

Audit profession and innovation: emerging practices in the era of digital transformation and their relationship to the environment

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Abstract: The business world is being disrupted by information and communication technologies (ICTs). The digital race continues in its velocity with the evolution of any new technology. However, this change cannot go unnoticed by the measures that organizations are taking to maintain the sustainable development of our ecological sphere. Of course, the financial audit profession is fully committed to this approach. This article aims to enrich the lack of literature linking audit, digital and environment. It demonstrates the impact of the innovative practices that audit firms are adopting, in the era of digital transformation, on the protection of our natural environment. This research was initiated by a literature review exposing the state of knowledge on auditing and digital, the link between digital and the environment, to finally present the efforts that Morocco is deploying in the context of this transition. Then, to properly analyze our problem, we developed a quantitative study, using a questionnaire, for a sample of 38 financial auditors belonging to different hierarchical statuses. The results of our work prove that the actors in the audit field are aware of the environmental responsibility of their organizations. These professionals opt for digital means aimed at both customer loyalty, the promotion of innovation, but also the minimization of the harmful effects of pollution. This article serves as a starting point for audit firms to follow the path of organizations that have obtained environmental preservation certification.

Index Terms — Audit, audit firm, environment, innovation, technology, digital transformation, Morocco

1. Introduction

Several terms such as: blockchain, big data, cloud computing, Internet of Things (IoT) or Artificial Intelligence (AI) have revolutionized the business world. The stakeholders of modern society all speak the same language: technological transformation [1].

The link between auditing and digital technology has aroused the interest of several researchers. Starting from the advantages and disadvantages generated by this transformation, there are some who have dealt with the perception of professionals on said mutation. Others have gone so far as to follow the implementation of a digitalization process in an audit firm, while analyzing its internal and external environment.

On the other hand, few research projects have focused on the relationship between these two variables (audit and digital) and environmental protection. The impact of new technologies on our environment cannot be negligible. This requires rapid production of different materials and technological tools, and therefore more waste (electronic equipment at end-of-life) than humans have to take responsibility.

This work evaluates how the digitalization of audit firms can have a relationship with the preservation of the environment, and determines the practices that these professionals adopt to maintain this action.

Indeed, this scientific work aims to enrich the research carried out in this subject, and to answer the following question: "*How can the digitalization of the audit profession have an impact on the preservation of the environment?*"

In order to fully understand this question, this article consists of four main sections. We begin with an introduction that first presents the state of knowledge in our research topic, and then trace the problem studied. This section also serves to identify the objectives and gaps to be filled, how these objectives can be achieved and the value provided by this study (1).

The following section defines the methodology followed, in addition to the reasons that led to this methodological choice. It outlines the locations, the time period, the description of the statistical sample, the methods and techniques adopted for data collection and finally the tool chosen for the analysis of these data (2).

Subsequently, the results of the empirical study are presented through the responses of a set of professionals in the field, while maintaining the anonymity of these people (3). Finally, the last part will be reserved for the discussion of the results obtained (4).

1.1. Audit and digital

Made essential after the advent of the health crisis, the adoption of information and communication technologies (ICT) within audit firms has proven its performance. Indeed, professionals in this field perceive this change as imperative due to five key factors according to their opinions [2]:

- **The skills of auditors:** the auditor of tomorrow is required to master the various ICTs. The profiles from the Moroccan university lack expertise at the technological level, while the use of AI techniques will disrupt the requirements of the labor market.
- **Human capital in the face of digital:** R&D costs are added to the audit invoice. On the other hand, the role of the auditor will be more oriented towards advice by giving way to the machine to perform repetitive tasks.
- **Regulatory change:** the legal framework in relation to the business will change according to the digitization of processes. However, regulators face new challenges.
- **Change in the auditor-client relationship:** technological means offer ease of access to data and a high level of security. Financial reporting to shareholders is more reliable and transparent.
- **Change of procedures for auditors:** the sampling method will disappear thanks to digitalization. Firms can detect anomalies in the annual accounts by performing comprehensive audits instead of random audits.

In addition, the traceability offered by digital means makes it possible to avoid information asymmetry (agency theory) and to provide reliable financial information to the various stakeholders (stakeholder theory) [3].

1.2. Digital and environment

Today's world faces several challenges thanks to the development of artificial intelligence. A significant number of new technologies emerge over a fairly limited period of time. These ICTs, far from being neutral on the environment, are required to reduce the effects they can have on the ecological environment (consumption of exhaustible resources, greenhouse gas emissions, energy consumption, use of toxic products, etc.).

At present, the use of new digital tools has made teleworking possible. A practice that has served to reduce travel to business premises and perform all tasks from home. This has made it possible to optimize the consumption of transport-related fossil fuels, but also to reduce pressure on the axes linking the most used areas during rush hour [4].

These digital solutions highlight an important notion which is effectiveness and efficiency: saving resources, time, and energy, while performing the same task. It is thanks to them that we can foresee a future where human beings can evolve within their environment.

Of course, digital manipulation is not a miraculous option. Its deployment has a close relationship with the behaviors of its users, as well as the policies mobilized in its practices.

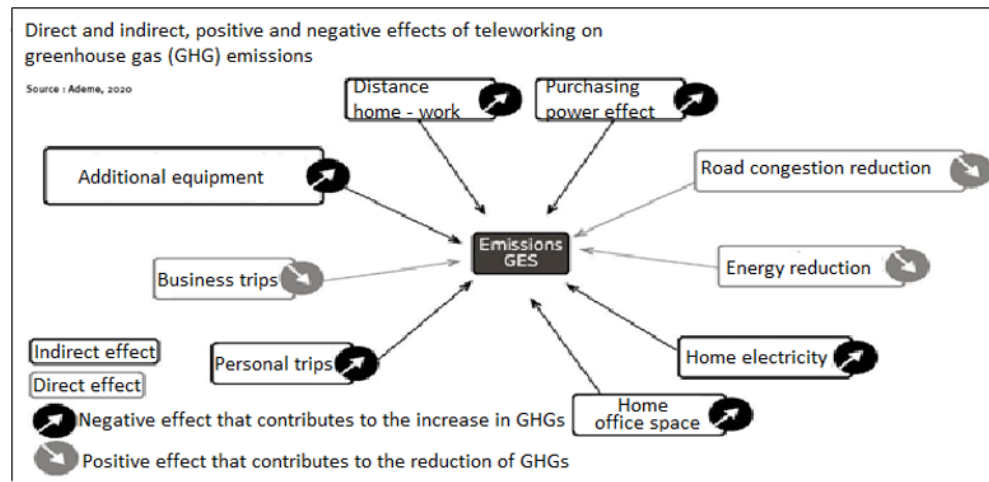


Fig. 1. Effects of telecommuting on greenhouse gas (GHG) emissions

1.3. Morocco, a country that encourages digitalization

The Kingdom of Morocco is making considerable efforts to encourage digitalization. Indeed, the main role of the Ministry of Digital Transition and Administrative Reform is to design and ensure the implementation of government policy on the Digital Transition. It is responsible for improving the quality of services for users by simplifying administrative procedures. This aims to promote digital administration and transparency in public management.

In the same vein, the Digital Development Agency (ADD), created in 2017, has the mission to develop digital tools and their use by society's stakeholders. It also contributes to the promotion and expansion of initiative and entrepreneurship in the field of the digital economy.

In addition, several pieces of legislation come to frame this orientation. These include Law 07-03 on offences concerning automated data processing systems. It provides for penalties for unauthorized intrusion into automated data processing systems. Also, Law 53-05 on the electronic exchange of legal data regulates legal data exchanged electronically, as well as electronic signatures [5].

2. Methodology

2.1. Data collection

All research work requires a study of the field, leading to a clear understanding of all the questions related to the subject. The quantitative method was selected to perform the empirical part of this research, taking the form of a questionnaire.

The limited time frame according to which this study was carried out, implied the choice of this method. In addition, the questionnaire remains the most affordable tool for respondents by offering them the necessary time to think carefully about their answers. It also allows them to avoid direct contact with the interviewer and therefore pay close attention to the questions asked [6].

This line of research serves to save the effort and time of the researcher. It is no longer mandatory to travel to distribute your questionnaire, but rather it is recommended to administer it only online.

We chose to stay in the Moroccan context, targeting audit firms based in Morocco to do our study. Data collection continued throughout June 2023, on a sample of 38 respondents (out of a total population of 110). This sample is made up of professionals from different hierarchical positions, and the female presence occupied a percentage of 26.3% of the responses.

Hierarchical status	Number of respondents
Partner (chartered accountant)	12
Manager	6
Senior	11
Junior	9

Tab. 1. Respondents' hierarchical status on the questionnaire

By focusing on a wide selection in terms of age that varies between 23 and 45 years, the level of study of these young listeners oscillates between a Bac + 5 (Master, diploma of Grande Ecole) and a Bac + 8 (diploma of accounting, doctorate). In fact, they belong to organizations of sizes varying between VSEs (Very Small Enterprises), SMEs (Small and Medium Enterprises) and GEs (Large Enterprises).

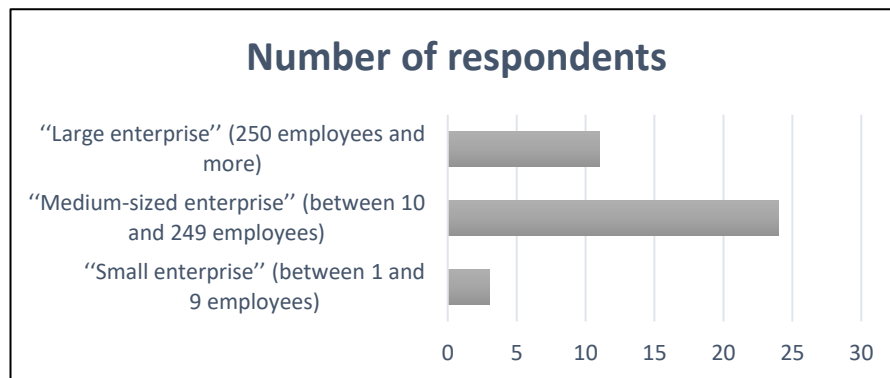


Fig. 2. Distribution of respondents by organization size

The questionnaire was designed using Google Forms survey administration software. However, faced with the time constraint, it was broadcast on different virtual channels (LinkedIn, email address, personal contacts).

2.2. Data analysis

The analysis, presentation and interpretation of the collected data requires a tool that assists in organizing and aggregating respondent feedback. To do this, the adoption of Microsoft Excel software was chosen to facilitate this task.

The most striking advantages of this tool are the ease of presentation and management of the data obtained. It offers the possibility to sort, filter the numbers and create formulas according to the needs of the researcher.

The adoption of teleworking marked its peak during the Covid-19 health crisis [7]. The return to business premises was gradually restored after the lifting of restrictions imposed by the authorities. Admittedly, the teleworking system decreased after the pandemic (34.2%) or even eliminated (42.1%), but remained the same and evolved (10.5%) in some cases. However, the statements of respondents (50%) demonstrate that it still marks a presence within the firm in which they work.

Digital transformation has impacted the way financial audits are conducted. Digitized means (software specific to each firm) are used in the realization of audit work (50%). Even sharing documents with clients has shifted from traditional email exchange to adopting new applications (50%) making it easier for auditors to have the necessary supporting documents for their work.

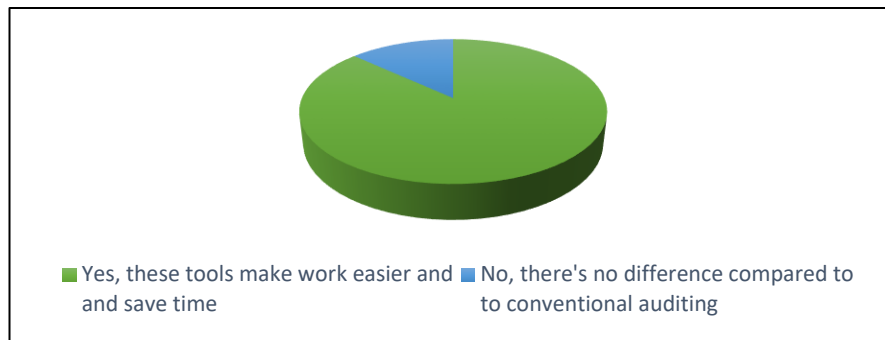


Fig. 3. Auditors' perception of the use of digital means in audit assignments

Nowadays, it is no longer necessary to travel to the client's premises to hold an audit engagement. A significant number of respondents (60.5%) confirmed that testing can be carried out exclusively remotely in some cases. Furthermore, teamwork in audit can turn into an advantage when it comes to travel. Employees often prefer to travel as a team in a single vehicle (65.8%) or even opt for public transport to do so (36.8%).

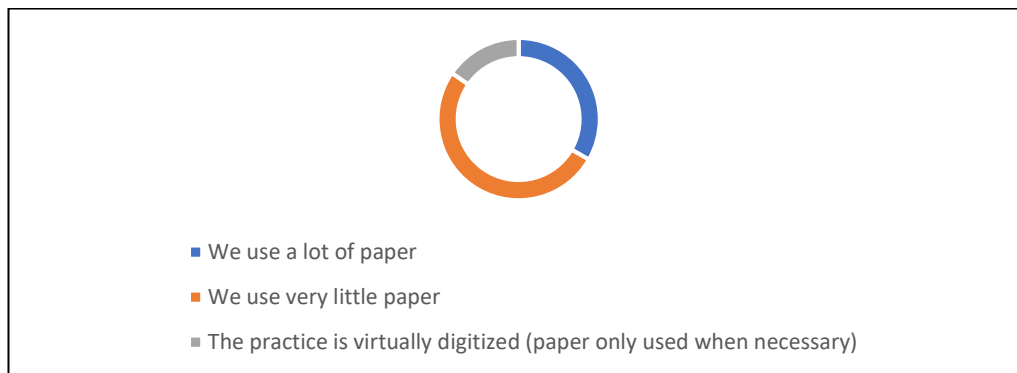


Fig. 4. Frequency of paper use within the firm

As shown in the graph below, the more we develop the use of new technologies, the less we use paper during the work. A practice promoting, without doubt, the sustainable development of the planet.

During our study, we wanted to find out if audit firms go further in this approach to environmental preservation. Among the questions was whether the organization had certification for environmental protection. Statements (15.2%) were received on this point. Admittedly, this percentage remains limited, but it can only prove that efforts are beginning to be made in this direction.

3. Results

According to the results of the study, the adoption of telework is continuing, but with a decreasing evolution. It has even been abolished for a good number of firms. The global trend of work requires doing what we are used to doing but in a different way. In some cases, remote work can even improve employee performance, saving effort and energy. It will be optimal for these companies to think about maintaining this approach as much as possible.

Almost half of the respondents confirmed that they use digital tools during their client assignments. This proves that the road to digitalization is moving forward. On top of that, almost the majority of the sample has a positive perception of these tools. They feel that the work is easier and the deliverable is returned to the client in a concise time.

Indeed, we note that people belonging to large audit firms have confirmed the use of these digital means more than other professionals. Obviously, this type of structure would have more means to make such investments in order to save more time and build customer loyalty [8].

In the same vein, the international network of audit firms Ernst & Young has developed the EY Canvas tool [9]. It is an online platform connecting professionals to clients (document sharing), regardless of the location of the audit. It allows real-time monitoring of mission progress, allowing for rapid reporting of risk findings to the core team. In addition, it establishes the link with the client's stakeholders for a better circularization of information (case of outsourcing of accounting for example).

However, this study shows that new profiles entering the field are rarely familiar with these digital means since the period of their studies. As noted in the literature review, universities still need innovation in this area. Therefore, firms must invest in their training and integration into the profession.

4. Discussion

Based on the results of our questionnaire, the organizations to which these auditors belong contribute positively to the preservation of our natural environment. Audit firms in Morocco must opt for more missions exclusively remotely. Eventually, they should encourage teams to limit their individual trips to customers' premises using a collective vehicle or even public transport. This act encourages the minimization of greenhouse gas emissions, given the considerable number of these actors in the economic sphere.

The claims made about reducing paper use support the profession's active contribution to the sustainable development of the planet. The production of paper and cardboard is considered to be among nature's most destructive industries due to the deforestation and water consumption caused by this sector.

On the other hand, telecommuting saves the burden of water and electricity bills destined for the workplace. It reduces the consumption of diesel caused by personal transport and therefore restricts the use of natural energy resources.

All these practices may seem minimal to us, but are able to provide certification of environmental protection to the entity concerned. No doubt, it would have a great impact in maintaining the balance of human life in the long term.

In light of the results obtained from our research, we note that our literature review is consistent with the answers to our questionnaire. In addition, we see that the digital transformation that the audit profession is going through is taking a promising direction. It is certain that the path to digitalization is not without obstacles, but the challenge remains.

Like any other research, this study was conducted under constraints that limited it. It will be appropriate, for future scientific research, to opt for the development of an interview guide for professionals practicing this profession, in order to have their opinion on the subject as well as concrete examples of the new technologies with which they work.

5. Conclusion

In Morocco, the digital transition of audit firms is taking on an impressive dimension. Every year, new entrants to the sector emerge. Networks of international firms are attracted to invest in Morocco. As a result, it is no longer a question of choice to innovate and acquire new digital solutions, but rather an obligation to ensure its survival.

This research aims to fill the gap in literature linking audit, digital and environment. The main issue of this quantitative study is to highlight the relationship between the innovative practices adopted by audit professionals and the preservation of the environment.

The results of our questionnaire demonstrate that audit firms are motivated to follow the global trend of innovation. Maintaining remote work, minimizing the use of paper and replacing it with digital documents and limiting travel through audiovisual exchanges [10] are all measures among others serving to save our mother planet.

We can conclude that the efforts made by some actors in this field leave positive environmental footprints [11], because the profession is integrated into the service sector, which considers itself less polluting compared to industry.

However, this digital transformation has several harmful effects. The manufacture of electronic materials cannot spare the new waste caused by the new technologies sector [12]. Also, the remote mode restricts human contact, which is considered an important lever for the mental health of individuals. Beyond that, it cannot be denied that a good number of professions will disappear in the future in the face of the installation of artificial intelligence tools.

References

1. H. Han, R. K. Shiwakoti, R. Jarvis, C. Mordi, & D. Botchie, (2023). « Accounting and auditing with blockchain technology and artificial Intelligence: A literature review ». International Journal of Accounting Information Systems, 48, 100598.
2. S. Mighiss, (2021) "Audit in the era of digital transformation", Review of Control, Accounting and Audit "Volume 5: Number 1" pp: 193- 209.
3. R. Manita, N. ELOMMAL, P. BAUDIER, L. HIKKEROVA (2019) « The digital transformation of external audit and its impact on corporate governance », Technological Forecasting and Social Change, 150, 119751.
4. P. Y. LONGARETTI, F. BERTHOUD, (2021) "Digital technology, hope for the ecological transition?". L'Economie Politique (No. 90), pp. 8 – 22.
5. DGSSI website : <https://www.dgssi.gov.ma/fr/content/loi-53-05-relative-l-echange-electronique-de-donnees-juridiques.html>
6. M. L. Gavard-Perret, D. Gotteland, C. Haon, A. Jolibert, (2008). "Research Methodology - Successful Dissertation or Thesis in Management Sciences". Pearson Education France
7. Impact of the covid-19 CRISIS on employment and MSMEs in Morocco https://www.ilo.org/wcmsp5/groups/public/---ed_emp/documents/publication/wcms_767858.pdf
8. M.A. NAFZAOUI, M. EL ADIB, (2020) "The impact of the implementation of digital in an audit firm", International Journal of the Researcher "Volume 1: Number 3" pp: 66 – 90
9. Ernst & Young website : https://www.ey.com/en_gl/audit/technology/canvas
10. R. EL MOUISSIA, A. BENBDELHADI (2021) "New approaches to work: teleworking; case of internal audit"; International Journal of Management Sciences "Volume 4: Number 2" pp: 730- 744.
11. O. HARAZEM, A. ELHAMMA, (2023) "Digitalization in the era of the COVID-19 health crisis and sustainable development: Case of the legal audit in Morocco", International Journal of Management Sciences "Volume 6: Number 1" pp: 524 – 545
12. C. Gossart, R. Garelo, (2015) "Digital technologies and the environment". La Revue de l'électricité et de l'électronique, 4, pp.39 - 44. {hal-02387240}