

# The explanation of the role of management audit information in the strategy development process based on the actors-network approach

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## Abstract

Increasing attention to the role of information and communication and social factors as well as sociology in all sciences is considered one of the effective infrastructures in development growth and prosperity in every science. Accounting and auditing as knowledge, experience and skills that are always on the path of growth, from the two perspectives of knowledge and professionalism, are always intertwined in various dimensions with the surrounding environment and society of the organizations and companies and on the path of evolution, progress, construction and interaction are in communication and interaction with many actors and networks. The theory of actors pays attention to the relationship between variables. The existing communication and recognition of the role of each actor in an organizational environment, regarding the functions of the information system, can contribute to the extensive evolution of accounting from two perspectives of knowledge and profession. The Actor-network theory is one of the theories of sociology. Auditing every organization always tries to operate efficiently, effectively, and with the lowest cost, using all facilities for economic effectiveness and helping the management provide timely reporting for strategic decisions. The independent evaluation of managers' performance is done through these internal audit groups. The present research is correlational and scientific, and it was carried out using questionnaires, distributed among 250 accountants and auditors of Iranian public and private auditing institutions and the stock exchange market, as well as using the SPSS Software. Based on this, according to the practical aspects of the research and as a distinguishing feature from other conducted research, considering its innovative aspect, the effect of the actors-network and its constituent parts is explained, and its impact is investigated in improving the situation and strategic decisions.

Keywords: management audit, strategy formulation process, actor network theory (ACT)  
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## 1 Introduction

Management or performance audit will actually have a decisive role in the fate of a business because it will have the greatest impact on management decisions [1]. The main task of the management audit department is to provide the necessary advice to the company's management. The management audit by monitoring all or a part of an organisation systematically examines its activities and takes steps to improve the performance of that part of the organization by strengthening its strengths and identifying its weaknesses [13]. The purpose of management audits and the services they provide are to help managers of organizations better manage their organizations. By helping managers, this part of the audit tries to help managers manage working conditions by evaluating the effectiveness, efficiency and economy of economic enterprises and providing practical suggestions to form and lead a successful business [16]. In recent years, since the use of financial statements cannot sufficiently inform managers about the efficiency of different departments of their organization, the need for more accurate and professional departments such as the management audit department is felt very much. That is why many managers of large companies have thought of using the management audit department and use it in their organization [20]. The presence of fraud as a crisis-causing factor in the financial and economic arena is considered a serious threat to public trust in financial information and the financial reporting process and has heavy costs and consequences for the economy and various groups. Iran's Auditing Standards No. 240 and 450 have established duties for independent auditors regarding the auditor's responsibility concerning fraud and mistakes in the audit of financial statements and the evaluation of distortions identified in the audit so that possible frauds can be disclosed and reported by the auditors before the publication of the audited financial reports [19]. In many countries of the world, non-governmental and non-profit organizations whose financial activities exceed a certain limit are forced to accept external sworn auditors at the end of each financial year. This is to apply an extra-organizational control force by checking the registration correctness and accurate calculation of financial transactions. In a country like Iran, where social institutions do not receive significant government financial support, the task of auditing can be entrusted to special non-governmental organizations that are established to provide auditing services. In this way, the financial transactions of non-governmental organizations can be examined and scrutinized by the sworn auditors of another member of the civil society. In the same way, the management association of any working non-governmental organization can control the performance of the executive managers of their organization by holding internal audits. Because social institutions actually belong to all public participants, the request for these audits may be issued by any category of people involved in the work and activities of the non-governmental organization [12]. In the third millennium, information and knowledge have become the main wealth of organizations, and therefore commercial enterprises and production units seek to use this wealth as much as possible in their critical decisions in today's dynamic environment and to gain a competitive advantage. Today, the use of information and communication technology in all business elements, as well as accounting systems and software, has formed the basis of business activities and has become a suitable repository for organizational data. Therefore, considering the importance of decision-making in the organization and the need for the decision-making process to be supported through business intelligence, integrating decision-making support with the accounting information systems of the organization's process and database is becoming clearer [9].

The actor-network theory, which is considered the development of the broader school of thought on the Social Constructionism of Technology, considers the creation, survival and stability of networks consisting of human and non-human components (individuals, organizations, communication software and hardware, and infrastructure standards) by examining the social and technical dimensions at the same time. This theory has its roots in the studies of the network of dependencies among social functions in the field of knowledge and technology and is based on the idea that the topology of networks is generally non-local and often has a series of limited (boundary) goals that arise from non-local and scale-breaking interactions [7]. The Actor Network Theory believes that the world is full of complex identities including human and non-human components, for example, information structures. So the Actor-network theory is used for situations where it is difficult to distinguish between these components. The Actor-network theory states that there are no purely technical or social relationships in the information system, and everything that appears to be social at first glance has technical streaks and is a part of every technical, and social dimension [29]. Therefore, actor networks are unified systems whose existence is owed to actors and human and non-human components. These networks are inherently variable over time and are constantly evolving and changing due to the presence of actors involved in the network. In other words, after replacing each actor, the network also changes [34]. This theory can analyze social and technical dimensions simultaneously. The purpose of the network of actors is to explain a community of human and non-human actors who are equally connected in the network and strive to achieve specific goals, for example, the application of accounting information in the decision-making of accountants and managers [2]. In the Actor-network theory, successful networks consist of interested members and are formed by the membership of a sufficient body of allies, beneficiaries and the interpretation of their interests, so that these actors are willing to participate in certain intellectual and practical ways that pursue the goal of network sustainability. The Actor-network

theory views the construction of reality as a black box [31]. This black box is created when the interests of human and non-human actors are regulated in a single set and then the network is formed in a relatively reliable way, but the reality is not published in a classic form. Instead, beliefs are interpreted and by the role and influence of other actors are strengthened or weakened [22]. Therefore, these beliefs are transmitted consistently over time and space as the human network expands and otherwise. So, the publication of information does not depend on the specific belief of a person, and in other words, it is not the result of the decision of a single actor, but it depends on the decision of other actors in time and locus, and the final reality of each claim is thus determined. In other words, the Actor-network theory is a framework for studying social action and the interaction of human and non-human actors in real-life situations [18]. One of the key aspects of the network theory is its emphasis on a wide range of micro and macro structures. In the sense that, from the point of view of network theory, activists can be people, but the groups, guilds and societies can also be considered as the activists. Another fundamental aspect of network analysis is that it tends to lead auditors from examining social groups and categories toward examining the links between actors; that is, examining the links between activists who are not so intertwined and tied together that they could be considered as a group [15].

The actor-network theory as an effective approach in studying the creation, application, promotion, acceptance and use of information, logically portrays the complexity and disorder of the social system and explains the interaction of the social network in the production process until the use of information [26]. In the actors-network theory, the development of information is considered as a consequence of how the actors interpret their benefits and interests. In this way, the successful interpretation of the interests of human and non-human actors leads to the formation of a coherent body of allies and the effective acceptance and implementation of information. The accounting system is also an information system whose purpose is to provide useful information to a wide range of financial information users to help them make informed decisions [17]. In this deliberately created system, right from the beginning of information formation, the scientific, technical, social, economic and political considerations have been mixed with it and shaped its overall structure, and therefore various actors participate in its design and implementation [18]. These actors include a wide range of human resources such as managers, accountants, and audits and also non-human resources such as computer software and hardware, guides and instructions, models for analysis, planning, control and decision-making processes and information bases, data, instructions and equipment, as well as technical resources such as cost calculation methods, technological resources, as well as socio-political resources such as culture, experience, gender, literacy level, etc.

Each of these actors can shape financial and accounting information according to their purpose. Changing the shape, deviating the information from the original form, surrendering to the information conditions, adding to the dimensions and aspects of the information, adapting and allowing the information to leave the cycle, are each of the actions performed by actors [21].

Strategy can be considered as a multidimensional concept that includes all the basic activities of the organization, which creates a sense of integration, unity, alignment and existence, and also facilitates the creation of necessary changes induced from the environment [11]. Strategy includes setting goals, expectations and how to implement activities in the long term. On the other hand, planning makes it possible to achieve macro goals by predicting activities and necessary actions to achieve strategic goals. Planning may also be used as a coordinating mechanism by establishing a formal connection and communication between macro goals and plans with individuals working on specific activities throughout the organization. The variety of strategic planning methods includes a wide range of formal and organized methods to informal and emerging methods. Although it is useful to separate the both concept and the process from each other for a better understanding of the matter, it should be known that these two are not separable from each other and are inherently interdependent. Also, it should be noted that although the essence of the strategy is to obtain excellent financial performance by differentiating the organization from other competitors; but the strategy process creates an order in which all key managers can effectively participate in defining the strategy. Therefore, it can be seen that the concept and the process both are necessary for each other [23].

Considering the economic situation in the last two decades in Iran, the role of management accounting in the economic enterprises of the country has become more apparent. With the move towards privatization, the changes in the patterns of competition, production, company structure, and technology development, as well as the emergence of the Resistance Economy, the importance of management accounting and auditing in economic enterprises is clearly evident. Recent empirical researches show that management audit, to maintain its position, must be coordinated with the change in the economic situation and organizational dimensions and, accordingly, the needs of managers. To survive in competitive markets, many companies have to use new methods to continuously improve the quality and reduce the cost of their products. The realization of this requires planning and control and formulating strategies at different levels. Accounting systems, especially information related to management accounting and auditing, play an important

role in this regard. Considering the potential and actual possibilities and limitations in every economic organization, the management audit, as one of the control methods, impartially evaluates and judges the past performance and the future prospects of management, the degree of efficiency, effectiveness and economy of operations with any volume, size and shape. In this way, it involves the officials and guardians of protecting the rights and interests of shareholders in the better management of affairs [30].

Today, in many countries, members and general meetings of the board of directors, industrial owners and senior managers of economic units, etc., always demand to receive performance evaluation reports and independent advice in the field of management audit, because, in addition to the duty of stewardship, they have high degrees of accountability and responsibility. Executive officials of economic units may not even imagine a reason for the existence of a problem, but they often believe that an impartial review and providing practical suggestions can create positive effects for their economic unit. Examining the increasing demands for receiving operational audit services by the managers of various industries, shows that issues such as observance of efficiency, effectiveness of operational activities and economic efficiency in economic units have provided a suitable platform for conducting operational audits. In general, to conduct a complete preliminary investigation in the management performance audit, a series of issues should be considered such as: knowing the history of the economic unit, past performance and prospects, goals, strategies, operational decisions and executive plans of the economic unit, limitations and possibilities of the economic unit, the quantitative and qualitative benefits of the economic unit, operational and non-operational activities of the economic unit, new management methods and quantitative and qualitative controls of economic unit, management performance audit risks and other information related to management performance evaluation. Therefore, the complexity of accounting information, from production to use, on the one hand, and the involvement of various institutions and individuals in the production, promotion and using the information, on the other hand, as well as the factors affecting the structure and content of the message, etc. in the accounting information system, have made it necessary to introduce and explain the Actors-network Theory as one of the proposed theories in the field of sociology focusing on the information system, which identifies the types of actors and their role in each information system, and shows the effective communication between the actors and the constituent parts of each system. According to the above prerequisites, the present research aims to provide an appropriate answer to this basic question: What is the role of management audit information and the strategy formulation process based on the Actor-network approach among official auditors?

## 2 Theoretical foundations and research background

The increasing progress of science, technology, trade the globalization issue as well as the creation of a competitive environment have caused all the activities of commercial, production and economic units to undergo permanent and rapid changes to discover new markets and speed up from other competitors and provide quality products and services [10]. In such circumstances, providing appropriate financial information is felt more than ever. The Information helps users within the organization on the one hand and external users on the other hand to meet the information needs for better, optimal and informed decisions. These vital needs are met by providing information for investors and other users outside the organization and by providing information for managers through financial management accounting [5]. Because the result of these decisions is presented in the form of financial statements for users outside the organization and provides the basis for their decisions [35]. Management accounting is the process of recognizing, measuring, accumulating, analyzing, adjusting, changing and communicating the financial and operational information that is used by managers for planning, evaluating and controlling the organization and ensuring its accounting process and how to use related resources [37]. It also includes preparing financial reports for people outside the management group such as creditors, shareholders and legal and tax authorities. Management accounting is a knowledge that through the use of effective operational methods in the financial data processing process of an economic unit, on the one hand, helps the management in proper planning to achieve specific goals, and on the other hand, provides wise and rational decision-making conditions to achieve the predetermined goals [33]. Management accounting is a process that includes several dimensions such as methods and concepts necessary for effective planning and appropriate decision-making. The basic purpose of management accounting is to help the organization to obtain the strategic principles of the organization. These principles meet the needs of shareholders and other customers. Strategy is a way by which a company can differentiate itself from other competitors and find its high position [30]. The actor-actor-network theory is a qualitative approach to studying the complex processes and mechanisms resulting from the interaction between society and technology. The main focus of this theory when applied in specific fields is to try to describe the process by which relatively fixed networks of allies are created and sustained, and why such networks stop working. The changes in accounting and auditing as a fact are not only a change in the accounting and reporting system, but a change in thinking, opinion and perspective. This is a strong reason that the human resources working in the accounting and auditing sector have a fundamental position in these developments, and this issue makes it necessary to pay attention

to the consequences and effects of these developments on them. The developments of the profession show that the process of forming the network of actors has not been fully implemented, in other words, united and coherent networks of actors have not been created yet [6].

Putri and Putri [28] have research entitled "The Audit of Household Financial Management and Information Technology on Lifestyle in the New Normal Era" "The purpose of their article is to investigate the importance of internal audit, governance changes of information technology and designing the relationship between audit and information technology on the quality of the family economy. In this developmental research, the samples examined are university employees and lecturers with the criteria of married men and women with several 35. The scale of the questionnaire was a Likert scale. The result of their study showed that the audit of financial management using information technology is considered very good because some of them have recorded all their household expenses and it has diversified their lifestyle.

Hyvönen et al. [14] in research described the role of integrated information systems in organizations and used the Actor-Network Theory. They have concluded that the resource planning systems of the organization are linked with the accounting organizational processes. this makes it possible to create and manipulate the comprehensive real dimensions around the nature and the flow of operations and resources.

Grabowski [8] in a comparative study has investigated the Actors-networks and promotion of management accounting innovations as a process of constructing and interpreting the network of actors. They aimed to understand the nature of accounting changes, and by using the Actor-network Theory, they investigated the fate of innovation in processes. This innovation included activity-based costing. They show how the stages of problem-finding, recruitment and membership as well as mobilization happen in many ways to promote innovation.

Burga and Rezania [3] in research entitled "Project accountability: An exploratory case study using Actors–Network Theory", using the concept of accountability and Actors- network Theory found that non-human actors (artefacts) play an important role in transferring accountability and evaluation through information disclosure. They also found that the accountability in the project is distributed among the project parts at the beginning of the work process is transferred through the stages of actors' approval, and finally is reconstructed through the completion of the project goals. In addition, accountability becomes often mandatory spontaneously without being designed.

Esmaeili Kia et al. [6] in research titled "Investigating the Impact of Public Sector Accounting Reforms on Accountants' Identity by Focusing on the Actor-Network-Theory" investigated the impact of public sector accounting developments on the identity of accountants with a focus on the Actor-network Theory. The statistical population of their study was all the employees of the accounting and financial departments of the government offices of Ilam city-Iran. Using the Cochran formula, a sample size of 113 employees was determined, and using the non-parametric chi-square and one-sample t-test, the data of 121 completed questionnaires was analyzed using SPSS software. The findings showed that the developments have not been implemented according to the four stages of the process of forming the Actors-network, in other words, united and coherent networks of actors have not been created. Also, according to specialized writings, four types of identity were identified among accountants, and the largest group of them are progressive accountants. A part of accounting innovations may imply the design and technical aspects of studies, but the requirement for its successful implementation is to pay attention to the human dimension. Ignoring this dimension leads to serious negative consequences such as increasing stress, weakening motivation, demoralization, illness and even concrete negative effects on the identity of employees, which in turn leads to a low level of acceptance of developments and so its limited effects.

Khaksari et al. [19] in a research titled "Developing a Local Model to Detect the Unethical Behavior of Managers in Financial Reporting" investigated the ability of the Beneish and Spathis models to discover fraudulent financial reporting. The coefficients of these two models were modified using logistic regression and then, the ability of these two new modified models was studied to detect fraudulent financial reporting. In this regard, the data of 99 manufacturing companies admitted to the Tehran Stock Exchange (1089 views) were reviewed during the years 2007-2017. The results showed that the original Beneish and Spathis models do not have good power in detecting fraudulent financial reporting, but the adjusted Beneish model and the adjusted Spathis model can detect fraudulent financial reporting with an accuracy of 77% and 82%, respectively.

Rahnama Rooddposhti et al. [33] analyzed and explained the effects of technical and human actors on the functions of the management accounting information system using actor-network Theory. The main purpose of their research is to explain the role of technical and human actors in the functions of the management accounting system using the actors-network theory. This research was descriptive and correlational, and the necessary data were collected through a survey from a sample of 310 financial managers and accountants. To test the hypotheses, the structural equation modelling was done using Lisrel software. The results of the research showed that technical and human actors play

an effective role in improving the functions of the management accounting system, and unlike the common traditional approach, in the actor approach, these actors are viewed as interventionists who can influence and change strategic decisions and make us able to search for resources of long-term changes in the management accounting system and their role in the society around us. Therefore, the patterns of planning, control and evaluation as management accounting tasks have been changed and developed beyond the financial sectors, and by applying the concept of Actors- network and interpretation process, the multifaceted nature of communication between different actors can be observed.

### 3 Research hypotheses

Based on the stated framework and theoretical foundations of the research, the following assumptions have been formulated for the present research:

The First Hypothesis: there is a significant relationship between the Actors - network and strategy formulation.

The Second Hypothesis: There is a significant relationship between the actor-network and management audit.

The Third Hypothesis: There is a significant relationship between management audit and strategy formulation.

The Fourth Hypothesis: there is a significant relationship between the actors-network, strategy formulation and management audit.

### 4 Conceptual model of the research

Based on the assumptions, the conceptual model of the research was designed according to figure 1.

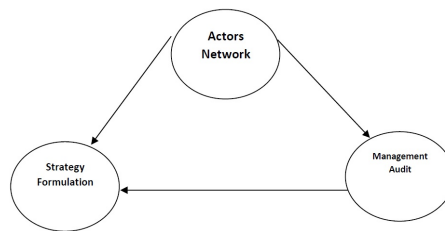


Figure 1: The research conceptual model

### 5 Research methodology

The approach of this research is naturalistic. Because in the naturalistic paradigm, the main assumption to be emphasized is that the observed reality depends on the interpretation of observers and their mentality. The present research in terms of the purpose is practical because it investigates theoretical constructions in practical and real contexts and situations. This applied research, in terms of the nature of the research, is part of original and first-hand research, which means that this research contains a series of facts that have not been published yet.

In terms of the nature of the data, the present research is a mixed qualitative and quantitative research. Because the rational aspects of both perspectives (qualitative and quantitative) are taken into consideration and a middle and practical solution is reached for many research problems. So in the first step, the quantitative data is examined and then using qualitative data, the characteristics are described. In terms of methodology, this is descriptive research, because it studies the characteristics and traits of society members, and examines the current state of the society in the form of several attributes or variables such as age, gender, weight, etc. In terms of the type of argument, it is deductive-inductive. Because in deductive reasoning, the movement is from correct general premises toward partial conclusions (from the whole to the part) and all the observations are collected, then by studying the collected observations, a general conclusion is reached (from the part toward the whole). In terms of data collection this is archival and questionnaire research, and so is statistical research based on the analysis. Also, in terms of the nature and method of the research, it is correlational research. Library studies are used to examine theoretical foundations and research literature, and field methods and questionnaires are used in order to test hypotheses and draw conclusions. In the present research, since the data are obtained from the answers to the predetermined questions (questionnaire) received from a sample of respondents, it is considered a survey research. Also, based on the way of data collection, it is a survey descriptive research. The current research is quantitative in nature, and in terms of time scale, it

is considered a crossStrategy Formulation Management Audit Actors Network sectional research. How to calculate Cronbach’s alpha is the following formula, which is calculated in the software:

$$\alpha = \left( \frac{k}{k - 1} \right) \left( 1 - \frac{\sum_{i=1}^k S_i^2}{S^2} \right). \tag{5.1}$$

Table 1: Reliability of the research questionnaire to measure the variables

Row	Variables	Question No	Cronbach’s alpha co- efficients	The number of Questions
1	Actors-network and Strategy formulation	1-33	0.835	33
2	Actors-network and Management Audit	34-60	0.892	27
3	Management Audit and Strategy Formulation	61-76	0.888	15

According to the results of the table, the Cronbach’s alpha coefficient for all variables and the entire questionnaire is greater than 0.7, so the questionnaire has the necessary reliability.

The statistical population in the present research is all the certified accountants working in the Iranian Auditing Organization and other auditing institutions that are active in the management accounting sector. The sample size was selected based on the Morgan table and by the method of multi-stage cluster sampling and in the form of simple random sampling. Based on this, the research sample includes 250 certified accountants working in the Iranian Audit Organization and other audit institutions in the management accounting sector, who completed the research questionnaire. Sampling adequacy was implemented based on the following formula:

$$KMO = \frac{\sum \sum_{i \neq j} r_{ji}^2}{\sum \sum_{i \neq j} r_{ji}^2 + \sum \sum_{i \neq j} a_{ji}^2} \tag{5.2}$$

## 6 Research findings

In order to get a better understanding of the research population and get more familiar with the research variables, before analyzing the statistical data, it is necessary to describe these data. Therefore, before testing the research hypotheses, the descriptive statistics of the variables used in the research were examined. The average, as one of the central tendencies, represents the centre of gravity of the research population, and in other words, it shows that if the average is placed instead of all the observations, there will be no change in the sum total of the population’s data. Also, the maximum shows the highest variable number in the statistical population and the minimum shows the lowest variable number in the statistical population. The results of descriptive statistics are presented in the table below.

Table 2: Descriptive statistics

Factor	Number	Mean	S.D	Min	Max	Skewness	Kurtosis
Actors-network	250	3.289	1.221	1.212	4.697	-0.477	-1.680
Management Audit	250	3.286	1.259	1.222	4.852	-0.444	-1.645
Strategy Formulation	250	3.165	1.169	1.063	4.625	-0.449	-1.605

In order to implement statistical methods and calculate appropriate test statistics and have a logical inferences about research hypotheses, the most important action before any action is to choose the appropriate statistical method for the research. For this purpose, in this research, the valid Kolmogorov-Smirnov test was used to check the assumption of normality of the research data. In this test, according to the following assumptions, the normality of the data has been checked. The empirical distribution function, Kolmogorov-Smirnov statistic is defined as follows:

$$D_n = \sup_x \left| \hat{F}_n(x) - F(X) \right| \tag{6.1}$$

$$\sqrt{n}D_n > K_\alpha, \quad \text{Reject } H_0, \quad Pr(K \leq K_\alpha) = 1 - \alpha \tag{6.2}$$

According to the values in the above table, the significance level of the test for all variables is less than 0.05, it can be said that the  $H_0$  hypothesis is rejected and therefore the distribution of the variables does not follow the normal distribution. Therefore, non-parametric methods are used in order to check the relationships of the research variables and check the hypotheses. In this section, the fitting of the model was discussed. The meaning of model fit is to what

Table 3: Normality test of the research variables

Variable	Statistic	Sig	Output
Actors-network	0.294	0.000	Not Normal
Management Audit	0.245	0.000	Not Normal
Strategy Formulation	0.245	0.000	Not Normal

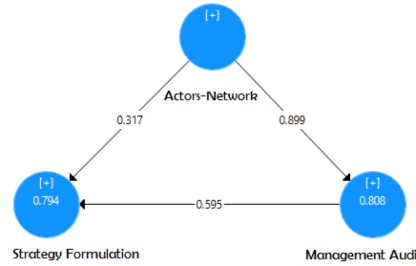


Figure 2: Standard regression coefficients of the research model

extent a model is consistent and agreeable with the relevant data. So, in this section, the fit of the assumed research model is evaluated to ensure its compatibility with the research data, and finally, the answers to the research questions are deduced.

According to the above fitted model, the standardized regression coefficient of the influence of the actors-network on the management audit is equal to 0.899, the standardized regression coefficient of the influence of the actors-network on the strategy formulation is equal to 0.317, and the impact of the variable of management audit on strategy formulation is equal to 0.595. Also the value of the adjusted coefficient of determination for the strategy formulation variable is equal to 0.794. This means that the variables of management audit and actors- network express 79.4% of the variance of the strategy formulation variable. The accounting system is an information system whose purpose is to provide useful information for a wide range of users of financial information in order to help them make informed decisions. In this system, which is created deliberately, right from the beginning of the formation of information, scientific, technical, social, economic and political considerations have been mixed with it and shaped its overall structure, and various actors have been involved in its design and implementation.

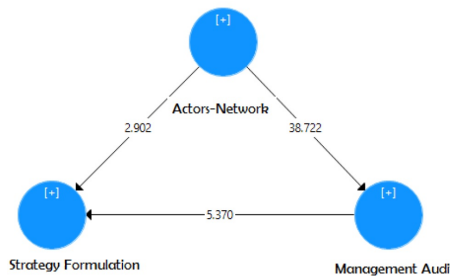


Figure 3: T-Value values for the research model

Due to the fact that in SmartPLS software, the t-statistic value is used in order to check the significance of the coefficients and this value is 1.96 for a 5% error, so in order to check the significance, the comparison of the t-statistic value with the above assumed number is used. So that if the t-statistic value is greater than 1.96, the relationship shown is significant. Therefore, according to the above figure, it can be seen that all the relations of the model are significant. In the following, the reliability and convergent validity are described based on the components of the model. The method of calculating the composite reliability is as follows:

$$CR = \frac{(\sum_{i=1}^n \lambda_i)^2}{(\sum_{i=1}^n \lambda_i)^2 + \sum_{i=1}^n \delta_i} \tag{6.3}$$

The mean value of extracted variance is calculated using the following formula:

$$AVE = \frac{\sum_{i=1}^n \lambda_i^2}{n} \tag{6.4}$$



Table 4: The results of reliability and convergent validity

Variables	Composite Reliability Coefficient ( $Cr > 0.7$ )	Extracted average variance ( $AVE > 0.5$ )
Strategy Formulation	0.925	0.531
Management Audit	0.959	0.578
Actors-network	0.956	0.56

Considering that the composite reliability numbers (internal consistency) and AVE are all in the relevant range, it is possible to confirm the appropriateness of the reliability and convergent validity of the research model. In the following, the fit goodness criteria of the research model are shown.

Table 5: goodness of fit criteria

Variable	R Square	Communality
Strategy Formulation	0.794	0.531
Management Audit	0.808	0.578
Actors-network	–	0.560

The Communality (common values) in the GOF formula is obtained from the squared average of the factor loadings of each variable. GOF is obtained by calculating the geometric mean of the common mean and also the adjusted determinant coefficient mean ( $R^2$ ). And it has a value between zero and one, the closer to one, the better the fit of the model. Also, some researchers have stated that the model with a good fit has a value higher than 0.36 and the model with an average fit has a value between 0.19 and 0.36. The value of the GOF formula is calculated as follows (Eq. (6.5)).

$$GOF = \sqrt{\text{communalities} \times R^2} \quad (6.5)$$

Using the formula and table values, the value of  $GOF=0.667$  was obtained. According to this value, the proper fit of the research model was confirmed. After examining and analyzing the fit of the measurement models and the structural model and having the desired fit of the models, the research hypotheses are examined and tested. Therefore, the results of significant coefficients for each of the hypotheses are expressed.

**The First Hypothesis:** According to the structural model, and the standardized regression coefficient, the impact of the actors- network on strategy formulation is 0.317. Also, the amount of T -statistics for this coefficient is 2.902 and more than 1.96, which means that this coefficient at the error level of 5% is significant. In general, the results of the model estimation indicate that the null hypothesis is rejected and its opposite (The first hypothesis) is confirmed, in other words the actors- network has a significant effect on strategy formulation.

**The Second Hypothesis:** According to the structural model, and the standardized regression coefficient, the impact of actors- network on management audit is 0.899. Also the amount t-statistic is equal to 38.7222 and more than 1.96, which means that this coefficient at the error level of 5% is significant. In general, the results of the model estimation indicate that the null hypothesis is rejected its opposite ( i.e. the Second Hypothesis) is confirmed, in other words, the Actors-network has a significant effect on management audit.

**The Third Hypothesis:** According to the structural model, and the standardized regression coefficient, the impact of the management audit on the strategy formulation is 0.595. Also, the amount of T -statistics for this coefficient is 5.370 and more than 1.96, which means that this coefficient at the error level of 5% is significant. In general, the results of the model estimation indicate that the null hypothesis is rejected and its opposite (The Third Hypothesis) is confirmed, in other words the Management Audit has a significant effect on the Strategy Formulation.

**The Fourth Hypothesis:** According to the structural model, and the standardized regression coefficient, the impact of the Actors-network on the Management Audit is 0.899. and the impact of Management Audit on the Strategy Formulation is equal to 0.595. Also, the amount of T -statistics for this coefficient more than 1.96, which means that this coefficient at the error level of 5% is significant. In general, the results obtained from the estimation of the model indicate that the Actors-network has an effect on strategy formulation through the mediating role of management audit. Also, considering that the value of Sobel's t-test [36] is more than 1.96, it shows that the management audit has a mediating role on the relationship between the actors' network and strategy formulation.

## 7 Conclusion

The analysis and review of the data showed that there is a significant relationship between the actors-network and strategy formulation, which was confirmed. Based on the findings of this hypothesis, it can be concluded that the influence of the structure of non-profit networks as a set of interested parties who want to use management audit information based on multiple demands and goals is very important. Therefore, attention should be paid to this important factor and the interested actors in formulating a strategy. It should be noted that the results of the first hypothesis test were in line with the research of researchers such as [32, 33]. Also, the current research has not been in full compliance with the research of researchers such as [24]. The possible reason for this can be their non-compliance in identifying the approach of non-profit networks, as well as the temporal and spatial scope of their research. . The relationship between the strategy formulation process based on management audit information and broader network structures was confirmed and analyzed in detail. Therefore, it can be concluded that in the process of formulating a strategy based on management performance audit and designing a suitable model related to it, while paying attention to management audit information and access to qualitative information such as creditworthiness, a broader network structure of actors, including institutional actors and real actors, audit staff, audit managers, etc. and their active role should be given special attention. The test of this hypothesis also revealed that the network structure of the range of actors is very important. The comparison of the findings and results of the second hypothesis test has been consistent with the research results of [13, 25, 27, 33, 38].

Also, this hypothesis is not in line with the research results of [4, 8, 14]. and its reason is as the reasons mentioned in the first hypothesis. In the strategy formulation process, it is necessary to pay attention to management audit information. The link between actors should be considered in terms of content and intensity of interaction between them, and there is also a significant relationship between them. Therefore, in the process of formulating a strategy, i.e., the path to achieving goals and developing performance audit programs, which is the meaning and concept of strategy in this field, on the one hand, focusing and paying attention to management audit information in terms of form and title is very important, and in addition, it is necessary to pay attention to the link between actors. The findings of this hypothesis were in line with the findings of researchers such as [33, 37, 38]. Also, the findings of this hypothesis were not in line with the researchers such as [3]. The possible reason for the non-compliance of the results of this research in this hypothesis with other research can be stated in the difference between the spatial domain - the temporal domain and the characteristics of the researched subjects etc. Based on the results, the significant relationship between the cross-links of the inter-branch network in these actors and other actors related to the development of management performance audit strategy was confirmed. In the process of formulating a management performance audit strategy, attention should be paid to the key role of actors and the multilateral structures between them (both official and informal, verbal and written, verbal and non-verbal, etc.). The results of the fourth hypothesis test of this research are in line with the results of researchers such as [4, 13, 32, 33]. Also, it was not in line with the researchers such as [24].

Considering the interpretation of the results of the first hypothesis, it is suggested that the designers and architects of the development of the management audit strategy, create a balance between the costs and achieve the results and maximize productivity, as well as the use of all the facilities, human resources and software equipment, should have a broad look at the expansion and development of intra-organizational technology and the connection of multiple actors and the strengthening of audit information systems as appropriate support tools and information sharing between different departments. According to the result of the second hypothesis, evidence is provided that in formulating the management performance audit strategy, a full understanding of its special conditions should be made by using strategic planning to the dynamics of the organization and also paying attention to the wide structure of the networks of actors within the organization. The results related to the third hypothesis test show that in the process of formulating strategies based on management audit, the role of the structure of non-profit networks as the most important stakeholders of management audit results should be considered. In the strategy formulation process, it should be noted that actors have a unique influence on the status of the organization and have sufficient information about its needs in the strategy formulation process. In fact, these calculations can facilitate the working conditions in the evaluation criteria of various departments of the organization in order to maximize commercial power. The present research has been done from the perspective of the network of actors in management audits. However, more research by researchers can be done on other alternative theoretical perspectives such as other economic theories, and representation structure. Future researchers are suggested to investigate the role of actors in other accounting components such as environmental accounting and corporate social responsibility.

## References

- [1] D. Ahadianpoor Parvin, *Cultural relativism based behavior approach with emphasis on the role of management accountants for management decision making*, J. Account. Knowledge Manag. Audit. **3** (2014), no. 9, 33–51.
- [2] B. Banitalebi Dehkordi, F. Rahnama Roodposhti, H. Nikomaram, and G. Talebnia, *Explaining actor network theory in accounting from the perspective of knowledge*, Sci. Res. Quart. J. Manag. Account. Audit. **4** (2017), no. 16, 119–130.
- [3] R. Burga and D. Rezania, *Project accountability: An exploratory case study using actor–network theory*, Int. J. Project Manag. **35** (2017), no. 6, 1024–1036.
- [4] A.A. Daryaei and A. Azizi, *The impact of ethics, experience and competency on audit quality (With auditors professional skepticism as a moderating variable)*, J. Financ. Account. Knowledge **5** (2018), no. 1, 79–99.
- [5] Z. Dianati Deilami, A.H. Hossein Pour, and H. Ahmadi, *Effect of tools of evolution steps of management accounting on operating profit of companies listed in Tehran Stock Exchange exchanged: An empirical examination*, Sci. Res. Quart. Financ. Account. Empir. Stud. **12** (2015), no. 29.
- [6] G. Esmaeili Kia, F. Sabzalipour, M. Bagherizadeh, and M. Omidi, *Investigating the impact of public sector accounting reforms on accountants' identity by focusing on the actor-network-theory*, Empir. Stud. Financ. Account. **18** (2021), no. 72, 139–168.
- [7] Z. Fanni, *Space, scale and globalization with the analysis of actor network theory*, Strat. Stud. Public Policymak. **4** (2013), no. 12, 93–106.
- [8] L.J. Grabowski, *Real estate decision making: an actor network theory analysis of four, small, charitable organizations*, Georgia State University, 2012.
- [9] Z. Hajiha and M. Kharratzadeh, *Study the relationship between the uses of management accounting innovation and financial indicators of performance evaluation of listed companies In Tehran Stock Exchange*, Financ. Account. Res. Quart. **8** (2014), no. 19, 79–102.
- [10] S. Hamidi, *Investigating the relationship between management accounting information system and production performance, a case study: Manufacturing companies in Khuzestan province*, First Nat. Conf. Mod. Res. Iran World Manag. Econ. Account. Human., Shiraz, Shushtar University of Applied Sciences, 2017.
- [11] G. Harris, *The art of quantum planning: Lessons from quantum physics for breakthrough strategy, innovation, and leadership*, Berrett-Koehler Publishers, 2010.
- [12] Y. Hassas Yeganeh, Z. Dianati Dilami and E. Noruzbeigi, *Management accounting practices in the firms listed on the Tehran Stock Exchange: An empirical examination*, J. Manage. Account. **4** (2011), no. 23, 1–18.
- [13] Y. Hassas Yeganeh, E. Malekian Kale Basti and E. Tavakolnia, *An attitude to auditor' s fear of losing the client; emphasizing on management performance audit*, Knowledge Quart. J. Manag. Account. Audit. **7** (2018), no. 29, 209–220.
- [14] T. Hyvönen, J. Järvinen, and J. Pellinen, *Struggling for a new role for the business controller*, The 8th Conference of the European information and reward systems, J. Account. Res. **38** (2019), 1–34.
- [15] A. Jaberi, *Applications of the actor-network theory in anthropological researches of organizations: The anthropological study of the formation of the network and the relations of human and non-human actors in an industrial-oil organization in Asalouye Bushehr*, Master's Thesis, Faculty of Social Sciences, University of Tehran, 2012.
- [16] A. Jalili and I. Moshiri, *Mental biases in management accounting concepts*, Sci. Res. Quart. J. Account. Knowledge Manag. Audit, **2** (2013), no. 6, 41–50.
- [17] L. Justesen and J. Mouritsen, *Effects of actor-network theory in accounting research*, Account. Audit. Account. J. **24** (2011), no. 2, 161–193.
- [18] S. Khajavi, M. Hallaj, and K. Ganji, *The comparison between domain theory and method theory in management accounting researches: the emphasis on actor-network theory*, Manag. Account. Res. Quart. **9** (2016), no. 25, 53–72.
- [19] I. Khaksari, M.R. Shurvarzi, A. Mehrazzin, and A. Masihabadi, *Developing a local model to detect the unethical behavior of managers in financial reporting*, J. Islamic Econ. Bank. **10** (2021), no. 36, 325–351.

- [20] A. Khosravani and M. Tajiani, *The role of management accounting in the decision making of industry managers*, Chamber Commerce Lett. **556** (2012), 18–19.
- [21] R. Krishnan, *A multi-theoretical approach to management accounting research*, Plenary speech at the 7th EIASM conference on New Directions in Management Accounting, Brussels, 2010, pp. 15–17.
- [22] K. Lukka and J. Vinnari, *Domain theory and method theory in management accounting research*, Account. Audit. Account. J. **27** (2014), no. 8, 1308–1338.
- [23] R.G. McGrath and I.C. MacMillan, *Discovery-Driven Growth: A Breakthrough Process to Reduce Risk and Seize Opportunity*, Harvard Business Press, 2009.
- [24] H. Moghaddaspour and A. Ebrahimi Koedlar, *Compilation and explanation of the management accounting development model in Iran*, J. Account. Knowledge Manag. Audit. **3** (2014), no. 10.
- [25] M. Namazi and G. Rezaei, *The effects of earnings quality criteria on the agency costs: (Evidence from Tehran stock exchange market)*, Proc.-Soc. Behav. Sci. **230** (2016), 67–75.
- [26] T. Pipan and B. Czarniawska, *How to construct an actor-network: management accounting from idea to practice*, Critical Persp. Account. **21** (2010), no. 3.
- [27] J. Pollack, K. Costello, and S. Sankaran, *Applying Actor–Network theory as a sensemaking framework for complex organisational change programs*, Int. J. Project Manag. **31** (2013), no. 8, 1118–1128.
- [28] R.F. Putri and R.F. Putri, *The audit of household financial management and information technology on lifestyle in the new normal era*, Account. Bus. J. **4** (2022), no. 1, 1–17.
- [29] F. Rahnama Rooddposhti and B. Nejad Toolami, *Management accounting ontology in the context of postmodernity (performativity, actant-network and applications)*, Quart. J. Account. Manag. Audit. Knowledge **9** (2016), no. 29, 1–13.
- [30] F. Rahnama Rooddposhti and N. Rostami Mazoei, *A review of psychological theories in management accounting research*, Manag. Account. Sci. Res. Quart. **8** (2017), no. 29.
- [31] A.J. Richardson, *Paradigms, theory and management accounting practice: a comment on Parker 'Qualitative management accounting research: assessing deliverables and relevance*, Critic. Persp. Account. **23** (2012), no. 1, 83–88.
- [32] Rikhardsson and P. Kræmmergaard, *Identifying the impacts of enterprise system implementation and use: Examples from Denmark*, Int. J. Account. Inf. Syst. **7** (2006), no. 1, 36–49.
- [33] N. Rostami Mazoei, F. Rahnama Rooddposhti, S.M.Raeiszadeh, and Z. Poorzamani, *Examining and explaining the effects of technical and human actors on the functions of the management accounting information system using actor network theory*, Manag. Account. Quart. **12** (2019), no. 41, 91–110.
- [34] C. Rowe, M. Shields and J. Birnberg, *Hardening soft accounting information: Games for planning organizational change*, Account. Organ. Soc. **37** (2012), no. 4, 260–279.
- [35] A. Sayadi Somar, K. Nasri, and F. Sabzalipoor, *Evolution management accounting tools; the solution to reduce the ominous shadow opportunistic restatements*, Manag. Account. Res. Quart. **11** (2018), no. 38, 59–78.
- [36] M.E. Sobel, *Asymptotic confidence intervals for indirect effects in structural equation models*, Sociol. Meth. **13** (1982), 290–312.
- [37] B. Talebi and J. Bahri Sales, *The relationship between management accounting system components, task uncertainty, decentralization and performance of managers manufacturing company Bonab*, Manag. Account. Sci. Res. Quart. **11** (2018), no. 36, 15–30.
- [38] A. Tatnall, *Business culture and the death of a portal*, BLED 2007 Proc. Centre Int. Corporate Governance Res., Victoria University, 2007.