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Implementation Model of Operational Auditing in Iranian State-Owned Companies: A Multi-Grounded Theory Approach

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ABSTRACT

Auditing knowledge has advanced significantly in recent decades. The expansion of corporate activities, the increasing complexity of organizational relationships, and technological growth have led to a rising demand for conducting operational audits. However, a significant gap is observed between legal requirements and the lack of an indigenous model for its effective implementation within Iranian state-owned companies. The objective of the present study is to design an implementation model for operational auditing in these companies, considering the environmental characteristics and prevailing conditions of the country. Given the exploratory nature of the research, a qualitative approach and the Multi-Grounded Theory (MGT) method were employed. To this end, in-depth interviews were conducted in the first half of 2025 with 14 academic experts and prominent auditing professors possessing professional experience in the public sector. Based on the findings, the final model comprises six main dimensions: the core phenomenon (establishment of an integrated operational auditing system and the institutionalization of the continuous performance evaluation process); causal conditions (governance and legal requirements, strategic needs of senior management, and environmental pressures); contextual factors (organizational structure, governance, organizational culture, and attitudes toward auditing); intervening conditions (resource constraints and methodological challenges); strategies (development of professional capacities and interaction with internal stakeholders); and consequences (enhancement of decision-making quality, improvement of governance and accountability, and development of organizational maturity). The research results indicate that success in establishing operational auditing requires moving beyond a fragmented and project-oriented perspective toward a systematic understanding, where the enhancement of auditors' technical capabilities is accompanied by strategies for gaining management support and changing attitudes at high organizational levels. This framework allows public sector managers and policymakers to redefine the relationship between legal requirements, managerial needs, and implementation barriers within a coherent model, serving as a roadmap for the effective execution of operational auditing.

Keywords: Operational Auditing, Performance Evaluation Process, Legal Requirements, Strategic Needs, Public Sector.

Introduction

In an era of increasing demand for transparency, accountability, and efficiency, the role of auditing has evolved far beyond its traditional financial attest function. Modern organizations, particularly those in the public sector and

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state-owned enterprises (SOEs), are under immense pressure to demonstrate not only fiscal responsibility but also operational effectiveness and value for money (1). This paradigm shift has propelled operational auditing—also known as performance or value-for-money auditing—to the forefront of corporate governance and public administration. Unlike financial auditing, which focuses on the fairness and accuracy of financial statements, operational auditing provides a systematic and independent assessment of an organization's operations, focusing on the "three Es": economy, efficiency, and effectiveness (2). Its primary objective is to identify opportunities for improvement and provide management with actionable recommendations to enhance performance, streamline processes, and achieve strategic objectives (3).

The historical roots of operational auditing can be traced back to early twentieth-century efforts to apply scientific management principles to governmental operations, with English-speaking nations pioneering its development as a formal discipline (2). Early frameworks focused on establishing standards for auditing government services to ensure that public funds were utilized prudently and effectively (4). Over the decades, the practice has matured from a compliance-oriented review into a strategic management tool. Contemporary approaches to operational auditing are increasingly forward-looking, seeking to inform strategic decision-making and enhance an organization's overall operational capabilities (5). This evolution reflects a growing recognition that sustainable success is contingent not just on financial health, but on the robustness and efficiency of the underlying operational processes that drive value creation.

State-Owned Enterprises (SOEs) represent a unique and critical domain for the application of operational auditing. As entities that operate at the nexus of commercial objectives and public service mandates, SOEs face a complex set of challenges and stakeholder expectations (6). They are often pivotal to national economies, managing critical infrastructure and providing essential services, which makes their performance a matter of significant public interest. Consequently, the governance structures within SOEs are a subject of continuous academic and practical inquiry, with a strong emphasis on establishing models that can balance commercial agility with public accountability (7, 8). An effective operational auditing function is a cornerstone of such robust governance, serving as a critical mechanism for oversight and continuous improvement (9). It provides an independent lens through which governing bodies and external stakeholders can assess whether an SOE is fulfilling its mandate efficiently and effectively, thereby mitigating risks related to mismanagement, operational inefficiency, and even corruption (9).

The impact of a well-executed operational audit in the public sector and within SOEs can be profound. Studies have demonstrated that performance audits can lead to tangible improvements in public sector organizations by identifying systemic weaknesses and prompting corrective actions (10). For instance, by scrutinizing specific programs, such as sustainable energy development initiatives in SOEs, integrated audit approaches can ensure that public policy objectives are being met in an economically viable and efficient manner (11). The development of sophisticated, risk-based performance audit frameworks is directly linked to enhancing the overall value of SOEs, as it helps align operational activities with strategic goals and manage risks proactively (12). The accountability systems for operations and investment within these enterprises are significantly strengthened when supported by high-quality audits, creating a virtuous cycle of improved performance and increased stakeholder trust (6). The capability of the internal audit function within the public sector is therefore a critical determinant of an SOE's ability to achieve its objectives and maintain public confidence (13).

Despite its recognized benefits, the successful implementation of operational auditing is fraught with challenges. The journey from conceptual acceptance to practical institutionalization requires navigating a complex landscape

of organizational, methodological, and cultural hurdles. A key prerequisite for success is a strong and capable Internal Audit Function (IAF). The key elements of a modern IAF include not only technical expertise but also a deep understanding of the business, strong communication skills, and strategic alignment with the organization's goals (14). The effectiveness of the IAF is so critical that it is often subject to evaluation by independent external auditors to ensure it can be relied upon (15). To enhance their effectiveness, modern IAFs are adopting advanced techniques such as business process modeling to improve audit planning and execution, particularly in complex SOE environments (16). However, the overarching question of how to measure the effectiveness of performance audits remains a persistent challenge, requiring a multi-faceted approach that looks beyond mere cost savings to consider broader impacts on governance and decision-making (17).

The challenges are further compounded by methodological and resource-based constraints. Developing clear, relevant, and measurable indicators of effectiveness and efficiency is a non-trivial task that requires both technical expertise and contextual understanding (18). The very culture of applying auditing standards can vary significantly, influencing how findings are documented, communicated, and acted upon (19). Furthermore, the field is continuously evolving, with emerging technologies like predictive analytics and function transformation being explored to enhance audit capabilities, introducing new layers of complexity and training requirements (20). A modern model of operational auditing must therefore be sophisticated enough to improve auditors' judgment and enhance internal control quality in a dynamic environment (21). Even the specific operational context, such as auditing a company's e-commerce sales function, demands a tailored approach and specialized knowledge (22). The selection of a suitable audit firm or the development of an internal team requires careful consideration of industry-specific needs, whether for small and medium-sized enterprises in the textile industry or for large, complex SOEs (23).

These universal challenges are often magnified and shaped by specific national and organizational contexts. In Iran, the legal framework and governmental directives mandate the implementation of operational auditing in public sector entities, including SOEs. This top-down push aims to enhance transparency, improve the efficiency of public resource allocation, and strengthen accountability mechanisms. However, a significant gap exists between these legal requirements and the practical, on-the-ground implementation of effective operational auditing systems. Despite the clear mandate, many Iranian SOEs struggle to move beyond traditional financial compliance audits towards a fully integrated and value-adding operational audit function. Research within the Iranian context highlights a series of specific executive barriers that impede this transition. These include a lack of specialized expertise, insufficient management support, organizational resistance to change, and ambiguity regarding the appropriate methodologies and standards to apply (24).

The need for a localized, indigenous approach is paramount. Generic, one-size-fits-all models imported from other countries often fail to account for the unique legal, cultural, and institutional landscape of Iran. For example, efforts to explain performance audit components with an emphasis on specific national priorities, such as environmental performance, illustrate the need for contextual adaptation (25). Similarly, work on identifying and explaining performance auditing indicators specifically for the Iranian public sector underscores the necessity of developing tools and frameworks that are relevant and applicable within the local context (26). The dominant organizational culture and prevailing attitudes toward auditing can either be a powerful enabler or a significant barrier, and these cultural nuances must be understood and addressed in any implementation model (19). Without a model that is grounded in the lived experiences and perceived realities of Iranian managers and auditors,

implementation efforts are likely to remain superficial, failing to achieve the intended goals of performance enhancement and improved governance. The existing literature has successfully identified many of these individual barriers and components, but what is conspicuously absent is an integrated, holistic model that explains the dynamic interplay between the causal drivers, contextual factors, strategic actions, and ultimate consequences of implementing operational auditing within Iranian SOEs.

This research addresses this critical gap by moving beyond a simple inventory of challenges to develop a comprehensive, multi-dimensional implementation model. By employing a qualitative, data-driven methodology, this study seeks to construct a framework from the ground up, based on the insights of experts with direct experience in Iran's public sector. This approach avoids the imposition of pre-existing theoretical structures and instead allows a model to emerge that is an authentic representation of the complexities, challenges, and success factors inherent to the Iranian context. The resulting paradigmatic model aims to provide a practical and theoretically sound roadmap for policymakers, managers, and auditors seeking to institutionalize operational auditing effectively.

Therefore, the primary aim of this research is to design an indigenous implementation model for operational auditing in Iranian state-owned companies by identifying its constituent dimensions and their interrelationships.

Methods and Materials

This study seeks to achieve a deeper and more profound understanding of the factors and concepts of the model for implementing operational auditing components in Iranian state-owned companies. The use of a qualitative research method can provide a more appropriate understanding of the subjects. Philosophically, this research falls within the interpretive paradigm; in terms of execution logic, it is inductive; regarding its purpose, it is applied research; and in terms of research type, it is qualitative. In this research, the multi-grounded theory method has been utilized.

In studying the components of operational auditing implementation in Iranian state-owned companies, attitudes and behaviors are sometimes disproportionate to each other. One of the research methods that allows for the interpretation of subjects causing the aforementioned behavioral discrepancies in real life is the qualitative grounded theory method. Using this method, the situations, causes, and factors that place individuals' attitudes and behaviors in disharmony are discovered and explained. The grounded theory method is based on the paradigmatic principles of social interpretivism. The conceptual framework of grounded theory relies more on the data and constructs of actors rather than previous literature, meaning that this theory is data-driven and avoids deductive hypothesis testing. In the grounded theory method, the data collected in this process are compared with each other and with other similar data from various angles. In this methodology, the researcher adjusts data collection according to the progression of the theory, meaning that they abandon erroneous paths and ask more relevant required questions. The researcher codes the collected data; these initial ideas are categorized, conceptualized, and written down. In the current research, the systematic approach, which is recognized as the most well-known existing approach, has been used.

The collection and analysis of the data for the present study were conducted through interviews with 14academic experts and prominent auditing professors possessing professional experience in the public sector in 2025. The sampling method is a combination of purposive and snowball sampling methods. For this purpose, in the first step, three individuals from the statistical population who were recognized as experts based on their expertise in fields related to the research topic or their academic and executive backgrounds in the relevant domain were purposively

selected. In the second step, individuals from the statistical population who were introduced to the researcher by the interviewees based on the snowball method and were available for an interview were added to the statistical sample, and the criterion for reaching the end of data collection is the theoretical saturation point. In other words, data collection continues until the newly collected data do not differ from the previously collected data, and the researcher has reached the saturation stage.

Sampling was conducted using a combination of purposive and snowball methods. The selection criteria for participants were as follows: 1) having academic expertise in the field of auditing (academic rank of associate professor or higher), 2) possessing executive or consulting experience in public sector auditing, 3) publishing articles or authoring books in the field of operational or performance auditing, and 4) familiarity with the legal requirements and indigenous conditions of Iranian state-owned companies.

Data collection continued until theoretical saturation was achieved. Theoretical saturation refers to the stage where new interviews do not provide fresh data toward developing existing concepts and categories, and the main categories are sufficiently rich and developed in terms of characteristics and dimensions. In this research, after the twelfth interview, the researcher observed that the new data were primarily repetitions of previous findings, and no novel concept or category was extracted. To ensure this, two additional interviews were conducted, which confirmed this issue, and the researcher achieved theoretical saturation.

Table 1. Demographic characteristics of research experts

Variable	Criteria	Frequency	Percentage
Gender	Male	12	87.50%
Female	2	12.50%	
Total	14	100.00%	
Age	Up to 45 years	3	18.75%
46 to 55 years	6	43.75%	
Above 56 years	5	37.50%	
Total	14	100.00%	
Work Experience	Under 15 years	3	18.75%
15 years and more	11	81.25%	
Total	14	100.00%	
Academic Rank	Ph.D.	12	86.00%
Master's degree	2	14.00%	
Total	14	100.00%	

To examine the validity of the research, evaluation methods suitable for qualitative studies were used. Since in qualitative research, subjectivity and interpretation rather than objectivity are the goals (Haq et al., 2017), validity and reliability in qualitative research consist of trustworthiness and consistency. To achieve this goal, qualitative researchers employ a range of techniques in a coordinated manner to record their observations, including interviews, observation, images, documents, and records, etc. (Mohammadpour, 2010). Guba and Lincoln (1985) used the term dependability instead of reliability in qualitative research. The method for evaluating internal validity in this research to align the findings with reality was conducted in such a way that the interviews took place over a relatively long period (between half an hour to one hour). At the end of each question and after receiving the answer, the researcher would ask the interviewee about their understanding of the concepts in the form of a question such as: "Do you mean that…?" If the person disagreed with the perceived concept, they were asked to provide further explanations so that the interviewer could grasp the real intention of the interviewee. Additionally, the interviews were recorded, which increases the credibility of the data.

In this research, investigator triangulation has been used to evaluate the validity of the research. In using investigator triangulation, more than one researcher is employed to collect, analyze, or interpret the data. Finally, to assess dependability, the level of agreement between the coders (researchers) is examined (Coyle, 1996). For this purpose, all stages of interviewing and coding were conducted in parallel by two individuals, yielding identical results. Recoding of a portion of the data obtained from the interviews by the second researcher: For this task, approximately $20\%$of the interviews (four interviews) were provided to a second researcher familiar with qualitative research methods and aware of the research topic, and the coding agreement percentage was calculated. This index demonstrates the inter-coder agreement between two different coders. The results are presented in Table (2), which are acceptable.

$$Reliability\ Percentage = \frac{(2 \times Number\ of\ Agreements)}{Total\ Number\ of\ Codes} \times 100$$

Table 2. Calculation of the reliability of two coders in the interview phase

Interview Number	Total Number of Codes	Number of Agreements	Number of Disagreements	Reliability Between the Two Coders
2	37	17	3	91.89%
4	31	13	5	83.87%
9	34	16	2	94.12%
11	38	18	2	94.74%
Total	140	64	12	91.43%

As shown in Table 2, the agreement percentage in the extracted codes was calculated to be 91%. The obtained agreement percentage is higher than 60%; therefore, the codings possess sufficient validity (Coyle, 1996). It should be noted that the number of extracted codes in Table 1 solely relates to the analysis of the selected interviews intended for evaluating the research validity through the investigator triangulation method.

Findings and Results

In this research, data analysis was conducted using the Multi-Grounded Theory approach through three stages: open, axial, and selective coding. In the open coding stage, the interview transcripts were examined line by line, and the initial concepts were extracted. In this stage, initial concepts were extracted from the data, and after removing duplicate items and merging similar concepts, the final concepts were identified. These concepts were then categorized into sub-categories based on semantic similarities. In the axial coding stage, the relationships among the sub-categories were identified and organized into main categories (including the core phenomenon, causal conditions, contextual factors, intervening conditions, strategies, and consequences). In this stage, the paradigmatic model of Strauss and Corbin was used to link the categories together. Finally, in the selective coding stage, the core category or the “core phenomenon” was selected under the title “establishment of an integrated operational auditing system and the institutionalization of the continuous performance evaluation process,” and the other categories were integrated around this core. In this stage, by reviewing the data and categories again, the relationships among them were validated, and the final research model was drawn.

Open coding, in terms of the unit of analysis, can be done line by line, phrase by phrase, paragraph by paragraph, or on a separate page basis. If the coding unit is a line, a concept or code is attached to each line or sentence. This code or concept must be able to maximally saturate its conceptual and semantic space. In this stage, all information

is coded. The open coding stage consists of 2sub-stages: initial or first-level coding, and focused or second-level coding.

In the initial or first-level coding stage, the researcher attaches a code (concept, name, label) to each desired unit based on the coding unit. This concept must be able to saturate its conceptual space as much as possible. The concepts or codes obtained in this stage form the foundation of the subsequent major categories as well as the main components of the emerging grounded theory. Along with the initial data coding, for each designated code, write a memo (personal note and explanation) or, according to Glaser, a theoretical memo. A memo is a brief and short written note that the researcher themselves writes regarding a code. This memo is the researcher's own explanation of that code and can help them in linking concepts to build categories and also relating categories to each other in the later stages of the work (Strauss & Corbin, 1998). Table (1) presents an example of initial coding.

Table 3. Example of Initial Coding

Level One Category	Concepts
Governance and legal requirements	Legal requirements of operational auditing
	Directives of supreme supervisors
	Macro policies for performance improvement
	Development of corporate governance frameworks
	National strategies for transparency and accountability
Strategic needs of senior management	Request to evaluate operational effectiveness
	Management expectations for resource efficiency improvement
	Demanding analysis of operational risks
	Need for consultation for strategic decision-making
	Providing information for macro-planning
Environmental pressures and stakeholder expectations	Shareholders' expectations of operational performance
	Transparency requirements in public reporting
	Being influenced by international models
	The need for competitiveness in the public sector
Organizational structure and governance	Arrangement of the internal audit unit
	Reporting hierarchy to the audit committee
	Clarity of managerial responsibility lines
	Integrated internal control system
	Transparent process structure
Organizational culture and attitude toward auditing	Acceptance of the added value of operational auditing
	Culture of continuous performance improvement
	Tendency toward transparency in reporting
	Collaboration of departments with the audit unit
	Mutual respect between managers and auditors
Resource constraints of internal auditing	Shortage of specialized operational auditing personnel
	Limitation of the annual audit budget
	Lack of time to execute operational projects
	Insufficient access to operational data
	Lack of advanced analytical software
Methodological and standard challenges	Absence of localized executive guidelines
	Ambiguity in selecting performance evaluation indicators
	Lack of a database for comparative criteria
	Difficulty in gathering convincing evidence
	Lack of integration in defining operational auditing
Establishment of an integrated operational auditing system	Designing a risk-based operational auditing plan
	Developing a localized conceptual framework for operational auditing
	Creating a link between organizational goals and auditing goals
	Defining phased executive mechanisms
Institutionalization of the continuous performance evaluation process	Creating an operationalization roadmap
	Institutionalizing continuous evaluation processes
	Establishing a performance improvement monitoring system
	Developing an operational quality management cycle

Development of professional and methodological capacities	Specialized training for auditors in the operational field
	Preparing step-by-step executive guidelines
	Using external consultants in designing the framework
	Formulating key operational performance indicators
Constructive interaction with internal stakeholders	Gaining senior management support for operational audit projects
	Creating a joint steering committee with operational managers
	Submitting periodic reports to the audit committee
	Holding briefing sessions for middle managers
Enhancing the quality of managerial decision-making	Providing deep insights into the organization's operational performance
	Identifying areas for process efficiency improvement
	Mitigating identified operational risks
	Facilitating optimal allocation of organizational resources
Improving organizational governance and accountability	Increasing transparency in non-financial performance reporting
	Strengthening the operational internal control system
	Promoting an accountability culture at various levels
	Increasing stakeholder trust in organizational performance
Development of organizational maturity and learning capacity	Institutionalizing the culture of continuous evaluation
	Enhancing the ability to adapt to environmental changes
	Creating organizational knowledge in the field of operations
	Elevating operational risk management capability

Then the second stage of open coding begins. In this stage of coding, the researcher no longer deals with raw texts, but rather with the concepts they have produced. The goal of this stage of open coding, which is also known as focused coding, is the production and extraction of major categories.

Focused coding involves using the most meaningful or frequent initial codes to sift through and reduce a large amount of data. In this stage of coding, the researcher, while referring to the memos of each code and comparing the codes with each other, seeks to identify overlapping and similar codes. By determining and organizing the codes or concepts, the researcher places similar and common codes into a single category. Therefore, the mass of data (codes, concepts) is reduced to a specific and limited number of major categories. Hence, each category contains a number of similar, overlapping, and synonymous codes. A category refers to concepts at a higher level of abstraction that are constructed from a set of lower-level concepts based on their common characteristics.

The second stage of data coding is known as axial coding. In this stage, categories are linked together in a network. Finding common codes and axial categorizations also requires the use of the constant comparative method. At this stage, the theory gradually emerges. The purpose of this stage of coding is to restore order and coherence to the coded data, to categorize, combine, and organize a large amount of data, and to reassemble them in new ways. Strauss defines axial coding as building a dense texture of relationships around the axes of a category. It is through axial coding that the relationships and proportions between categories are unraveled (Strauss & Corbin, 1998). In this stage of coding, three axial variables are identified and revealed: conditions, actions/interactions, and consequences. Conditions represent the entire set of circumstances or situations in which the phenomenon is situated. Actions/interactions are the strategic or routine responses that individuals or groups make to the issues, affairs, and events that arise under those conditions. Consequences are the results of actions/interactions. Consequences or results tell us what has happened or will happen as a result of the actions and interactions that individuals and groups have taken or failed to take in response to a specific situation under such conditions.

After axial coding, the final stage of coding, namely selective coding, begins. At this stage, the theory has almost reached robustness. And the researcher, after making some possible theoretical modifications, deals with few categories. The process of grounded theory building almost concludes in the selective coding stage. At this stage,

the researcher develops the theory with a small number of abstract categories and does not need to code new data. The categories used are theoretically saturated. And each of them is logically placed next to each other based on the concepts coded in the first and second stages. Then the researcher must select the core category. The core category is selected in two ways. In the first method, the researcher may select one of the existing categories, and in the second method, they must determine or construct a new category; selecting the core category in the selective coding stage requires careful examination of the data in the previous two stages. There are criteria for determining or constructing the core category as follows:

- The core category must be central; meaning that all other major categories must be related to it.
- It must appear frequently in the data. This means that in all or most cases, phrases referring to the categories should exist in the raw data.
- It must be logical and not force the data onto each other.
- The title or phrase used to describe the core category must be abstract enough to be used for research in other substantive areas and lead to the production of a more general theory.
- The central concept or category must be capable of explaining variations while at the same time emerging from the data (Strauss & Corbin, 1998). Considering the three levels of qualitative analysis and also relying on the research literature, we selected the variable “establishment of an integrated operational auditing system and the institutionalization of the continuous performance evaluation process” as the core (central) category.

In the process coding stage, the major categories are linked to each other around the core category within the framework of a paradigmatic model (meaning the grounded model). In fact, the drawn model provides a formal description of the category and analyzes and explains it. This process is referred to as integrating the core category and refining and trimming the constructs derived from it. The mentioned model can be drawn as a formal, yet semantic and conceptual model or diagram, and then discussed in detail.

Based on the results obtained from the data coding process, which are presented in Table (4):

Table 4. Data Coding Results

Selective Coding	Sub-category	Sample of Concepts Extracted from Interviews
Causal Conditions	Governance and legal requirements	Legal requirements of operational auditing
		Directives of supreme supervisors
		Macro policies for performance improvement
		Development of corporate governance frameworks
		National strategies for transparency and accountability
	Strategic needs of senior management	Request to evaluate operational effectiveness
		Management expectations for resource efficiency improvement
		Demanding analysis of operational risks
		Need for consultation for strategic decision-making
		Providing information for macro-planning
	Environmental pressures and stakeholder expectations	Shareholders’ expectations of operational performance
		Transparency requirements in public reporting
		Being influenced by international models
		The need for competitiveness in the public sector
Contextual Conditions	Organizational structure and governance	Arrangement of the internal audit unit
		Reporting hierarchy to the audit committee
		Clarity of managerial responsibility lines
		Integrated internal control system

		Transparent process structure
	Organizational culture and attitude toward auditing	Acceptance of the added value of operational auditing
		Culture of continuous performance improvement
		Tendency toward transparency in reporting
		Collaboration of departments with the audit unit
		Mutual respect between managers and auditors
Intervening Conditions	Internal audit resource constraints	Shortage of specialized operational auditing personnel
		Limitation of the annual audit budget
		Lack of time to execute operational projects
		Insufficient access to operational data
		Lack of advanced analytical software
	Methodological and standard challenges	Absence of localized executive guidelines
		Ambiguity in selecting performance evaluation indicators
		Lack of a database for comparative criteria
		Difficulty in gathering convincing evidence
		Lack of integration in defining operational auditing
Core Category	Establishment of an integrated operational auditing system	Designing a risk-based operational auditing plan
		Developing a localized conceptual framework for operational auditing
		Creating a link between organizational goals and auditing goals
		Defining phased executive mechanisms
	Institutionalization of the continuous performance evaluation process	Creating an operationalization roadmap
		Institutionalizing continuous evaluation processes
		Establishing a performance improvement monitoring system
		Developing an operational quality management cycle
Strategies	Development of professional and methodological capacities	Specialized training for auditors in the operational field
		Preparing step-by-step executive guidelines
		Using external consultants in designing the framework
		Formulating key operational performance indicators
	Constructive interaction with internal stakeholders	Gaining senior management support for operational audit projects
		Creating a joint steering committee with operational managers
		Submitting periodic reports to the audit committee
		Holding briefing sessions for middle managers
Consequences	Enhancement of managerial decision-making quality	Providing deep insights into the organization's operational performance
		Identifying areas for process efficiency improvement
		Mitigating identified operational risks
		Facilitating optimal allocation of organizational resources
	Improvement of organizational governance and accountability	Increasing transparency in non-financial performance reporting
		Strengthening the operational internal control system
		Promoting an accountability culture at various levels
		Increasing stakeholder trust in organizational performance
	Development of organizational maturity and learning capacity	Institutionalizing the culture of continuous evaluation
		Enhancing the ability to adapt to environmental changes
		Creating organizational knowledge in the field of operations
		Elevating operational risk management capability

In this stage of the coding process, all the identified categories around the core phenomenon or category, which are the functional factors of the components for implementing operational auditing in Iranian state-owned

companies, are united and integrated, forming the paradigmatic (grounded) model of the present research as shown in Figure (1):

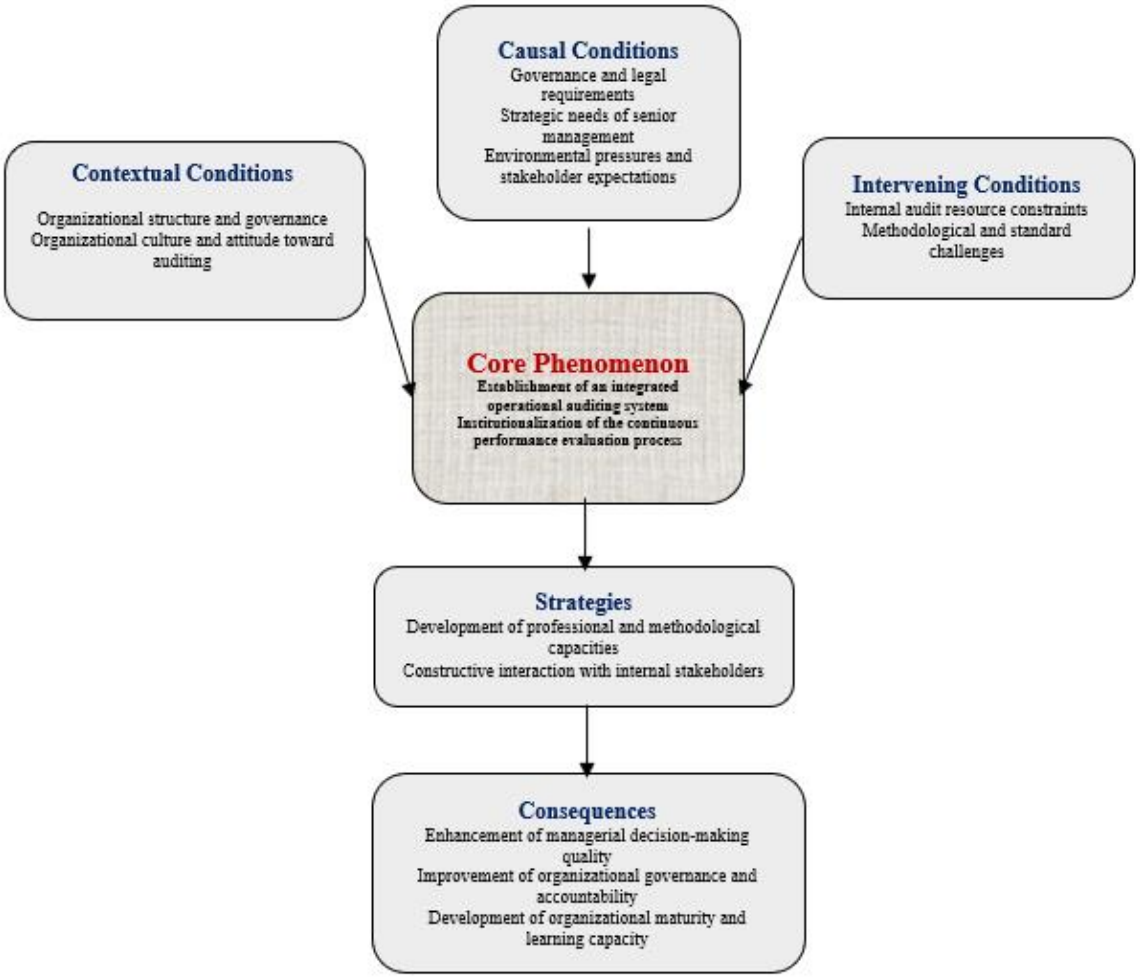

Figure 1. Multi-grounded paradigmatic (grounded) model extracted from the coding process

Next, each of the model's dimensions is defined:

Table 5. Definition of Operational Auditing Dimensions

Macro-categories	Definitions
Causal Conditions	This macro-category includes a set of internal and external stimuli that create the initial necessity and motivation for attention, investment, and action toward establishing an operational auditing system in the organization. These conditions are rooted in the macro-context governing public organizations and can be analyzed in three layers: legal requirements and directives of supervisory bodies that act as formal and mandatory rules; strategic needs of the organization's senior management arising from the perceived need to improve performance, optimally allocate resources, and make more informed decisions; and environmental pressures stemming from the expectations of macro-stakeholders, international developments, and the necessity of competitiveness, which compel the organization to enhance transparency and accountability. Together, these conditions shape the "why" and the justification for initiating the establishment process.
Contextual Conditions	This category refers to the relatively stable and structural contexts and characteristics of the organization that facilitate or restrict the implementation, penetrability, and effectiveness of actions related to operational auditing. These conditions are concentrated in two structural and cultural domains. The structural domain includes the design and arrangement of formal organizational elements such as the position of the internal audit unit in the organizational chart, reporting hierarchy, clarity of responsibility and authority lines, transparency of processes, and integration of internal control systems. The cultural domain encompasses the dominant values, attitudes, beliefs, and norms within the organization, which determine the degree of acceptance of auditing as a value-adding factor, the tendency toward transparency, the spirit of collaboration, mutual respect, and commitment to continuous improvement. These conditions provide the "context" and "possibility" for successful implementation.

Intervening Conditions	This category encompasses a set of factors that act as practical barriers, limitations, or challenges in the path of successful execution and institutionalization of operational auditing, and can negatively impact the speed, quality, and even the final outcome of the process. These conditions are primarily classified into two broad categories: resource constraints (such as a shortage of specialized personnel combining auditing and operational knowledge, budget limitations, lack of time, and insufficient access to data and advanced analytical tools) and methodological challenges (including the absence of localized executive guidelines, ambiguity in selecting evaluation indicators, lack of comparative criteria, difficulty in gathering solid evidence, and lack of consensus on the exact definition and scope of operational auditing). These conditions must be identified and managed as the “limitations” and “intermediate challenges” of the path.
Core Category	This category constitutes the central and focal core of the model around which all conditions and strategies are organized. The core category is the “establishment of an integrated operational auditing system.” This concept represents a purposeful, planned, and structured process to institutionalize a continuous, systematic, and evidence-based evaluation mechanism of the efficiency, effectiveness, and economy of the organization’s operations, in such a way that this mechanism becomes an integral part of the organization’s management and governance system. Establishing such a system requires moving from a state of ad-hoc and scattered projects toward creating a localized conceptual framework, designing a risk-based plan, defining transparent executive mechanisms, and ultimately, internalizing the evaluation process into the natural management cycle of the organization. This category represents the “ultimate goal” and “final purpose” of all efforts.
Strategies	This macro-category includes a set of deliberate, conscious, and selective actions and measures adopted and executed by the main actors (especially the internal audit unit and senior management) to realize the core category, leverage favorable contextual conditions, overcome obstructive intervening conditions, and respond to stimuli arising from causal conditions. The strategies are developed along two complementary axes: the axis of developing intra-organizational capacities (including specialized training for auditors, preparation of executive guidelines, formulation of key performance indicators, and sometimes utilizing external consultation for design) and the axis of constructive interaction and communication with internal stakeholders (including gaining senior management support, establishing joint steering committees, presenting regular reports to the audit committee, and holding briefing sessions for managers). These strategies determine the “how” and the “means” of achieving the core category.
Consequences	This category addresses the expected and realizable outputs, results, and impacts resulting from the successful implementation of strategies and, ultimately, the partial or complete establishment of the integrated operational auditing system. The consequences are distinguished at three macro levels: at the managerial performance level, leading to enhanced decision-making quality, facilitation of resource allocation, and provision of deeper organizational insights; at the organizational governance and accountability level, resulting in the strengthening of the internal control system, increased transparency, promotion of an accountability culture, and gaining stakeholder trust; and at the organizational maturity and learning level, leading to the institutionalization of a continuous evaluation culture, creation of organizational knowledge, increased adaptability, and enhancement of risk management capability. These consequences are the “achievements” and the “ultimate justification” for the investment made in this system.

The definitions provided for each of the six macro-categories have been formulated with a systematic perspective and based on the causal-semantic relationships among them. These definitions not only clarify the nature of each category independently but also delineate its position within the overall constellation of the model as part of a flexible process starting from stimuli (causal conditions), within a specific context (contextual conditions), navigating through obstacles (intervening conditions), toward realizing an ultimate goal (core category), through specific actions (strategies), and to achieve tangible results (consequences). Careful attention to these definitions provides a comprehensive understanding of the internal logic of the operational auditing implementation model within the context of Iranian state-owned organizations.

Discussion and Conclusion

The primary objective of this study was to design an indigenous implementation model for operational auditing in Iranian state-owned enterprises (SOEs) using a qualitative Multi-Grounded Theory (MGT) approach. The findings yielded a comprehensive paradigmatic model comprising six core dimensions: Causal Conditions, Contextual Conditions, Intervening Conditions, the Core Phenomenon, Strategies, and Consequences. This model provides a structured understanding of how operational auditing can transition from a mere legal mandate to a value-adding, institutionalized process within the complex environment of Iranian SOEs.

The results regarding **Causal Conditions** revealed that the push for operational auditing is primarily driven by governance and legal requirements, the strategic needs of senior management, and environmental pressures

coupled with stakeholder expectations. In the context of SOEs, these enterprises are increasingly subjected to stringent oversight to ensure public resources are utilized efficiently. This aligns with historical perspectives emphasizing the necessity of auditing standards for government services to maintain public trust (2, 4). Furthermore, as management faces the dual burden of achieving commercial viability and fulfilling public service mandates, their strategic need for actionable operational insights intensifies. Previous studies support this, indicating that modern organizations require robust performance metrics to survive environmental pressures, compelling them to demand independent operational evaluations (1). The necessity to optimize compliance audit functions and mitigate corruption also acts as a powerful causal driver in public enterprises (9).

Regarding **Contextual Conditions**, the study identified organizational structure, governance, and organizational culture—specifically the attitude toward auditing—as foundational environments that either facilitate or hinder the implementation process. A transparent reporting hierarchy and a well-integrated internal control system are structural prerequisites. This finding is heavily corroborated by literature emphasizing that the corporate governance model within SOEs dictates the effectiveness of oversight mechanisms (7, 8). Moreover, an organizational culture that views auditing not merely as a policing function but as a partner in continuous improvement is critical. The ethnographic realities of how auditing standards are culturally applied within corporate management significantly affect audit outcomes (19). The capability and structural positioning of the internal audit function within the public sector provide the necessary context for operational audits to gain traction and respect (13, 14). The independent evaluation of these internal functions is also a contextual reality that shapes audit quality (15).

Despite favorable causal and contextual factors, the findings highlighted significant **Intervening Conditions** acting as barriers, specifically internal audit resource constraints and methodological/standard challenges. Iranian SOEs frequently suffer from a shortage of specialized personnel who possess both accounting acumen and deep operational knowledge. The lack of localized, universally accepted evaluation indicators further complicates the auditor's task. This mirrors the findings of researchers who have explicitly analyzed the executive barriers to operational auditing in Iran, noting that resource deficits and methodological ambiguities are primary obstacles (24). The struggle to define reliable statistics and monitoring indicators for effectiveness and efficiency in public entities remains a pervasive challenge (18). Addressing these constraints often requires complex decision-making, such as evaluating suitable external accounting and auditing firms to supplement internal deficiencies (23).

At the heart of the model lies the **Core Phenomenon**: the establishment of an integrated operational auditing system and the institutionalization of the continuous performance evaluation process. Rather than treating operational audits as isolated, ad-hoc projects, the findings emphasize the need for a systemic, risk-based approach embedded within the organization's DNA. This integrated vision is supported by contemporary research advocating for an integrated audit approach when evaluating critical, sustainable public programs in SOEs (11). Furthermore, establishing a core framework based on risk significantly enhances the overall value of state-owned enterprises by aligning audit focus with the most critical operational vulnerabilities (12). The definitions, concepts, and models of performance auditing universally point toward this systemic integration as the ultimate goal of the audit function (3).

To realize this core phenomenon and overcome intervening barriers, specific **Strategies** emerged from the data: the development of professional and methodological capacities, and constructive interaction with internal stakeholders. Capacity development involves specialized training, utilizing modern analytical tools, and optimizing business process modeling during audit planning (16, 20). For instance, auditing specific, highly operational functions like e-commerce sales requires tailored, localized methodologies that must be systematically developed

(22). Concurrently, strategies emphasizing constructive interaction highlight that auditors must step out of their silos. Building joint steering committees and gaining the active support of operational managers ensures that audit findings are grounded in operational realities and are more likely to be implemented.

Finally, the **Consequences** dimension delineates the ultimate value of establishing this system: enhancement of managerial decision-making quality, improvement of organizational governance and accountability, and the development of organizational maturity and learning capacity. When operational auditing is successfully institutionalized, it transitions from a compliance exercise to a strategic advisory tool. Studies have shown that performance audits have a profound impact on public sector organizations, directly improving operational efficiency and policy execution (10). An effective accountability system for operations significantly elevates the overall audit quality and governance of state-owned enterprises (6). By identifying key components of performance, especially in critical areas like environmental impact in the public sector, organizations can make more informed, holistic decisions (5, 25). The modern model of operational auditing ultimately improves auditors' professional judgment, enhances internal controls, and answers the long-standing question of audit effectiveness by demonstrating tangible organizational maturity (17, 21, 26).

Despite the rigorous methodology employed, this study is subject to several limitations that should be acknowledged. First, the qualitative nature of the Multi-Grounded Theory approach relies heavily on the subjective perceptions, experiences, and interpretive lenses of the interviewed experts. While steps like member checking and inter-coder reliability were taken to ensure validity, the findings are inherently qualitative and may not capture absolute objective realities. Second, the sample size, though achieving theoretical saturation, is confined to 14experts within a specific geographic and administrative context—Iranian state-owned companies. Consequently, the cultural, legal, and economic idiosyncrasies of Iran heavily influence the extracted dimensions, potentially limiting the generalizability of the model to private sector companies or state-owned enterprises in other countries with different regulatory frameworks. Finally, the study was conducted cross-sectionally; thus, it captures the experts' perspectives at a single point in time and may not fully reflect how the implementation dynamics of operational auditing evolve over a prolonged period of organizational change.

To build upon the findings of this study, several avenues for future research are highly recommended. Researchers should consider utilizing quantitative methods, such as Structural Equation Modeling (SEM) or Partial Least Squares (PLS), to empirically test and validate the relationships between the six dimensions identified in this paradigmatic model across a larger, more diverse sample of state-owned enterprises. Longitudinal studies would also be highly beneficial to track organizations over time, observing how causal conditions trigger strategies and how long it actually takes for the hypothesized consequences and organizational maturity to materialize. Furthermore, comparative studies could offer valuable insights; for instance, contrasting the implementation barriers of operational auditing in the Iranian public sector with those in the private sector, or comparing the Iranian model with localized models in other developing or developed nations. Finally, future research could delve deeper into the specific methodological challenges identified, aiming to develop standardized, industry-specific key performance indicators (KPIs) for operational audits.

For policymakers, board members, and senior managers in state-owned enterprises, the findings offer actionable insights for successfully institutionalizing operational auditing. First, management must move beyond mere verbal endorsement and actively sponsor operational audit initiatives by allocating dedicated budgets and creating joint steering committees between auditors and operational unit heads. This bridges the cultural gap and reduces

organizational resistance. Second, there is a critical need to invest in human capital; audit departments should recruit personnel with diverse backgrounds—such as engineering, IT, and operations management—rather than relying solely on traditional financial accountants, thereby overcoming the identified resource and expertise constraints. Finally, standard-setting bodies and audit committees should prioritize the compilation of localized, step-by-step executive guidelines and customized performance metrics that align with the specific strategic goals of the enterprise, ensuring that operational audits provide practical, value-adding recommendations rather than generic compliance checklists.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adheried in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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