

Generative artificial intelligence technologies ((ChatGpt, Gemini , Claude) chat bots) and their impact on creative thinking skills and enhancing the efficiency of audit

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Abstract

The research focuses on addressing the contribution of modern generative artificial intelligence technologies, especially interactive chat applications such as (ChatGpt, Gemini, Claude and others) in supporting the audit process and auditors and developing their creative thinking.

Due to the recent emergence of these applications for public use, the research reviewed the previous literature on these applications to become acquainted with the ideas and contributions they contain, in addition to identifying the capabilities and benefits of these applications for individuals and organizations, especially those concerned with government auditing. The experience of the Federal Court of Accounts in Brazil in this field was addressed as an applications - based tool was used. The research also sought to investigate the opinion of auditors who actually used these applications to identify their experiences on the usefulness of these applications and their impact on creativity and enhancing the efficiency of the audit process. The research reached a set of results, the most important of which is that these applications provide distinguished capabilities in multiple aspects for individuals and organizations such as (content creation - Productivity improvement - software development - scientific research support - customer service improvement - translation - planning and prediction). This in turn , contributes to supporting the role of SAIs in all aspects towards different stakeholders internally and externally.

These applications provide information to the auditor in various fields, including theoretical and practical information in auditing and provide ideas that contribute to the efficiency and effectiveness of the audit process and more is expected with the rapid and continuous development of them. The opinions of the sample of research confirmed that interaction with these technologies contributes to the development of creative thinking for auditors by providing visions for appropriate solutions to the challenges that may face them during the audit process and thus reduce audit risks .The sample of research sees such applications as a more direct and capable means of generating diverse ideas by the auditor, and developing his/her accounting, legal and audit knowledge and his academic and practical capabilities and that the interaction with them saves time and effort to access the required information in a way that contributes to the effectiveness of the audit process.

The main recommendations of the research are: to encourage auditors to use these applications on a personal level and take advantage of the capabilities they offer, provide specialized training to ensure realizing the greatest possible benefit and reducing risks to a great extent , harness them effectively in the different stages of the audit and stimulate innovation and creativity by investing in these applications.

SAIs should attach great importance to these applications because of the services they can provide to support their missions and make them part of their short-term strategies,

and these institutions should build (a virtual consultant or assistant to the auditor) by integrating these applications with their databases and making them available to workers in these organizations and building programs that achieve the greatest benefit from these applications and forming an integrated system with them, that avoids the disadvantages and caveats of using these applications.

Key words: Generative artificial intelligence, chatbots (ChatGpt, Gemini ,Claude) creativity, enhancing the audit process.

Introduction

In November 2022, OpenAI announced the launch of its artificial intelligence engine ChatGPT, a generative artificial intelligence application that aims to automatically create new and innovative content in different types, such as texts, images, sounds, codes and others, so that they look like human-made instead of just analyzing or using existing data. This announcement made a huge impact in the world of technology and business and formed the beginning of a frantic and accelerated race between major companies around the world and even exceeded the business world to form a new revolution in using machines to serve humans. One of the results of this was the very rapid development of similar applications and their expansion and spread until they were available on personal phones to turn into a personal assistant that helps in easy access to information and facilitates interaction with it and is constantly increasing to be an additional resource of knowledge and expertise. With its increasing integration into various electronic programmes and applications, its sufficient use in the future will be inevitable. This research tries to identify the nature of this development and its impact on the world of accounting and auditing.

First : Research Methodology

A. Research Justifications and their Importance

1. The great development that has appeared in the last two years on the applications of generative artificial intelligence, which constituted an important and promising leap in dealing with humans in their daily life with technology and its use in various fields of life and business.
2. The use of generative artificial intelligence and its applications (ChatGpt, Gemini, Claude) in audits is an innovative and progressive new experience that may have a positive impact on improving and developing the services of auditing, and transforming it into an interactive process that contributes to increasing the effectiveness and efficiency of the audit process by answering the various asked questions and obtaining immediate answers (currently) or very rapid developments that are almost daily in this field that add more characteristics and capabilities.

3. This technology may contribute to drawing the auditor's attention during the audit to things that he/she did not realize in the midst of his/her routine audit work.
4. Enhancing innovation in the audit profession: These applications can open new horizons for innovation in the audit profession. This allows auditors to focus on high value-added tasks.
5. Providing a valuable tool for information provision, helping auditors to gather and analyze relevant information quickly and efficiently.
6. Generative AI is a vast field that is still being experimented, analyzed, explored and developed.

b. Research Problem

Audit profession faces great challenges in keeping pace with the rapid developments in various fields in a complex and accelerated business environment in addition to the increasing pace of digital and technological transformation, which requires using all possible resources and capabilities and increasing innovation and creativity for success and continuity. The most prominent among such technologies that have emerged recently are natural language models-based generative artificial intelligence technologies and its most famous applications (ChatGpt, Gemini, Claude), which are considered promising in providing innovative solutions that include all fields and audit profession is not an exception. It is also impacted by the effects of these technologies. The current research problem can be summarized by the following questions:

First. What are the applications of generative artificial intelligence (ChatGpt, Gemini, Claude) and what is their impact on the audit profession at the level of audit institutions and what are the opportunities and challenges they provide in audits ?

Second . Do generative artificial intelligence applications such as ChatGpt, Gemini, Claude contribute to enhancing the creative performance of auditors? Do auditors , sample of the research, recognize the importance of these technologies and the extent to which they contribute to enhancing audits from their perspective?

c. Research Objectives

1. Studying the impact of generative artificial intelligence applications such as (ChatGpt, Gemini ,Claude) on the audit process and identifying how these applications are used in audit services and the possibilities of using them to develop and improve the audit process, and what are the solutions and capabilities that these applications provide to the auditor?
2. Identifying the ability of generative artificial intelligence applications such as (ChatGpt, Gemini, Claude) in terms of creating and providing information that helps in the audit process, and to what extent this information the audit findings derived are accurate and reliable?
3. Studying the opportunities provided by these applications in the audit process.

4. Identifying the ability of these applications in enhancing the creative performance of external auditors and identifying the perception of the auditors ,sample of the research, of the importance of these techniques.
5. Identifying the obstacles faced by auditors in the field of using these applications.

d. Research Hypotheses

The research is based on the following hypothesis

1. Generative artificial intelligence applications such as (ChatGpt, Gemini,Claude) provide significant benefits to audit organizations, especially the Supreme Audit Institutions (SAIs) and their employees based on the published literature.
2. Generative AI applications (ChatGpt ,Gemini, Claude) contribute to enhancing the creative thinking of auditors from the perspective of auditors at the FBSA
3. Generative AI applications (ChatGpt. Gemini, Claude) contribute to enhancing the audit process from the perspective of auditors at the FBSA.

e. Research Approach

- Theoretical Aspect: A review of published literature, including academic papers and research studies related to generative AI application models and their use in accounting and auditing was conducted. This review sought to establish a comprehensive understanding of the prevailing methodologies, performance standards, and comparative analyses in this area.
- The applied aspect: In order to achieve the research objectives, hypotheses and questions, the applied aspect was divided into two parts. The first is to test a set of questions and inputs in a simulation of the prevailing literature to the most popular models used for generative artificial intelligence applications in order to achieve the objectives and purpose of the research.

The second is to distribute a two-topic questionnaire to survey a group of auditors about the ability of these applications to develop creative thinking and enhance audit processes.

- f. **The research population and sample**: it consists of a group of auditors who practice auditing at the Iraqi FBSA, which is the highest governmental audit body aimed at auditing public funds in Iraq. The FBSA audits and reviews the financial accounts of all ministries, governmental bodies and public companies, with the aim of ensuring the proper spending of public funds and preventing financial and administrative corruption.

g. Previous studies

1 . Foreign studies

1) (Atanasovski et al, 2023)Study

Research on CHATGPT Tools in Learning - Perspective from Students in Accounting and Auditing

This study aims to provide experiential evidence to cover different aspects of academic research. The research results that are based on a survey of nearly 300 accounting students at universities of economic specialization in Vietnam showed a significant increase in self-learning ability, self-motivation and learning effectiveness when students integrate ChatGPT into their learning processes. In addition, learner evaluations provide other benefits and show the restrictions and risks associated with the application of this artificial intelligence tool. Finally, the research provides discussions and recommendations to help accounting and auditing students use ChatGPT effectively and safely.

2) (Gu et al, 2023) Study

Artificial Intelligence Co-Piloted Auditing

This paper examines the concept of AI co-pilot auditing, focusing on the collaborative potential of auditors and specific firm models such as LaMDA, DALL-E, and GPT-4 in the field of auditing.

It presumes the preparation of audit that enhances auditor's capabilities through artificial intelligence providing optimal results across a variety of audit tasks. To embody the potential of this joint audit model, a precise approach to adjusting the process was organized using a series of ideas that enable learning and thinking. The capabilities of joint audit are showcased by adjusting GPT-4 towards three different audit tasks : financial ratio analysis ,text extraction and testing the recording of entries in the journal ,providing a detailed description of the claim and corresponding response protocols resulting from CHATGPT, ensuring the potential to repeat . The results obtained emphasize the transformative role of models in reshaping the future of auditing and call for continued exploration in this field . This work is an initial step towards the widespread implementation of joint auditing , paving the way for more efficient and accurate audit procedures.

3. (Kurt,2003) Study

Digital Transformation In Accounting And Auditing : Insight From The CHATGPT Example

This research addresses the evolving role of the accounting and audit professions in the digital age, focusing on the implications of CHATGPT. It uses a novel approach by engaging CHATGPT to predict the future of this profession through extensive investigation and inquires aimed at achieving a deeper understanding. It reveals that despite the rapid digital transformation and the integration of artificial intelligence into accounting process ,the core accounting profession will continue . Thus, it highlights a significant shift in skill requirements and the importance of accountants enhancing their expertise in data analysis ,cyber security and technological adaptability . It also explores the potential applications of Artificial Intelligence in auditing, suggesting that AI can increase efficiency ,accuracy and risk assessment . It also highlights the value of personal (professional) judgment, which cannot be replaced in complex problems. Interestingly ,the insights generated through interactions with chat GPT show a strong alignment with previous literature, confirming the tool utility and reliability in professional contexts . The results indicate that embracing technological advancement and continuous learning are essential for accountants to remain relevant and competitive in this rapidly evolving digital landscape.

4. (Duhaylungsod,Chavez.2023) Study

ChatGPT and Other AI Users: Innovative and Creative Utilitarian Value and Mindset Shift

The popularity of AI-powered chat models among students is addressed due to their accessibility and convenience, as chat models are programmed to respond to specific prompts in various fields and disciplines.

AI in education has provided a platform for students to use AI chat models to assist in their academic tasks. This research analyzed the narratives of university students about their experiences using AI-powered chat models in their academic tasks. Sixteen (16) students from engineering and computer science majors participated in individual interviews. The thematic analysis indicated that AI-based chat models hold significant utilitarian value for learners, especially in tasks that require innovation and creativity.

AI models provide substantial feedback and immediate access to real-time information, effectively reducing the time spent on research. As a result, students can enhance their innovative and creative endeavors, as AI models help them visualize their ideas and integrate new perspectives.

However, students were also concerned about their over-reliance on AI models, which prevents them from being creative and innovative. Some students acknowledged that relying on AI models poses a threat to autonomy and decision-making. The convenience

provided by AI models can lead to a shift in mindset among students, where they may no longer feel the need to engage in thinking or visualization because AI can easily provide the information and ideas they need. This research is important in providing insights into the psychological value and mindset shift that AI chat models evoke in education.

2 . Arabic Studies

1. (Nashwan, 2023) Study

Electronic Brainstorming for the Joint Audit Team and Its Impact on Enhancing the Efficiency of the Auditing

The study aimed to determine the impact of electronic brainstorming by the joint audit team on enhancing audit efficiency. The research used the descriptive analytical method to reach logical results that support the hypotheses used, through conducting a field study to collect the opinions of auditors practicing auditing .The study hypotheses were tested by using a variety of appropriate and diverse statistical methods. The most significant findings included a substantial and effective impact of electronic brainstorming for the joint audit on various aspects, including increased fraud detection, successful completion of audit procedures, understanding the nature of the auditee's operations, and enhancing creative thinking among auditors. These results in turn , contribute to the efficiency of the audit process.

In light of the study's results, a set of recommendations was proposed, the most important of which is the necessity for regulatory bodies to design and implement specialized programs to apply electronic brainstorming at all stages of the joint regulatory work. Additionally, it is essential for relevant and responsible authorities to focus on developing appropriate methods to activate and adopt the use of electronic brainstorming in joint audits to distribute tasks and coordinate efforts during joint audit operations.

2. (Menasria, 2023) Study

Assessing ChatGPT for Compliance with International Standards of Auditing: Analytical, Framework-Opportunities and Challenges

This research paper explores the role of ChatGPT in achieving compliance with International Standards on Auditing (ISA) and analyzes the opportunities and challenges associated with it.

In the rapidly evolving audit landscape, the integration of artificial intelligence, specifically ChatGPT, presents the potential for transformative change. ChatGPT's capabilities include tasks such as data analysis, risk assessment, and report generation, providing auditors with enhanced efficiency and accuracy. However, the implementation of ChatGPT within the framework of ISAs also involves complex challenges.

Through a comprehensive evaluation, this research paper provides valuable insights for auditors and organizations considering the integration of artificial intelligence, particularly ChatGPT, into their audit practices. By examining the opportunities and challenges, stakeholders can make informed decisions to effectively navigate the evolving landscape of auditing in the digital age.

This paper argues that organizations should consider adopting hybrid audit models that combine the strengths of human auditors and ChatGPT. These models ensure that human judgment and oversight remain integral to the audit process while leveraging AI for data analysis and insights

3. (Aqeeli, 2024) Study

The Impact of Applying Generative Artificial Intelligence (ChatGPT) on the Quality of Financial Reports in Construction and Real Estate Investment Companies Listed on the Egyptian Stock Exchange.

The primary objective of the study is to investigate and analyze the practical impact of generative artificial intelligence technology and its role in improving the quality of financial reports, as well as to examine the risks and obstacles of its application. It also aimed to analyze the concepts of financial report quality and its measurement indicators.

The researcher relied on a theoretical analytical methodology based on four main sections related to the study variables and achieving its objectives, as well as an applied study on a sample of seven construction and real estate investment companies operating in the Egyptian market through a time series of three years from 2021 to 2023.

The researcher reached several results, the most important of which is that the application of generative artificial intelligence technology contributes to improving the quality of financial reports in construction and real estate investment companies in terms of : accurate measurement and objectivity of the financial position, improving the profitability of financial performance, increasing the level and quality of disclosure, and contributing to the preparation of sufficient and accurate indicators to evaluate

performance. It was also found that there is a statistically significant difference between the construction and real estate investment companies under study regarding the financial report quality indicator, as well as a statistically significant positive relationship between the application of generative artificial intelligence and the improvement of the financial report quality level in the construction and real estate investment companies, subject of study.

2. Theoretical Framework

1. The Concept of Generative Artificial Intelligence and its Applications

Generative Artificial Intelligence (GenAI) is a field of artificial intelligence that focuses on generating new and innovative information through machine learning from large databases of various experiences and information. This is realized through the use of a model that is trained on a large set of examples. Generative models can be used to process natural language (human language) to produce new materials that resemble the style and content of a particular author or topic.

There are many applications and uses for generative artificial intelligence, such as creating new texts and music. It is also used in natural language processing and speech recognition, creating realistic images for video games, simulation, virtual reality, and the like , in addition to discovering new chemical compounds for medical research.

It is also called conversational computing and is an extension and advancement of the human-machine interaction interface, where a new class of interaction interface tools - natural language - is increasingly applied. It is also designed to allow users to interact closely with high-tech products as if they were talking to another person. (Al-Hadi, 2023)

(Al-khaleefa 2023:8) defined generative artificial intelligence as a field of artificial intelligence that aims to automatically create new and innovative content, rather than just analyzing or using existing data. It can produce various types of content, such as texts, images, sounds, codes, etc., making them appear human-like. The World Economic Forum defined it as referring to a class of artificial intelligence algorithms that generate new outputs based on the data it has been trained on.

Generative artificial intelligence is not just a new technical tool, but a driver of innovation and change in a wide range of fields. It can change the way you live, work, and play, and can open doors to a limitless future. Accordingly, there are many fields

that use generative artificial intelligence and its applications in our daily lives, such as healthcare, education, art, environment, and others.

This makes generative artificial intelligence proficient in performing tasks that involve content creation, data summarization, and pattern and trend recognition in large amounts of data. Examples include chatbots like ChatGPT and Copilot. (CAQ, 2024)

In general, generative artificial intelligence can be used to serve four general cases: (Al-Hadi, 2023) , (Al-Khalifa, 2023)and (CAQ, 2024)

(1) Supporting the thinking process: Generative artificial intelligence helps enhance creative thinking through brainstorming, summarizing and simplifying complex content, generating ideas, and asking questions in a way that facilitates learning and exploration.

(2) Relieving burdens: Generative artificial intelligence provides assistance in daily tasks such as writing letters, drafting emails, reviewing and proofreading content, and performing routine tasks efficiently.

(3) Content creation: It enables the creation of diverse materials including presentations, course content, tests, images, videos, and educational curricula, which accelerates the creative production process.

The Center for Audit Quality (CAQ) is an independent, non-partisan, and non-profit organization located in Washington, D.C., and is affiliated with the American Institute of Certified Public Accountants (AICPA). The center was established in 2007 in the United States with the aim of enhancing investor and public confidence in the financial market.

4. Strategic Development and Planning: Enhances developing strategic plans of the management or the institutions, developing detailed plans to the projects and providing support in programming and improving technical solutions.

McKinsey & Company's research has estimated that the new generation of AI has the potential to add up to 4.4 trillion dollars in the economic value to the global economic alongside to boosting AI impact by 15 to 40 percent. Many companies' leaders are determined to benefit from this value, with growing recognition that the opportunities of general AI come with significant risk. In a recent snapshot survey in more than 100 organization with annual revenues more than 50 million dollars. McKinsey & Company found that 63% of the correspondents describing implementing general AI as a "high" or "very" high priority. (Oliver et al, 2024).

If 2003 was the year where the world began to discover generative AI, then 2024 is considered as the year where the institutions truly began to use this new technology and extract business value from it. McKinsey's latest survey on AI stated that 65% of the respondents reported that their institutions use the new generation of AI regularly. This is nearly double the percentage of a previous survey just ten months ago. (67%) of the respondents expect that their institutions will increase investment in AI for the next three years (Alex, 2024).

Following are some of the most famous generative AI tools launched to the users during the last two years:

Application	Company
ChatGPT	OpenAI
Bard later known as Gemini	Google
Claude	Anthropic
Wit.ai	Facebook
HunyuanAide	Alibaba
OPT	Meta
AlexTM	Amazon

Most published literature ,in dealing with generative AI applications, focused on one model i.e. (ChatGPT)among many various AI models used to create content due to its early launch and fast spread . This application gained significant fame because of its ability in processing language. It was trained on a huge amount of internet texts.

GPT stands for (generative pre-trained transformer) and it's the name of the neural network architecture powering it. This application is distinguished by several features that change the rules of interaction in AI-generated content, such as:

1. Conversational nature: unlike other traditional content maker models, ChatGPT was designed to engage in a conversational exchange. It can understand and respond to user inputs. This makes it a valuable tool for creating interactive checklist.
2. Understanding the context: ChatGPT is characterized by an amazing feature of understanding the context and maintaining the content throughout the conversation. This enables it to generate contextually relevant checklist terms and coherent responses.
3. Versatility: ChatGPT can be trained and tuned to suit specific domains or industries, making it adaptable to create checklists in various fields, including healthcare, finance, education, and more.
4. Natural language: ChatGPT excels at generating text that mimics human speech patterns. This makes AI-generated checklists more relatable and easier to use.
5. Continuous learning: as an AI model, ChatGPT can continuously learn from user interactions and improve its language understanding and production capabilities. This ensures that the content it creates evolves and stays updated.
6. Re-checking : integrating ChatGPT into the checklist creation process opens up new possibilities for the companies and individuals looking to improve their productivity and accuracy.

ChatGPT is considered as an advanced model in processing natural language because of its pre-training on data .This in turn, enables it to generate a coherent language contextually appropriate usually indistinguishable from what human – write.

ChatGPT allows to produce text in any terms or subjects for any input prompt it receives from users as its design allows to perform a variety of tasks, including answering questions, machine translation, language modeling and others. It can also be used to develop virtual assistance and chatbots in addition to creating human-like discussions, it is already used in a variety of industries and can also be used to develop complex applications in any sector such as: medicine, education, finance and others. (Aydin.O,2023:4).

ChatGPT presents responses either as text or voice (currently) depending on how the user interacts. It is designed to suit the different types of information and topics that can be discussed, which means making the conversation more natural and tailored to meet user's needs and interests. It can understand and respond to input in multiple languages and handle the exchange of large amount of data, so it can be used to enhance conversations with many users in the same time. Also, it has the ability to integrate with many various basic platforms to increase ease. (Nhinj, 2024).

Auditors need to recognize the emerging importance of generative AI and stay informed in the ever-changing landscapes, and understand how this technology improve accounting processes, preparing financial reports and how the profession can respond to this emerging field.

One of the reliable chartered accountants that due to the simplicity and importance if GenAI, it has the ability to transform a vast number of commercial transactions including those affecting the financial statement. For example: GenAI can summarize and analyze vast number of information to create accounting notes or prepare first draft for financial statements.

For auditors, the probabilistic nature of GenAI is a key distinction from other techniques they may have historically encountered in while drafting the company's financial reports that may help auditors in identifying and evaluating the risks of material misstatements including identifying risks on the level of the process or the risks emerging from information technology. (CAQ, 2024)

b. fields of accounting and auditing in literature published on generative AI and its applications

after reviewing the previous studies to identify the research gap, determine the appropriate methodology, and present the research context, we aim, in this section, to explore accounting and audit topics and processes tested and check the ability of these application to apply them in other studies that deal with these studies and their impact on accounting and audit. Also, we aim at reviewing the information contained in these researches and studies on using these applications in these two fields and whether they succeeded in this in a way that enriches the theoretical and scientific background and the accumulated knowledge for both researches and auditors. Below are some of these studies:

1. Using natural language models in accounting work, making comparison between its applications and extracting information from documents:

In his study, Li addressed a very important aspect which is the advantage of using large natural language models (LLMs)(the corner stone of generative AI)to extract the accounting data comparing to XBRL and dealing with commonly used documents. The study spotlighted LLMs abilities as an alternative to the traditional methods to unify data by presenting a multi-use framework applicable to various contexts while presenting financial information within PDF document, limitations, and constrains in this framework in comparison XBRL. Li dealt with one of the pioneering application of LLM (GPT4) in order to propose a framework to extract financial information form unstructured sources with special focus on PDF reports by using a program to convert them to plain formant and extract information from the tables in the reports. A test was conducted by using question and answer functions to extract the full information from a PDF document into two applications (ChatGPT- 4 and Claude 2). This test included applying the same set of prompts used by the framework directly to whole reports. Li believes that the framework was highly accurate in extracting the financial statements via two different scenarios.

The study also addressed the performance of these applications in large-scale extraction tasks. A test was developed for a more comprehensive group of more than 4000 reports. This intensive application resulted in the extraction of more than 80000 data points. Examination of random samples revealed that the framework maintained accuracy average of 96% which, to a large extent ,confirms its effectiveness as proposed in the study .

Instead of using GPT-4 alone, a comparison of performance was drawn between it, Claude 2 and Google Bard by using a random sample of files. The results showed that GPT-4 achieved accuracy average of 96%, Claude achieved 93.72%, while Bard was unable to generate any results as the length of prompts exceeded the allowed input limits (Li, 2023).

2. Integration with audit process to perform tasks and enhance the process in the different stages of audit :

The study carried out by Eulerich presented the integration of generative AI, specifically ChatGPT, in use with the different steps of audit process. The presentation depended on important discussions with internal audit experts in multinational companies and external auditors in big accounting corporates and how

they tested ChatGPT to perform audits in addition to the writers' experiences acquired in educational and training workshops in this respect .

The paper introduced many examples on how to use ChatGPT technology in enhancing audit, namely :

First: Using ChatGPT in planning stage: ChatGPT can be used during the risk- based audit planning stage to obtain initial insights and understand the potential risks of audit. It can provide visions in various fields especially when auditors do not have detailed knowledge or experience, for instance: these applications can propose potential risks related to the emerging issues such as: environmental and social audit, governance or new regulatory developments.

The study depicted a general example focusing on a general audit design without specific data input, the output contained concrete ideas for global (comprehensive, general) structure and content for audit. The study showed that the internal auditors of Uniper international company believed that using ChatGPT can identify almost 80% of audit risks. Then, ChatGPT was used to create a draft risk-based audit list. As part of the audit plan, ChatGPT can assign tasks to auditors based on their experiences and skills and accommodate constraints and limitations (such as: vacations, travel restrictions, etc.) and updating them. Therefore , we conclude that ChatGPT is used to generate questions that help in identifying audit goals, determining timescale and the required resources.

Second: using ChatGPT in the implementation stage: while preparing for audit, ChatGPT can help in providing questions for interviews, making preliminary checklist of items or areas to be audited. This can help simplify preparation process, allow auditors to improve audit scope, preliminary analyses and preparation process. "Auditing purchase function" was addressed virtually via asking ChatGPT first about the related data (sources) that can be analyzed. A detailed list of typical examples of purchase data was obtained. Then relevant SAP tables were also requested based on the previous results. The program generated all relevant SAP tables that allow the auditor to extract data.

As another example of performing concrete audit tasks, ChatGPT was asked to create a risk control matrix for a purchase payment process. This type of audit procedure would help the auditor identifying for concrete risks and related controls. In addition, ChatGPT was also asked to add a description of the control element and a classification of the control type.

ChatGPT was then asked to identify double payments as a typical example of the data analysis that an auditor would perform. The model was able to identify all relevant double payments in the experimental tool, despite the researcher including somewhat difficult and complex double payments by including things like quarterly payments for the same invoice. Chat GPT was able to identify these double payments correctly as well, compared to the participants in the experimental research. Chat GPT solved the task in a few seconds, while the experimental participants took much longer (an average of 8.4 minutes). ChatGPT was then used to help prepare the scope of the audit engagement and identify the areas that the auditor should examine as part of the engagement in the procurement audit. ChatGPT was then asked to prepare the audit notification letter for the hypothetical audit after identifying additional steps to customize this letter based on specific risk factors previously identified by ChatGPT. Finally, ChatGPT was used to help plan resources for the hypothetical audit engagement. These examples can help guide auditors in creating an initial audit resource plan.

Third: Using ChatGPT in the reporting phase: ChatGPT can be used to generate reports that summarize the audit results accurately and concisely in the audit implementation phase, as ChatGPT can provide support in many tasks that do not require complex calculations (newer versions of ChatGPT can be used with plugins to perform more complex calculations) as it can help in querying specific program codes, understanding data or table structures, and even providing initial suggestions for control test steps. This can greatly facilitate the data analysis process and lead to more efficient audit implementation.

Fourth: Using Chat GPT in the follow-up phase: It was used to generate inquiries that help in following up on the implementation of recommendations and evaluating the effectiveness of corrective measures. In addition to what was mentioned above, different situations and questions were raised about evaluating the situation and possible recommendations to improve the effectiveness of internal controls.

The results provided a very detailed assessment of the quality of control and identified weaknesses in internal audit as well as recommendations to improve the effectiveness of internal audit. The study concluded that integrating generative AI into internal audit provides a range of opportunities but brings significant challenges. One of these challenges is knowing how Chat GPT can be useful to internal auditors. The success of applying AI in auditing depends on the existence of a well-organized internal audit, standardized processes, employee motivation, and the ability to meet practical challenges such as identifying appropriate use cases, managing the handling of

algorithms, ensuring the quality of available data, and the necessary IT infrastructure. Moreover, the introduction of AI creates risks such as concerns about data privacy, security and confidentiality that must be carefully managed. (Eulerich,2023).

3. Generative AI tools for SAIs and creating software codes for auditing purposes: Study Pleșa addressed the analysis of the use of digitization at the level of SAI and the transition to artificial intelligence, as well as its impact on performance management, whether at the level of these institutions or at the level of the public sector as a whole. At the same time, the paper aimed to identify a series of tools based on artificial intelligence that can be used in external public auditing, especially with regard to the oversight of public procurement, given the importance of the funds allocated in this field.

The study showed that in terms of the use of AI in SAIs, the most appropriate tools are text-based and it is believed that to produce audit reports that are attractive and more accessible to the general public who are not accustomed to the language of technical auditing, the use of DALE (one of the large language models in AI) can have a positive impact by creating images from the text of the audit report and at the same time more complex analyses can be performed on EXCEL files.

This study was carried out by asking generative intelligence models to create codes and symbols in the Python programming language for audit purposes such as selecting samples of financial statements with adjusting their size as well as to identify anomalies in financial statements. A Python code was also created that is capable of identifying restrictive conditions within grant documents related to public procurement procedures to identify changes made to public procurement contracts during their implementation. Therefore, based on these techniques, a series of tools can be created that the external auditor can use in his activity to facilitate the analysis of the information provided by the auditee, which contributes to saving time significantly. The study believes that the development of such tools should be a priority for all SAIs and perhaps even a strategic priority due to their role and importance in protecting the financial interests of taxpaying citizens and the main beneficiaries of external public audit reports.

It also touched on a group of SAIs in various countries that use artificial intelligence in their operations, including the development by the SAI of Georgia of a platform called Budget Monitoring based on public data already available on other platforms for public sector institutions and on information held by the SAI resulting from previous audits. This platform is designed on an algorithm that enables the identification of fraud and corruption phenomena in the field of public procurement, based on a machine learning

model that has the ability to discover hidden patterns and connections to identify risk areas in the entire public procurement database.(Pleša,2023).

4. The possibility of using ChatGPT in SAIs and the most important benefits and challenges: This is a study conducted by Suntharanurak that addressed the use of chatGPT in the State Audit Office(SAO) of Thailand, which embarked on a digital transformation journey with the aim of leveraging artificial intelligence to enhance audit performance and foster a data-driven culture within the organization. This article focuses on the feasibility of integrating an advanced language model such as generative artificial intelligence such as chatGPT into performance audit of (SAO) by addressing:

- Challenges and readiness:

For a smooth transition, SAO must be ready to implement artificial intelligence. This means creating a strong technical infrastructure, implementing data governance, developing skills through training, and managing change effectively. Strategic alignment with the organization's goals and compliance with legal and ethical considerations is vital.

- Benefit measurement:

The benefits of implementing AI can be measured through various metrics such as efficiency, accuracy, cost savings, auditee satisfaction, risk mitigation, and learning capabilities. These are all criteria that can indicate successful implementation. It is important to maintain a balanced implementation to measure the achievement of these measures because the benefits often become more apparent over time and with continued use.



Figure (1) shows the benefits of implementing artificial intelligence for SAIs

Four scenarios were developed based on the study of the benefits of implementing ChatGPT in performance auditing in SAO Thailand. The four scenarios were prepared based on varying levels of readiness and potential benefits that can be obtained from implementing ChatGPT in performance auditing in SAO Thailand.

Scenario (1) AI compatibility - high readiness, high benefit outcome: In this ideal scenario, SAO Thailand is fully prepared to integrate ChatGPT as the infrastructure, training, and organizational culture have reached a point where it can easily integrate AI.

The study finds that performance auditing has been significantly improved through integration with ChatGPT, with a significant increase in audit speed, accuracy, and comprehensiveness.

Scenario (2) Technology dominance (technical aspect) - Despite high readiness, the result is low benefit: SAO Thailand has high readiness with a strong infrastructure and supportive organizational culture. However, the integration of ChatGPT does not significantly improve performance auditing due to limitations or unexpected obstacles in applying AI to specific audit tasks.

Scenario 3: Good Surprise – Low Readiness, High Benefit Outcome: Despite not being fully prepared for AI integration, implementing Chat GPT in performance auditing leads to significant improvements. Low readiness may lead to initial difficulties, slower AI uptake, or ineffective use of the technology, limiting potential benefits.

Scenario 4 Rough Waters – Low Readiness, Low Benefit: In this less ideal scenario, SAO Thailand is not well prepared to integrate AI in terms of infrastructure, training, or culture. Moreover, the integration of Chat GPT does not significantly enhance performance auditing either due to the nature of the tasks or the inefficiency in using artificial intelligence.

These scenarios provide a comprehensive range of possibilities that could arise from the integration of ChatGPT into SAO Thailand's performance audit and underscore the need for preparedness and realistic expectations regarding the benefits of AI integration.

The study concluded with a set of recommendations that can be considered:

- **Technology Adaptation:** It is recommended that SAO Thailand invest in technology infrastructure and training programs to facilitate smooth integration and use of ChatGPT.

- Regulatory amendments: Legal and ethical guidelines need to be reviewed and updated to accommodate the use of AI in audits.
- Fostering a data culture: There must be a continued focus on fostering a data culture where data is valued and used effectively.
- Regular Evaluation: After implementation, regular evaluation of the impact of ChatGPT on performance auditing should be conducted to ensure its effectiveness and address any issues immediately. (Suntharanurak,2023)

5. Using ChatGPT in the field of forensic accounting, making entries, and analyzing data:

The objectives of the Street study included providing an overview of the use of large language models such as ChatGPT in the field of forensic accounting and explaining how certified accountants can benefit from this modern technology. It also sought to provide principles and guidance for accountants on how to use these models effectively and safely in practicing their profession, in addition to explaining the current capabilities and limitations of large language models in the field of accounting.

It covered several examples and scenarios in the field of financial accounting and forensic accounting, including:

1. Preparing daily entries and financial statements.
2. Evaluating Chat GPT capabilities in generating financial reports for complex situations.
3. ChatGPT application in financial statements analysis to identify fraud risks.
4. Using Chat GPT to discuss advanced accounting topics.
5. Submitting forensic accounting questions to Chat GPT and evaluating its response in this context.

These points are considered to enhance this study and contribute to enhancing accountants understanding of how to use modern technology in the field of accounting.(street , 2023)

6. Using generative AI in banks for compliance, credit, and other areas

Rahul study focused on the fact that, among the multiple and promising applications of generative AI in financial institutions, there are specific areas that banks are exploring to be at the forefront of the first wave of adopting such applications. These areas include regulatory compliance, financial sector crimes, credit risks, finance and statements analytics, cybersecurity risks, and climate risks.

The study generally observed that generative AI applications are expanding across risk and compliance functions, offering advanced solutions in these areas through three main models.

First. The Virtual Expert: Users can ask questions and receive concise answers based on long documents and unstructured data. These technologies are trained to answer questions related to laws, company policies, and guidelines. Additionally, this technology has the capability to compare policies, regulations, and operational procedures to ensure alignment and identify areas of non-compliance or deficiencies.

Second. Automation of Manual Processes: Generative AI saves time by performing complex and time-saving tasks, such as automating regulatory compliance checks and sending warning notifications regarding potential violations. This enhances the efficiency of compliance management within the company.

Third. Combating Financial Crimes: Generative AI provides highly effective advanced solutions, enabling the generation of detailed reports on suspicious activities based on an in-depth analysis of customer data and transactions. Furthermore, it facilitates the automating and updating of customer risk assessments by monitoring changes in Know Your Customer (KYC) information. This approach improves the accuracy and effectiveness of transaction screening by generating and optimizing codes necessary to detect suspicious activities and efficiently analyze transactions, thereby enhancing financial security and reducing financial crime risks.

In the field of credit risk, generative AI is expected to revolutionize how banks handle credit risk by compiling and analyzing customer information, including transactions with other banks. This type of AI accelerates the credit process from start to finish. (Rahul, 2024)

7. Criteria for Selecting a Specific Language Model for Application and Its Impact on Financial and Accounting Tasks

The efficiency of large language models (LLMs) was analyzed in a study conducted by Rane et al. from various perspectives, which could be of great importance to organizations when selecting a specific language model for application, such as model size and its significant impact on requirements, where larger models demand more resources. Additionally, architecture (such as the transformer-based design, a neural network architecture, used in Gemini and ChatGPT) influences efficiency, particularly in parallel processing.

Finally, optimizing software instructions and algorithms is crucial to reducing costs. The study concludes that the choice between Gemini and ChatGPT depends on the specific task requirements. Gemini is more suitable for scenarios requiring intensive analysis and deep comprehension, despite its higher costs. Conversely, ChatGPT is preferred for tasks prioritizing speed, text processing, and resource efficiency. The study also analyzed differences in model characteristics, noting that Gemini and

ChatGPT differ significantly in terms of size and access to training data. Since Gemini is part of Google AI, it can access larger datasets and undergo training with more resources, which may enable it to encode complex financial knowledge. However, this advantage in scale comes with increased costs.

The study found that differences in efficiency have implications for tasks in finance and accounting, as follows:

- **Financial Report Analysis:** Due to its complexity, Gemini may excel at detecting subtle patterns in financial data, making it useful for auditing and fraud detection.
- **Risk Assessment:** Gemini's deep understanding of financial data and market dynamics can lead to more accurate predictions, though at a higher resource cost.
- **Financial Forecasting:** Gemini's extensive knowledge may offer advantages in long-term forecasting, while ChatGPT provides faster responses with lower computational expenses.
- **Report Generation:** ChatGPT's optimization for text-based tasks may make it more suitable for generating concise financial reports compared to Gemini, which may require further fine-tuning.
- **Enhancing Financial Analysis and Reporting Efficiency:** Financial analysis often involves filtering large datasets. In this area, Gemini excels by efficiently processing vast amounts of data, identifying patterns and anomalies, and providing concise summaries. For example, instead of manually reviewing quarterly reports, Gemini can quickly extract key financial metrics, detect trends, and highlight potential areas of concern.
- **Simplifying Account Reconciliation and Auditing:** Account reconciliation requires meticulous attention to detail, and Gemini's strength lies in its ability to accurately identify discrepancies within extensive numerical datasets. Its fact-based approach makes it well-suited for detecting inconsistencies and potential non-compliance issues, thereby enhancing audit effectiveness.

In the field of auditing, ChatGPT can complement Gemini by leveraging its natural language processing capabilities. It can analyze policy documents and compare them with financial records, making it easier to identify anomalies or deviations.

- **Utilizing Gemini and ChatGPT in Customer Service and Financial Consulting:** Both models have applications in customer service. ChatGPT's conversational skills facilitate natural interactions and problem-solving, making it well-suited for relationship-building and addressing initial inquiries. On the other hand, Gemini enhances customer service by providing factual insights and explanations. For instance, it can analyze transaction data and offer step-by-step details, ensuring accuracy in tax inquiries or account audit processes.
- **Auditing and Fraud Detection:** both Gemini and ChatGPT show promising results in

streamlining and enhancing the auditing process. They can efficiently review financial documents, compare them with historical data, and quickly identify anomalies or inconsistencies.

With their advanced pattern recognition capabilities, these models can detect red flags or trends indicative of fraudulent activity within large datasets. However, Gemini’s superior ability to interpret information from diverse sources—such as financial news or government files—enhances its capacity to identify unusual financial behavior within a broader context.

Based on the above analysis, the findings can be summarized in the following table:

Standard	Gemini	ChatGPT
Financial report analysis	yes	No
Risk assessment	yes	yes
Financial forecasting	No	No
Generating reports	No	yes
Natural conversation capabilities	No	yes
Unique capabilities	Complex text analysis, fraud detection	Languages translation, creative content writing
Simplifying financial report analysis	Yes	No
Enhancing the auditing process	Yes	No
Customer service and financial consulting	No	No
Efficient resource utilization	High	High
Accuracy of information and facts	High	High

The table indicates that Gemini outperforms ChatGPT in financial report analysis and risk assessment, while ChatGPT excels in report generation, language translation, and creative content writing. Each model has unique capabilities that make it suitable for specific tasks.

It is important to note that continuous advancements in AI applications mean that some of the results of this comparison are subject to ongoing change. (Rane et al., 2024)

8. The Audit Environment and Associated Risks in the Age of Generative AI

CAQ has published a report titled The Use of Generative AI (GenAI) in Financial Audits. The report highlights the significant growth in interest in generative AI since the launch of several chatbot models based on large language models at the end of 2022. Its

purpose is to provide an overview of the principles of generative AI, the emerging risks associated with its use in financial reporting and internal controls, and its implications on auditing.

The report also examines the regulatory environment, including the understanding of laws and regulations affecting the use of generative AI in auditing. Additionally, it discusses key considerations when auditing companies that employ generative AI, as well as identifying potential risks and how AI could impact audit processes.

The report also addresses examples of current use cases, potential future applications, and additional audit considerations.

At the conclusion of the report, the Audit Quality Center emphasizes several key recommendations:

- The need for continuous monitoring: Auditors must stay informed about advancements in generative AI to ensure quality and reliability in financial audits.
- Ongoing training: Financial auditors and other audit stakeholders must understand new technologies and keep up with continuous developments in generative AI.
- Collaboration between regulators and companies: Organizations should work closely with regulatory bodies to ensure compliance with evolving standards and regulations.
- Developing innovative audit strategies: Companies need to create and implement audit strategies that account for both the challenges and opportunities presented by generative AI.

Thus, this report provides a comprehensive overview of how generative AI affects financial auditing, with a focus on understanding the emerging risks and challenges associated with these technologies. It also offers recommendations on how audit strategies can be adapted to keep pace with rapid developments in the field, ultimately enhancing the efficiency and effectiveness of financial audits in the future. (CAQ, 2024)

c. The Reality of Generative AI Use in Supreme Audit Institutions

Audit institutions, like other organizations, are impacted by the advancements brought by generative AI. Given the unique role of supreme audit institutions (SAIs) and their relevance to this study, this section explores the experience of one such institution in adopting generative AI applications.

The Experience of the Brazilian Federal Court of Accounts

The Brazilian Federal Court of Accounts (TCU-Brasil) has made significant strides in AI initiatives, becoming one of the first institutions in Brazil to implement generative AI technologies (E) integrated with various internal systems for use by both employees and citizens.

In 2023, the court adopted a custom AI model (ChatTCU), based on natural language processing (NLP). This virtual assistant was developed using ChatGPT.

ChatTCU offers a greater level of security because it has been implemented internally on the new Microsoft network of the TCU, and not on a public network. Additionally, conversations are protected under a contract that guarantees the confidentiality of the information provided by users.

The group was created to enhance the safe and appropriate use of artificial intelligence tools in TCU by leveraging all the features these solutions provide in the most responsible way possible, given that their use has become a reality. The GPT technology was discussed and studied with the IT team at TCU, and the desired model was reached, which has been implemented in TCU.

The actual version of the tool is integrated into the TCU systems. The responses generated are built on TCU procedures and the selected judicial jurisprudence of TCU and the administration system. Along with a vast database of information specific to the model that relies on Chat GPT.

ChatTCU relies on the latest versions of ChatGPT, providing high-quality answers and reducing the likelihood of errors or clarifications (inaccurate or fake answers) as part of the tool through possible application means, such as selecting information from audit documents, finding legal precedents, converting complex data into clear-text language, conducting translations and reviews, and providing administrative consultations, and the like. In this way, the exclusive generative AI model allows for internal use within TCU by relating the institutional knowledge with the best engine for AI in the market which permits supporting the complicated missions under the servers' control.

ChatTCU has been specifically designed for internal use and has been utilized by more than 1,300 users, including trainees, collaborators, and officials. Between June and November 2023, 145,000 conversations and more than 50,000 messages were recorded, with approximately 80 new conversations being created daily and around 500 messages exchanged.

The Court's Chief Information and Digital Development Officer explains that : 'By integrating the tool into TCU's systems, the auditor can consult our management system and gain insights into a specific audit process. For example, it is possible to extract data and subject-specific information for the purpose of planning the work.'

TCU has also shared its experience with ChatTCU with other public administration bodies, offering to run the tool across 80 federal institutions.

To continue improving ChatTCU and maximize the benefits provided by these solutions, new functionalities will be developed, including the future integration of audit standards, providing guidance for court activities, and the ability to search the internet for updated content to answer questions based on institutional knowledge, referencing publications, and integrating with other institutional systems to create queries and reference databases using natural language.

The TCU court is about to launch its fourth version, which will provide new features such as consulting TCU's internal rules (decisions, regulations, standard instructions, etc.), along with one of the most requested features by users: the ability to upload documents for analysis. Research is also being conducted on the decentralization of ChatTCU to develop specialized versions for specific departments within the Court, enhancing response accuracy.

According to the OECD (Organization for Economic Cooperation and Development), the development of ChatTCU shows how this type of technology can be used to increase the efficiency of auditors in reviewing all documents.

A Court official states, 'We adopted this technology before any other agency thought of it. This adoption was based on the understanding that this technology is here to stay, and we must be ready for its conscious use, understanding its potential risks and raising awareness of the best ways to use it.'

This tool has attracted the interest of the Office of the Comptroller General of Chile (CGR), which expressed great interest in implementing something similar in CGR. They emphasized the importance of learning from this experience to enhance their oversight activities. The tool has also aroused the interest of the Inter-American Development Bank (IDB), which has held meetings with TCU to understand its nature (PORTAL.TCU.GOV.GOV.BR).

d. Strategy for Implementing Generative AI in SAIs

A study by Suntharanurak (2023) suggests that to ensure the successful implementation of generative AI in SAIs, the following strategy should be adopted:

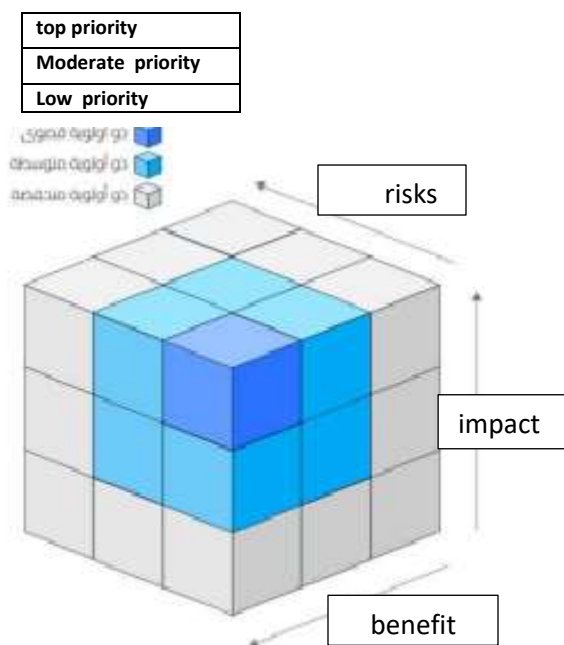
1. **Building Awareness and Literacy in Generative AI:** SAIs should enhance knowledge and capacity regarding the use of Generative AI among stakeholders, including auditors, managers, and decision-makers. This can be achieved through online workshops, webinars, and other educational initiatives.
2. **Clear objectives for artificial intelligence:** SAIs should define the specific outcomes they expect from integrating generative AI into their operations. These goals may include increasing efficiency, improving accuracy, or reducing risks.
3. **Assessment of the feasibility of generative artificial intelligence:** SAIs should assess current auditing procedures and the infrastructure to specify whether the Generative AI is useful a solution including assessment of the availability of data, technical expertise of employees, and the organizational environment.
4. **Developing a Generative Artificial Intelligence Roadmap:** Senior management must create a roadmap that defines the vision, objectives, and necessary steps to integrate generative AI into its operations. And this roadmap should be flexible enough to adapt to changes in technology and the audit environment.
5. **Conduct pilot projects:** Before deploying generative AI on a large scale, SAI should conduct pilot projects to test the technology and identify any potential challenges. This will help ensure that the technology is fit for purpose and that the SAI is prepared to manage any risks.
6. **Implementing generative AI on a recurring basis:** SAIs should implement generative AI in an iterative manner, starting with small projects and gradually expanding its use over time. This will allow the organization to learn from its experiences and make necessary adjustments as needed.
7. **Training auditors on generative AI:** SAIs should provide training for auditors on how to effectively use generative AI. This training should cover the basics of generative AI, how to apply it to specific auditing tasks, and how to detect inaccuracies and biases.
8. **Adherence to ethical standards and compliance:** SAIs should confirm that using generative AI is committed to ethics and compliance. This includes ensuring that technology is used in a fair and unbiased manner and that it does not violate individuals' privacy and dignity.

9. Establishing partnerships with generative AI experts: SAs should establish partnerships with generative AI experts to stay updated on the latest developments in this field and receive guidance on how to effectively implement the technology.

Rahul 2024 believes that although there are many attractive applications of generative AI that promise to enhance productivity, however determining the priorities of these applications is considered necessary step to ensure extracting the true value from this technology in responsible and sustainable way. There are three main dimensions that risk management leaders should consider in order to prioritize these applications in a way that ensures the maximum positive impact from those applications.

Risk leaders can prioritize risks and assess their impact and benefit when planning to use generative artificial intelligence in risk-related functions.

Preliminary evaluation to determine priorities for Generative AI use cases based on impact, benefit, and risk assessment.



Risks

Data source and use
Security threats
Performance and transparency
Strategic risks
Risks of external parties

Impact

Revenue generation
Operating cost savings
The organization's strategic gains
The expansion of generative artificial intelligence
Addressing the gaps not covered by traditional artificial intelligence

Benefit

Data quality and structure
Assessment of the **preparedness** for technological implementation
Needs for competencies upgrading and employment
Changing administrative needs

Mckinsey and Company

To ensure that organizations fully benefit from the power of generative artificial intelligence, it is essential to adopt a well-organized and meticulous strategy that starts from the top. In other words, senior management must lead this transition with a clear and defined vision.

C. Potential Risks and Threats

Despite the enormous benefits identified by scientific studies regarding the use of generative artificial intelligence applications (especially those connected to public and free-to-use networks), there are risks and limitations associated with using these applications that may undermine the reliability of the results derived from their use. Liu (2023) argues that it is crucial not to overlook certain flaws and potential threats, including:

1. The insufficient accuracy of the conversational content, as ChatGPT's training data is collected from the internet, means that its training data may contain some inaccurate or misleading information.
2. Bias in language models: Since ChatGPT's training data is sourced from the global internet and user-generated content, it may be influenced by certain societal and cultural biases. Furthermore, the model may not always recognize subtle distinctions in specific fields, leading to inaccurate results.
3. Risks: The generative technologies get huge benefits from individuals and society but it might also imply high risks and Chat GPT is not an exception.
4. Users are asked to enhance their professional knowledge: ChatGPT implies the risk of making errors. Now, though it faces several problems and makes significant errors, it can only meet the growing information needs and cannot fulfill the requirements of "making critical decisions".
5. Using the minimum of individual knowledge: when searching for information, for you, it is often like exploring an unknown area, and individuals may not necessarily be aware of the existing knowledge in a particular field before starting the search. The process of acquiring knowledge and information through ChatGPT largely depends on the cognitive and logical abilities of the individual.

As Hacker (2023) suggests, there are some important considerations that should be taken into account:

1. Currently, the use of artificial intelligence is not a substitute for human expertise when it comes to the ability to understand complex financial data and make informed decisions. Specifically, artificial intelligence cannot offer any assistance in identifying and analyzing interrelationships that go beyond current knowledge.

2. In an artificial intelligence system, there is no check for the logical and realistic validity of the data generated so far. The system may tend to "hallucinate," which can only be detected through expert auditing.
3. One of the biggest issues is data privacy and security. As the use of artificial intelligence in accounting and report preparation increases, it is essential for companies to take steps to ensure the integrity of their financial data and protect it from unauthorized access or theft. This requires stringent security measures such as encryption and access controls.
4. Another critical consideration relates to the possibility of errors or inaccuracies in financial statements: Although AI technologies can automate many routine tasks, they are still prone to human error, and it is important for organizations to have procedures in place to detect and correct any errors or inaccuracies.
5. ChatGPT does not provide sources for the data it presents by default when requested. These sources can sometimes be outdated, partially incorrect, or even fabricated freely (by the program).

C. Creativity

Many different literatures have addressed the topic of creativity and innovation, discuss its dimensions, characteristics, and various details. Here, we will discuss it in its general concept and the skills and elements it requires to meet the research requirements. To define the concept of creativity, (Gumusluoglu&lisev, 2009:461) sees it as the process of building and generating a new idea at the individual level, characterized by the ability to think of alternative and new methods, as well as exceptional, unconventional, and original solutions.

While (Dubrin,2019) refers to creative abilities as the ability to convert knowledge and ideas into new products, processes, and systems that benefit both the organization and stakeholders, (Abd-Mutalib, 2020) defines the ability to innovate as the capacity to make significant improvements and modifications to current technologies and to create new ones. Other studies define the ability to innovate as the capacity of organizations to be creative in their processes, generate ideas and methods, and ultimately create and deliver new services.

The distinctive traits of a creative personality are important because they represent the tools and characteristics that differentiate the creative manager's personality within an organization from others. The more they activate and practice them in a different and

tangible way, the more they resonate and receive a positive response from employees within that organization. Many researchers have addressed these distinctive characteristics of a creative leader or manager, which include several elements. Many researchers mentioned four of them: originality, fluency, flexibility, and sensitivity to problems.

1. Originality: This refers to the ability of an individual to generate new and unique ideas, methods, and approaches that have not been previously repeated by others. The individual always aspires to innovate, seeking fresh ideas that are serious and have inherent value, while avoiding traditional solutions and practices.

2. Fluency: One of the creative traits possessed by a creative individual is fluency, which makes them quick-witted and capable of responding and reacting at a high speed. This is what will distinguish the individual in any organization. Fluency is the ability to brainstorming and present new ideas within a limited and short period of time. This is a significant advantage that sets the individual apart from others by comparing the number of ideas presented".

3. Sensitivity : "It means the ability to be aware of the problems in a particular situation and to comprehend all its dimensions and the factors influencing it".

4. Flexibility: It is the mind's ability to adapt to changes and emerging situations, shifting from a rigid perspective to more adaptable angles required by the process of confrontation". (Muthaliff,2020).

"The Applied Framework of the Research"

a. Methods of Researching

Continuing from what we were introduced previously in the theoretical aspect in the previous axes , and achieving to the study goals to acquaint with the abilities of generative AI applications and in order to study assignment test practically, the applicable part classified to two parts:

First: selecting a group of questions via directing it to examples of the most well-known generative artificial intelligence applications in use, in line with the previous literatures that were presented and prepared after analyzing this literatures to extract the main ideas and key points, and classifying the information contained within it. This included reviewing the questions raised, with a focus on the most important and interesting aspects".

In our research, we will discuss the three most famous applications, which are chatgpt from OPenAI Co. , Gemini from Google Co. and Claude from Anthropic Co. in simplified manner.

The method of use is similar, by instructing the program to deal with a specific command and execute it directly.

The pilot test, Appendix A, was conducted by asking questions directly to the applications (chatGPT , Gemini and Claude) , The questions were taken into account to be normal , basic and simple , not specialized and complex to be suitable for the regular user. The aim of the study is to form a preliminary understanding of these applications and interact directly with them and obtain the answers they provide to learn about the practical capabilities of these applications. We will also avoid going into detail with the questions and will not repeat what has been discussed in the previous literature. Instead, we will focus on questions related to the traditional or innovative services that these applications can provide. Additionally, we will examine the ability of these applications to contribute to generating innovative ideas, assist in the verification process, and offer services to Supreme Audit Institutions (SAIs) supporting them in implementing their assigned engagements. This will provide the full understanding of the differences in the answers provided by these applications.

Second : A questionnaire was distributed to survey a group of auditors to assess their understanding of these applications and whether they are used in their daily auditing engagements, as well as the nature and effectiveness of their use, to obtain the targeted responses, the questionnaire was divided into two main axes: the first axis reflects the sample's opinion regarding how these applications support creative thinking, while the second one focuses on enhancing the auditing process.

b. Analysis of the interaction of generative artificial intelligence with questions and its responses.

- 1.** In the beginning, the goal of the first question was for the application itself to explain what it can offer in the field of auditing and review?

Appendix (A) the questions directed to the applications and their responses

Q1\What are the fields in which you can assist in the field of auditing and financial review?		
ChatGPT	Gemini	Claude
<p>Generative language models techniques, such as [ChatGPT], can assist in many fields in auditing and financial review. Here are some key fields:</p> <ol style="list-style-type: none"> 1. Data analysis : <ul style="list-style-type: none"> ○ Description: ChatGPT can help analyze large amounts of financial data quickly and efficiently. ○ Examples: Trends analysis. Identifying anomalies and detecting unusual patterns in the data. 2. Reporting: <ul style="list-style-type: none"> ○ Description: Generative language models can generate reports. 	<p>As a large language model trained on a vast dataset of texts and code, I can assist in various fields of financial auditing and review, including:</p> <ol style="list-style-type: none"> 1. Data Analysis <ul style="list-style-type: none"> •I can analyze large amounts of financial statements, such as accounting statements and transaction records, to identify potential patterns and trends that may indicate risks or violations. 	<p>I can assist in various aspects of financial auditing and review, including:</p> <ol style="list-style-type: none"> 1. Audit planning 2. Financial statements analysis 3. Internal control evaluation 4. Preparing audit reports 5. Reviewing compliance with accounting standards. 6. analyze the financial risks .

The image above is part of the answer, with details in Appendix (A)

The response was detailed and varied, indicating that these applications have significant potential, as mentioned in previous literature. The responses from the three applications (ChatGPT, Gemini, and Claude) highlighted their large capabilities in improving accounting and auditing processes. They can analyze vast amounts of data quickly and accurately, detect suspicious activities in the data provided, and automate routine engagements, leading to improved operational efficiency and reduced human errors. It was noted that these applications offered general guidance on the auditing process and its steps. It was also observed that the Claude application provided concise responses with general headings, while the other applications were more detailed and explanatory. ChatGPT, in particular, provided the most detailed responses, highlighting its writing and expressive abilities.

2. The goal of the second question was to understand how the applications contribute to the auditing process for a company that practices a specific activity in the form of a general question without specifying specific details in order to determine how they respond and build a productive interaction that can be beneficial.

Question 2: Can you assist in conducting a financial audit for a joint-stock company operating in the field of computer hardware manufacturing		
ChatGPT	Gemini	Claude
<p>Certainly, I can assist you in conducting a financial audit for a joint-stock company operating in the field of computer hardware manufacturing. We can divide the audit process into several key steps, including planning and preparation, performing tests , documentation, and preparing the final report. Below are the main steps:</p> <p>1-Planning and Preparation</p> <p>1.1Understanding the Company and the Industry:</p> <p>*Industry Analysis: Collecting information about the computer hardware industry, key competitors, challenges, and opportunities.</p> <p>*Understanding the Business: auditing the company structure, products and services, target markets, and growth strategies.</p> <p>1-2Risk Assessment</p> <p>*Document review: Reviewing previous financial reports, company policies, and internal systems.</p> <p>*Identifying Risks: Identifying potential risks such as:</p>	<p>Yes, I can assist you in conducting a financial audit for a joint-stock company operating in the field of computer hardware manufacturing. I will provide you with the steps for the financial audit process, with a focus on key aspects of the computer hardware industry:</p> <p>Main Steps of the Financial Audit Process:</p> <p>1-Planning audit process :</p> <p>*Defining the Scope and Objective of the Audit</p> <p>*Understanding the Company and Its Operations.</p> <p>*Assessing Risks Related to the Company.</p> <p>*Developing a Detailed Work Plan for the audit process.</p> <p>2-Testing Internal Control</p> <p>*Evaluating the Effectiveness of the Company's Internal Controls:</p> <p>*Identifying weaknesses in Internal Controls</p> <p>*Conducting control tests to collect evidence.</p> <p>3-Performing objectivity Tests</p> <p>* Testing the validity of Opening Balances of Accounts</p>	<p>Certainly, I can assist you in planning and implementing a financial audit for a joint-stock company operating in the computer hardware manufacturing industry. Below are the main steps we can follow:</p> <p>1-Initial Planning</p> <p>-Understanding the nature of the company and the computer hardware industry.</p> <p>-Identifying risks associated with this Sector</p> <p>Reviewing Previous Financial Reports</p> <p>2- Evaluating the Internal Audit System:</p> <p>-Testing of inventory and purchasing audit procedures.</p> <p>- Evaluating the utilized Information Technology Systems</p>

The image above is part of the answer, with details in Appendix (A)

The response was an explanation of the auditing process for this activity in general, with main outlines for each step of the audit. Then, the applications were instructed to provide a program for auditing a specific activity, such as sales.

Can you prepare an audit program for the sales activity of a company engaged in the sale of computer hardware?		
Preparing an audit program for the sales activity of a company engaged in selling computer hardware requires creating a comprehensive plan that covers all aspects related to sales operations to ensure transparency, efficiency, and	<p>***Audit Program for the Sales Activity of a Company Selling Computer Hardware:</p> <p>Introduction:</p> <p>The purpose of this program is to assess the effectiveness, integrity, and accuracy of the sales operations in a company</p>	<p>Certainly, I will provide you with an audit program for the sales activity of a company selling computer hardware. This program will cover the key aspects of the sales process:</p> <p>1-Audit Planning:</p>

prevent financial and administrative corruption. Here is a suggested model for a comprehensive audit program: ###1- Planning the Audit Process ####. Defining Audit Objectives Verifying the accuracy and validity of sales records.	that sells computer hardware. The program covers all aspects of the sales activity, from receiving orders to delivering products and collecting payments.	Defining the scope and objectives of the audit -Collecting preliminary information about the company and its sales policies
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The image above is part of the answer, with details in Appendix (A)

This is exactly what was done, with specific details provided that contribute to the actual audit process of the activity. Additionally, a general overview of the sales activity audit was included, which adds a sense of reassurance regarding this program written by these applications.

3. The goal of the third question was to understand the capability of these applications if directly instructed to provide innovative ideas or if they had specific requirements for demonstrating their ability to innovate, and what the appropriate way of question would be to obtain creative and innovative answers:

Q3/ How can you test your innovation capabilities?		
ChatGPT	Gemini	Claude
You can test my innovation capabilities in the audit process through a practical scenario that involves auditing specific aspects of a company or project. Defining the objective: Clarify the purpose of the audit. Is it a financial audit, operational audit, or technological audit? I request for a suggestion on innovative tools or techniques that can be used in the audit process. Also instruct me to design an innovative audit plan that includes new or unconventional stages. Also, propose new methods for data analysis and evidence collection for auditing a company, the purpose of the audit is financial audit, and the company operates in the industry.	###**Testing my innovation **My innovation capabilities can be tested in several ways, including: **1-Evaluat my ability to generate new and innovative ideas. *** Give me an open task, such as writing a short story or designing a new product, and evaluate my ability to come up with new and innovative solutions. ****I was instructd to improve an existing idea*** For example, providing suggestions to improve a website or a business process and evaluating my ability to innovate.	To test my innovation capabilities, several methods can be followed. Here are some suggestions: 1- Presenting complex problems. Present me with real, complex problems from different fields and ask me to suggest innovative solutions. The more complex and challenging the problem is, the better it is to test the ability to innovate. 2-requesting unconventional ideas. instruct me to generate unconventional ideas for specific situations or products. For example, suggest 5 unconventional uses for a pencil

The image above is part of the answer, with details in Appendix (A)

The answer indicated the need to build a complete scenario or picture of the situation or case presented and to request innovative ideas for auditing a specific, uncommon activity. The response included a set of methods that were considered innovative and could help the auditor in their work, although most of them were related to modern technology and costly capabilities. Therefore, we develop the question to focus on low-cost methods. The applications then proposed a range of specific methods and techniques that were broad and diverse.

I want the methods and innovations to be low-cost and simple		
<p>Of course, I can suggest some lower-cost methods and innovations that the auditor can use in the financial audit process for a medium-sized petrochemical company. These methods focus on utilizing available resources and improving efficiency without the need for significant investments in technology:</p> <p>Data analysis using open-source software:</p> <ul style="list-style-type: none"> - Using programs like R or Python to analyze financial statements instead of purchasing expensive commercial software, - The auditor can develop simple scripts to automate some of the analysis processes. <p>2. Applying advanced statistic samples techniques</p>	<p>Open Source Data Analysis Tools:</p> <p>Software like Hadoop and Spark provide powerful capabilities for analyzing large amounts of financial transaction data without the need to purchase expensive licenses.</p> <p>Tools like R and Python provide a strong programming language and graphical capabilities.</p> <p>Continuous Auditing Tools:</p> <p>Software like Audit Trail and ACL Analytics provide capabilities for continuously monitoring financial data and identifying potential risks in real-time, reducing the costs of traditional auditing.</p>	<p>Based on your request for innovative and cost-effective auditing tools, here are some suggestions.</p> <ol style="list-style-type: none"> 1- Open Source Auditing Software: Such as OpenAudit or OCS Inventory, Which provide basic functions at a low cost or for free. 2- Automation of engagements by scripting : using languages such as Python or PowerShell to create customized auditing tools at low cost.

The image above is part of the answer; details are in appendix (a)

4. The purpose of question (4) was to assess these applications ability to obtain information about supreme audit institutions, and

Q4 / Search for information about the Federal Board of Supreme Audit of Iraq.		
ChatGPT	Gemini	Claude
<p>The Federal Board of Supreme Audit of Iraq is an independent governmental body responsible for overseeing public funds in Iraq. The Board conducts financial and administrative audits of all ministries,</p>	<p>Information about the Federal Board of Supreme Audit of Iraq</p> <p>Historical Background:</p> <ul style="list-style-type: none"> - The Federal Board of Supreme Audit was established in 1927 and is considered one of the 	<p>Here are some key details about the Federal Board of Supreme Audit of Iraq:</p> <ol style="list-style-type: none"> 1. Establishment and Mission: The Board was founded in 1927 and serves as the highest

<p>government agencies, and public companies to ensure the proper management of public funds and to prevent financial and administrative corruption.</p> <p>Main Objectives and Responsibilities:</p> <p>1. Financial Oversight: Auditing the financial accounts of ministries, agencies, and public companies to verify their compliance with the budget and financial regulations.</p> <p>2. Administrative Oversight: Evaluating the administrative efficiency of government bodies and ensuring the proper performance of public employees.</p> <p>3. Anti-Corruption Efforts: Detecting financial and administrative violations and taking legal action against offenders.</p>	<p>oldest audit institutions in Iraq and the Arab region.</p> <p>- Initially, it was named the "State Audit Bureau," then renamed the "Public Financial Control Bureau" in 1964, and finally became the "Federal Board of Supreme Audit" in 2005.</p> <p>Duties and Responsibilities:</p> <p>- According to Article 103 of the 2005 Constitution of the Republic of Iraq, the Board enjoys financial and administrative independence.</p> <p>- It oversees public funds wherever they exist, ensuring compliance with financial regulations and promoting accountability.</p>	<p>financial oversight body in Iraq. Its primary mission is to monitor state funds and ensure their proper and efficient use.</p> <p>2. Independence: The Board enjoys financial and administrative independence and operates under the supervision of the Iraqi Parliament.</p> <p>3. Authorities: The board audits the accounts and activities of government institutions and has the authority to access all financial records and documents.</p>
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The image above is part of the answer; details are in appendix (a)

to pose more detailed questions , such as the number of reports it issues each year.

How many Reports does the Federal Board of Supreme Audit of Iraq annually issue?		
<p>The number of reports issued by the Federal Board of Supreme Audit of Iraq varies each year depending on several factors, including the scope of activities, assigned tasks, cooperation with government entities, and the number of cases requiring auditing and investigation. Generally, these reports can be categorized into different types, such as annual reports, periodic reports, and special reports.</p> <p>Main Reports Issued Annually:</p> <p>1. Annual Reports: Typically, a comprehensive annual report is issued, covering audit results for all ministries and government agencies.</p> <p>2. Financial and Administrative</p>	<p>The Federal Board of Supreme Audit of Iraq issues two main types of reports during the year:</p> <p>1. Periodic Reports:</p> <ul style="list-style-type: none"> Annual Report: The Board issues one annual report within 120 days from the end of each year, which includes the key aspects resulting from the implementation of the Board annual plan. The report contains information about: <ul style="list-style-type: none"> - The audit engagements carried out during the year. - The results achieved through the audit. - The violations detected and the recommendations made. - The challenges faced by the 	<p>I do not have accurate and updated information about the exact number of reports issued by the Federal Board of Supreme Audit of Iraq annually. The number of reports may vary from year to year depending on several factors, such as the scope of work, available resources, and audit priorities. Generally, FBSA issues several types of reports:</p> <ol style="list-style-type: none"> 1. Comprehensive Annual Reports on government and public institutions' performance. 2. Quarterly or Semi-Annual Reports in some cases. 3. Special Reports on specific issues or particular investigations.

Audit Reports: These reports may be issued monthly, quarterly, or upon the completion of a specific audit engagement.	FBSA and its key future plans. <ul style="list-style-type: none"> Other Periodic Reports: FBSA may issue other periodic reports as needed, such as quarterly or monthly reports. 	
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The applications were asked to present some of the observations included in the reports for a specific year and a specific institution to identify more capabilities of these applications. Here, we notice that the response of the ChatGPT application was the only one that mentioned specific observations along with the sources from which these observations were obtained. However, the other applications apologized for being unable to provide such information.

Can you present the most important observations published by the Iraqi Federal Board of Supreme Audit regarding the Iraqi Ministry of Electricity for the year 2017?		
<p>In 2017, the Iraqi Federal Board of Supreme Audit pointed out several important observations regarding the Iraqi Ministry of Electricity. One of the most significant observations was the expenditure of approximately \$937 million on contracts for purchasing electricity that was not actually received due to 'take-or-pay' agreements signed with investment companies between 2014 and 2016. These contracts obligated the ministry to pay large sums for unreceived electricity, resulting in substantial financial waste that could have been used to establish new power plants with a capacity of up to 1,000 megawatts (ultrairaq.ultrasawt) (shafaq) (saymar). FBSA also revealed the absence of clauses in most purchasing contracts requiring the transfer of ownership of investment</p>	<p>Unfortunately, I do not have direct access to the reports of the Iraqi Federal Board of Supreme Audit. However, I can assist you in finding these reports through:</p> <ul style="list-style-type: none"> The official website of the Iraqi Federal Board of Supreme Audit: https://fbsa.gov.iq(https://fbsa.gov.iq)* Searching Iraqi news websites. Looking through social media platforms. Contacting FBSA directly. <p>Here are some tips for finding the reports of the Iraqi Federal Board of Supreme Audit:</p> <ul style="list-style-type: none"> Use specific keywords, such as "Iraqi Federal Board of Supreme Audit," "Iraqi Ministry of Electricity," and "Year 2017." 	<p>Unfortunately, I am unable to provide specific and accurate information regarding the observations published by the Iraqi Federal Board of Supreme Audit about the Iraqi Ministry of Electricity for the year 2017 directly. My database may not contain such detailed and specific information. However, I can suggest ways for you to obtain this information:</p> <ol style="list-style-type: none"> Official website: Visit the official website of the Iraqi Federal Board of Supreme Audit. These institutions often publish their reports on their websites.

power plants to the ministry after the contract period ended and the recovery of their construction costs, leading to additional financial losses for the ministry."		
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The image above is part of the answer; details are in appendix (a)

Here, we notice that the responses varied in their approach, ranging from historical narration to presenting the concept along with objectives and tasks or providing basic information. There were differences in the level of detail presented by the applications and the information included, such as references to the legislation under which the Federal Board of Supreme Audit operates or the constitutional provisions defining its functions. Additionally, differences appeared in the sources from which the information was obtained, the suggestions offered to users for further research, or in case more information were requested.

Despite the fact that no answer was provided to the question about the number of financial reports issued by the FBSA due to the lack of available information, these applications provided an explanation of the nature of the reports issued by the FBSA.

5. As for question 5, its purpose was that these applications introduce themselves and their capabilities to institutions and the possible abilities and services to the public to enhance the role, activities, and vision of the Iraqi Federal Board of Supreme Audit.

Q5 / As a chatbot, what services can you provide to citizens to convey the vision and activities of the Iraqi Federal Board of Supreme Audit?		
<p>As a chatbot, I can provide a range of services to citizens to effectively convey the vision and activities of the Iraqi Federal Board of Supreme Audit:</p> <p>1. Providing Information and Guidance, Answering Inquiries: Offering instant responses to citizens' questions regarding the FBSA's functions and activities, as well as guidance on how to file complaints or report corruption.</p> <p>Providing Resources: Sharing links to the FBSA's annual reports and other relevant resources, such as laws and regulations.</p> <p>2. Raising Awareness, Articles, and Informative Posts: Sharing</p>	<p>Services I provide to citizens to convey the vision and activities of the Iraqi Federal Board of Supreme Audit:</p> <p>As a chatbot, I can offer various services to citizens to communicate the vision and activities of the Iraqi Federal Board of Supreme Audit, including:</p> <p>1. Providing Information:</p> <ul style="list-style-type: none"> - I can answer citizens' questions regarding the FBSA's duties, responsibilities, operations, and published reports. - I can provide information on the key observations issued by the FBSA regarding various government ministries. - I can share details about the Board's future plans. 	<p>As a chatbot, I can provide several services to assist in conveying the vision and activities of the Iraqi FBSA to citizens:</p> <p>1. Providing General Information:</p> <ul style="list-style-type: none"> - Explaining the role and duties of the FBSA in simple and easy-to-understand language. - Clarifying the importance of financial auditing in safeguarding public funds. <p>2. Answering Frequently Asked Questions:</p> <ul style="list-style-type: none"> - Responding to citizens' inquiries about the FBSA work and powers. - Explaining how to contact the FBSA or file complaints. <p>3. Simplifying Reports:</p>

<p>short articles and awareness posts explaining the Board's role and the importance of financial control in combating corruption and improving government performance.</p> <p>Short Educational Lessons: Offering brief and simplified lessons on topics such as how to read financial reports.</p>	<p>2. Facilitating Communication with the FBSA:</p> <ul style="list-style-type: none"> - I can assist citizens in submitting complaints or reports to the FBSA. 	
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The image above is part of the answer; details are in appendix (a)

The responses from these applications and their various capabilities can be categorized under the following headings:

- **Providing Information and Guidance:** Offering instant answers to citizens' inquiries regarding the tasks and activities of the FBSA, how to file complaints or report corruption, and providing information about the board's future plans.
- **Providing Resources:** Sharing links to the FBSA's annual reports and other relevant resources such as laws and regulations.
- **Raising Awareness:** Sharing short articles and awareness posts explaining the role of the FBSA and the importance of financial oversight in combating corruption and improving government performance. Additionally, offering brief, simplified lessons on topics such as how to read financial reports or understand financial oversight laws.
- **Facilitating Interaction and Communication with the FBSA:** Providing interactive forms for citizens to fill out surveys regarding their satisfaction with government services or to submit specific feedback and complaints. Assisting citizens in booking appointments to visit the FBSA.
- **Automated Reporting:** Guiding citizens on how to use online portals to submit complaints and report violations.
- **Continuous Updates:** Offering regular updates on the latest FBSA reports and audit findings, including key observations and analyses.
- **Instant Notifications:** Sending real-time notifications about important events, such as the publication of annual reports or the results of special investigations.
- **Multimedia interaction such as explanatory videos:** Providing links to videos that visually and simply explain the role of the FBSA and the results of its work as well as sharing visual representations of financial and administrative data in an easy-to-understand format.
- **Coordination with Relevant Authorities and Directing Individuals to Competent Authorities:** Helping citizens identify the appropriate authorities they can turn to for more information or legal action.
- **Providing Translation Services:** Translating information about the FBSA and its activities into different languages to assist non-Arabic-speaking citizens in communicating with the FBSA.
- **Providing Smart Services:** Summarizing Reports and presenting FBSA reports in a simplified manner for citizens, analyzing the data collected by the FBSA and presenting it in the form of charts and tables and developing smart applications to help citizens stay

updated on FBSA news and activities.

d. Analysis of the Sample of research Responses to the Questionnaire Questions

1. Description of the Sample of Research Characteristics

A total of 109 questionnaires were distributed to the research sample, out of which 66 were retrieved and found valid for analysis, resulting in a 60% response rate. The 40% non-response rate was attributed to the lack of knowledge among non-respondents regarding the use of these applications.

Table (1) below presents a description of the research sample within the studied institution, as illustrated:

Gender	Male		Female		Total
Frequency	47%		19%		66
Percentage	71%		29%		100%
Educational qualification	PhD	Master's	Bachelor's	Higher Diploma	Total
Frequency	25	23	11	7	66
Percentage	39%	34%	16%	11%	100%
Years of services	Less than 5 years	5-10 years	11-15 years	More than 15 years	Total
Frequency	10	14	27	15	66
Percentage	15%	21%	41%	23%	100%

2. Presenting the results of the creative thinking development axis

The table below shows the trends of the sample's responses to the items of the axis

	Paragraph	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree		Mean	Standard Deviation	Coefficient of Variation
		Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%			
	Dimension of Measuring the Impact of Using Generative AI Applications (ChatGPT, Gemini, Claude) on Developing Creative Thinking													
1	Using Generative AI Applications (ChatGPT, Gemini, Claude) helps in finding appropriate solutions to challenges that may arise during the auditing process, thereby reducing audit risks	20	30.3	31	46.9	15	22.7	--	--	--	--	4.07	0.72	0.17
2	The use of Generative AI Applications (ChatGPT, Gemini, Claude) directly enhances the auditor's ability to generate diverse ideas, which positively impacts audit efficiency and effectiveness	10	15.1	48	72.7	8	12.1	--	--	--	--	4.03	0.52	0.13
3	Using Generative AI Applications (ChatGPT, Gemini, Claude) facilitates greater focus on tasks, enabling the auditor to perform duties more effectively.	5	7.5	34	51.5	27	40.9	--	--	--	--	3.66	0.61	0.16
4	Generative AI Applications (ChatGPT, Gemini, Claude) can enhance the auditor's ability to assess the materiality of any item, thus assisting in applying professional skepticism throughout all audit stages.	14	21.2	38	57.5	7	10.6	7	10.6	--	--	3.89	0.86	0.22
5	The use of Generative AI Applications (ChatGPT, Gemini, Claude) contributes to developing the auditor's accounting, legal, and auditing knowledge, thereby strengthening the auditing	23	34.8	35	53.0	8	12.1	--	--	--	--	4.22	0.65	0.15

	process.													
6	Using Generative AI Applications (ChatGPT, Gemini, Claude) helps enhance the auditor's academic and practical skills in performing audit tasks, ultimately improving audit quality.	10	15.1	52	78.7	4	6.0	--	--	--	--	4.09	0.45	0.11
	Overall Arithmetic Mean											3.99	0.63	0.16

This section aims to analyze the auditors' opinions on the ability of these applications to contribute to the development of skills and creative thinking for users of these applications, especially in the field of auditing and accounting:

1. When analyzing the arithmetic mean and standard deviation of the auditors' responses to the first question, which is "The use of applications (ChatGPT, Gemini, Claude) helps the auditor find appropriate solutions to challenges they may face during auditing."

The arithmetic mean was (4.07) which indicates that the general opinion of the sample is highly inclined towards agreeing that the use of these applications helps in finding appropriate solutions and reducing audit risks while the standard deviation was (0.72) which indicates that there is little variation in auditors' evaluations, i.e. most auditors have similar opinions about the usefulness of artificial intelligence applications in the audit process and the coefficient of variation was (0.17) which means that the percentage of variation to the mean is relatively low, which indicates that the auditors are relatively in agreement about the effectiveness of using them in enhancing the audit processes and risk reduction.

From the above results, it can be concluded that auditors are highly inclined to believe that the use of applications (Chatgpt, Gemini, Claude) helps them to find appropriate solutions to the challenges they face during the audit process, thereby reducing audit risks. It is also concluded that there is strong agreement among auditors on the usefulness of these applications in their work, and that these tools contribute to reducing audit risks.

2. For the second question(the use of the applications (ChatGpt, Gemini, Claude) is a more direct and capable way to generate diverse ideas by auditors , a factor that adds to the efficiency and effectiveness of the audit) the coefficient of variation was (0.13) which measures the convergence of the opinions of the sample and the standard deviation (0.52) and the arithmetic mean was (4.03) which is higher than the used hypothetical mean of five –point Likert scale which amounted to (3) degrees . It indicates that most auditors tend to agree with the statement that the use of these applications helps in generating diverse ideas, which enhances the efficiency and

effectiveness of auditing, indicating that there is low to moderate variation in the opinions of auditors.

3. For the third question, which states (the use of applications (ChatGpt, Gemini Claude) by auditors facilitates greater focus on tasks, enabling them to perform their duties more effectively), the coefficient of variation was (0.16), which measures the degree of convergence of the opinions of the sample, the standard deviation was (0.61) and the arithmetic mean was (3.66), which is higher than the default mean of the used five-point Likert scale of (3) degrees.

It indicates that there is positive agreement among auditors that these applications help focus and improve effectiveness, but the agreement is less strong compared to the previous results, i.e. perhaps not to the same degree as their impact on generating ideas or solving challenges, and this may indicate that some auditors may be more conservative in assessing the impact of these tools on focus and effectiveness.

4. For the fourth question (the use of generative artificial intelligence applications (ChatGpt, Gemini, Claude) can enhance auditor abilities in assessing materiality of any item, and thus help them to exercise professional skepticism at all stages of the audit), the coefficient of variation was (0.22), which measures the extent of convergence of the opinions of the sample and the standard deviation was (0.86) and the arithmetic mean was (3.89), which is higher than the default used mean of the five-point Likert scale of (3) degrees.

This shows that there is strong agreement that these applications enhance auditor analytical abilities in assessing the relative importance of different items in the audit process and that these tools help them to better apply professional skepticism during all stages of the audit. The results also indicate that the use of these techniques can lead to an improvement in the quality of the audit process as a whole. The standard deviation and coefficient of variation indicate that there is diversity in auditors' experiences with these tools, some may find them more useful than others, but despite the strong agreement, the presence of some variation indicates that some auditors may be more cautious in assessing the impact of these tools on professional skepticism.

5. For the fifth question (the use of generative artificial intelligence applications (Chatpt, Gemini, Claude) by auditors leads to developing their accounting, legal and auditing knowledge which enhances the audit process), the coefficient of variation was (0.15) which measures the convergence of the opinions of the sample, the standard deviation was (0.65) and the arithmetic mean was (4.22) which is higher than the default used mean of the five-point Likert scale of (3) degrees.

This indicates that auditors are highly inclined to believe that the use of these applications enhances the development of their accounting, legal and auditing knowledge, which leads to the improvement of the audit process with moderate

variance in opinions i.e. there are some differences in views among auditors, but these differences are not significant.

6. For the sixth question, which stated that (the use of generative artificial intelligence applications (ChatGpt Gemini claude) by auditors helps in enhancing their academic and practical abilities in performing audit tasks and thus improving their quality), the coefficient of variation was (0.11) which measures the convergence of the opinions of the sample, the standard deviation was (0.45) and the arithmetic mean was (4.09) which is higher than the default used mean of the five-point Likert scale of (3) degrees.

This shows that there is an almost complete consensus among the auditors that Generative AI applications greatly enhance their academic and practical abilities as they contribute to the development of their skills at both theoretical and practical levels. There is a strong belief that the use of these technologies leads to a tangible improvement in the quality of the audit process and there is great confidence in the ability of modern technology to improve professional practices in the field of auditing. This shows us that these tools may bring about a positive change in how the audit profession is learnt and practiced and thus help in the continuous communication between academic knowledge and practical application and may indicate a willingness by auditors, sample of the research, to integrate these technologies into their daily work.

3. Presenting the results of “Enhancing the Audit Process” topic

For the purpose of verifying hypotheses (2) and (3), we will analyze the opinions of the sample through their answers to the questions posed to them in the questionnaire .The table below shows the trends of the sample's answers to the paragraphs of this aspect:

No.	paragraphs	Strongly agree		Agree		Neutral		Disagree		Strongly disagree		arithmetic mean	standard deviation	coefficient of variation
	Dimension of measuring the impact of using generative artificial intelligence applications (ChatGpt, Gemini Claude) in enhancing the audit process	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%			
1	Using generative artificial intelligence applications Chatpt, Gemini, Claude contributes to understanding the nature of audit office operations and generating innovative ideas in the planning stage	8	12.1	51	77.2	7	10.6	--	--	--	--	4.01	0.48	0.11
2	Mental interaction with generative artificial intelligence applications (ChatGpt, Gemini, Claude) contributes to the development of the auditor's skills to perform the task as required and develop his/ her expertise.	10	15.1	40	60.6	16	24.2	--	--	--	--	3.90	0.62	0.16
3	The use of generative AI applications (ChatGpt, Gemini, Claude) enhances communication and interaction between team members to exchange ideas confidentially and in the shortest time possible.	12	18.1	18	27.2	17	25.7	19	28.7	--	--	3.34	1.08	0.32

4	The use of generative AI applications (Chatpt, Gemini, Claude) enhances the verification of the accuracy and efficiency of the audit evidence needed to carry out the work.	2	3.0	24	36. 3	16	24. 2	24	36. 3	--	--	3.0 6	0.9 2	0.30
5	The use of generative AI applications (ChatGpt, Gemini, Claude) helps to detect manipulation and misrepresentation during the execution of the audit plan and ensure the integrity of the financial statements.	7	10. 6	20	30 .3	16	24. 2	2 3	34. 8	--	--	3.1 6	1.0 3	0.32
6	The use of artificial intelligence application(chatgpt, Gemini, claude) saves time and effort to access the required information ,which helps in the effectiveness of the audit process	31	46. 9	30	45 .4	5	7.5	--	--	--	--	4.3 9	0.6 2	0.14
General arithmetic mean												3.64	0.79	0.22

This section aims to explore the auditors' opinion on the ability of these applications to contribute to enhancing the audit process:

1. For the first question (the use of generative artificial intelligence applications (Chatgpt, Gemini, Claude) contributes to understanding the nature of audit office operations and generating innovative ideas in the planning stage), the coefficient of variation was (0.119) which measures the convergence of the sample's opinions, the standard deviation was (0.48) and the arithmetic mean was (4.01) which is higher than the default used mean of the five-point Likert scale which is (3) degrees.

The results show that auditors tend to clearly agree that the use of these applications contributes to understanding the nature of the audit office operations and generating innovative ideas in the planning stage. However, the variance in opinions is low, which indicates that most auditors have close opinions about the effectiveness of these applications and that these tools contribute significantly to improving the audit planning stage and help in generating innovative ideas at this stage, which is a crucial stage in the overall process . These tools also help auditors to better understand the nature of the audit office operations.

2. For the second question (mental interaction with generative artificial intelligence applications (ChatGpt, Gemini, Claude) contributes to developing auditor skills to do the

task as required and developing their expertise), the coefficient of variation was (0.160) which measures the extent of convergence of the opinions of the sample, the standard deviation was (0.62) and the arithmetic mean was (3.90) which is higher than the default used mean of the five-point Likert scale of (3) degrees.

The standard deviation and coefficient of variation indicate a good consensus, with some diversity in experiences and perceptions. These results indicate a positive agreement among auditors that interaction with generative AI applications contributes to the development of their skills and expertise and that these tools help them perform their tasks as required, indicating an improvement in professional performance. There is also a strong belief that interaction with these technologies contributes to the development of auditors' expertise, which may lead to a constant professional development, since the auditors see value in mentally engaging with these tools, demonstrating that they stimulate thinking and learning.

3. The third question states that the use of generative artificial intelligence applications (ChatGpt, Gemini, Claude) to enhance communication and interaction methods between team members to exchange ideas confidentially and in the shortest possible time). The coefficient of variation was (0.325), which measures the extent of convergence of the sample's opinions, and the standard deviation was (1.08). The arithmetic mean was (3.34), which is slightly higher than the default mean of the five-point Likert scale used, which is (3) points.

This indicates moderate agreement among participants with the statement presented, as it indicates that auditors believe that generative AI applications contribute to some extent to enhancing communication and exchange of ideas among team members. The standard deviation is relatively high, indicating a large dispersion of answers around the mean, which indicates a noticeable variance in participants' opinions. The relatively high coefficient of variation confirms the existence of clear differences in participants' opinions, as it becomes clear that auditors are not entirely sure of the ability of these tools to enhance confidentiality and accelerate the exchange of ideas.

4. As for the fourth question which states that the use of generative artificial intelligence applications (ChatGpt, Gemini, Claude) contributes to enhancing the verification of the accuracy and efficiency of the audit evidence necessary to implement the work, the coefficient of variation was (0.302), which measures the extent of convergence of the sample's opinions, and the standard deviation was (0.92), and the arithmetic mean was (3.06), which is higher than the default mean of the five-point Likert scale used, which is (3) degrees.

This mean is very slightly higher than the default mean, therefore it indicates neutral or slightly positive agreement among participants with the statement presented. The standard deviation and coefficient of variation are relatively high, indicating a large

dispersion of responses around the mean. These results indicate that auditors, in general, have a neutral attitude towards the effectiveness of these tools in enhancing the accuracy and efficiency of audit evidence. Some auditors found these tools useful in verifying evidence, while others did not find them very useful. This indicates uncertainty among auditors about the ability of these technologies to significantly improve the accuracy and efficiency of audit evidence and these tools are below the required level to have a significant impact on the verifying audit evidence. Such a neutral stance may reflect a professional reservation by auditors towards relying on technology in a sensitive area like evidence verification."

5. As for the fifth question which state that the use of generative artificial intelligence applications (ChatGpt, Gemini, Claude) helps in detecting manipulation and misstatement during the implementation of the audit plan and ensuring the integrity of financial statements , the coefficient of variation was (0.325), which measures the extent of convergence of the sample's opinions, the standard deviation was (1.03), and the arithmetic mean was (3.16), which is higher than the default mean of the five-point Likert scale used, which is (3) degrees.

It is slightly higher than the default mean, indicating a slight positive agreement among participants with the presented statement. This suggests that auditors generally believe that generative AI applications help to some extent in detecting manipulation and misstatements and confirming the integrity of financial statements. The standard deviation and coefficient of variation confirm the existence of clear differences in participants' opinions.

6. The sixth question states that the use of generative artificial intelligence applications (ChatGpt, Gemini Cloud) saves time and effort to access the required information, which helps in the effectiveness of the auditing process. The coefficient of variation is 0.143, which measures the extent of convergence of the sample's opinions, and the standard deviation is (0.62). The arithmetic mean was (4.39), which is higher than the default mean of the five-point Likert scale used, which is (3) points.

This average is very high and much higher than the default mean, which indicates the participants' agreement with the given statement. This shows that the auditors firmly believe that generative AI applications save time and effort and contribute to the effectiveness of the auditing process. There is little dispersion in the responses around the mean, which confirms high agreement among participants in their opinions. The very low value of the coefficient of variation confirms the high homogeneity of the responses and strong consistency in the participants' opinions. This explains the almost complete consensus among auditors that generative AI applications save time and effort and improve the effectiveness of the audit process. They also believe that these tools

contribute significantly to accelerating the process of accessing the required information, which is reflected in improving the auditing process.

C. Conclusions:

After completing the theoretical and practical aspects, the most important conclusions reached can be summarized as follows:

First. Conclusions of the theoretical aspect

1. Generative AI technologies (ChatGpt, Gemini, and Claud) represent one of the most important modern technological advancements that have become widespread in a very short period of time and will impact major aspects of life, including cognitive and scientific aspects.
2. These applications have already begun to make confident strides towards practical implementation, thanks to their capabilities and the availability of factors that lead to their success and spread.
3. Ease, simplicity and speed of access to these applications and the great information they provide in all fields, including commercial fields, make these applications candidates to play a significant role in the field of accounting and auditing. Therefore, these applications can be used in auditing services and to develop and improve their operations.
4. The continuous development of these applications and their competitive and rapid releases provide more solutions and capabilities that these technologies offer to auditors and organizations in general.
5. Generative AI in general, and these applications in particular, have several potential benefits in accounting and auditing, particularly in improving efficiency, accuracy, speed, and creativity.
6. Previous literature indicates that these tools may change how auditors acquire new skills and experiences, thus changing the methodology of learning and professional development.
7. The ease of access to these applications at any time contributes to the widespread acceptance of the use of artificial intelligence technologies as a means of developing professional skills and expertise.

8. These applications have diverse capabilities for handling, analyzing, and summarizing various types of documents. This facilitates the process of analyzing and summarizing reports, which benefits the audit process.

9. Adopting such technologies contributes to providing continuous learning for auditors, which is essential for maintaining contact with the latest professional and academic updates and remaining more competitive in light of the digitalization and rapid development.

10. These applications can be used at all stages of the audit process.

11. These applications have great potential to enrich auditors' narrative skills.

12. Previous literature has revealed various experiments by researchers to try to use these applications in accounting and auditing in various aspects, and the results showed important and powerful capabilities of these applications.

13. Some SAIs have adopted these technologies and have seen significant benefits from them, and others have shown interest in applying them. Therefore, the hypothesis that these applications provide significant benefits to audit organizations, especially SAIs, is proved based on existing actual experience and the literature presented as well .

14. Each of these applications has specific features and a construction method different from other applications based on the producing companies, the design, and the capabilities upon which it is based, which provides certain superior aspects for one application at the expense of the other. It is best for SAIs to take this into consideration when wishing to use one of these applications within an internal database and in a manner that suits the needs of these institutions.

15. These applications have the ability to summarize and translate videos, which is useful for viewing conferences, seminars, courses of SAIs and the latest educational lessons published by them.

16. Despite the significant benefits of these applications, there are challenges and obstacles that must be taken into consideration when adopting their use.

Second: Conclusions of the practical side

1. By analyzing the first main topic in the practical aspect of the responses of these applications to the questions posed in Appendix (A) and what some of the literature that was discussed has addressed, these applications have distinct capabilities in multiple aspects, including content creation, improving productivity, software development,

supporting scientific research, improving customer service, training, translation, planning and forecasting.

2. These applications have the potential to support the role of SAs in all aspects towards various stakeholders, both internally and externally.

3. These technologies respond to users effectively and efficiently, interacting with them on various aspects of accounting and auditing, and providing them with information based on ongoing updates or training provided to these applications.

4. Auditors can use more than one application at the same time quickly and efficiently and compare the ideas or information they provide.

5. These applications provide information to the auditor in various theoretical and practical aspects of audit and offer ideas that help make the auditing process more efficient and effective. More capabilities are expected from them as they continue to evolve.

6. There is great confidence in the ability of modern technology to improve professional practices in the field of auditing. This shows us that these tools may bring about a positive change in how the auditing profession is learned and practiced, thereby helping to bridge the gap between academic knowledge and practical application.

7. Through the responses of several auditors that indicate non familiarity with these applications, it is noticeable that there is a lack of technical communication among a certain group of auditors. This points to a negative situation that should be addressed through encouragement and awareness-raising.

8. Through the analysis of the second axis in the practical aspect of the sample's responses to the questionnaire (Appendix B), the results of the sample's opinions showed that interaction with these technologies contributes to the development of auditors' creative thinking by finding appropriate solutions to the challenges they may face during the auditing process. Consequently, this reduces audit risks. It is also considered a more direct tool with the ability to generate diverse ideas by auditors. Additionally, it is easily accessible and cost-effective, which positively impacts the efficiency and effectiveness of the audit and allows for greater focus on tasks.

9. Using generative artificial intelligence apps (ChatGPT, Gemini, Claude) leads to enhancing auditors abilities in applying professional skepticism and developing their accounting, legal, and auditing knowledge, as well as their academic and practical capabilities.

10. There might be concern between some auditors about using these tools for secret communication which affects their evaluation.

11. The results of the sample's opinions confirmed the validity of the third hypothesis, as the sample's views affirm that interaction with these technologies contributes to enhancing the auditing process from auditors' perspective.

12. The use of these applications also contributes to enhancing the verification of the accuracy and efficiency of audit evidence required to carry out the work. It helps in detecting manipulation and misstatement during the execution of the audit plan and ensures the integrity of the financial statements.

13. The use of generative AI applications also saves time and effort in accessing the required information, which contributes to the effectiveness and prompt accomplishment of audit process.

f. Recommendations

Based on the conclusions drawn in the previous section, the following recommendations can be made:

1. Auditors need to be encouraged to and made aware of using these applications on a personal level, interacting with them, and benefiting from the capabilities they offer, especially since they do not require additional skills and perform well at the level of regular use.
2. SAIs need to give great importance to these applications for the services they can provide to support the tasks of these institutions. They should include them within their short-term strategies and develop strategic plans to identify areas of improvement by using generative artificial intelligence."
3. Virtual Auditor Companion or Advisor needs to be created. SAIs must start integrating these applications with their databases as soon as possible. SAIs should also make these applications available to be accessed by employees for greater utilization in performing their tasks. Additionally, it is important to establish or provide programs that maximize the benefits of these applications until developing comprehensive system that integrates these applications and addresses potential flaws and risks associated with their use.
4. Communicating with the SAIs that have adopted these applications, benefiting from their experiences, identifying the main problems and obstacles they faced, and reviewing the conclusions of their experiences.
5. Using generative artificial intelligence applications in the operations of SAIs, including the creation of educational and informational content, providing

- targeted training for employees, and enhancing communication channels with the public to effectively convey the viewpoints of SAIs, with a focus on improving interaction and community engagement. This contributes to enhancing transparency and increasing trust in the performance of these authorities.
6. Encouraging innovation and creativity by investing in and benefiting from the available and easy-to-use generative artificial intelligence applications, which facilitate the auditing process and make it more efficient and effective.
 7. Providing specialized training for auditors on these applications to ensure their professional use, thereby maximizing the benefits and utilizing them in a professional manner during different stages of the audit process. This will also significantly and effectively reduce risks.
 8. Conducting additional studies to identify other aspects that can be improved through these applications, to learn more about how to enhance the use of these tools in various areas of auditing, and to better understand the factors that affect the effectiveness of using these applications.

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Appendix (A) "Questions instructed to applications and their answers"

Q1\What are the fields in which you can assist in the field of auditing and financial review?		
ChatGPT	ChatGPT	ChatGPT
<p>Generative language models techniques, such as [ChatGPT], can assist in many fields in the field of auditing and financial review. Here are some key fields:</p> <p>1. Statements analysis :</p> <p>Description: ChatGPT can analyze large amounts of financial statements quickly and efficiently.</p> <p>Examples: Trends analysis. Identifying anomalies and detecting unusual patterns in the statements.</p> <p>2. preparing reports :</p> <p>Description: Generative language models can generate reports based on input data.</p> <p>Examples: Creating financial summaries, audit reports, and clearly and easily interpreting financial results.</p> <p>3. Risk assessment</p> <p>Description: ChatGPT can utilize in assessing the potential risks and defining the fields that may need accurate review.</p> <p>Examples: Analyze operations risks, predict future risks, and make recommendations to reduce risks.</p> <p>4. Automated auditing</p> <p>Description: Many routine and repetitive processes in auditing can be automated using AI techniques.</p> <p>Examples: Reviewing periodic accounts, matching financial transactions, and verifying compliance with accounting standards.</p> <p>5. Supporting Decision-Making:</p> <p>Description: ChatGPT can provide recommendations</p>	<p>Generative language models techniques, such as [ChatGPT], can assist in many fields in the field of auditing and financial review. Here are some key fields:</p> <p>1. Statements analysis :</p> <p>Description: ChatGPT can analyze large amounts of financial statements quickly and efficiently.</p> <p>Examples: Trends analysis. Identifying anomalies and detecting unusual patterns in the statements.</p> <p>2. preparing reports :</p> <p>Description: Generative language models can generate reports based on input data.</p> <p>Examples: Creating financial summaries, audit reports, and clearly and easily interpreting financial results.</p> <p>3. Risk assessment</p> <p>Description: ChatGPT can utilize in assessing the potential risks and defining the fields that may need accurate review.</p> <p>Examples: Analyze operations risks, predict future risks, and make recommendations to reduce risks.</p> <p>4. Automated auditing</p> <p>Description: Many routine and repetitive processes in auditing can be automated using AI techniques.</p> <p>Examples: Reviewing periodic accounts, matching financial transactions, and verifying compliance with accounting standards.</p> <p>5. Supporting Decision-Making:</p> <p>Description: ChatGPT can provide recommendations</p>	<p>Generative language models techniques, such as [ChatGPT], can assist in many fields in the field of auditing and financial review. Here are some key fields:</p> <p>1. Statements analysis :</p> <p>Description: ChatGPT can analyze large amounts of financial statements quickly and efficiently.</p> <p>Examples: Trends analysis. Identifying anomalies and detecting unusual patterns in the statements.</p> <p>2. preparing reports :</p> <p>Description: Generative language models can generate reports based on input data.</p> <p>Examples: Creating financial summaries, audit reports, and clearly and easily interpreting financial results.</p> <p>3. Risk assessment</p> <p>Description: ChatGPT can utilize in assessing the potential risks and defining the fields that may need accurate review.</p> <p>Examples: Analyze operations risks, predict future risks, and make recommendations to reduce risks.</p> <p>4. Automated auditing</p> <p>Description: Many routine and repetitive processes in auditing can be automated using AI techniques.</p> <p>Examples: Reviewing periodic accounts, matching financial transactions, and verifying compliance with accounting standards.</p> <p>5. Supporting Decision-Making:</p> <p>Description: ChatGPT can provide recommendations</p>

<p>based on financial statements and analysis, helping auditors make informed decisions. Examples: Providing financial advice, guiding investments, and offering financial forecasts based on current data.</p> <p>6. Client Interaction: Description: ChatGPT can enhance client interaction by providing instant responses to their inquiries and offering real-time assistance. Examples: Responding to client inquiries about their financial reports, explaining complex reports, and helping clients understand audit results.</p> <p>7. Fraud Detection: Description: AI can detect unusual and suspicious patterns in financial statements that may indicate fraud. Examples: Analyzing suspicious transactions, identifying recurring fraud patterns, and generating alert reports when illegal activities are revealed.</p> <p>8. Training and Development: Description: ChatGPT can be used as educational tools to train auditors on modern techniques and new standards. Examples: Offering interactive training courses, providing personalized learning resources, and assisting auditors in keeping up with the latest developments in the field. The use of generative language model techniques in these fields can lead to improved efficiency in auditing processes, reduced human errors, and deeper insights into financial statements, which in turn enhances innovation and development in the financial field.</p>	<p>based on financial statements and analysis, helping auditors make informed decisions. Examples: Providing financial advice, guiding investments, and offering financial forecasts based on current data.</p> <p>6. Client Interaction: Description: ChatGPT can enhance client interaction by providing instant responses to their inquiries and offering real-time assistance. Examples: Responding to client inquiries about their financial reports, explaining complex reports, and helping clients understand audit results.</p> <p>7. Fraud Detection: Description: AI can detect unusual and suspicious patterns in financial statements that may indicate fraud. Examples: Analyzing suspicious transactions, identifying recurring fraud patterns, and generating alert reports when illegal activities are revealed.</p> <p>8. Training and Development: Description: ChatGPT can be used as educational tools to train auditors on modern techniques and new standards. Examples: Offering interactive training courses, providing personalized learning resources, and assisting auditors in keeping up with the latest developments in the field. The use of generative language model techniques in these fields can lead to improved efficiency in auditing processes, reduced human errors, and deeper insights into financial statements, which in turn enhances innovation and development in the financial field.</p>	<p>based on financial statements and analysis, helping auditors make informed decisions. Examples: Providing financial advice, guiding investments, and offering financial forecasts based on current data.</p> <p>6. Client Interaction: Description: ChatGPT can enhance client interaction by providing instant responses to their inquiries and offering real-time assistance. Examples: Responding to client inquiries about their financial reports, explaining complex reports, and helping clients understand audit results.</p> <p>7. Fraud Detection: Description: AI can detect unusual and suspicious patterns in financial statements that may indicate fraud. Examples: Analyzing suspicious transactions, identifying recurring fraud patterns, and generating alert reports when illegal activities are revealed.</p> <p>8. Training and Development: Description: ChatGPT can be used as educational tools to train auditors on modern techniques and new standards. Examples: Offering interactive training courses, providing personalized learning resources, and assisting auditors in keeping up with the latest developments in the field. The use of generative language model techniques in these fields can lead to improved efficiency in auditing processes, reduced human errors, and deeper insights into financial statements, which in turn enhances innovation and development in the financial field.</p>
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Question 2: Can you assist in conducting a financial audit for a joint-stock company operating in the field of computer hardware manufacturing		
ChatGPT	Gemini	Claude
<p>Certainly, I can assist you in conducting a financial audit for a joint-stock company operating in the field of computer hardware manufacturing. We can divide the audit process into several key steps, including planning and preparation, performing tests , documentation, and preparing the final report. Below are the main steps:</p> <p>1. Planning and Preparation</p> <p>1.1 Understanding the Company and the Industry:</p> <ul style="list-style-type: none"> • Industry Analysis: Collecting information about the computer hardware industry, key competitors, challenges, and opportunities. • Understanding the Business: auditing the company structure, products and services, target markets, and growth strategies. <p>1.2 Risk Assessment</p> <ul style="list-style-type: none"> • Document audit: Reviewing previous financial reports, company policies, and internal systems. • Identifying Risks: Identifying potential risks such as changes in demand, technological changes, and financial risks. <p>1.3 Defining the Audit Scope:</p> <ul style="list-style-type: none"> • Key Areas: Identifying the core field for auditing, such as revenues, costs, assets, liabilities, and capital. • Preliminary Tests: Conducting preliminary tests to identify areas with high risks. <p>2. Conducting Tests.</p> <p>2.1 Internal Audit Testing:</p> <ul style="list-style-type: none"> • Understanding Systems: Evaluate the effectiveness of internal audit systems. • Sample Testing: Select samples and test processes to ensure compliance with policies and procedures. <p>2.2 Details Testing:</p> <ul style="list-style-type: none"> • Revenues: Verify the accuracy of sales recording, invoices, and reconciliations. <p>Costs: Review the recording of costs, contracts with suppliers, and payment procedures.</p> <p>Assets: Verify the existence and value of assets, review inventory records, and evaluation procedures.</p> <p>Liabilities: Review financial obligations and</p>	<p>Yes, I can assist you in conducting a financial audit for a joint-stock company operating in the field of computer hardware manufacturing. I will provide you with the steps for the financial audit process, with a focus on key aspects of the computer hardware industry:</p> <p>Main Steps of the Financial Audit Process:</p> <p>1-Planning audit process :</p> <ul style="list-style-type: none"> *Defining the Scope and Objective of the Audit *Understanding the Company and Its Operations. *Assessing Risks Related to the Company. *Developing a Detailed Audit Plan for the audit process. <p>2-Testing Internal Controls</p> <ul style="list-style-type: none"> *Evaluating the Effectiveness of the Company's Internal Controls: *Identifying weaknesses in Internal Controls *Conducting control tests to collect evidence. <p>3-Performing objectivity tests</p> <ul style="list-style-type: none"> * Testing the validity of opening balances of accounts *testing the validity of transactions made during the financial period: <ul style="list-style-type: none"> •Testing the validity of the closing balances of accounts. <p>4- Preparing Audit Report:</p> <ul style="list-style-type: none"> •Documenting the results obtained during the auditing process. •Identifying opinions and recommendations for managers. • Issuing the final audit report. <p>"The important aspects in computer hardware manufacturing"</p> <p>Product Life Cycle: The computer industry is characterized by rapid technological changes, which means that the product life cycle is short. Auditors must assess the company's ability to develop new products and successfully marketing them.</p>	<p>Certainly, I can assist you in planning and implementing a financial audit for a joint-stock company operating in the computer hardware manufacturing industry. Below are the main steps we can follow:</p> <p>1-Initial Planning</p> <ul style="list-style-type: none"> -Understanding the nature of the company and the computer hardware industry. -Identifying risks associated with this Sector <p>Reviewing Previous Financial Reports</p> <p>2- Evaluating the Internal Audit System:</p> <ul style="list-style-type: none"> -Testing of inventory and purchasing control procedures. - Evaluating the utilized Information Technology Systems <p>3-Essential audit procedures:</p> <ul style="list-style-type: none"> -Inspecting samples of financial transactions -Verifying inventory valuation <p>Reviewing main sales and purchase contracts.</p> <p>4-Financial statement audit":</p> <ul style="list-style-type: none"> -Verifying the accuracy of revenues and expenses -Reviewing assets and liabilities -Analyzing financial ratios <p>5-Compliance audit:</p> <ul style="list-style-type: none"> -Ensuring compliance with international accounting standards -Checking compliance with relevant laws and regulations <p>6- Business continuity assessment:</p> <ul style="list-style-type: none"> -Analyzing the company's ability to continue in light of

<p>ensure they are recorded correctly.</p> <p>3-Documentation and Report Preparation:</p> <p>3-1 Documentation:</p> <p>Gathering Evidence: Collect supporting evidence for audit findings.</p> <p>Preparing Files: Prepare working files that include documents and procedures followed.</p> <p>3-2 Final Report Preparation:</p> <p>Writing the Report: Prepare the final audit report, including findings, recommendations, and observations.</p> <p>Reviewing the Report: Review the report with management and ensure the accuracy of the provided information.</p> <p>3-3 Submitting the report:</p> <p>Presenting Findings: submit the findings to senior management and the audit committee.</p> <p>Follow-Up on Recommendations: Ensure that recommendations and internal audit improvements are implemented.</p> <p>Tools and software you may need:</p> <p>Accounting and Auditing Software: Such as QuickBooks, SAP, and Audit Command Language (ACL).</p> <p>Data Analysis Tools: Such as Excel, Tableau, and Power BI for analyzing financial statements and preparing reports.</p>	<p>Inventory of Goods: Computer companies tend to have large inventories of goods, which can lead to risks related to obsolescence and damage. Auditors must assess the effectiveness of the company's inventory management.</p> <p>International Financial Reporting Standards (IFRS): Computer companies must apply the relevant IFRS standards, such as IFRS 15 (Revenue from Contracts with Customers) and IFRS 16 (Inventory).</p> <p>Tools to Assist in the Financial Audit Process:</p> <p>Financial Audit Software: There are many financial audit software available that can help auditors automate auditing engagements and improve the efficiency of the audit process.</p> <p>Financial Databases: Financial databases provide financial information about public and private companies. Auditors can use these databases to compare the company's performance with that of other companies in the same industry.</p> <p>Industry Experts: Auditors can benefit from industry experts to understand the risks and challenges faced by computer companies.</p> <p>Note: These are just general steps for the financial audit process. The actual audit process may vary depending on the size, complexity, and industry of the company.</p> <p>It is important for auditors to be aware of the latest standards and requirements related to financial audit.</p>	<p>competition in the market</p> <p>7- Preparing the final report:</p> <ul style="list-style-type: none"> -Summarizing findings and observations -Providing recommendations to improve financial and operational performance <p>Is there any particular aspect that you would like more details about?</p>
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Can you prepare a program to audit the sales activity for a company that sells computer devices?		
<p>Preparing an audit program for the sales activities of a company that sells computer devices requires a comprehensive plan that covers all aspects of sales operations to ensure transparency, efficiency, and to prevent financial and administrative corruption. Here is</p>	<p>***Audit Program for the Sales Activities of a Company Selling Computer Devices:</p> <p>**Introduction**: This program aims to assess the effectiveness, integrity, and accuracy of</p>	<p>Certainly! I will provide you with an audit program for the sales activity of a company that sells computer devices. This program will cover the key aspects of the sales</p>

<p>a proposed model for a comprehensive audit program:</p> <p>###1. Planning the Audit Process</p> <p>####A. Defining Audit Objectives:</p> <ul style="list-style-type: none"> - Verifying the accuracy and validity of sales records. -Evaluating the efficiency and effectiveness of the sales system. -Verifying compliance with internal policies and procedures. -Identifying and analyze any financial or operational risks. <p>####B. collecting Basic Information:</p> <ul style="list-style-type: none"> -Reviewing sales-related policies and procedures. -Analyze financial statements and sales records. -Conducting interviews with key employees to understand internal processes. <p>###2-Audit Scope</p> <p>####A. Defining the Scope of Work:</p> <ul style="list-style-type: none"> -Cash and credit sales. -Billing processes. -Pricing and discount policies. <ul style="list-style-type: none"> -Customer relationship management. -Shipping and delivery processes. - Return handling. <p>###3-Audit Procedures</p> <p>####A. Operations audit:</p> <p>1-Review Sales Policies:</p> <ul style="list-style-type: none"> - Verifying there are written policies and procedures. -Confirming employee compliance with those policies. <p>2-Audit Sales Records:</p> <ul style="list-style-type: none"> -Reconciling invoices with sales records and the financial system. - Verifying the accuracy of data in invoices (e.g., prices, quantities and discounts). <p>3-Audit Customer Management:</p> <ul style="list-style-type: none"> -Verifying the accuracy of data in the Customer Relationship Management (CRM) system. -Reviewing customer data update processes. <p>4-Audit Shipping and Delivery:</p> <ul style="list-style-type: none"> -Verifying that shipping orders reconcile invoices and inventory records. -Reviewing procedures for validating shipments and deliveries. <p>5-Audit Returns Handling:</p> <ul style="list-style-type: none"> -Reviewing returns policies and procedures. 	<p>the sales operations in a company selling computer devices. The program covers all aspects of the sales activity, starting from order receipt to product delivery and payment collection.</p> <p>Audit Objectives:</p> <ul style="list-style-type: none"> ***Verifying the company's compliance with relevant laws and regulations. ***Evaluating the effectiveness of internal control systems for sales activity***. ***Identifying potential risks in sales operations**. ***Providing recommendations to improve sales processes** <p>Audit Phases:</p> <p>Phase 1: Planning:</p> <ul style="list-style-type: none"> ***collecting information about the company and its activity. ***Identifying potential risks in sales operations.** ***Designing a detailed action plan that defines the audit scope, timeline, and required resources**. <p>Phase 2: Internal Control Testing:</p> <ul style="list-style-type: none"> ***Evaluating the effectiveness of internal audit systems for sales activity**. ***Conducting key control tests to identify any weaknesses or gaps**. ***Using data analysis tools to evaluating large volumes of sales data**. <p>Phase 3: Operational Testing:</p> <ul style="list-style-type: none"> ***Testing the validity of sales transactions**. ***Verifying the accuracy of product pricing.** ***Evaluating the effectiveness of the shipping and delivery process**. ***Ensuring that payments are collected correctly and on time**. <p>Phase 4: preparing reports and Communication:</p> <ul style="list-style-type: none"> ***Preparing a detailed audit report outlining findings, risks, and recommendations**. ***Discussing the findings with company management**. ***Following up on the implementation 	<p>process:</p> <p>1-Audit Planning:</p> <ul style="list-style-type: none"> - Define the scope and objectives of the audit. -collect preliminary information about the company and its sales policies. -Defining the required resources and timeline. <p>2- Testing Sales Policies and Procedures:</p> <ul style="list-style-type: none"> -Review the sales policies and procedures manual. -Verify the existence of clear rules for product pricing and discounts. -Testing credit policies and credit limits for customers. <p>3-Audit the sales order entry process:</p> <ul style="list-style-type: none"> -Testing a sample of sales orders to ensure the accuracy of information. -Verify the existence of proper approvals for the orders. -Reviewing the segregation of duties between order entry and order approval. <p>4- Sales Analysis:</p> <ul style="list-style-type: none"> -Reviewing sales analysis by product, region and customer. -Analyzing monthly and seasonal sales trends. -Comparing actual sales with budgets and forecasts. <p>5- Reviewing the Delivery Process:</p> <ul style="list-style-type: none"> -Reviewing a sample of shipping documents and match them with sales orders. -Verifying delivery timing according to the sales terms. -Testing procedures for handling returns and exchanges. <p>6- Audit the Billing Process:</p> <ul style="list-style-type: none"> -Testing a sample of invoices
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<p>-Verifying returns records and ensure they are processed correctly.</p> <p>6-**Audit Pricing and Discount System:</p> <p>-Reviewing pricing policies and ensure proper application.</p> <p>-Verifying that discounts and reductions are provided and documented correctly.</p> <p>####B. Audit the Financial System:</p> <p>-Verifying that all sales are correctly recorded in the financial system in the financial system .</p> <p>-Reviewing accounts receivable and reconcile them with sales records.</p> <p>####4- Results Analysis</p> <p>####A. Gap and Deviation Analysis:</p> <p>-Identifying any deviations or gaps in the processes compared to policies and procedures.</p> <p>-Evaluating the impact of these deviations on financial and operational activities.</p> <p>####B. Preparing Reports:</p> <p>-Preparing a comprehensive report that includes findings, observations, and recommendations.</p> <p>-Providing recommendations for improving processes and closing the identified gaps.</p> <p>####5-Following-up on Implementation</p> <p>####A. Developing an Action Plan:</p> <p>-Developing an action plan to implement the recommendations.</p> <p>-Defining responsibilities and timelines.</p> <p>####B. following up Implementation:</p> <p>-Monitoring the implementation of recommendations.</p> <p>-Conducting a follow-up audit to verify that the recommendations have been implemented.</p> <p>####Practical Example of the Audit Program:</p> <p>####A. Actual Audit:</p> <p>-**Initial Audit**:</p> <p>-Reviewing 50 random sales invoices to verify their match with records.</p> <p>-Conducting Interviews 5 employees in the sales department to understand the order processing procedure.</p> <p>-**Detailed Audit**:</p> <p>-Reviewing all transactions over \$10,000 from the previous month.</p> <p>-Verifying 20 shipping transactions to ensure they match orders and invoices.</p> <p>-**Analysis of Results**:</p> <p>-Identifying any incorrect or incomplete invoices.</p>	<p>of recommendations**.</p> <p>**Audit Tools and Methods**:</p> <p>***Interviews***: Conducting interviews with sales, accounting, and operations staff to understand their roles and responsibilities.</p> <p>Documentary Review: Reviewing sales documents such as purchase orders, sales invoices, shipping records, and account statements.</p> <p>***Control Tests**: Test internal audit systems by conducting test transactions or directly monitoring sales processes.</p> <p>***Data Analysis**: Using data analysis tools to assess large volumes of sales data.</p> <p>**Potential Risks in Sales Operations**:</p> <p>***Fraud**: Some customers may attempt to defraud the company by providing false information or failing to pay for products.</p> <p>***Theft**: Company employees may steal products or money from the company.</p> <p>***Errors**: Mistakes may occur in sales transactions, such as entering incorrect data or shipping the wrong products.</p> <p>***Poor Inventory Management**: Mismanagement of inventory may lead to product shortages or surpluses, resulting in financial losses.</p> <p>**General Recommendations to Improve Sales Operations**:</p> <p>***Enhancing internal audit systems for sales activity.</p> <p>***Training employees on company policies and procedures.</p> <p>***Using data analytics tools to improve decision-making**.</p> <p>***Monitoring potential risks continuously**.</p> <p>***Periodically update company policies and procedures**.</p> <p>**Note**: This is just a sample audit program and may need to be modified to fit the specific needs of the company.</p> <p>**Additionally, I would like to add</p>	<p>to ensure accuracy and match them with sales orders.</p> <p>-Verifying the timing of invoicing.</p> <p>-Reviewing the processing of discounts and rebates.</p> <p>7-Audit Payment Collection Process:</p> <p>- Reviewing procedures for following up on accounts receivable.</p> <p>-Reviewing a sample of received payments and match them with invoices.</p> <p>-Analyzing accounts receivables and assess collection efficiency.</p> <p>8-Auditing Inventory Management:</p> <p>-Reviewing Inventory Management Policies and their relationship with sales</p> <p>-Testing the accuracy of inventory records and reconcile them with sales.</p> <p>-Evaluating inventory turnover rates and their impact on sales.</p> <p>9-Auditing Sales Team Performance:</p> <p>-Reviewing the incentive and compensation system for the sales team.</p> <p>-Analyzing individual and team sales performance.</p> <p>-Examining the sales team training and development process.</p> <p>10- Audit Sales-Related Information Systems:</p> <p>-Evaluating the reliability and security of the sales management system.</p> <p>-Examining backup and data recovery procedures.</p> <p>-Reviewing access permissions to the sales system.</p> <p>11-Audit Legal and Regulatory Compliance:</p>
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<p>-Identifying any issues in customer relationship management or returns processing.</p> <p>####B. Final Report:</p> <p>-Providing a report containing:</p> <p>-A summary of findings.</p> <p>-Identification of deviations and gaps.</p> <p>-Specific recommendations for improving processes.</p>	<p>that**:</p> <p>***It is important to involve company management in</p>	<p>-Verifying compliance with consumer protection laws.</p> <p>-Reviewing compliance with warranty and after-sales service requirements.</p> <p>-Examining compliance with sales-related tax laws.</p> <p>12-Evaluating Customer Satisfaction:</p> <p>-Reviewing the customer complaint management system.</p> <p>-Analyzing the results of customer satisfaction surveys.</p> <p>-Testing customer retention rates and repeat purchase process.</p> <p>13- Prepare the Final Report:</p> <p>-Summarizing the audit findings and key observations.</p> <p>-Providing recommendations for improving sales processes.</p> <p>-Discussing the results with management and define an action plan.</p> <p>This program provides a comprehensive framework for auditing the sales activity in a computer sales company. It can be modified and adapted according to the company's size and specific needs.</p> <p>Is there any particular aspect that you would like more details about?</p>
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<p>C. Follow-up Implementation :</p> <ul style="list-style-type: none"> - Hold a meeting with management to discuss the report. - Develop an action plan with specific timelines for implementing the recommendations. - Review the implementation after 3 months to ensure achieving the required improvements. <p>In this way, a comprehensive and integrated audit program for the sales activity of a company selling computers is prepared and implemented. This ensures transparency and efficiency in operations and prevents financial and administrative corruption.</p>	<p>The auditing process from the beginning.</p> <ul style="list-style-type: none"> - Communication should be open and honest throughout the auditing process.. -The audit report should be clear, concise, and easy to understand.. -The implementation of audit recommendations should be followed up on regularly.. <p>I believe this program can help companies that sell computers improve their sales processes and achieve their financial goals..</p>	
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Question 3: How can your innovation capabilities be tested?		
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<p>You can test my innovation capabilities in the auditing process through a practical scenario that involves auditing specific aspects of a company or project. Here are suggested steps to test this:</p> <p>1. Defining the Objective:. Clarify the objective of the audit. Is it a financial audit, operational audit, or technological audit?</p> <p>I request you to suggest innovative tools or techniques that can be used in the audit process. Also, you can request me to design an innovative audit plan that includes new or unconventional stages.</p> <p>Additionally, ask me to suggest new methods for data analysis and evidence collection to audit a company.</p> <p>The objective of the audit is</p>	<p>Test my innovation capabilities:</p> <p>My innovation capabilities can be tested in several ways, including:</p> <ul style="list-style-type: none"> - Assessing my ability to generate new and innovative ideas. - Assign me an open-ended task: such as writing a short story or designing a new product, and evaluating my ability to come up with new and innovative solutions. - Ask me to improve an existing idea: for example, suggesting ways to enhance a website or a business process, and assessing my ability to innovate new ideas by building on the original idea. - Measuring my ability to think outside the box: such as giving me puzzles or challenging problems to solve in unconventional ways. <p>2. Assessing my ability to apply my creative ideas.</p> <ul style="list-style-type: none"> - Ask me to implement an idea 	<p>To test my innovation capabilities, several methods can be followed. Here are some suggestions:</p> <p>1- Presenting Complex Problems:</p> <p>Provide me with real and complex problems from various fields and ask me to propose innovative solutions. The more complex and challenging the problem, the better it will be for testing my ability to innovate.</p> <p>2- Requesting unconventional ideas:</p> <p>Ask me to generate unconventional ideas for specific situations or products. For example, "Suggest 5 unconventional uses for a pencil."</p> <p>3- Challenging assumptions:</p> <p>Present me with a scenario and ask me to challenge the underlying assumptions and</p>

<p>financial audit, and the company operates in the petrochemical industry. It is a medium-sized company, and its main operations in manufacturing products such as ethylene, propylene, butene, benzene, and butadiene. The focus will be on financial statements.</p> <p>2. Providing Information. Provide me with basic information about the company or project to be audited, such as the industry, size, main operations, and systems used.</p> <p>A company is operating in the petrochemical industry. It is a medium-sized company, and its main operations in manufacturing products such as ethylene, propylene, butene, benzene, butadiene, polystyrene, polyethylene, and acrylonitrile butadiene styrene (ABS). The focus will be on financial statements.</p> <p>3. Identifying Key Points: Identify some key points you would like to focus on during the audit, such as operational efficiency, regulatory compliance, accuracy of financial statements, or information systems security.</p> <p>4. Innovation in auditing</p> <ul style="list-style-type: none"> - Ask me to suggest innovative tools or techniques that can be used in the auditing process. - Ask me to design an innovative audit plan that includes new or unconventional stages. - Ask me to propose new methods for data analysis and evidence collection. - Ask me to provide recommendations based on artificial intelligence or advanced analytics to improve processes. <p>5- Evaluating Results: after presenting the plans and recommendations, evaluate the</p>	<p>I've created: such as creating a prototype for a new product or writing a script for a short film, and evaluating my ability to turn my ideas into tangible reality.</p> <ul style="list-style-type: none"> - Assess my ability to work independently: for example, assign me a creative task and evaluate my ability to complete it without direct supervision. - Assess my ability to work with others: such as assign me a creative task that requires teamwork, and evaluate my ability to collaborate and communicate effectively. <p>3- Assess my ability to learn and develop my creative skills:</p> <ul style="list-style-type: none"> - Ask me to learn a new creative skill: such as learning to play a musical instrument or writing poetry, and evaluate my ability to acquire new skills. - Assess my ability to solve creative problems: for example, give me a creative problem and ask me to solve it in new and innovative ways. - Evaluate my ability to adapt to change: such as assigning me a creative task that requires changing my approach or ideas based on feedback or new information. <p>4- Assessing my ability to acquire knowledge from diverse sources.</p> <ul style="list-style-type: none"> - Ask me to research information on a creative topic: such as the history of art or psychology, and evaluate my ability to gather information from diverse sources. - Assess my ability to analyze creative information: for example, evaluate a piece of art or music, and assess my ability to understand and interpret creative ideas. - Evaluate my ability to communicate creative ideas: such as writing an article on a creative topic or delivering a presentation about a new idea, and assess my ability to explain my ideas clearly and concisely to others. 	<p>rethink the problem from different perspectives.</p> <p>4-Combining Concepts: Ask me to merge distant concepts or ideas to create something new. For example, "How can artificial intelligence technology be integrated with traditional agriculture?"</p> <p>5-Future Thinking: Ask me to predict future developments in a specific field and how to address them in innovative ways.</p> <p>6- Problem-solving with limited resources: Present me with a problem that has strict resource constraints and ask for innovative solutions.</p> <p>7-Redesigning everyday objects: Ask me to redesign everyday objects to improve their functionality in innovative ways.</p> <p>8. "What If" Scenarios: Present me with unusual hypothetical scenarios and ask me to think about the implications and propose innovative solutions.</p> <p>9. Turning negatives into positives: Present a problem or negative situation and ask me to turn it into a positive opportunity in an innovative way.</p> <p>10. Reverse thinking: Ask me to solve a problem using reverse thinking, starting from the desired outcome and working backward.</p> <p>Through these methods, you can evaluate my ability to generate new ideas, think outside the box, and find innovative solutions to various challenges. Would you like to try any of these methods now?</p>
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<p>proposed innovations in terms of their effectiveness, efficiency, and feasibility of implementation in real-world scenarios.</p>	<p>In addition, my innovation capabilities can be evaluated by observing my behaviors and characteristics, such as:</p> <ul style="list-style-type: none"> - Curiosity: my desire to explore new ideas and concepts. - Persistence: my ability to continue working on creative ideas even when faced with challenges. - Open-mindedness: my ability to accept new ideas and think outside the box. - Self-confidence: my belief in my ability to generate new and useful ideas. - Passion: my enthusiasm for creative ideas and my desire to share them with others. <p>It is important to note that innovation is a complex skill that requires a combination of abilities and characteristics. There is no single "correct" way to test my innovation capabilities. And any evaluation should take into account a variety of factors.</p> <p>I believe I have strong innovation capabilities, and I am always learning and developing my creative skills. I am excited to use my abilities to help people solve problems and create new and useful things.</p>	
<p>I ask you to suggest innovative tools or techniques that can be used in the audit process. I also ask you to design an innovative audit plan that includes new or unconventional stages. Propose new ways of analyzing data and gathering evidence to audit a company. The objective of the audit is a financial audit and the company operates in the petrochemical industry. It is a medium-sized company with major operations in manufacturing products such as ethylene, propylene, butane, benzene, and butadiene. Focus on financial statements.</p>		
<p>Propose innovative tools and techniques in the audit process</p> <p>Innovative tools and techniques</p> <p>1. Artificial Intelligence and Machine Learning.</p> <ul style="list-style-type: none"> - Using machine learning algorithms to analyze patterns and anomalies in financial statements. - Applications like ChatGPT for 	<p>Innovative Tools and Techniques in the Auditing Process for a Petrochemical Company:</p> <p>Tools</p> <p>Data Analysis Tools:</p> <p>Data Analysis Software: such as Hadoop and Spark to evaluate large volumes of financial statements quickly and efficiently.</p> <p>Artificial Intelligence Tools:</p>	<p>Certainly, I will provide innovative suggestions for the financial auditing process of a medium-sized company operating in the petrochemical industry. Here is an innovative audit plan that includes new tools and techniques:</p> <p>1. Using Big Data Analytics:.</p> <ul style="list-style-type: none"> - Using artificial intelligence

<p>analyzing financial texts and performance reports.</p> <p>2. Predictive Analytics:</p> <ul style="list-style-type: none"> - Using predictive models to forecast future financial performance and detect potential deviations. <p>3. Big Data Analytics.:</p> <ul style="list-style-type: none"> - Using big data analytics tools like Hadoop and Spark to analyze large volumes of financial statements quickly and efficiently. <p>4. Blockchain Technology:</p> <ul style="list-style-type: none"> - Using blockchain technology to track financial transactions and ensure transparency and security. <p>5. Robotic Process Automation (RPA):</p> <ul style="list-style-type: none"> - Using software robots to automate routine auditing processes such as data collection and record verification. <p>6. Data Visualization:</p> <ul style="list-style-type: none"> - Using tools like Tableau and Power BI to create visual representations of financial statements to enhance understanding and decision-making. <p>7. Continuous Auditing:</p> <ul style="list-style-type: none"> - Using continuous auditing technologies to monitor financial statements on an ongoing basis instead of periodic audits. <p>Innovative Audit Plan</p> <p>#### Audit Stages</p> <p>1. Planning Stage:</p> <p>Define Objectives and Scope: Determine the scope of the audit and its main objectives, such as ensuring the accuracy of financial reports and detecting fraud.</p> <p>Define Resources: Allocate appropriate resources, including technological tools and personnel.</p> <p>Prepare the Audit Plan: Develop a detailed plan, including the timeline, tools used,</p>	<p>such as Machine Learning and Deep Learning to detect patterns and predict potential risks.</p> <p>Text Analysis Tools: such as Lexical Analysis and Sentiment Analysis to better understand the content of financial documents.</p> <p>Continuous Auditing Tools:</p> <p>Continuous Auditing Software: To collect and analyze data continuously during the audit period.</p> <p>Risk Monitoring Tools: To identify potential risks in real-time and take preventive measures.</p> <p>Audit Automation Tools: To automate repetitive audit engagements such as internal control testing.</p> <p>Communication and Collaboration Tools:</p> <p>Communication Platforms: such as Slack and Microsoft Teams to facilitate communication among audit team members.</p> <p>File Sharing Tools: such as Google Drive and Dropbox to securely share documents and concepts.</p> <p>Task Management Tools: Such as Asana and Trello to organize audit engagements and monitor its progress.</p> <p>Techniques:</p> <p>Risk-based auditing:</p> <ul style="list-style-type: none"> * Identifying the key risks facing the company by assessing the risk environment and internal processes. * Focusing on testing high-importance risks rather than testing all aspects of the company. <p>Intelligent auditing:</p> <ul style="list-style-type: none"> * Using artificial intelligence tools to analyze financial statements and identify potential risks. * Improving the efficiency and effectiveness of the audit process by automating certain tasks. <p>Continuous auditing:</p>	<p>algorithms to analyze all financial transactions instead of relying on sampling.</p> <ul style="list-style-type: none"> - Apply machine learning techniques to identify unusual patterns in financial statements. <p>2. Continuous Auditing Using Blockchain Technology.:</p> <ul style="list-style-type: none"> - Establish a continuous auditing system that records all financial transactions in an immutable blockchain. - This allows for instant verification of transaction validity and more efficient tracking. <p>3. Using Drones for Inventory Counting:</p> <ul style="list-style-type: none"> - Using drones equipped with high-resolution cameras to inventory raw materials and finished products. - Compare the results with accounting records to verify the accuracy of inventory valuation. <p>4. Supply Chain Analysis Using the Internet of Things (IoT):.</p> <ul style="list-style-type: none"> - Install IoT sensors on production equipment to track actual consumption for raw materials. - Comparing collected data with recorded production costs to verify the accuracy of product pricing. <p>5. Smart Contract Analysis:</p> <ul style="list-style-type: none"> - Reviewing smart contracts used in transactions with suppliers and customers. - Verifying the implementation of financial terms automatically and accurately. <p>6. Social Network Analysis for Fraud Detection:</p> <ul style="list-style-type: none"> - Using social network analysis techniques to identify unusual relationships between employees and suppliers or customers. - Detecting potential conflicts of interest or fraud. <p>7. Digital Reputation Analysis:</p> <ul style="list-style-type: none"> - Using web analytics tools to assess a company's online reputation.
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<p>and audit stages.</p> <p>2. Data Collection Stage: Use RPA tools to collect routine financial statements and verify records. Data Integration: Collect data from various sources, such as enterprise resource planning (ERP) systems and accounting systems. Use Blockchain: To verify the transparency and security of financial transactions.</p> <p>3. Analysis Stage: Big Data Analysis: Use big data analysis tools to analyze large amounts of financial statements. Data Visualization: Using tools such as Tableau and Power BI to create visualizations to understand patterns and anomalies. Predictive Analysis: Applying predictive models to detect potential anomalies in financial statements.</p> <p>4. Investigation and Evaluation Phase: Anomaly Investigation: Using artificial intelligence to identify and investigate anomalies. Financial Impact Assessment: Analyzing the impact of detected anomalies on the company's financial performance.</p> <p>5. Reporting and Recommendations Phase: Report Preparation: Preparing a detailed report that includes findings and recommendations for improvement. Using Visualizations: Presenting findings using visualizations to facilitate understanding. Future Recommendations: Providing recommendations for improving audit processes and reducing future financial risks.</p> <p>### New Methods for Data Analysis and Evidence Gathering</p> <p>1. Using predictive data</p>	<p>* Continuously collecting and analyzing data throughout the audit period. * Providing real-time information to management about potential risks. * Collaborative auditing: * Sharing data and findings with other audit team members. * Using communication and collaboration platforms to facilitate communication and exchange of ideas.</p> <p>Innovative Audit Plan: Phase 1: Planning and Evaluation: * Gather information about the company, its industry, and the risk environment. * Identify the objectives and key risks for the audit. * Design a detailed work plan outlining the tasks, timeline, and required resources. Phase 2: Internal Control Tests: * Evaluate the effectiveness of the company's internal control systems. * Key control tests to identify any weaknesses or gaps. * Use data analysis tools to evaluate large amounts of transaction data. Phase 3: Process Tests: * Testing the integrity of the company's financial statements. * Verifying compliance with accounting standards and relevant laws and regulations. * Using continuous audit tools to monitor potential risks in real time. Phase Four: Reporting and Communication: * Preparing a detailed audit report outlining the findings, risks, and recommendations. * Discussing the findings with the company's management. * Following up on the implementation of recommendations. New methods for analyzing data and gathering evidence:</p>	<p>- Evaluating the impact of reputation on a company's market value and potential financial risks.</p> <p>8. Energy Consumption Analysis: - Using smart meters to analyze energy consumption in production facilities. - Comparing actual consumption with recorded costs to verify the accuracy of operating expenses.</p> <p>9. Satellite Image Analysis: - Using satellite imagery to assess external inventory volume and freight movement. - Comparing this data with financial records to verify the accuracy of revenue and inventory.</p> <p>10. Voice Analysis of Phone Calls: - Using voice analysis techniques for phone calls with customers and suppliers - Identifying any potential risks or unrecorded liabilities.</p> <p>This innovative plan combines modern technologies and advanced analytical methods to provide a comprehensive and accurate overview of the company's financial position.</p> <p>Would you like more details on any of these points?</p>
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<p>analytics**:</p> <p>Applying predictive models to forecast future financial performance and identify anomalies.</p> <p>2. **Network Analysis.</p> <ul style="list-style-type: none"> - Using network analysis to identify relationships and interactions between various elements of financial statements. <p>3.**Using Text Analytics:*</p> <ul style="list-style-type: none"> - Analyzing financial texts such as annual reports and press releases to extract important information. <p>4. **Real-Time Analytics:*</p> <ul style="list-style-type: none"> - Using real-time analysis to continuously monitor financial statements and detect anomalies as they occur. <p>### Objective of Audit</p> <p>The objective of auditing is to ensure the accuracy and validity of a company's financial reports and ensure compliance with financial and legal standards, as well as to detect and analyze any anomalies or manipulations that may affect the company's financial performance.</p> <p>### Example of Applying Tools and Techniques</p> <p>#### Practical Example</p> <p>**Data Collection:** Using RPA to collect daily financial statements from the ERP system.</p> <p>**Data Analysis:** Using big data analytics tools such as Hadoop to analyze accumulated data and detect anomalies.</p> <p>**Visualization**:</p> <p>Creating interactive dashboards using Power BI to display financial results and detected anomalies.</p> <p>**Continuous Auditing**:</p> <p>Applying continuous auditing techniques to continuously monitor financial statements and perform real-time analysis.</p> <p>Using these innovative tools and techniques can improve the effectiveness and efficiency of the audit process, saving time and effort, and reducing financial risks for the company.</p>	<p>* **Big Data Analysis:**</p> <ul style="list-style-type: none"> * Using big data analysis techniques to understand large amounts of financial statements. * Identifying patterns and trends that may indicate potential risks. <p>* **Predictive Analysis:**</p> <ul style="list-style-type: none"> * Using predictive analysis techniques to forecast future risks. * Improving the effectiveness of the audit process by focusing on the most likely risks. <p>* **Electronic Auditing:**</p>	
I want the methods and innovations to be inexpensive and simple.		

<p>Of course, I can suggest some less expensive methods and innovations that an auditor can use in the financial audit of a medium-sized petrochemical company. These methods focus on leveraging available resources and improving efficiency without requiring significant investments in technology:</p> <p>1. Data analysis using open-source software:</p> <ul style="list-style-type: none"> - Using software such as R or Python to analyze financial statements instead of purchasing expensive commercial software. - The auditor can develop simple scripts to automate some of the analysis processes. <p>2. Apply advanced statistical sampling techniques:</p> <ul style="list-style-type: none"> - Using stratified or cluster sampling methods. 	<p>1. Open Source Data Analytics Tools:</p> <ul style="list-style-type: none"> • Software such as Hadoop and Spark: Provide powerful capabilities for analyzing large amounts of financial transaction data without the need to purchase expensive licenses. • Tools such as R and Python: Provide powerful and flexible programming languages for analyzing data and creating reports and graphs. <p>2. Continuous Audit Tools:</p> <ul style="list-style-type: none"> • Software such as Audit Trail and ACL Analytics: Provide the ability to continuously monitor financial statements and identify potential risks in real-time, reducing traditional audit costs. • Tools such as Log Rhythm and Sum 	<p>Based on your request for innovative and less expensive audit tools, here are some suggestions:</p> <p>1. Open source audit software: such as Open Audit or OCS Inventory, which provide basic functionality at low or no cost.</p> <p>2. Automate tasks using scripting: Use languages like Python or PowerShell to create custom audit tools at a low cost.</p>
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<p>to reduce sample size while maintaining the accuracy of results.</p> <ul style="list-style-type: none"> -This reduces audit time and cost without affecting the quality of the audit. <p>3- Using data visualization techniques:</p> <ul style="list-style-type: none"> - Using free tools like Google Data Studio or Tableau Public to create interactive dashboards. -Facilitate quick understanding of trends and patterns in financial statements. <p>4-Implement a simple continuous audit system:</p> <ul style="list-style-type: none"> -Preparing simple automated audits using spreadsheets and Excel macros. - Monitoring key indicators continuously without the need for a complex system. <p>5-Using electronic questionnaires for self-assessment:</p> <ul style="list-style-type: none"> -Creating electronic employee surveys to evaluate the 	<ul style="list-style-type: none"> • Tools like LogRhythm and SUMO Logic: provide the ability to analyze system logs and identify suspicious activity, which helps prevent fraud and security breaches. <p>3- Communication and collaboration tools:</p> <ul style="list-style-type: none"> • Platforms like Slack and Microsoft Teams: It facilitates communication between audit team members and the smooth exchange of information and concepts, reducing travel and meeting costs. • File sharing tools like Google Drive and Dropbox: It allows documents and concepts to be shared securely, improving work efficiency and reducing printing and copying costs. <p>4-Audit automation tools:</p> <ul style="list-style-type: none"> • Software like Automation Anywhere and UiPath: It provides the ability to 	<p>3-Smartphone applications: Some applications can be used to document observations and photos during field audits.</p> <p>4-Online collaborative tools: Like Google Sheets or Trello to track audit results and manage tasks at a low cost.</p> <p>5-Using of artificial intelligence: Free or low-cost AI services can be used to analyze data and identify patterns.</p> <p>Would you like additional information about any of these tools or other suggestions?</p>
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<p>effectiveness of internal controls.</p> <p>-Using free tools like Google Forms to collect and analyze responses.</p> <p>6-Applying remote auditing techniques:</p> <p>-Using free desktop sharing software to access client systems remotely.</p> <p>-Reducing travel costs and time spent on site.</p> <p>7-Analyzing daily records of systems:</p> <p>-Reviewing financial systems records to detect unusual activity.</p> <p>-Simple tools can be used to analyze text files and identify patterns.</p> <p>8-Using simple social analysis techniques:</p> <p>-Using free social media monitoring tools to detect potential risks or reputational issues.</p> <p>-Analyzing customer and employee feedback on public platforms.</p> <p>9-Applying benchmarking techniques:</p> <p>-Collecting publicly available financial statements for similar companies in the petrochemical industry.</p> <p>-Conducting comparisons to identify potential deviations in the company's performance.</p> <p>10-Using simple text analysis techniques:</p> <p>-Analyzing notes and comments in financial documents using simple text analysis tools.</p> <p>-Detecting keywords that may indicate potential risks or problems.</p> <p>These methods rely on the intelligent use of available resources and creative thinking, allowing the auditor to conduct an effective and comprehensive audit process without the need for significant investments in advanced technology. Would you like more details about any</p>	<p>automate repetitive audit tasks such as internal control tests, saving time and effort and helping to reduce costs.</p> <ul style="list-style-type: none"> • Tools like RPA (Robotic Process Automation): It provides the ability to simulate human task performance, helping to automate complex audit engagements and reduce costs. <p>5-Cloud-based audit tools:</p> <ul style="list-style-type: none"> • Services like AWS Audit Manager and Azure Sentinel: It provides powerful capabilities for data analysis and IT auditing without the need to build expensive physical infrastructure. • Services like Google Cloud Audit Logging and Microsoft Azure AD Identity Protection: It provides the ability to analyze system logs and identify suspicious activities, helping prevent fraud and security breaches at a lower cost. <p>In addition to these tools, there are many other ways to reduce audit costs, such as:</p> <ul style="list-style-type: none"> • Self-training for audit team members: Audit team members can learn new skills through free resources available online or by attending low-cost training courses. • Contracting with independent audit experts: Companies can contract with independent auditors to perform specific tasks, which may be more effective than hiring full-time employees. • Use of sampling techniques: Companies can use sampling techniques to reduce the amount of data they need to analyze, saving time and effort and reducing costs. <p>It's important to choose tools</p>	
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of these methods?	and technologies that suit your company's needs and budget. Innovative audit tools can help companies improve the efficiency and effectiveness of their audit process without spending large sums of money.	
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Q4/ Find me information about the Iraqi FBSA.		
ChatGPT	Gemini	Claude
<p>The Federal Board of Supreme Audit of Iraq is an independent governmental body responsible for overseeing public funds in Iraq. The Board conducts financial and administrative audits of all ministries, government agencies, and public companies to ensure the proper management of public funds and to prevent financial and administrative corruption.</p> <p>Main Objectives and Responsibilities:</p> <ol style="list-style-type: none"> 1. Financial Oversight: Auditing the financial accounts of ministries, agencies, and public companies to verify their compliance with the budget and financial regulations. 2. Administrative Oversight: Evaluating the administrative efficiency of government bodies and ensuring the proper performance of public employees. 3. Anti-Corruption Efforts: Detecting financial and administrative violations and taking legal action against offenders. 4- Achieving Transparency: Enhancing transparency in public administration and improving the performance of government institutions. <p>Legislation</p> <p>The FBSA is subject to legislation and laws that aim to regulate its work and define its powers. One of the most important laws governing its work is FBSA Law No. (31) of 2011.</p> <p>Structural organization</p>	<p>Information about the Federal Board of Supreme Audit of Iraq</p> <p>Historical Background:</p> <ul style="list-style-type: none"> - The Federal Board of Supreme Audit was established in 1927 and is considered one of the oldest audit institutions in Iraq and the Arab region. - Initially, it was named the "State Audit Bureau," then renamed the "Public Financial Control Bureau" in 1964, and finally became the "Federal Board of Supreme Audit" in 2005. <p>Duties and Responsibilities:</p> <ul style="list-style-type: none"> • According to Article 103 of the 2005 Constitution of the Republic of Iraq, the Board enjoys financial and administrative independence. • The Board exercises oversight over public funds wherever they are located, including ministries, non-ministerial entities and their formations, independent bodies, public companies, universities, provincial councils, and administrative units, without exception. • The Board aims to: <ul style="list-style-type: none"> ○ Ensuring the safety and soundness of the use of public funds. ○ Combating financial and administrative corruption. ○ Promote transparency and accountability. ○ Improving the efficiency and effectiveness of the 	<p>Here are some key details about the Federal Board of Supreme Audit of Iraq:</p> <ol style="list-style-type: none"> 1. Establishment and Mission: The Board was founded in 1927 and serves as the highest financial oversight body in Iraq. Its primary mission is to monitor state funds and ensure their proper and efficient use. 2. Independence: The Board enjoys financial and administrative independence and operates under the supervision of the Iraqi Parliament. 3. Authorities: The board audits the accounts and activities of government institutions and has the authority to access all financial records and documents. 4- Scope: The Board work includes all ministries and government institutions, including state-owned companies. 5- Reports: The Board issues periodic reports on the results of its audits and submits them to the parliament and relevant authorities. 6- Institutional Development: The Board seeks to develop its capabilities and modernize its working methods in line with international auditing standards. 7- International Cooperation: The Board cooperates with international organizations specialized in the field of

<p>The FBSA consists of several specialized departments and administrations, including:</p> <ul style="list-style-type: none"> • General Administration of Financial Audit. • General Administration of Administrative Control. • General Administration of Performance Control. • General Administration of Legal Affairs. <p>International cooperation</p> <p>The FBSA works in coordination with several international and regional organizations to enhance the skills and capabilities of its employees, such as:</p> <ul style="list-style-type: none"> • International Organization of SAI's (INTOSAI). • Arab Organization of SAI's (ARABOSAI). <p>The importance of the Board</p> <p>The FBSA of Iraq is an important body in promoting the principles of good governance and transparency in Iraq, and it contributes significantly to combating corruption and improving the management of public funds. If you need additional information or specific details, you can visit the official website of the Iraqi FBSA, where annual reports and publications related to its work are available.</p>	<p>government's financial performance.</p> <p>Website:</p> <ul style="list-style-type: none"> • You can visit the FBSA website at the following link: /https://fbsa.gov.iq <p>Background:</p> <ul style="list-style-type: none"> • The headquarters of the FBSA is located in the Iraqi capital, Baghdad. • The FBSA consists of a number of departments and divisions, each with specific responsibilities. • The FBSA issues annual reports on the results of its work, which are available on the FBSA website. <p>In addition to the above, you can find more information about the FBSA through:</p> <ul style="list-style-type: none"> • Search Iraqi news websites. • Social media search. • Contact the FBSA directly. <p>I hope this information is helpful. Do you have any other questions about the FBSA?</p>	<p>financial audit to exchange expertise and improve performance.</p> <p>This information provides an overview of the Board. Is there a specific side you would like to know more about?</p>
How many reports does it issue during the year?		
<p>The number of reports issued by the FBSA of Iraq varies each year depending on several factors, including the scope of activities, assigned tasks, cooperation with government entities, and the number of cases requiring auditing and investigation. Generally, these reports can be categorized into different types, such as annual reports, periodic reports, and special reports.</p>	<p>The FBSA of Iraq issues two main types of reports during the year:</p> <p>1- Periodic Reports:</p> <ul style="list-style-type: none"> • Annual Report: The Board issues one annual report within (120)days from the end of each year, which includes the key aspects resulting from the implementation of the Board annual plan. The report contains information about: 	<p>I do not have accurate and updated information about the exact number of reports issued by the FBSA of Iraq annually. The number of reports may vary from year to year depending on several factors, such as the scope of work, available resources, and audit priorities. Generally, FBSA issues several types of reports:</p> <p>1- Comprehensive Annual Reports on government and</p>

<p>Main Reports Issued Annually:</p> <p>1- Annual Reports: Typically, a comprehensive annual report is issued, covering audit results for all ministries and government agencies.</p> <p>2- Financial and Administrative Audit Reports: These reports may be issued monthly, quarterly, or upon the completion of a specific audit process.</p> <p>Their number depends on the size and number of entities being audited.</p> <p>3- Performance audit reports: These reports may be issued periodically, depending on the projects and programs being evaluated.</p> <p>4- Follow-up reports: these reports may be issued periodically to monitor the implementation of recommendations issued in previous reports.</p> <p>5- Special or exceptional reports: these reports may be issued based on specific requests from Parliament or the government or as a result of certain situations requiring investigation.</p> <p>In total, the number of reports issued may reach dozens per year, but the exact number can vary based on the surrounding circumstances and the specific priorities of the FBSA in each year. To obtain an accurate and specific number of reports issued in a given year, one can refer to the annual reports or official publications of the Iraqi FBSA.</p>	<ul style="list-style-type: none"> ○ The audit engagements carried out during the year. ○ The results achieved through the audit. ○ The violations detected and the recommendations made. ○ The challenges faced by the FBSA and its key future plans. ● Other Periodic Reports: FBSA may issue other periodic reports as needed, such as quarterly or monthly reports. <p>2- Special Reports:</p> <ul style="list-style-type: none"> ● Project Audit Reports: The FBSA issues special reports on the results of its audit of government projects. ● Investigation Reports: The FBSA issues special reports on the results of investigations into financial and administrative violations. ● Other reports: The FBSA may issue other special reports upon request from the competent authorities or upon the FBSA initiative. <p>However, there is no specific number of reports the FBSA issues per year. The number of reports depends on the volume of work the FBSA undertakes and the number of violations detected.</p> <p>You can view the reports issued by the FBSA website at the following link: /https://fbsa.gov.iq I hope this information is helpful to you.</p>	<p>public institutions' performance.</p> <p>2- Quarterly or Semi-Annual Reports in some cases.</p> <p>3- Special Reports on specific issues or particular investigations.</p> <p>4-Follow-up reports on the implementation of previous recommendations.</p> <p>For accurate and updated information, I suggest:</p> <p>1- Visit the official website of the FBSA, if available.</p> <p>2- Contact of the FBSA directly for inquiries.</p> <p>3- Review the FBSA latest annual reports, which may include statistics on the number of reports issued.</p> <p>Would you like to learn more about specific types of reports issued by the FBSA?</p>
<p>Can you present the most important observations published by the Iraqi FBSA regarding the Iraqi Ministry of Electricity for the year 2017?</p>		
<p>In 2017, the Iraqi FBSA pointed out several important observations regarding the Iraqi Ministry of Electricity. One of the most significant observations was the expenditure of approximately \$937 million on contracts for purchasing electricity that was not actually received due to 'take-or-pay'</p>	<p>Unfortunately, I do not have direct access to the reports of the Iraqi FBSA. However, I can assist you in finding these reports through:</p> <ul style="list-style-type: none"> ● The official website of the Iraqi FBSA: /https://fbsa.gov.iq ● Searching Iraqi news 	<p>Unfortunately, I am unable to provide specific and accurate information regarding the observations published by the Iraqi FBSA about the Iraqi Ministry of Electricity for the year 2017 directly. My database may not contain such detailed and specific information.</p>

<p>agreements signed with investment companies between 2014 and 2016. These contracts obligated the ministry to pay large sums for undeceived electricity, resulting in substantial financial waste that could have been used to establish new power plants with a capacity of up to 1,000 megawatts "(ultrairaq.ultrasawt) (shafaq) (saymar).</p> <p>FBSA also revealed the absence of clauses in most purchasing contracts requiring the transfer of ownership of investment power plants to the ministry after the contract period ended and the recovery of their construction costs, leading to additional financial losses for the ministry."</p> <p>(ultrairaq.ultrasawt)</p> <p>In response to these comments, the Ministry of Electricity explained that it had begun reviewing these contracts since the formation of the new government. A committee headed by the Minister of Electricity was formed to prepare recommendations aimed at preserving public funds and reviewing previous and current contracts to ensure transparency and clarity in future operations. (saymar)(shafaq)</p>	<p>websites.</p> <ul style="list-style-type: none"> Looking through social media platforms. Contacting FBSA directly. <p>Here are some tips for finding the reports of the Iraqi FBSA:</p> <ul style="list-style-type: none"> Use specific keywords, such as "FBSA", "Iraqi Ministry of Electricity" and "Year 2017." Explore the website's various sections, such as the reports and news sections. Use advanced search tools: such as searching by date or by report number. Contact the FBSA staff: They may be able to help you find the reports you are looking for. <p>You can also search for summaries or news reports covering the most important observations published by the Iraqi FBSA concerning the Iraqi Ministry of Electricity for 2017. I hope this information helps you find the reports you're looking for.</p> <p>Do you have any other questions about the Iraqi FBSA or the Iraqi Ministry of Electricity?</p>	<p>However, I can suggest ways for you to obtain this information:</p> <ol style="list-style-type: none"> 1. Official website: Visit the official website of the Iraqi FBSA. These institutions often publish their reports on their websites. 2- Direct Contact: You can contact with the FBSA directly and request a copy of the Ministry of Electricity's 2017 report. 3- Government Archives: You may find this information in the Iraqi government archives if they are publicly available. 4- Media: Look for news reports from 2017 that may have covered the most important points in the FBSA report. 5- National Libraries: National libraries may retain copies of these reports. <p>Usually, the observations of the FBSA include matters such as:</p> <ul style="list-style-type: none"> Spending and Budget. Efficient use of resources. Compliance with laws and regulations. Project implementation and quality. Contracts and Procurement Management. <p>Would you like to learn more about how to search for this information or what types of comments the FBSA typically provides?</p>
<p>Q5: As a chatbot, what services can you provide to citizens to communicate the vision and activities of the Iraqi FBSA?</p>		
<p>As a chatbot, I can provide a range of services to citizens to effectively convey the vision and activities of the Iraqi FBSA:</p> <p>1- Providing Information and Guidance, Answering Inquiries: Offering instant responses to citizens' questions regarding the FBSA's functions and activities, as well as guidance on how to file complaints or report corruption.</p>	<p>Services I provide to citizens to convey the vision and activities of the Iraqi FBSA:</p> <p>As a chatbot, I can offer various services to citizens to communicate the vision and activities of the Iraqi FBSA, including:</p> <p>1- Providing Information:</p> <ul style="list-style-type: none"> I can answer citizens' questions regarding the FBSA's duties, 	<p>As a chatbot, I can provide several services to assist in conveying the vision and activities of the Iraqi FBSA to citizens:</p> <p>1- Providing General Information :</p> <ul style="list-style-type: none"> - Explaining the role and duties of the FBSA in simple and easy-to-understand language . - Clarifying the importance of financial auditing in safeguarding public funds .

<p>Providing Resources: Sharing links to the FBSA's annual reports and other relevant resources, such as laws and regulations.</p> <p>2- Raising Awareness, Articles, and Informative Posts: Sharing short articles and awareness posts explaining the FBSA role and the importance of financial auditing in combating corruption and improving government performance.</p> <p>Short Educational Lessons: Offering brief and simplified lessons on topics such as how to read financial reports or understand the laws related to financial audit.</p> <p>3- Facilitating interaction, interactive forms: Providing interactive forms for citizens to fill out surveys about their satisfaction with government services or to submit specific comments and complaints.</p> <p>Automated Reporting: Guiding citizens on how to use electronic portals to submit complaints and report violations.</p> <p>4- Providing continuous updates, news and recent reports: Providing periodic updates on the latest reports of the FBSA and audit results, including notes and analyses of the most important points as well.</p> <p>Instant notifications: Send instant notifications about important events, such as the publication of annual reports or the results of special investigations.</p> <p>5- Interact with multimedia and explainer videos: Provide links to videos that explain, in a simple and visual way, the role of the FBSA and the results of its work.</p> <p>Graphs and Charts: Sharing graphs and charts that show financial and administrative statements in a simple and easy way to understand.</p>	<p>responsibilities, operations, and published reports.</p> <ul style="list-style-type: none"> • I can provide information on the key observations issued by the FBSA regarding various government ministries. • I can share details about the FBSA future plans. <p>2- Facilitating Communication with the FBSA:</p> <ul style="list-style-type: none"> • I can assist citizens in submitting complaints or reports to the FBSA. • I can help citizens communicate with the FBSA staff via email or phone. • I can help citizens book appointments to visit the FBSA. <p>3- Spreading awareness:</p> <ul style="list-style-type: none"> • I can raise awareness about the importance of financial audit in combating corruption and promoting transparency. • I can publish information about citizens' rights and responsibilities in the area of financial audit. • I can encourage citizens to participate in the fight against corruption by reporting any violations they observe. <p>4- Providing translation services:</p> <ul style="list-style-type: none"> • I can translate information about the FBSA and its activities into different languages. • I can help non-Arabic speaking citizens communicate with the FBSA. <p>5- Providing smart services:</p> <ul style="list-style-type: none"> • I can summarize the reports issued by the FBSA and present them to citizens in an easy-to-understand manner. 	<p>2- Answering Frequently Asked Questions :</p> <ul style="list-style-type: none"> - Responding to citizens' inquiries about the FBSA's work and powers . - Explaining how to contact the FBSA or file complaints . <p>3-Simplifying Reports:</p> <ul style="list-style-type: none"> - Summarizing the main points from the FBSA's reports in a simplified manner. - Explaining technical terms used in reports. <p>4- Awareness:</p> <ul style="list-style-type: none"> - Disseminating information about citizens' rights to access public financial information. - Raising awareness of the importance of combating corruption and reporting financial violations. <p>5- Updates:</p> <ul style="list-style-type: none"> - Informing citizens of the latest news and activities of the FBSA. - Referring to new reports issued by the FBSA. <p>6- Interaction:</p> <ul style="list-style-type: none"> - Collecting citizens' opinions and comments on the FBSA work. - Directing citizens to channels for community participation in financial audit.
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<p>6. Coordination with parties concerned, directing parties concerned: helping citizens in knowing the parties concerned to obtain more information from or to take the necessary legal procedures.</p> <p>Through these services, I ,as a chatbot, can be an effective means to communicate FBSA's vision and facilitate the citizens' interaction with it in multiple and simplified ways.</p>	<ul style="list-style-type: none"> - I can analyze data gathered by the Board and present it to citizens in the form of graphs and tables. - I can develop smart applications that help citizens follow up the Board's news and activities. <p>I believe that these services will contribute to communicating FBSA's vision and activities to all the citizens and enhancing financial control in Iraq.</p> <p>Do you have any other ideas on how to improve my services?</p>	<p>7. Referral:</p> <ul style="list-style-type: none"> - Directing the citizens to the formal sources for more information. - connecting the citizens with the parties concerned in the Board when needed. <p>These services can contribute to increasing transparency and enhancing communication between the Board and citizens. Is there a specific aspect of these services you would like to explore further?</p>
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Appendix (B)

Dear respondent,

Greetings,

This study aims to explore () in ().As we trust in the sincerity of your cooperation, kindly answer the questions in the attached questionnaire with the accuracy and objectivity we expect from you by marking the answer you deem appropriate with (X). Please note that all information will be kept strictly confidential and used solely for scientific purposes.

Thank you for your cooperation in completing this research. Please accept our highest respect.

Section: Personal Information

Sex: male ☐ female ☐

Education: PhD ☐ master's degree ☐ bachelor's degree ☐ High diploma

Service: less than 5 years ☐ 5-10 years ☐ 11-15 years ☐ more than 15 ☐

Are you acquainted with on Generative Artificial Intelligence applications (ChatGPT, Claude, and Gemini) or have you used them ?

Yes ☐ no ☐

If the answer is "No" , please do not complete the questionnaire.

No.	Dimension of measuring the effect of using (ChatGPT, Gemini) applications on developing innovative thinking.	Strongly agree	Agree	Neutral	disagree	Strongly disagree
1	Using GenAI applications (Gemini, ChatGPT) helps auditors to find the appropriate solutions for the challenges faced during audit, consequently minimizing audit risks.					
2	Using GenAI applications(Gemini, ChatGPT) is a more direct and capable way to generate diverse ideas by auditors. It is a factor that adds to efficiency and effectiveness of audit.					
3	Using GenAI applications(Gemini, ChatGPT) by auditors facilitates focusing more on tasks thus enabling them to perform duties with greater effectiveness.					
4	Using GenAI applications (Gemini and ChatGPT) can enhance auditor capabilities to assess materiality of any item. This in turn , assist auditors to practice professional skepticism in all audit stages.					
5	Using GenAI applications (Gemini and ChatGPT) by auditors improves their legal, accounting and audit knowledge .This in turn, enhances audit process.					
6	Using GenAI applications(Gemini and ChatGPT) auditors contributes to improving their academic and practical capabilities in performing audit engagements thus improving their qualities.					
No.	Dimension of measuring the effect of using Generative applications(ChatGPT, Gemini) on enhancing audit process.	Strongly agree	Agree	Neutral	disagree	Strongly disagree
1	Using GenAI applications (Gemini and ChatGPT) contributes to understanding the nature of audit office operations and generating innovative ideas during planning stage.					
2	Mental interaction with GenAI applications (Gemini and ChatGPT) contributes to improving auditor capabilities to perform their tasks appropriately and developing their skills.					
3	Using GenAI applications (ChatGPT and Gemini) contributes to enhancing methods of communication and interaction among team members to exchange ideas confidentially and in the shortest time possible .					
4	Using Gen.AI applications (ChatGPT and Gemini)contributes to verifying audit evidence accuracy and adequacy required					

	to carry out the audit work					
5	Using GenAI applications (ChatGPT and Gemini) contributes to detecting manipulation and misstatements during the implementation of audit plan and ensuring the financial statement integrity .					
6	Using GenAI applications (ChatGPT and Gemini) saves time and efforts in accessing the required information, thus it contributes to the efficiency of audit process.					