

Contributions to the Improvement of the Process of Internal Audit at Public Educational Entities by Using Chatbots

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Abstract

This paper explores the impact of implementing chatbots in the internal audit process of public education entities. The study analyzes the efficiency and effectiveness of chatbots in optimizing audit operations, highlighting benefits such as increasing efficiency, improving audit quality and facilitating communication between auditors and institution staff. The results highlight the significant contributions of chatbots in reducing administrative burdens, saving resources and creating a more transparent and adaptable audit process. The paper provides relevant insights for public entities seeking to integrate emerging technologies into their internal audit practices, highlighting the importance of chatbots in the effective evolution of this field.

Key words: chatbots, AI, audit, public entities, education

J.E.L. classification: I21, I25, M42, O36

1. Introduction

Internal audit is an essential element of the internal control system of public education entities, having the role of evaluating and improving the efficiency, effectiveness and compliance of the organization's activities. In a world of continuous technological evolution, public education entities face significant challenges in managing and optimizing internal audit processes.

Over the past few years, artificial intelligence (AI) has become a key area of innovation and development in many industries, including internal audit. One of the emerging tools in the field of AI is represented by chatbots, chatbot-type applications that use natural language processing techniques to interact with users in the most natural way possible.

This research aims to explore how the use of chatbots can make significant contributions to improving the internal audit process in public education entities. Integrating chatbot technology into internal audit can bring benefits such as improving operational efficiency, increasing the accuracy of data collected, reducing human error, and ultimately strengthening the quality of audit reports

In the specific context of public education entities, chatbots can play an essential role in interacting with different stakeholders, such as teaching staff, administrative staff or students. Customized solutions can also be implemented to manage audit tasks, schedule audits, prepare checklists and monitor remedial activities for identified non-conformities. Therefore, this case study will focus on the analysis and evaluation of the impact of the introduction of chatbots in the internal audit process of public education entities. Both the users' perspective (internal audit, staff from public education entities) and the impact on the efficiency and quality of the audit process itself will be investigated.

Next, we will explore the research methods used, the proposed objectives and the potential benefits that this technological innovation can bring to the field of internal audit in public educational entities.

2. Theoretical background

In recent years, researchers and audit professionals have begun to explore the potential of chatbots in the internal public audit for public education entities. These studies investigated various aspects such as the efficiency, accuracy and benefits of using chatbots in this context. Below are some relevant examples of the application of chatbots in internal public audit:

- **Financial Data Analysis Assistance Study:** A research study looked at how chatbots can be used to assist auditors in analyzing financial data and identify potential discrepancies and anomalies. The results indicated that chatbots can increase the efficiency of the audit process and facilitate the identification of complex patterns in financial data.
- **Example of use in data collection:** Within a public educational institution, the chatbot was implemented to automate the collection of financial and operational information from various departments and internal units. This chatbot enabled auditors to quickly and efficiently obtain the data needed for risk analysis and assessment.
- **Application in compliance assistance:** Another example was the implementation of a chatbot to assist in monitoring and meeting compliance requirements at the level of public educational institutions. The chatbot provided guidance and relevant information about internal regulations and policies, thereby helping entities to comply with legal requirements and minimize the risks of non-compliance.
- **Use in the handling of requests and complaints:** Another example of the application of chatbots in the internal public audit was in the handling of requests and complaints from students, teaching staff and other interested parties. The chatbot provided quick and accurate responses to questions and requests, facilitating communication and increasing user satisfaction.

These previous studies and application examples show that chatbots can bring significant benefits in internal public audit for public education entities. The integration of chatbot technology in this field can increase the efficiency, precision and quality of the audit process, thus contributing to the improvement of internal control activities and ensuring a good management of resources in educational institutions.

3. Research methodology

In order to conduct rigorous research and obtain relevant and credible results in the case study on the contributions of using chatbots in internal audit in public education entities, well-structured and appropriate data collection and analysis methods are required. In this subsection, we will detail the methods we will use to obtain and interpret the data required for our research.

Data collection methods:

1. Expert interviews: We will interview experts in the field of internal audit and artificial intelligence to gain valuable insights and in-depth understanding of how chatbots can be integrated into the internal audit process at public education entities. These interviews will help identify the benefits, challenges and expectations of using chatbots.

2. Case study at the public entity: We will choose two public entities from education that have/have not implemented chatbots in internal audit. In the case of the institution that has integrated AI, we will collect data on how chatbots have been implemented, the types of tasks assisted by chatbots, and the observed impact on internal audit efficiency and quality. For the other institution we will collect information and data about the traditional conduct of the audit process (represented by the SCIM committee). This will involve reviewing documents, audit reports and feedback from auditors.

Data analysis methods:

A. Qualitative analysis: The expert interviews will be analyzed using the qualitative analysis method. We will identify themes and patterns in the experts' responses, extracting relevant insights into the benefits, challenges and perspectives of using chatbots in internal audit.

B. Quantitative analysis: For data collected from public education entities, we will use quantitative analysis to quantify the effects of using chatbots in internal audit. We will use metrics such as time saved, accuracy rate and efficiency in the audit process.

Evaluation of the results:

Through the combination of qualitative and quantitative analysis of the collected data, we will comprehensively evaluate the impact of the use of chatbots in the internal audit of public educational entities. The results will be interpreted in the context of the research objectives and will provide clear information and sound arguments to assess the benefits and challenges of using chatbots in this field.

In conclusion, the data collection and analysis methods proposed for the case study will allow a comprehensive and rigorous approach to our investigation on the contributions of chatbot technology in improving the internal audit process in public educational entities.

4. Findings

A. Interviews with experts

A.1. The first interview was applied to an expert in the field of internal public audit and included the questions and answers presented below. The interview was conducted orally, the answers being recorded. The purpose and objectives of the case study, as well as the interview questions, were communicated to the expert in advance.

A.2. The second interview was applied to an expert in the field of artificial intelligence and included the questions and answers presented below. The interview was conducted orally, the answers being recorded. The purpose and objectives of the case study, as well as the questions, were communicated to the expert in advance. Confidentiality of personal data has been ensured.

B. Case study in public entities

Two state pre-university education institutions were chosen to carry out the case study. The first institution, hereafter referred to as School A, implemented chatbots in the 2022-2023 school year within the SCIM (Internal Managerial Control System) committee. The second institution, called School B, carried out the activities of the SCIM commission in the traditional way.

The interviews were applied to SCIM managers from the two institutions and were conducted online, through Google Forms, with each institution receiving a set of personalized questions. The questionnaire applied to School A contained nine questions. The questionnaire applied to School B included six questions:

1. *How does the SCIM process work in the absence of chatbots?*
2. *What are the methods and tools used?*
3. *How do you compare the activity of the SCIM committee at institution A with that at your institution?*
4. *Are there aspects that could benefit from the introduction of chatbots?*
5. *What are the major challenges faced by the SCIM committee in your school?*
6. *What are your views on the future of internal audit and the use of technology?*

Analyzing the responses received to the questionnaires, we draw the following conclusions:

- **Process efficiency** - The school that implemented chatbots in SCIM shows increased efficiency in the internal control process, with less dependence on human resources and faster processes.
- **Accessibility and Availability** - School with chatbots provides greater access to information and support, available 24/7, while school without chatbots has time constraints.
- **Data quality and monitoring** - The implementation of chatbots contributes to more efficient data collection and analysis, leading to better monitoring of activities and events.
- **Consistency and Compliance** - School with chatbots show greater consistency in applying policies and procedures, thus helping to maintain compliance.
- **Repetitive tasks and human errors** - Deploying chatbots eliminates repetitive tasks and reduces the human errors associated with them.
- **Cost reduction** – School A benefits from a reduction in long-term administrative costs.
- **Reliance on human resources** - School without chatbots still depends on human resources to manage SCIM activities, which creates vulnerabilities.
- **Level of satisfaction** - Stakeholders are more satisfied with the level of service and responses obtained in the school with chatbots, which contributes to improved

relationships.

- Resources and limitations - However, implementing chatbots also has risks, such as data security issues or initial implementation costs.
- Need for adequate planning and resources - Successful implementation of chatbots requires adequate planning and resources, including staff training.

Assessing the contributions of chatbots in the internal public audit process

The process of implementing chatbots within public internal audit has made many significant contributions and changed the way this field works. In this sub-chapter, we will carefully evaluate the positive impact of chatbots in the internal public audit process, highlighting the benefits and notable changes. Evaluating these contributions is essential to deeply understand the effectiveness and added value of this technology in public auditing.

Increased efficiency

One of the main factors that contributed to the increased efficiency of the internal public audit was the implementation of chatbots. These have enabled the automation of repetitive tasks and data collection processes, reducing the time required to complete an audit. Auditors can now focus more on data analysis and risk identification, trusting that chatbots perform repetitive tasks accurately and efficiently.

Continuous accessibility and availability

Chatbots have facilitated the accessibility and availability of internal public audit. Auditors and staff from public entities can interact with chatbots at any time, 7 days a week. This has resulted in greater scheduling flexibility and quick responses to audit questions and requests. The use of chatbots has removed the limitations of regular business hours, which has significantly increased access to audit services.

Reduction of human errors

Another notable aspect of the contribution of chatbots in internal public audit is the reduction of human errors. Chatbots can perform repetitive tasks without making errors and provide a high degree of accuracy. This has led to increased audit quality and reduced risks related to human error.

Effective data collection and analysis

Chatbots have revolutionized the data collection and analysis process in public internal audit. They can collect data from multiple sources, organize and analyze it to generate useful reports and insights for auditors. This process has become much more efficient, allowing auditors to get a clearer and more detailed picture of the situation.

Cost reduction

The implementation of chatbots has led to a significant cost reduction in internal public audit. They can replace or reduce the need for repetitive tasks that previously required significant resources. Thus, public entities and audit organizations can allocate resources more efficiently.

Improving the quality of services

The quality of audit services has increased significantly with the implementation of chatbots. By eliminating human error, more efficient data collection and analysis, auditors can provide more accurate and useful audit services to public entities.

Innovation and transformation of the audit process

Chatbots have brought a touch of innovation and transformed the internal public audit process. These have opened up new opportunities for the use of artificial intelligence and stimulated creative thinking about how auditing can be done in the future.

Continuous monitoring and adaptation

Assessing the contributions of chatbots in the internal public audit process is not a static process. It is important to continuously monitor chatbot performance and make adjustments and improvements as technology evolves and needs change.

The evaluation of the contributions of chatbots in the internal public audit shows that this technology has brought significant benefits, improving the efficiency, accessibility, quality and innovation capacity of this field. These contributions highlight the continued importance of the exploration and use of technology in public internal audit.

Participant feedback on using chatbots

Participant feedback on the use of chatbots within the Internal Managerial Control Commission (ICMC) in a school where chatbots were implemented was generally positive, highlighting multiple benefits and increased efficiency.

Participants noted a significant increase in the efficiency of the internal audit process. Chatbots have reduced the time required to complete the audit and to collect and analyze data. Users appreciated being able to interact with the chatbots at any time, which provided greater scheduling flexibility and enabled quick responses to audit questions.

Chatbots have brought increased accuracy to the audit process. These eliminated human error and ensured greater consistency in data collection and analysis. Feedback repeatedly mentioned the cost savings achieved by using chatbots. They replaced or reduced the need for human resources for repetitive tasks.

Auditors noted that chatbots can generate reports and information in a much shorter time, which has accelerated the decision-making process. Chatbots have been seen as an innovative tool that has helped transform the internal audit process. They brought a touch of innovation to SCIM.

Users have noted an improvement in the quality of audit services, thanks to the accuracy and consistency that chatbots bring to the process. Participants appreciated the ability to tailor chatbots to the specific needs of the school and the audit process. This allowed for greater customization.

Users also gave positive feedback to the chatbot implementation team for the support provided and proper training. Although there were some initial challenges in getting familiar with the chatbot technology, these were quickly overcome and were not major obstacles.

Overall, feedback from participants suggests that chatbots have been well received and have brought a number of significant benefits to the school's SCIM. These positive observations underscore the potential of technology to improve internal public audit and support decision-making at the school level.

5. Conclusions

The use of chatbots in the internal audit of public entities has undergone a thorough evaluation to determine the efficiency and effectiveness of this technology. The conclusions obtained highlight several key aspects related to the positive impact of chatbots in the internal audit process at public entities.

The use of chatbots has led to increased efficiency in the internal audit process. They have demonstrated the ability to perform repetitive tasks and collect data in a fast and accurate manner. The time required to complete the audit was significantly reduced, and auditors were able to focus more time on data analysis and risk identification.

Chatbots have brought greater accessibility and availability of internal audit services. Being able to interact with them at any hour, 7 days a week, removed the limitations of regular business hours. This increased flexibility and allowed easy access to audit services.

Another notable aspect is the reduction of human errors in the audit process. Chatbots have provided a high degree of accuracy in the execution of tasks, eliminating the risks of human error. This has led to an increase in audit quality and risk reduction.

The implementation of chatbots had a positive impact on costs in the internal audit of public entities. They replaced or reduced the need for human resources for repetitive tasks, which led to a better allocation of financial resources.

Chatbots have improved the quality of audit services by providing accuracy, coherence and consistency in data collection and analysis. This quality improvement is essential in the internal audit process.

The implementation of chatbots brought a touch of innovation and helped transform the internal audit process. They have opened up new opportunities for the use of technology and stimulated creative thinking about how auditing can be done in the future.

The findings show that continuous evaluation and adaptation of chatbots is essential to maintain their effectiveness. It is important to monitor performance and make adjustments as technology evolves and needs change.

Overall, the findings on the use of chatbots in internal audit at public entities indicate that this technology has brought significant benefits in terms of efficiency, accuracy, accessibility and quality of audit services. These conclusions support the continued exploration and implementation of technology in internal audit and indicate significant potential for improving the audit process in public entities.

Practical implications and recommendations for entities

The implementation of chatbots in the internal audit of public educational entities brings with it significant practical implications. To ensure effective integration and get the most out of this technology, specific recommendations are needed. Here are some practical implications and recommendations for entities:

- Each public entity has specific needs and requirements. Before implementing chatbots, it is essential to carefully identify the specific needs and goals of the entity. This will allow the chatbot to be customized to effectively respond to the entity's requirements.
- Choosing the right technology for chatbot development is crucial. It's important to evaluate the available options and work with chatbot development experts to create a chatbot tailored to your entity's needs.
- Protecting sensitive data is a major concern in public auditing. Implementing strong security measures and strict privacy policies is essential. Make sure your chatbot doesn't compromise data security and privacy.
- Make sure that the staff who will work with the chatbot are properly trained and have the necessary knowledge. A good understanding of how a chatbot works and its tasks is crucial to using the technology effectively.
- Monitoring chatbot performance and continuous evaluation of results is essential. Make sure the chatbot meets quality standards and adapts to changes in the entity's needs.
- Technology evolves rapidly. Entities must be prepared to adapt to technological changes and update the chatbot accordingly. Plan for regular updates and improvements.
- Make sure there is a clear line of communication between users and the chatbot. Clear documentation and easy-to-follow instructions can help with effective communication and problem solving.
- Evaluating the costs and benefits of the chatbot is crucial. Quantifying ROI will help justify the investment and evaluate the effectiveness of the chatbot.
- Collaboration with experts in chatbot development and internal audit can be essential. Bringing technology and audit specialists into the implementation process can bring additional expertise and insights.

In conclusion, the implementation of chatbots in the internal audit of public entities can bring many benefits, but it also involves specific responsibilities and requirements. Following the above recommendations and adapting them to the needs and context of the entity will contribute to the success of this technology in the internal audit process.

Limitations and directions for future research

Although the use of chatbots in the internal audit of public educational entities brings many benefits and promising perspectives, this subchapter highlights some limitations of the study and provides directions for future research

Limitations of the study

• Restricted generalization

The comparative case study involved only two institutions and may present particularities specific to their context. The results may have limited applicability in other institutions or public sectors.

• Technological cohesion

Significant differences in existing infrastructure and technologies in the two institutions may have influenced the results of the study.

• Time limitations

The study covered a certain time frame, and the long-term effects of implementing chatbots may require further research.

Directions for Future Research

• Extension of the study

Future research can involve more institutions or public sectors to get a more comprehensive picture of the impact of chatbots in internal audit.

- More detailed assessment of financial effects

Further research can address the financial effects of implementing chatbots in internal audit in more detail, including cost savings and increased financial efficiency.

- In-depth analysis of security and privacy

Issues related to data security and privacy in the context of chatbots could be the subject of dedicated research.

- Evaluation of user satisfaction

Research that investigates users' experience with chatbots, their level of satisfaction and their feedback can provide important insights.

- Qualitative studies

Qualitative studies such as interviews and surveys can provide a deeper understanding of user and staff experiences and perceptions of chatbots.

- Emerging technologies

Investigating how emerging technologies, such as advanced artificial intelligence, may influence internal audit in the future.

- Benchmarking

Conducting comparisons and benchmarking between public entities implementing chatbots for internal audit can provide additional context and comparative insights.

- Adapting to legislative changes

Studies that address how chatbots can be adapted to comply with legislative changes or internal audit regulations.

Finally, these limitations and directions for future research serve as a guide for developing and expanding knowledge regarding the use of chatbots in internal audit at public educational entities and reflect the dynamic nature of this evolving field.

Key results

- The implementation of chatbots in the internal audit of public entities in education can bring multiple benefits, such as increasing efficiency, reducing errors and significant savings in time and resources.

- The use of chatbots has facilitated data collection and analysis processes, allowing auditors to focus on value-added activities.

- Chatbots have helped improve communication with institution staff and other stakeholders, increasing audit transparency and effectiveness.

Key findings

- Chatbots have demonstrated the potential to revolutionize internal audit in public education entities, bringing significant advantages in terms of efficiency and effectiveness of the audit process.

- The implementation of chatbots requires a customized approach, taking into account the specifics of each public entity and ensuring adequate data security.

- Continually evaluating chatbot performance, monitoring user satisfaction, and adapting to legislative changes are critical to successful implementation.

Implications and recommendations

- Public educational institutions that want to integrate chatbots in internal audit should conduct a careful analysis of specific needs and develop customized chatbots.

- Collaboration with experts in chatbot development and internal auditing is recommended to ensure an efficient and secure implementation.

- Proper training and education of the staff who will work with the chatbot is essential.

- Financial evaluation of the impact of chatbots and quantification of ROI can help justify the investment.

General Synthesis

The use of chatbots in the internal audit of public educational entities represents a significant opportunity to improve processes and bring added value. However, the implementation must be well managed, adapted to the needs of the entity and accompanied by continuous evaluation. Chatbots are a powerful tool in the arsenal of public auditors and can significantly contribute to increasing the efficiency and effectiveness of internal audit in the public education sector.

6. References

- Borooah V.K., 2010. *Logit and Probit: Ordered and Multinomial Models* (series: Quantitative Applications in the Social Sciences). USA: Sage Publications
- Chelcea S., 2007. *Methodology of sociological research, qualitative and quantitative methods*. Bucharest: University Publishing House
- Dumbravă P., Sfetcu M., 2014. Ensuring the efficiency of the activity of public entities based on the recommendations of internal public auditors. *Financial Audit*, no. 12
- Dumbravă P., 2007. Objectives, attributions, and responsibilities of internal control and internal audit in public entities. *Financial Audit* no. 3
- Drăgănescu M., 2007. *Information and knowledge society. Vectors of the knowledge society*. Bucharest: Romanian Academy
- Ghiță M., 2007. *Internal Audit*. 2nd Edition. Bucharest: Economic Publishing House
- Homocianu D., Airinei D., 2015, Dynamic online dashboards in audit activities, *Financial Audit* no. 5. <https://doi.org/10.2139/ssrn.2602661>
- Hosmer D.W., Lemeshow S., Sturdivant R.X., 2013 - Applied Logistic Regression, Ed. Wiley-Blackwell, p.528. <https://doi.org/10.1002/9781118548387>;
- Hurghiș R., Tiron-Tudor A., Boța-Avram C., 2014. Analysis of audit committee practices in the context of corporate governance, *Financial Audit* no. 10 Kaplan R. S., Norton, D. P., 1996. Using the Balanced Scorecard as a strategic management system, *Harvard Business Review*, January-February, 1996, pp. 75-85
- Luger, G. F., 2005. *Artificial Intelligence: Structures and Strategies for Complex Problem Solving*. s.l.: Addison Wesley
- Morariu A., Suciuc Ghe., Stoian F., 2008. *Internal audit and corporate governance*. Bucharest: University Publishing House
- Nicolescu O., Verboncu I., 2008. *Fundamentals of organization management*, New Edition. Bucharest: University Publishing House
- Rohrmann B., 2005, Risk Attitude Scales: Concepts, Questionnaires, Utilizations. *Project Report University Melbourne, Australia*, January
- Ruiz-Mezcua, B., Garcia-Crespo, A., Lopez-Cuadrado, J. L. & GonzalezCarrasco, I., 2011. An expert system development tool for non AI experts. *Expert Systems with Applications*, Volume 38, pp. 597-609. <https://doi.org/10.1016/j.eswa.2010.07.009>
- Russell, S. et al., 2003. *Artificial Intelligence: A Modern Approach*. Upper Saddle River, NJ: Prentice Hall/Perason Education
- Sfetcu M., 2013. The impact of the professional depreciation of auditors on the performance of the internal public audit, *Modeling the new Europe*, Cluj Napoca, no. 8 / 2013
- Vâlceanu Ghe., Robu V., Georgescu N., 2005. *Economic and financial analysis*. Bucharest: Economic Publishing House.