The Impact of Intra-Network Communications of Actors on Financial Reporting Quality by Structural Equations Technique

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ABSTRACT

Actor-network theory, which is considered as a development of socio-technical structuralism school, observes reservation and stability of networks containing personal and impersonal components such as individuals, organizations, communication software and hardware, and infrastructural standards by examination of socio-technical dimensions concurrently.The goal of this research is studying the impact of intra-network communications of actors on quality of financial reporting by structural equations technique. This research is a causal one by nature and method and is an application one by goal. Its statistical society includes all accounting professors of Islamic Azad University and all accounting experts in Audit Organization. 107 questionnaires were gathered by accessible sampling method for 2016-2017 periods. The data was analyzed by Structural Equations Technique and PLS software. The results indicate that 74.7 percent of changes in financial reporting quality is described by 6 variables (observing rules, supplying infrastructures, human resources, principles of information systems, observing safety rules and control, and redacting required structure).

Keywords:
Actor-network theory (ANT), observing rules, supplying infrastructures, principles of information systems, financial reporting quality.

1. Introduction

Actor-network theory (ANT) has been noted by many authors as a comprehensive approach in information systems during the recent years, so that an increasing number of researchers in this field has applied this theory [1].Actor-network theory, which is considered as a development of socio-technical structuralism school, observes reservation and stability of networks containing personal and impersonal components such as individuals, organizations, communication software and hardware, and infrastructural standards by examination of socio-technical dimensions concurrently. The hypotheses of this theory in 1980s caused formation of different views about the roles and places of different beneficiaries in this network in order to utilize information technology. The first development and application of ANT is attributed to science sociology, which was founded by Michael Calon and Bruno Lator in Ecole Domain of Paris [21].Since accounting is seeking measurement and provision of economic information to users for deliberate judgment and decision-making, it is known as an information system. Organizations and managers need proper utilization of this information to become successful. Network actors manage performance an expectations effectively, so the reporting process remains stable. Financial accountability and reportingdo not merely deal with a virtual world. In fact, not only it provides an imperfect and false representation of styles, but also it interferes in the styles. Therefore, financial accountability and reporting depend on the executive results, which accounting is its accomplishment tool. In continuance of this accountability process we encounter feedbacks in which actors play their roles resorting ANT, whether they are demand ant or respondent. In this combat, power element beside knowledge element is traceable by accountability. Respondents shall seek powerful attendance in their spatial-temporal actor-network to be able to respond with lower execution. This conclusion also has a message for respondents and their reporting while they monitor this execution inside their own networks. They shall organize a dynamic and updated network for their powerful presence in actor-network to be able to see increment of quality of financial reporting.

2. Literature Review

There was a general movement in management research toward organizational relational theories that do not consider actors as independent persons, but consider them as fixed persons in social network systems. Social network view concentrates on how the relations between agents, such as persons, functional units, or organizations, affect the relations and outputs, in comparison with those theories that study individuals by their attributes, such as gender, age, education, or occupation. Zhu et al. (2010) suggest that network concept is a broad one and it can by imputed to many phenomena where a set of relations are applied in order to identify actors. Analysis of social networks connects together the organizations, groups, and persons around the world. Analysis of such networks is considered as an important capability in many organizations. For example, companies use social networks analysis for making decision about leasing, selling, or optimizing information circulation between staff and using their talents and ideas inside their organizations. Making decision in the areas such as specialty evaluation, criminology researches, and society perception relies on social networks analysis increasingly [22].McLinden (2013) suggests that social networks analysis is a method for analyzing the relations between individuals about a special problem and measures social aspects in order to identify and percept the relations between them [15].Garton et al. (1999) define a network as a set of nodes connected by edges. Nodes are actors, such as people, groups, organizations, or information systems. Edges connect actors to each other and can be different in content, direction, and power, which every one of them can affect network dynamicity [10].Ostrom (1990) assimilates the contents of nodes to the exchanged resources or normal liabilities such as information, money, advice, or relationship. The directions of edges indicate senders and receivers of resources. Furthermore, in some of networks, the edges are not arrowed, but relative powers of edges depend on activity level, such as communication intensity and applied social effects of nodes, which this shows that the edges can be valued or weighted. For example, the relative powers of edges in management studies often are considered as an important aspect of social effects, such as social punishment or isolation that can apply control [20]. Tatnall (2003) suggests that in the ANT, network scope is determined by actors that can produce a sense of their presence in the other actors.

Therefore, identification of an actor by the other actors depend its role in the accounting information network and its effect of production process to applying accounting information. Hence, although a broad spectrum of actors may play roles in production, application, and diffusion of information, this may be hidden from the sights of actors [20].Broad et al. (2004) suggest that the first audiences of accounting information system (AIS) are accountants and producers of accounting information that help managers. Managers are another actors of AIS and may be identified as another private, public, bank, investor, and beneficiary group in the network. The precise definition of social groups and revenue of each group helps proper diffusion and effective application of information [3].

2.1. Accounting information system (AIS)

A system is a set of two or many connected components that interact together to approach a common goal. Sometimes a system contains subsystems, each does a special duty and supports the main system. American Accounting Association (AAA) supports AIS as a decision-making support for managers and suggests: "AIS is a part of an information system that gathers, processes, classified, abridges, data in order to provide information to intra-organizational decision-makers [13].AIS gathers, stores, processes, converts data, and design internal controls. In the statement no. 2 of fundamental accounting concepts from Financial Accounting Standards Board (FASB), accounting is defined as an information system which its initial goal is providing useful information for making decision. AIS is an element in a company that prepares financial information for making decision by processing financial events. In other words, AIS is a set of processes and techniques for organizing information for decision-makers. Finally, by submission of intellectual financial reports, AIS can help decision-makers and managers in their strategic plans. Although AIS can merely contain several papers and user manual, today's AIS are very complex based on IT capabilities and traditional and advanced processes and methods [5].

An Information System (IS), which is also called Data Processing System, is an artificial system composed of a set of manual and automatic components, which is used for gathering, storing, and managing users' data. Fig. 1 shows the main components of an Information System.
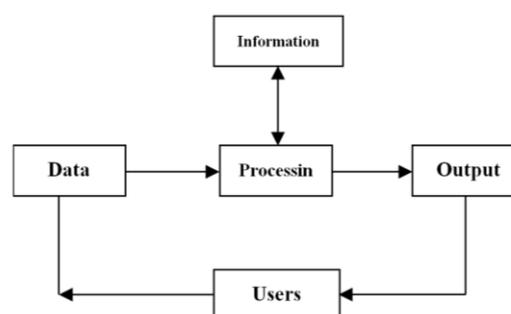

Fig. 1: Main components of an IS

2.2. Financial reporting quality

According to the theoretical concepts of Iranian financial reporting, the goal of financial statements is submission of abridged and classified information about financial situation, financial performance, and flexibility of a trade agency for a broad spectrum of users. Financial reporting quality points to a scope in which financial reports, economic situation, and performance of a company are measured in a specific period. Financial reporting is not merely a final product, but it is a process composed of several components, and quality of financial reporting depends on the quality of each component.

2.3. Actor-network theory and its process

Actor-network theory (ANT) which is considered as a development of socio-technical structuralism school, observes reservation and stability of networks containing personal and impersonal components such as individuals, organizations, communication software and hardware, and infrastructural standards by examination of socio-technical dimensions concurrently. The hypotheses of this theory in 1980s caused formation of different views about the roles and places of different beneficiaries in this network in order to utilize information technology. The first development and application of actor-network theory is attributed to science sociology, which was founded by Michael Calon and Bruno Lator in Ecole Domain of Paris [21].

ANT depicts complexes and disorder of a social system logically as an effective approach for studying, making applicable, diffusing, accepting, and applying

information, and it depicts social network interaction in production process. In ANT, information development is considered as the result of interpretations of actors and their interests and benefits. Thus, successful interpretation of benefits of personal and impersonal actors results formation of a cohesive body of united agents and efficient application of information. In this voluntarily-created system, just from the start of information formation, the scientific, social, economic, and political considerations are ingrained with it and form its general structure, which different actors share its design and execution. Any one of these actors can form financial and accounting information by its own goal. The actions of actors include deformation, deviation, submission, and addition of dimensions information and making suitable and letting quit of information from this cycle. Complexity of accounting information from production to application from one hand, and interferences of different entities and individuals in production, diffusion, and application of information from the other hand, and the effective factors on message structure and other components in AIS, have converted introduction of ANT as one of the important theories in sociology, based on IS, which deals with identification of actors and their roles in each IS, and effective communication between actors and system components. ANT believes that the world is full of complex identities including personal and impersonal components, which ANT is used for distinguishing between these components [7].

2.4. Actors

In ANT, "subject node" or "operant actor" is a general conception for personal and impersonal synthetics which the other network components move by its action and movement. ANT believes that all network personal and impersonal components have equal functions (Hermans, 2005), In fact, actors in ANT differ with the actors in the other views in social sciences so that this definition emphasizes action than actors, either as social or technical identities [9].

The first audiences of accounting information system (AIS) are accountants and producers of accounting information that help managers. Managers are another actors of AIS and may be identified as another private, public, bank, investor,… beneficiary group in the network. The precise definition of social

groups and revenue of each group helps proper diffusion and effective application of information [3].

The most important examining component in actor level is perception, goals, and resources, which sum of them forms actions of actors [12].

Perception, understanding, and other similar concepts such as belief system, recognition, and outlook points to the depiction of actors from their peripheral worlds and concentrates on causal beliefs and is formed based on mutual communication and perception, and improper perception of actors are modified by their audio-visual items. In accounting system, perception is the same belief and recognition system and views towards accounting discussions, theories, and their applications in the company's environment. Goals show directions that actors tend to move toward them [17].Resources point to practical tools and access to goals and return to the objects that are either controlled or interested by an actor. The resources may be either material (financial and budget) or immaterial (location at network), which they enable actors to affect their peripheral environment (actors, relations, and network rules). Therefore, the concept of resource has an important relation with the other concepts at network level. It may have a conception in the frame of a special network (knowledge in a special scope) or it may be independent and is not dependent to a special area or temporal and spatial territory (such as money). Fig. 2 shows the effective structures in demonstration of actions for each actor.
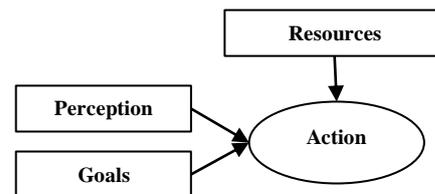

Fig. 2: Effective structures for action for each actor [12].

2.5. Network beside actors
a) Network

Network is recognized as the second key concept in actor-network theory. The social patterns network is independent network between actors by which they form their peripheral plans [12].Some of the basic concepts in the network level are actors, relations, and

rules. These concepts are applied for description of network structure. The form an environment in which the relations between actors cause special results. Therefore, in an AIS, a network can be viewed as a background for heterogeneous components, such as individuals, producers, information, users, beneficiaries, production organizations, commercial and service organizations, society, equipment and furniture, computer, newspaper offices, software, procedures, decision-making, entities, universities, bourse, central bank, other financial institutions, Court of Calculations, Audit Organization, etc.

b) Relation

According to the social network theory it can be said that actors are connected to each other through social connectors. A "connector" indicates the relation between a pair of actors. All equal connectors between group members is called "relations". Among the special relations between actors we can point to exchange relations (informatics), hierarchical relations (power), conflict agreement, or consultation relations. The relations between accountant-audit, accountant-manager, users-institution, are considered as relations between actors in actor-network theory in accounting system.

c) Rules

It is a set of predetermined agreements and codes pointing to public knowledge for demonstration of behaviors between actors in special networks. Thus, rules limit intra-network activities spectrum and form them. Rules are methodologies that affect behaviors of actors and their results. The sample rules based on ANT are code of conduct, regulations, standards, and accounting assumptions [17].

2.6. Background

Sandom, the previous head of AAA suggested that the role of information in society has found more important place. Therefore, information providers, especially accountants, shall provide high quality information for their services be purchased by higher prices; otherwise, they will lose their places in the future [9].

Barbara Wichmann& Kaufmann (2016) studied time and method of best usage of social network analysis for regulating supply chain management, and to do this, they studied phenomena of supply chain management by a social network view.

The research of Dehkordi et al. (2015) shows that ANT as a sociological information system can examine and describe Iranian accounting system, and AIS can be implemented successfully by prioritization of firstly organizational actors and secondly technical, economical, and socio-political actors.

McLinden (2013) believes that analysis of social networks is a method that examines relations between individuals about a special problem and deals with measurement of social aspects in order to identify the relations between them.

Saraf et al. (2012) suggest that according to the conceptual framework of Financial Accounting Standards Board (FASB) and International Accounting Standards (IAS), accounting shall be considered as an information system.

Zheu et al. (2010) suggested that network was a broad concept and it can be applied to many phenomena when a set of relations are used for identification of actors.

Etemadi et al. (2006) believe that IT is a key element for removing spatial and temporal limitations and cause better and more rapid access to information.

Tatnall and Gilding (2005) suggest that in ANT, network scope is determined by actors that can produce their individual attendance sense in the other actors. Therefore, identification of each actor by the other actors depends on its role in accounting information network and its effect on production process.

Broad et al. (2002) suggest that the first audiences of accounting information system (AIS) are accountants and producers of accounting information that help managers. Managers are another actors of AIS and may be identified as another private, public, bank, investor, beneficiary group in the network.

Garton et al. (1999) define a network as a set of nodes connected by edges. Nodes are actors, such as people, groups, organizations, or information systems.

3. Methodology

The present research studies ANT in AIS according to the philosophical and scientific approach and historical identification method. In fact, the researcher intends to introduce ANT and respond the hypotheses by this approach. Archived documents

from experimental studies were used for gathering data and theoretical fundamentals and history were identified by laboratory method. This research is an applied one by goal and is a causal one by gathering data. The statistical society of this research includes all accounting professors of Islamic Azad University and all accounting experts in Audit Organization. 107 questionnaires were gathered by accessible sampling method. Previous standard scales were used for measuring research structures. The questionnaire contains 45 questions about the effective components of communications of intra-network actors in Iranian AIS. The items were graded by Likert Spectrum from Very Agree (5) to Very Disagree (1).

3.1. Research hypotheses

Hypothesis 1: Observing rules affects financial reporting quality in Iranian AIS significantly.
Hypothesis 2: Supplying infrastructures affect financial reporting quality in Iranian AIS significantly.
Hypothesis 3: Human resources affect financial reporting quality in Iranian AIS significantly.
Hypothesis 4: Information systems principles affect financial reporting quality in Iranian AIS significantly.
Hypothesis 5: Observing safety rules and control affects financial reporting quality in Iranian AIS significantly.
Hypothesis 6: Redacting required structures affects financial reporting quality in Iranian AIS significantly.
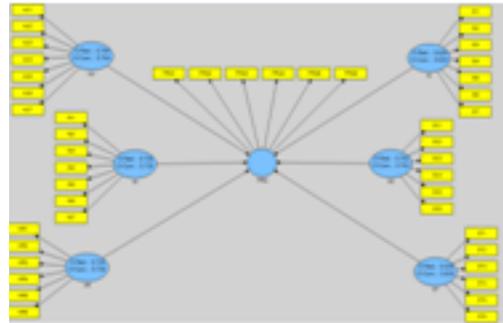
4. Results
4.1. Analysis of research questions

Structural Equations Technique and PLS software were used for responding the hypotheses, and Structural and Measurement Models Quality, Standard Model, and T Model charts were used accordingly. Intra-network actors communication indices in AIS include six indices: observing rules, supplying infrastructures, human resources, information systems principles, observing safety rules and control, redacting required structures.

4.1.1. Tests for structural and measurement models quality

This section CV COM index is used for examination of measurement model, and CV RED index is used for examination of structural model. On the other hand, GOF index is used for measuring general performance

of both models. The values 0.01, 0.25, and 0.36 are used as weak, average, and strong values in this index, respectively (Figs. 3, 4, and 5).

Fig. 3: Structural and measurement models quality

Since both values (CV COM and CV RED) are positive and larger than 0.36 in Fig. 3, the results indicate approval of Structural and Measurement Models Quality. Measurement Model tests approve the provided relations in the model. This section was tested in two steps (path coefficients and factor significance). Thus, Fig. 2 shows standard coefficients and Fig. 3 shows significance coefficients.

4.1.2. Tests for Structural Model (Indices test)

This section was tested in two steps (path coefficients and factor significance). Thus, Fig. 4 shows standard coefficients.

Fig. 5 show examination significance of path coefficients in three levels: 90%, 95%, and 99%, which they are 1.64, 1.96, and 2.58, respectively, according to T statistic.

Since in Table 6, significance of variables "observing rules", "supplying infrastructures", "information systems principles", and "safety rules and control" are greater than 2.85, we conclude that these variables affect financial reporting quality positively and significantly at confidence level of 99%. In addition, for "human resources" variable, T factor is greater than 1.96, which indicates that this variable affects financial reporting quality positively and significantly at confidence level of 95%. Regarding to the calculated coefficient in the Standard Model, we can suggest that 74.7 percent of changes in financial reporting quality is described by these six variables (observing rules, supplying infrastructures, human resources, information systems principles, and safety rules and control).
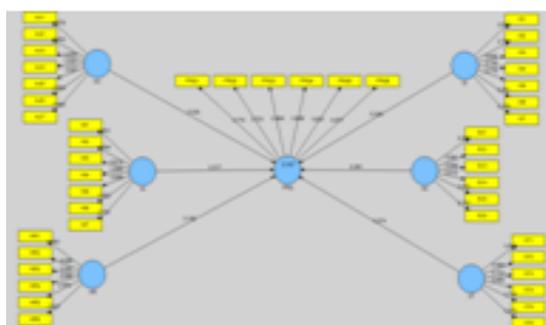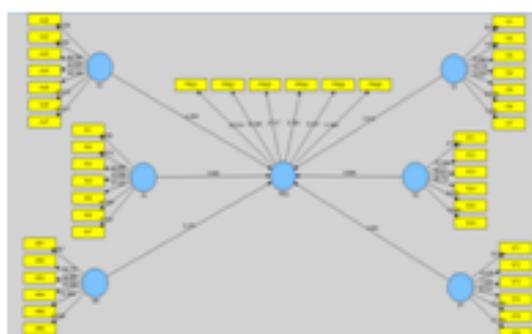
Fig. 4: Standard coefficients model

Fig. 5: Significance model (T statistic)

Table 6: Results for test of model

Path in model	T factor	Path coefficient
Observing rules → Financial reporting quality	2.894	0.200
Supplying infrastructures → Financial reporting quality	3.592	0.217
Human resources → Financial reporting quality	2.274	0.152
Information systems principles → Financial reporting quality	3.814	0.246
Safety rules and control → Financial reporting quality	5.689	0.351
Redacting required structures → Financial reporting quality	4.464	0.274

5. Discussion and Conclusions

Accounting is a field of knowledge which communicates with its peripheral environment and society by both knowledge and profession perspective and interacts with many actors and networks in its evolutional route, and familiarity with the available interactions and identification of the role of each actor in this system helps development and evolution of

accounting. The present research studies the impact of inter-network communication of actors on quality of financial reporting by structural equations technique. The results indicate that 74.7 percent of changes in financial reporting quality is explained through 6 variables (observing rules, supplying infrastructures, human resources, principles of information systems, observing safety rules and control, and redacting required structure). There are various classes of actors in an accounting system such as investors, creditors, public and private institutions, competitors, government, stockholders,… and their interactions requires a system in which many institutional components interfere in production and diffusion of technology. The engaged individuals and organizations contain information related with multiple duties for data production, supplying data, product preparation, marketing, and consumption. Capability of ANT is in identification of locations of actors in information systems, evaluation of their potentials and capacities, interpretation of their roles as socio-technical network components, formation of personal and impersonal network, network interactions, redefining information systems, and their application towards enjoyment of individuals, society, and environment.

In a similar research, Dehkordi et al. (2015) show that ANT, as a scientific information system theory, can examine and describe Iranian accounting system, and AIS can be implemented successfully by prioritization of firstly organizational actors and secondly technical, economical, and socio-political actors, which is compatible with the result of the present research. In addition, the results of the present research are compatible with those of Banitalebi Dehkordi et al. (2015), Sharifzadeh (2012), Corsi et al. (2010), and Boulianne (2007). Also, the results of the present research are compatible with those of Doolin& Lowe (2002), which examined discovery of relations of information systems that were formed by ANT. They suggested that according to ANT, AIS was formed from different sets of personal and impersonal actors.

In order to clarify the different dimensions of research subject and to reply the need of beneficiary groups, the following is recommended. According to ANT, an AIS has tools for evaluation and measurement of integrity of rules, financial resources, and technical resources, which after identification of fortes and foibles and system requirements, it modifies

AIS. Accounting is a field of knowledge which communicates with its peripheral environment and society by both knowledge and profession perspective and interacts with many actors and networks in its evolutional route, and familiarity with the available interactions and identification of the role of each actor in this system helps development and evolution of accounting. Regarding complexity of accounting information from production to application from one hand, and interferences of different entities and individuals in production, diffusion, and application of information from the other hand, and the effective factors on message structure and other components in AIS, it is recommended to introduce ANT as one of the important theories in sociology for identification of different actors, their roles in each IS, their communication, and the components of each system.

Additionally, according to the theoretical fundamentals and results of this research, it seems that the communication between AIS components in Iran, such as individuals, producers, information, users, beneficiaries, production organizations, commercial and service organizations, society, equipment and furniture, computer, newspaper offices, software, procedures, decision-making, entities, universities, bourse, central bank, other financial institutions, Court of Calculations, Audit Organization, etc., is weak and shall be strengthened. In fact, regarding the number of actors in many AIS locations in Iran, public and private sectors act separately instead of cooperation for solving problems (Rahnamaye Roodposhti et al., 2016). For example, more notice shall be devoted to the subsets of each index in observing rules, supplying infrastructures, and redacting rules, and the required communications between the related authorities shall be extended. It is recommended to note to human resources index in Iranian AIS and to examine the existing vacuums in this system in order to increase efficacy and efficiency of this system and to use accounting as a professional knowledge for preparing financial reports effectively.

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