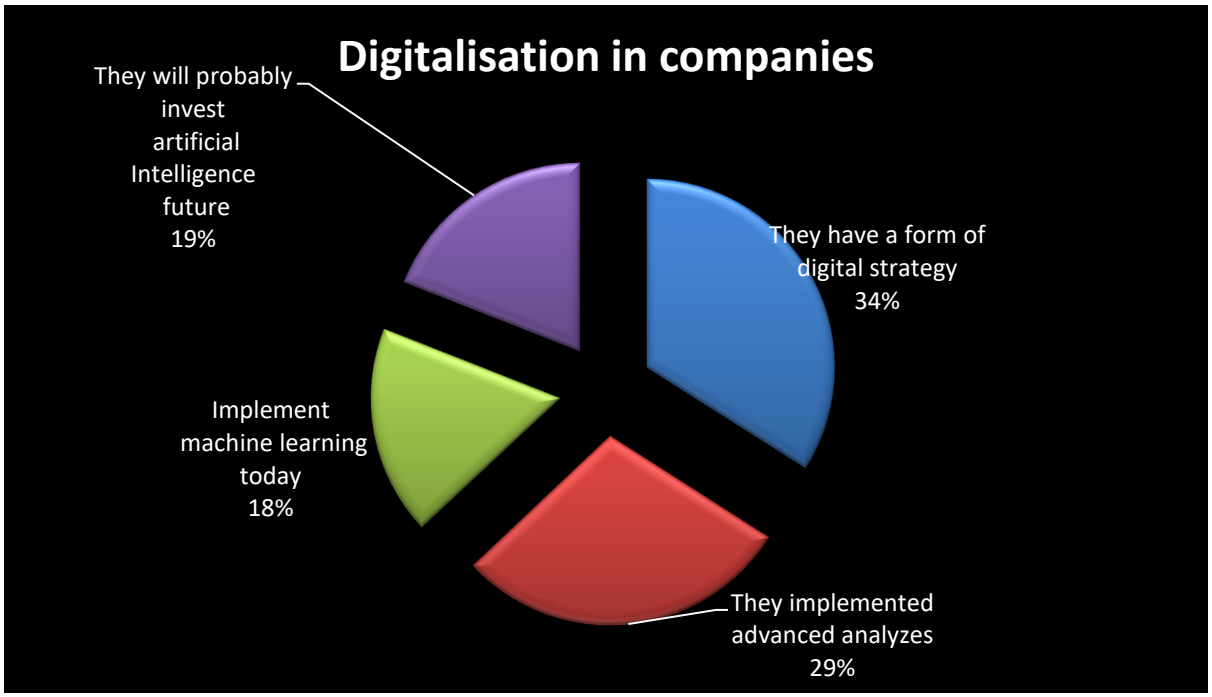
According to the previous study conducted by Forbes in collaboration with KPMG, clients are looking for auditors or audit firms to be / use the areas of technology, communication and critical thinking, followed by financial investigation skills. Most clients are looking for auditors who are up to date with new technologies and also use it. They believe that technology improves the quality of the audit and will continue to do so. They are also interested in other benefits, such as following trends, and alerting organizations to risky activities. The auditors will have to cover, in addition to the tests they perform, the audit report submitted to the client, including part of the financial advice to the audited companies.

It is said that flexibility is a positive effect of digitalisation (Zabihollah Rezaee, 2001), which all auditors suggest. Flexibility, and therefore the freedom to choose when and where to work, is one of the most positive effects that auditing emphasizes when it comes to digitization. This makes their job easier, especially when documents received from clients are uploaded to an internal server, involving accessibility and therefore flexibility. Other researchers say that digital information leads to more efficient audits. (Maziyar Ghasemi, 2011) (Granlund M. , 2007) Through the above, flexibility and efficiency are a positive effect of digitization on the audit profession, which facilitates the work of the auditor. However, a downside of digitization and efficiency is that it could lead to job losses.

In the simplest possible terms, digitalization changes very quickly what companies have to audit, and here we refer to internal audit. Business processes are like a flow of change, just like people, where data and technology are transforming. These major changes pose a threat that overall control may deteriorate if transformation risks are not proactively identified and prevented.

How they are classified depends on the specific use cases in the audit function and the level of maturity of the organization. Organizations should apply judgment in deciding which of these options may or may not be useful in their situation. Regardless of which of the technologies is applied, the roadmap consists of three steps: context, orchestration and result.

Conducting assessments, providing assurance and identifying strategies is a new technological frontier for internal audit. To meet those organizational needs, internal audit needs to evolve to become smarter about how IT audits are performed.




**Graphic no.3** - Digitalisation in companies
*Source:* EXL Service, 2019

**Data mining**

Lately, the value and complexity of accounting transactions have increased greatly. The auditor's responsibility is to audit a certain amount of transactions that require new techniques. The tools or applications that auditors use play a very important role in auditing.

There are a variety of software available that can assist the auditors. Moreover, there are softwares that are made exactly by the IT department within the audit firm, so that its own IT professionals are used to create them.

Data mining is a process of analyzing information or very large amounts of data and extracting relevant and useful information using statistical and mathematical methods. It is usually used by people working in the economic field, but also in the scientific field to extract the appropriate information.

***Key features of data mining:***

- Automatic predictions of statistical models based on the analysis of trends and behavior;
- Creating decision-oriented information;
- Automatic predictions of models based on analysis of trends and behavior;
- Predictions based on probable results;
- Used for large data sets and databases for analysis;
- Clustering based on findings and facts that were not previously known;

Data mining has three main main objectives: Description, prediction and prescription. The description focuses on finding interpretable models that describe the audited data, the prediction involves the use of variables or fields in the database to predict unknown or future values of other variables of interest. On the other hand, the prescription focuses on the best solution to the given problem. (Evans, 2013). These objectives can be achieved by using multiple data extraction tasks, including classification, grouping, predictive, prior detection, optimization, and visualization. It depends a lot on the tasks and the type of problem to be solved, as follows:

- Classification focuses on mapping data to a set of predefined qualitative attribute classes, which could be binary or multi-class.
- Clustering focuses on concentrating data in groups.

- Prediction focuses on finding a future numerical value (forecast) or a non-numerical value (classification).
- Detection is based on finding data that deviates significantly from normal.
- Optimization focuses on finding the best solution, given some resources.
- Visualization focuses on visual presentation and understanding of data.
- Regression focuses on estimating a dependent variable from a set of independent variables.

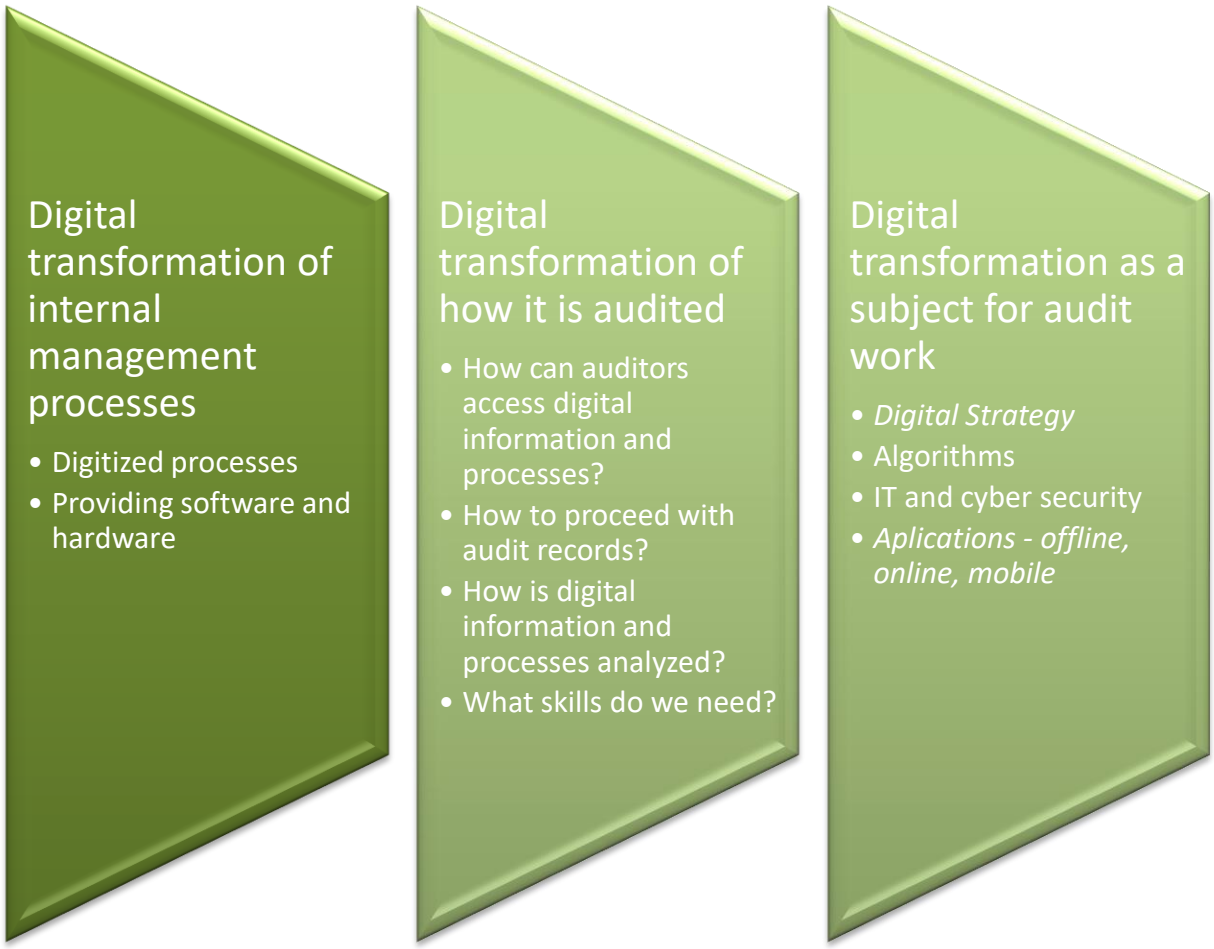



**Fig. no.1** The purpose of digitization and its transformation
*Source:* (European Court of Auditors, 2020)

In the context of continuous change and business transformation, the audit and financial teams are in constant motion to best serve the tasks they have to perform:

- Exploitation of recently created low costs
- Use of new and emerging technologies such as robotics and artificial intelligence
- Changing applications and automating processes

Several statistical tests can be used in the audit such as: Student Test, Anova Test, Single or Multiple Linear Regression or even nonparametric tests like Mann-Whitney-Wilcoxon or Kruskal test and so on.

Many of these tests are integrated into the audit programs that firms use, so they are calculated directly after the auditor enters the data into the system.

Text and information analysis technologies are needed in the audit to assess the risks, loss of the client's goodwill and the honesty of the auditee, the planning stage and customer services. For the analysis of very large data, Big 4 companies use certain programs to assess risk factors.

*For example, we will take them one by one to analyze them:*

- PwC (PricewaterhouseCoopers) uses the Halo platform. At the moment, it is not as well known in Romania, using Alteryx as well.
- EY (Ernst & Young) uses Helix.
- Deloitte uses the Optix program.
- KMPG uses the KRisk program.

For some of them, they are programs developed by companies, meaning they have a global IT department that deals with application development or programs to serve the audit work.

**Conclusion**

The paper analyzed points on data mining applications in accounting and proposed an organizational framework for auditors. The applications for extracting data or data mining from accounting have primarily focused, with different intensities, on three branches of accounting: insurance and compliance, managerial accounting and financial accounting.

Companies will have to adapt to new digitalization changes in order to remain equally competitive in the market, with artificial intelligence processes being an exception. Agility and digital will help artificial intelligence stay ahead of the changing business landscape.

Auditors will have to comply with the era of audit transformations and will have to prepare both in terms of audit - the profile of the audited client, the type of industry, the way of testing, planning, audit completion, etc., and technical.

Technically they will need to be informed and taught about new technologies in order to be able to use them in the audits they are put in and they will also need to automate their tasks in order to take on new ones and keep an updated status with the tasks to be performed by the end of each audit. Digitization helps reduce working time on certain tasks, but makes room for new ones.

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