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Challenges and Prospects of Internal Control in Moroccan Public Administrations in the Era of Artificial Intelligence

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Abstract

This paper examines the challenges and prospects of internal control in Moroccan public administrations within the context of the rapid advancement of Artificial Intelligence (AI). Internal control is a cornerstone of good governance, transparency, and accountability, ensuring efficient use of resources and the reliability of administrative processes. With the rise of AI, internal control systems are undergoing profound transformations, offering both opportunities and risks. On the one hand, AI enhances the automation of repetitive tasks, strengthens fraud detection, and provides predictive analytics for risk management. On the other hand, it raises concerns regarding data privacy, ethical responsibility, algorithmic bias, and over-reliance on technology. This study highlights the regulatory framework governing internal control in Morocco, the practical applications of AI in public administration, and the necessity of adapting existing methods to technological innovations. The findings emphasize that strengthening governance mechanisms, training public agents, and ensuring ethical use of AI are key to maximizing its benefits while minimizing risks. Ultimately, the integration of AI into internal control can significantly improve efficiency, transparency, and trust in public administration, provided that it is implemented within a robust regulatory and ethical framework.

Keywords

Internal Control; Artificial Intelligence; Moroccan Public Administration; Governance; Transparency; Risk Management; Accountability; Digital Transformation.

1. Introduction

This study aims to provide an in-depth look at the challenges and prospects for internal control in Moroccan public administrations in the era of artificial intelligence. By closely examining the impact of artificial intelligence on internal control, we can identify the risks, challenges, and opportunities associated with this major technological development. In addition, innovative perspectives will also be proposed to improve the effectiveness and efficiency of internal control with the aim of strengthening transparency and accountability within public administrations in Morocco. By fully integrating advances in artificial intelligence and developing appropriate strategies, Moroccan public administrations will be able to ensure more efficient and transparent management of their activities, which will strengthen citizens' trust in the system. Ultimately, this study will contribute to a better understanding of the crucial importance of internal control in the era of artificial intelligence, while offering clear guidelines for its continuous improvement.

1.1. Context of the study

The context of this study is the rapid evolution of information and communication technologies, particularly in the field of artificial intelligence. Moroccan public administrations are facing new challenges related to the adoption of these technologies in their internal control processes. This context requires an in-depth analysis of the implications of artificial intelligence on internal control and an adaptation of control methods to take advantage of these technological advances while mitigating potential risks.

1.2. Objectives of the study

The objectives of this study are multiple. First, it aims to explore the definitions and key concepts of internal control in Moroccan public administrations. Second, it aims to understand the impact of artificial intelligence on internal control and identify concrete applications of this technology in public administrations. In addition, this study seeks to analyze the benefits and challenges of using artificial intelligence in internal control, while identifying the potential associated risks. Finally, it proposes perspectives for improving the effectiveness of internal control through artificial intelligence and strengthening transparency and accountability within Moroccan public administrations.

2. Internal control of Moroccan public administrations

Internal control in Moroccan public administrations is an essential mechanism for ensuring good governance, transparency, and integrity in administrative practices. It aims to establish rigorous internal standards and procedures to ensure optimal effectiveness and efficiency of operations, unquestionable reliability of financial information, and strict compliance with applicable laws and regulations (BENTAHAR & RIFAI, 2022). This internal control system is based on a comprehensive integrated framework for verifying, evaluating, monitoring, and reporting administrative activities. It requires close coordination and continuous collaboration between different departments and services to ensure rigorous management of resources and optimal protection of state interests, while fostering a culture of excellence and accountability within the Moroccan public administration. (Ismail et al., 2024)

2.1. Definition of internal control

Internal control can be defined as the set of measures implemented by Moroccan public administrations to ensure control of their activities. It encompasses policies, procedures, systems, and practices for identifying, assessing, and managing risks related to administrative operations and processes. The objectives of internal control are to prevent errors, fraud, and irregularities, ensure the reliability of financial information, and promote the effectiveness and efficiency of operations. (Ismail et al. 2024)

2.2. Importance of internal control in public administrations

Internal control plays a crucial role in Moroccan public administrations. It helps strengthen transparency, integrity, and accountability in the management of public resources by establishing rigorous monitoring and control mechanisms. By establishing clear standards and precise procedures, it promotes efficient and optimal use of available resources, thereby maximizing the results obtained. (ACHOURI and OUBAL 2020) One of the main functions of internal control is to reduce the risks of fraud and abuse. By implementing appropriate controls and ensuring their compliance, it helps detect and prevent fraudulent practices or abuse of power. This has a direct impact on citizens' trust in public administration and its legitimacy. (EL and Latifa 2023) In addition, internal control helps improve the quality of services provided to citizens. By identifying gaps and proposing recommendations for improvement, it helps correct errors and malfunctions in administrative management. This also helps optimize the effectiveness and efficiency of internal processes, resulting in greater user satisfaction and better use of available resources. (SYAYIGHANZA and MPERE2024)Finally, internal control plays a vital role in preventing errors and negligence in administrative management. By implementing effective internal controls, it helps quickly identify potential failures, allowing them to be corrected before they cause larger problems. This strengthens the confidence of citizens and partners of the public administration in the latter's ability to effectively manage the resources entrusted to it. (ABAI et al.)(LAKIR, 2021)

2.3. Regulatory framework for internal control in Morocco

Internal control in Moroccan public administrations is governed by a specific regulatory framework. The main legal references in this area are the Constitution of the Kingdom of Morocco, the Organic Law on the Finance Law, the Organic Law on State Financial Control, as well as ministerial decrees and orders that define the rules and procedures relating to internal control. These texts establish the responsibilities, powers, and control methods to be implemented, as well as the sanctions in the event of non-compliance with standards and procedures. (BENAZZI and GHARRAFI2020)Internal control is of paramount importance in ensuring the transparency, integrity, and efficiency of public administration management in Morocco. It aims to prevent fraud, embezzlement, and abuse of power by establishing rigorous control mechanisms and assessing the compliance of administrative operations with established standards. (ACHOURI and OUBAL2020)Thus, the current regulatory framework requires that each public administration implement a suitable internal control system. This system must include, in particular, the definition of control objectives, the identification of risks, the implementation of control procedures, the evaluation of the effectiveness of internal controls and the documentation of results. (BENAZZI and GHARRAFI2020)In order to guarantee the independence and objectivity of internal control, it is also expected that those responsible for this control are distinct from those responsible for carrying out the controlled operations. This separation of functions aims to avoid conflicts of interest and ensure an impartial evaluation of administrative activities. (Amine et al.)In the event of non-compliance with internal control standards and procedures, sanctions may be applied. These can range from simple warnings to more severe disciplinary measures, such as temporary suspensions, fines or dismissal from office. (Reghay et al.2023)It should be emphasized that internal control is not limited to the prevention and detection of irregularities. It also plays an important role in the continuous improvement of administrative practices and the promotion of good governance practices. By identifying weaknesses and gaps in administrative processes, internal control makes it possible to provide recommendations and corrective measures to strengthen the effectiveness and efficiency of Moroccan public administrations. (EL and GUEHAIR2022)The regulatory framework for internal control in Moroccan public administrations is essential to ensure transparent, ethical and responsible administrative management. Through strict legal provisions and rigorous control mechanisms,It aims to prevent abuse, fraud and embezzlement, while promoting the continuous improvement of administrative practices.

3. Artificial intelligence and its impact on internal control

Artificial intelligence (AI) has a significant impact on the internal control of public administrations in Morocco. It makes it possible to automate certain repetitive tasks and process large amounts of data more efficiently. Furthermore, it offers predictive analysis opportunities that can help identify potential risks and make informed decisions. However, AI also presents challenges, particularly regarding the interpretation of results and the protection of sensitive data. It is therefore essential to understand in detail what AI is and how it can be used in public administrations. (MANTOUZI & Youssef, 2023)

3.1. Understanding Artificial Intelligence

Artificial intelligence is a field of computer science that aims to create machines capable of imitating certain human abilities, such as visual perception, natural language, and learning. (Sinapin, 2020) It relies on the use of sophisticated algorithms and mathematical models to analyze data and make decisions. AI can be classified into two main categories: weak AI, which focuses on specific tasks, and strong AI, which aims to replicate human intelligence comprehensively. (Cypel, 2023) Understanding the concepts and limitations of AI is essential to assess its potential in the internal control of Moroccan public administrations. Artificial intelligence can be used to improve the efficiency of administrative processes by automating certain common tasks, such as document management and data collection (MANTOUZI & Youssef, 2023). For example, an AI system might be able to quickly analyze large volumes of documents to detect errors or inconsistencies, saving time and resources. (DJELLABA & BENAMARA) Furthermore, AI can also help improve the accuracy of forecasts and analyses by using predictive models based on machine learning. This technology could be used to predict economic trends or identify areas of risk, which would help public administrations make more informed decisions. However, it is important to recognize that AI also has its limitations and challenges. For example, the ability of machines to understand the context and nuances of human language may be limited, which can lead to misinterpretation or translation. Moreover, there are also ethical concerns related to the use of AI, such as privacy protection and algorithmic discrimination. It is therefore essential to carefully assess the benefits and risks associated with the use of AI in Moroccan public administrations before implementing such solutions. (BRALY & HAMZA)

3.2. Applications of artificial intelligence in public administrations

Artificial intelligence has many applications in Moroccan public administrations. For example, it can be used to automate financial data collection and analysis processes, saving time and reducing errors. (BELHAJ2023) Furthermore, it can be used to detect fraud and abnormal behavior by analyzing user spending or behavior patterns. AI can also help improve the quality of public services by analyzing citizen feedback and complaints, allowing administrations to take appropriate corrective measures. Furthermore, it can be implemented to optimize administrative processes and improve the overall efficiency of public administrations. (Krichen, 2023) For example, by using machine learning algorithms, AI can identify areas where improvements are needed and offer recommendations for more efficient resource management. In this way, administrations will be able to allocate their resources more fairly and efficiently, ensuring greater citizen satisfaction. (Nicolas, 2023) Furthermore, AI can be used to predict future trends and provide strategic advice to public administrations, helping them make informed decisions and anticipate future challenges (EL and NAFZAOUI2023). This predictive capacity of AI will enable Moroccan public administrations to better plan and quickly adapt to the changing needs and demands of society. In short, artificial intelligence offers vast potential for innovation and improvement of public services in Morocco, paving the way for more efficient governance focused on the needs of citizens (ROUSSI, 2022).

3.3. Benefits and challenges of using artificial intelligence in internal control

The use of artificial intelligence in internal control offers numerous strategic and operational benefits. Not only does it significantly improve the accuracy and speed of analyses, but it also allows for more proactive detection of errors and fraud, thus providing enhanced protection for businesses. Furthermore, by automating manual processes, AI can significantly reduce operational costs, allowing companies to generate valuable savings that can be invested in other key areas of their business (BELHAJ2023). But the benefits of using AI go even further. This technology offers organizations increased flexibility and a better ability to adapt to change. Indeed, AI can easily be updated to take into account new regulations and new risks that may arise in a constantly evolving context. This agility allows companies to remain competitive and adapt quickly to market demands. (Frimousse & Peretti, 2020) However, despite all these advantages, it is important to remain aware of the challenges associated with using AI in internal control. Interpreting the results generated by AI algorithms can be complex and requires specialized expertise. Moreover, accountability for machine-made decisions remains a delicate topic that must be addressed thoroughly. Companies must ensure that adequate oversight and control mechanisms are in place to ensure that AI-based decisions are fair, ethical, and compliant with regulatory standards (Khaldi, 2023)(Sedkaoui, 2024). The use of artificial intelligence in internal control offers multiple benefits, including efficiency, accuracy, and cost reduction. However, it is essential to balance the effectiveness of AI with the need to implement appropriate controls and oversight. By taking a proactive and thoughtful approach, companies can maximize the benefits of AI while minimizing potential risks.

4. Challenges of internal control of Moroccan public administrations in the era of artificial intelligence

Moroccan public administrations are facing major challenges in the era of artificial intelligence regarding internal control. The introduction of artificial intelligence raises crucial questions regarding the reliability, security, and effectiveness of internal control processes. To guarantee meaningful results, administrations must ensure that the artificial intelligence systems used are flawlessly robust and free of bias or error. In addition, they must also fully consider the organizational changes necessary to seamlessly and optimally integrate artificial intelligence into their existing internal control processes. (Agbor, 2023) Above all, it is incumbent on Moroccan public administrations to establish strong governance mechanisms to closely supervise and monitor the use of artificial intelligence in internal control processes. It is crucial to train and raise awareness among public officials about the potential and limitations of artificial intelligence, thus enabling them to adopt a strategic approach in managing the risks and opportunities it presents. (EL et al.2022) In short, the successful integration of artificial intelligence into the internal control of Moroccan public administrations depends on the establishment of an appropriate regulatory framework, rigorous governance and an adequate support strategy. These measures will enable Moroccan public administrations to fully benefit from the advantages of artificial intelligence while minimizing potential risks. (El and Khalid2023)

4.1. Risks related to artificial intelligence in internal control

The use of artificial intelligence in the internal control of Moroccan public administrations presents certain major risks. (EL et al. 2022) First, there is a considerable risk of over-reliance on artificial intelligence systems, which could potentially lead to a drastic decrease in human involvement in the control process, which could have detrimental long-term consequences. (Wang) Furthermore, there is also a significant risk of bias and discrimination inherent in the use of artificial intelligence, which can be amplified exponentially in the field of internal control, thus compromising the accuracy and fairness of the decisions made. (Boily, 2021) Therefore, it is imperative to put in place extremely rigorous monitoring and control mechanisms to mitigate these potential risks and ensure the ethical and fair use of artificial intelligence in internal control. Furthermore, it is essential to train and raise awareness among the stakeholders involved so that they are fully aware of these risks and are able to take appropriate measures to mitigate them. This will help build trust in the use of artificial intelligence and maximize its potential benefits while minimizing the inherent dangers. (RAOUI & Leila, 2023) The integration of artificial intelligence into the internal control of Moroccan public administrations is a promising step forward, but it requires a thoughtful and responsible approach to ensure its safe, ethical, and equitable use.

4.2. Adaptation of internal control methods to new technologies

The emergence of new technologies such as artificial intelligence requires a profound adaptation of internal control methods in Moroccan public administrations. Traditional control processes must be completely rethought, reinvented, and readjusted to fully and intelligently take into account the complex capabilities and evolving limits of artificial intelligence. For example, in order to proactively address the specific needs of internal control, it may be essential to develop cutting-edge machine learning models that are highly customized and scrupulously adjusted to the specific requirements of each respective administrative domain. This will ensure the optimal and truly synergistic integration between human skills and the algorithmic capabilities of artificial intelligence. (Agbor, 2023)(EL2024)(Aissaoui and AISSAOUI2021)Furthermore, the involvement of highly qualified experts exclusively dedicated to artificial intelligence is of paramount importance in the design, coordination, and implementation of new internal control methods. This close and inseparable partnership will make it possible to take full advantage of the considerable benefits offered by these emerging technologies, while proactively minimizing the risks inherent in their use. These experts will be able to provide specialized perspectives, sound advice, and in-depth knowledge of the latest advances and trends in artificial intelligence, thus ensuring a harmonious integration and overall optimization of internal control performance. (Benhamou, 2022)(Lorenzon et al.)(KOSATKA, 2023)In short, it is essential that Moroccan public administrations actively embrace these new technological opportunities and invest in acquiring the necessary resources to support this transition. A comprehensive and adaptable strategy, supported by specialized training, close partnerships with technology companies, and a culture of continuous innovation, will help address the challenges associated with artificial intelligence while ensuring the continuous improvement, increased efficiency, and proactivity of internal control processes. In this way, Morocco will be able to fully grasp the benefits of artificial intelligence and strengthen its position as a regional leader in government innovation and the management of emerging technologies.

4.3. Training public officials in internal control in the era of artificial intelligence

In our current society, characterized by the unprecedented acceleration of technological progress, it is essential to pay particular attention to artificial intelligence. Indeed, the latter has the potential to revolutionize many areas, including that of internal control within public organizations. (Nohayla and Zineb2023)Thus, it is imperative to train and raise awareness among public officials about new internal control techniques related to artificial intelligence. Directors must therefore understand the fundamental concepts and practical applications of this technology in the specific context of internal control. This in-depth knowledge will enable them to optimally and efficiently use new AI technologies in their daily activities. (Béranger and Chassang2021)To achieve this objective, it is necessary to set up specialized training aimed at familiarizing public officials with the risks inherent in artificial intelligence. This training must enable them to detect potential biases generated by this technology and to implement best practices in the use of artificial intelligence in the context of internal control. (Cantens, 2023)By strengthening the skills of public officials, these training courses will help ensure the appropriate and thoughtful use of artificial intelligence in internal control. Proper use of these technologies offers multiple benefits, such as improving the quality of control processes, reducing fraud and errors, and optimizing government resources. (RARHOUI, 2023)It is therefore essential to invest in ongoing and targeted training for public officials. These training courses should include modules covering the theoretical and practical aspects of artificial intelligence, as well as case studies and discussion sessions to encourage exchange and reflection. It is also essential to promote collaboration between different public bodies to share knowledge and best practices regarding the use of artificial intelligence in internal control. It is crucial to raise awareness and train public officials on new internal control techniques related to artificial intelligence. This will optimize their use of AI-based technologies while reducing potential risks. By investing in training and promoting knowledge sharing, we will be able to ensure the appropriate and thoughtful use of artificial intelligence in internal control, for the benefit of all.

5. Perspectives on internal control of Moroccan public administrations in the era of artificial intelligence

The prospects for internal control in Moroccan public administrations in the era of artificial intelligence are extremely promising and open up exciting new possibilities. The introduction of artificial intelligence in the field of internal control will enable unprecedented optimization of processes, by efficiently automating repetitive tasks and using advanced algorithms to detect the slightest anomalies. Thanks to this major technological advance, public administrations will not only be able to improve their operational efficiency, but also strengthen their efficiency in carrying out their control missions. (Agbor, 2023) Indeed, artificial intelligence will revolutionize the way public administrations carry out their internal control functions. It offers a predictive dimension, making it possible to identify potential risks even before they materialize, and to make informed decisions in real time. Thanks to sophisticated data analysis, government agencies will be able to anticipate and resolve problems before they become major crises, thus ensuring better protection of public interests. (Pariente et al. 2023)Not only will artificial intelligence help detect risks, but it will also facilitate the development of even more effective prevention and detection strategies. Thanks to advanced algorithms, public administrations will be able to develop tailor-made approaches and adjust their control methods according to the specific needs of each sector. This will allow them to be more agile, proactive, and adapted to evolving threats and risks. (Agbor, 2023)Furthermore, artificial intelligence offers enormous potential in terms of continuous improvement and resource optimization in the field of internal control. By automating repetitive tasks and entrusting them to intelligent systems, public administrations will be able to free up their teams to focus on higher value-added tasks, such as in-depth data analysis and strategic decision-making. This will maximize the use of human talent and strengthen employee skills by positioning them on more challenging and high-impact projects. (Souad & Leila, 2023)In summary, artificial intelligence offers extremely promising prospects for the internal control of Moroccan public administrations, ranging from the automation of repetitive tasks to proactive risk detection, through better use of resources and informed decision-making. At the dawn of this revolutionary technological era,It is crucial that public administrations seize this unique opportunity to position themselves as leaders in innovation and ensure more efficient and transparent governance for the benefit of all Moroccan citizens.

5.1. Improving the effectiveness and efficiency of internal control through artificial intelligence

Artificial intelligence offers numerous opportunities to significantly improve the effectiveness and efficiency of internal control in Moroccan public administrations. Thanks to the power of automating simple and repetitive tasks, public officials will be able to focus on higher-value tasks, further boosting their productivity. Furthermore, revolutionary artificial intelligence will enable the early and accurate detection of anomalies and potential fraud, significantly reducing the risks and costs associated with errors. Using sophisticated and advanced algorithms, artificial intelligence will also be able to proactively and efficiently analyze huge volumes of data in real time, enabling faster, more accurate, and more informed decision-making. The significant improvement in the effectiveness and efficiency of internal control through artificial intelligence will undoubtedly contribute to more optimal resource management and exemplary governance in Moroccan public administrations, thus strengthening citizens' trust in their institutions. (DJELLABA & BENAMARA)(ACHIR & DOUARI, 2024)(Manaouil et al., 2024)

5.2. Strengthening transparency and accountability in public administrations

The introduction of artificial intelligence into the internal control of Moroccan public administrations will have a significant impact on transparency and accountability. Through the use of advanced data analysis techniques, artificial intelligence will be able not only to detect suspicious or fraudulent behavior, but also to anticipate and prevent potential problems. This will allow for increased monitoring of public administration activities, thus ensuring more efficient and ethical management of public resources. (EL et al. 2022) Furthermore, artificial intelligence will help improve the collection, analysis, and dissemination of relevant information to stakeholders. Thanks to sophisticated algorithms, it will be able to filter and organize data to provide clear and understandable information. This will allow citizens and other stakeholders to have easier access to reliable information, thus strengthening trust in Moroccan public administrations. (Rabah et al.) At the same time, the introduction of artificial intelligence will also promote greater accountability of public officials. By providing increased traceability of decisions made and actions taken, it will enable close monitoring of agents' performance and compliance. This will thus encourage a culture of accountability and transparency within Moroccan public administrations. (Chatit & Mohamed, 2023)

Artificial intelligence is a valuable tool for strengthening transparency and accountability in Moroccan public administrations. Its use will help detect fraudulent behavior, improve the collection and dissemination of relevant information, and promote greater accountability among public officials. Thanks to these technological advances, Morocco will be able to consolidate its position as an exemplary country in public governance.

5.3. Integration of artificial intelligence into existing internal control processes

Integrating artificial intelligence into the existing internal control processes of Moroccan public administrations will allow them to fully leverage its benefits. Rather than replacing existing processes, artificial intelligence will complement and strengthen traditional control methods. For example, it can be used to analyze financial data and identify suspicious patterns or behaviors that might escape the human eye. (AKKOUR et al. 2023) Artificial intelligence can also be integrated into internal monitoring systems, enabling real-time analysis of transactions and activities. By integrating artificial intelligence into existing internal control processes, Moroccan public administrations will be able to benefit from its advanced capabilities while retaining the achievements of their internal practices. (ACHIR & DOUARI, 2024) This means that they will be able to achieve more effective control and faster detection of errors or potential fraud. Thanks to artificial intelligence, administrations will also be able to make more informed decisions regarding resource management and allocation. Furthermore, artificial intelligence can help automate certain repetitive and tedious tasks, allowing employees to focus on more rewarding and strategic tasks. (Tchatchouang Wanko, 2023) In summary, the integration of artificial intelligence into the internal control processes of Moroccan public administrations opens the door to numerous possibilities for improvement and sophistication, thus contributing to increasing the efficiency and transparency of operations. Therefore, it is important for decision-makers and government officials to recognize the importance of this technology and take steps to promote its adoption and integration into existing structures. By investing in artificial intelligence and adapting to new control methods, Morocco can not only improve governance but also strengthen its position as a leading country in the field of technological innovation. Furthermore, greater use of artificial intelligence in the public sector can also boost the country's economic development, promoting the creation of specialized jobs and attracting foreign investment. However, it is also essential to ensure that the integration of artificial intelligence complies with ethical standards and protects data privacy (MANTOUZI & Youssef, 2023). By establishing appropriate policies and regulations,Morocco can ensure that the use of artificial intelligence benefits society as a whole, while minimizing potential risks. (Fettouma, 2023). The integration of artificial intelligence into the internal control processes of Moroccan public administrations offers enormous potential to improve the country's efficiency, transparency, and governance, while promoting economic and technological development. With a thoughtful approach and adequate measures, Morocco can position itself as a regional and global leader in the responsible and innovative use of artificial intelligence.

Conclusion

In conclusion, the internal control of Moroccan public administrations must address the many challenges and opportunities of artificial intelligence. This in-depth study has highlighted the paramount importance of internal control in the functioning of public administrations, as well as the considerable risks, benefits, and challenges associated with the growing use of artificial intelligence in this field. It is essential to constantly adapt to new technologies and adequately train public officials so that they can carry out their work even more efficiently and effectively in this revolutionary era of artificial intelligence. Through the peaceful and harmonious integration of artificial intelligence, internal control can significantly improve its effectiveness and efficiency, while simultaneously strengthening transparency and accountability in Moroccan public administrations. Moreover, by integrating artificial intelligence into existing internal control processes, it is possible to create a powerful synergy that further accelerates the development and growth of public governance. Thus, to ensure continued progress towards good governance and high-performance public administration, it is critically important that Moroccan public administrations fully and actively embrace the many opportunities offered by artificial intelligence. By proactively overcoming the challenges associated with this technological revolution, internal control can truly become a powerful and essential tool for the Republic of Morocco.

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