

# THE IMPACT OF EXTERNAL ENVIRONMENT VARIABLES ON ACCOUNTING INFORMATION SYSTEM

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## ABSTRACT

*The external variables have an impact on the adequacy and effectiveness of accounting information systems, which is reflected in the nature and type of information available to decision makers. Therefore, this research seeks to achieve a sorting out between the opportunities and threats facing the accounting information system in Iraq that arise as a result of the external environment variables. An applied study was conducted to examine the external environment variables on the accounting information systems in the construction sector companies, where the problem lies in how the information system can Accounting that adapts to the level of environmental uncertainty? What are the controlling factors that determine how? The accounting information system must be structured to be efficient and effective.*

*Consequently, the research is based on the hypothesis that "external variables have a significant impact on the accounting information system, which is reflected in the performance of its basic functions in a manner consistent with this change." The research concluded with a set of conclusions and recommendations. For the purpose of formulating the research according to a sound scientific perspective.*

*The research was divided into several axes, the first of which dealt with the theoretical framework of accounting information systems, while the second is devoted to explaining what the external environment variables are, and the third axis is devoted to the practical aspect, To end with a summary of conclusions and recommendations.*

**Keywords:** Information System, Effectiveness, External Environment, Impact

## INTRODUCTION

The need for developing and increasing the efficacy and effectiveness of "Accounting Information Systems" is strongly related to addressing the factors and variables affecting them in order to face the changes, adapt with them, and help decision-makers with the needed information on one hand. On the other hand, information accounting systems in construction sector have an importance and privacy related to the length of the operational cycle, the specific accounts used in the sector, and the financial funding in addition to the accounting methods and procedures that are applied particularly in this sector. All the pre-mentioned factors require taking this sector into consideration.

Furthermore, the accounting information system, which is considered part of the management information system, is expected to provide the information needed for making the decisions that vary based on the constantly changing economic conditions. This also requires making constant changes on the accounting information systems in order to take advantage of their basic function represented in providing information.

All the pre-mentioned reasons require providing an accurate accounting information system that is characterized by the ability to face challenges and deal with them, either directly as an information system, or indirectly in terms of its impact on the financial system.

## **The Study Methodology**

The study methodology includes a discussion of the study problem and its objectives, the main hypothesis being tested, the study sample, the methods of collecting and analyzing data, as well as the research duration and importance.

### **a. The Study Problem**

Most economic organizations seek to support and enhance the information system in order to depend on their results in making decisions, face the changes that emerge in the external environment, and set the suitable types of responses for such variables in order to manage them and make the decisions related to serving the organization in achieving its objectives.

The variables of the external environment constitute situational factors affecting information systems, *i.e.*, the change in accounting information system is a response to those factors, and hence we can determine the research problem.

The study aims to answer a number of questions:

1. How can the accounting information system adapt with the level of environmental uncertainty?
2. What are the control factors that determine the way the accounting information system should be structured in order to be effective?
3. What are the available domains in front of the accounting information system so that it can design its structure to cope with the environmental variables?

### **b. The Research Objectives**

The main objective of the research is identifying the impact of some variables of the external environment on accounting information systems and the degree of their response to the environmental variables in order to increase their efficacy and response to changes in general and to the sudden changes in particular. Based on this objective, the following points become evident.

- The importance of environment in studying accounting information systems.
- The impact of environmental uncertainty on accounting information systems.

### **c. The Study Importance**

The importance of this research lies in focusing the attention on the previously mentioned variables of external environment and their importance and impact on accounting information systems that weren't sufficiently researched in the past. This research also distinguishes between the opportunities and threats that face accounting information systems in Iraq resulting from external environmental variables. Moreover, the current research connects organizational and managerial subjects represented by studying the environment and between accounting subjects represented by the accounting information system and its components, where the accounting information system is considered as a part of management information systems, which operates within the internal environment of the organization but has a reciprocal impact with the external environment.

#### **d. The Research Hypotheses**

The research is based on the following main hypothesis: The external variables have a considerable impact on the accounting information system, and this leads to its change accordingly. This change can enable these systems to do their basic functions in a manner that correspond with that change. The following sub-hypotheses are divided from this main hypothesis:

-The change in laws, systems, and regulations, as well as the change in electronic computerized systems, lead to a change in accounting systems

-The scarcity of financial and economic resources prompts governments to make many strategic decisions toward controlling them and managing them in a centralized way, which, in turn, contributes to providing them for a longer time and best cases. This will be reflected on the economic plans and accounting information systems that should be corresponding to them.

#### **e. The Research Approaches**

This study is based on the deductive approach by studying the external environmental variables, identifying the effects and response degree of accounting information systems to these variables, as well as the impact of each variable on the components of accounting information system in order to find out the basic conclusions that serve accounting information systems in general.

#### **f. The Research Population and Application Site**

An applied study was conducted on the impact of external environment variables on accounting information systems in the companies in construction sector, where two sectors were selected in order to obtain initial evidence about the environmental effect. Then, the researcher performed the analysis for five of the surveyed companies in order to achieve the study objectives. Selecting the construction sector to conduct the field study is due to its importance and vital role in achieving the growth in the national economy.

#### **g. The Research Variables**

- The independent variable: the variables of external environment.
- The dependent variables: accounting information system
- The concept, classification of environment

### **The Concept of Environment**

The concept of environment varies based on the intention of using it. If the intention is related to the natural environment with its components of water, air, and soil, we can feel the place of the living being and its surrounding environment with all the senses or one of them. However, the issue is different in relation to perceiving the environment of the economic organizations. The concept to which we are concerned in this domain is the concept that has an effect on the organization and the systems working in it, including the accounting information system.

### **Classification of the Environment**

Many classifications emerged for environment based on certain basics. However, they were classified into several classes in order to study the environment in terms of the relationship and the effect on the organization, as follows:

#### **h. The Private Environment and the Public Environment**

The public environment includes all the economic, social, political, cultural, and geographical factors that have a direct and indirect impact on the organization, while the private environment includes certain parties, such as consumers, developers, and competitors as well as the other social factors (Hellriegel & Slocum, 2011). This division is similar to that suggested by Thomas, in terms of the components of the private and public environment.

#### **i. The Public Environment and the Important Environment**

Dill (2012) is seen as one of the pioneers in this division. He defined the concept of public environment as the space in which the organization works, including all its economic, social, political, and cultural factors, while the important environment includes the variables that have more connection with the organization, including consumers, developers, and competitors, as well as public departments and associations.

Gerloff (2013) suggested that it is difficult to define separation boundaries between the public environment and the important environment due to their connectedness with each other and their connection with the organization. (Daft, 2012) defined the important environment as the sectors that directly interact with the organization, while the public environment includes the indirect factors.

#### **j. The Internal Environment and the External Environment**

Duncan (2016) is seen as one of the pioneers in this domain, where he suggested that the external environment includes the social and financial factors surrounding the organization, while the internal environment includes the social and financial factors within the boundaries of the organization.

Giffin (1993) tended to divide the environment into an external environment that that represents everything outside the boundaries of the organization and has an effect on it, and an internal environment that includes the conditions and forces inside the organization. Then he divided the environment into a public environment and an important environment.

As for the environmental characteristics, Shortell (1997) identified four characteristics for the environmental factors as shown in the following figure.

The environment characteristics

\*Source: prepared by the researchers based on the pre-mentioned resources.

Therefore, researcher can see that the environment characteristics varied from static to dynamic, from simple to complex, from homogeneous to heterogeneous, and from nonthreatening to challenging.

However, this diversity in environmental classification, characteristics, and dimensions didn't discourage researchers from studying the environmental factors. Indeed, there has been more need and desire to study them based on the theory of open systems as well as situational theory, since giving more emphasis to the study of internal factors could expose the organization and its systems to serious risk due to its inability to recognize the environmental changes, either in relation to consumers' desires or the modern developments. This implies giving more attention to certain

factors in order to study them and identify their relationship and impact on the organization and provide the appropriate response accurately.

### **k. The Situational Theory**

The pioneers in the situational theory agreed that what is appropriate for a certain situation may not be appropriate to another. This theory stresses the unavailability of a single way that can be used for managing organizations in all the situations. However, the suitable way depends on the nature of situational factors affecting the organization (Brown & Moberg, 1980).

The researchers who addressed the situational theory had different views in determining the situational factors. Some researchers focused on environment as a situational factor affecting the organization, others focused on the size of the organization, while others emphasized technology as a factor affecting the organization (Al-Deeb, 1988).

### **l. The Variables of the External Environment**

There is a need to study the external environment in response to the rapid changes that take place which, in turn, requires the organization that includes a subsystem to analyze these changes constantly in order to plan for the available opportunities in the external environment, or determine that challenges that will face the organization and hinder it from achieving its objectives and to identify whether the environmental variables require basic changes or modifications in the plans or objectives

The environmental variables represent all the environmental restrictions outside the boundaries of the organization that affect it in two directions related to opportunities and challenges. Each variable within the external environmental variables consists of a set of elements composing the environment and has an effect on it. Some variables are considered as necessary for achieving the objectives of the organization, while others hinder the organization from achieving its objectives. Here are some of the basic external environmental variables:

- Economic variables
- Social variables
- Cultural variables
- Political and legal variables
- Technological variables

#### **Practical cases about the impact of external environment**

After applying the questionnaire and demonstrating its results as well as obtaining initial perceptions in order to give more profound analysis, the researcher conducted practical case studies on a number of companies. The researcher obtained as much information as possible about each case despite the difficulties faced for doing so. The methods and procedures followed by each company were investigated (as a practical case by itself). Then, the final accounts (the outcomes of the working system) were observed in order to identify the cases of environmental impact by linking the factors, making comparisons, and analyzing them in order to utilize them in identifying the environmental impact and attract the attention of those interested in the domain. In this regard, the researcher selected most of the companies that were involved in the questionnaire in order to achieve the study objective represented by motivating the targeted population to predict the events and variables in an attempt to manage challenges and take advantage of the opportunities available

in the external environment in addition to enabling the accounting information systems so that they are capable of realizing them and setting the conceptualizations about them

In this regard, we will introduce two practical cases, followed by an analysis for the impact of environmental variables for each case, either in procedures, methods, or in introducing the reports, noting that the practical cases were represented by the following companies:

- The first case: Al-Mansour Contracting Company.
- The second case: Al-Mo'tasim Contracting Company.

### \*The First Case

#### m. Al-Mansour Contracting Company

It is one of the companies belonging to the Ministry of Housing and Construction and was established in 1987. The company used the method of mediated closure until 1991, and then converted to the method of performed contract. Due to the centralized decisions, the company failed to achieve a set of projects with a total of 7.000.000 dinars. The company also was able to gain profits with a total of 8.000.000 dinars and sold materials with higher prices that amounted to 6.1 million dinars, which, in turn, increased its profits.

In third year, the company had a deficit of about 473,508) dinars and several projects were canceled based on the direction from competent parties with a total of 7.208.677 dinars. In seventh year, the total capital profits for the company reached 12.293.391 dinars resulting from selling cars. As for projects, two projects achieved profits that amounted 55 million dinars from the net profit that amounted to 64.1 million dinars. As for the savings achieved from the differences of pricing related to the materials prepared by the company itself, the gained profits reached 80.4 million dinars. Here is a display for the impact of external environment variables on accounting information systems used in the company:

1. The effects of governmental interaction through the governmental laws and legislation, which are demonstrated as:
  - a. The company faced a deficit in a number of projects with about 7.000.000 dinars based on centralized decisions in third year due to the implications of item (c) below
  - b. Distributing productivity incentives in eight year with about 5.940.846 dinars
  - c. Canceling a number of projects based on centralized decisions with about 7.208.677 dinars on third year that weren't decisive until fifth year.
  - d. Awarding the company with a number of private delegation contracts.

Based on those examples, we can see that the productive activity was influenced by many centralized decisions, which, in turn, affected the activities of accounting systems; the effects of private contracts were related to the accounting information systems as well as reducing the importance of planning budget.

2. The external environmental conditions contributed to achieving non-real profits for the company; indeed, they were related to the effects of inflation or the scarcity of financial resources. Certainly, this increased the amount of money in a considerable degree, followed by an increase in the procedures, methods, and requirements used in performing the accounting processes and demonstrating the financial reports. The impact of that is seen on

the stages and components of the accounting information systems used in these cases as shown in Table (1).

<b>Profits</b>	<b>Gained by Internal sales</b>	<b>Capital profit</b>
Third year	8000	6100
Fifth Year	4897	3500
Seventh Year	12293	80400
Eighth Year	----	64400

These profits which include two types of yields: either as capital profits resulting from selling cars and machines, or profits related to increasing the prices of produced materials, affected the financial lists either at the expense of product, Profits, and losses, or at the expense of general budget. They also added routine Burdens related to an increase in the employed methods and procedures as well as the processes of recording and classifying them. It is worth noting that one of the factors that contributed to achieving profits is related to the scarcity of financial resources and the increase in their prices within the environment. This was considered an opportunity from which the company could utilize and achieve capital profits and represented a new challenge that the system should accommodate and realize by demonstrating its impact on the financial lists. In this way, the decision-makers would be informed *via* the information provided by the system.

3. The accounting information system applied in Al-Mansour Contracting Company responded to the accounting professional instructions, particularly in relation to the accounting rule (1), where the company changed its policy from the method of mediated closure, which is based on a uniform accounting system, to the method of performed contract, which is based on extracting the activity outcome for the activity after completing it
4. The environmental conditions contributed to delaying the percentages of financial achievement for some projects from the percentages of technical achievement, as well as delaying the percentages of technical achievement for some projects from the percentages of temporal achievement due to unresolved contracts, or due to the scarcity of financial resources in other projects. All these factors have implications on the accounting information system due to the delay in documentation in the accounting records and a delay in finding out the activity results. We noticed that the company didn't close some of its projects even though it reached an achievement percentage of 100 percent. The following table shows the percentages of financial, technical and temporal achievement for some projects.

<b>Projects</b>	<b>Rate of financial achievement</b>	<b>Rate of Technical Achievement</b>
Project 1	61%	100%
Project 2	28%	100%
Project 3	33%	100%
Project 4	50%	74%
Project 5	64%	90%
Project 6	40%	100%

The delays in financial achievement percentages in comparison with technical achievement percentages are due to legal obstacles. The delay in technical achievement percentages in comparison with temporal achievement percentages is due to the scarcity of resources.

<b>Years</b>	<b>First Year</b>	<b>Second year</b>	<b>Third year</b>	<b>Fourth Year</b>	<b>Fifth year</b>	<b>Sixth year</b>	<b>Seventh year</b>
Inventory	17280	8081	6218	11955	69524	25335	23657
Debtors	16825	26355	46891	49017	58571	173087	29042
Creditors	18731	20332	36418	26663	93264	13659	272572

Referring to the above table, we can see that the balance of the inventory increased by fifty-five times in eight year even though the quantities did not increase with the same percentage, which wasn't disclosed by the financial lists.

5. The standardized accounting system applied by some contracting companies is comprehensive. This system, which is applied by some commercial and industrial companies, did not disclose the information that should appear in the general budget, such as the under implementation activities, which were incorporated with the stock and include different items. However, the under implementation activities are demonstrated in reports enclosed with general budget based on that system. Hence, we can say that the system satisfies the need related to that domain, but not so well since it doesn't consider the privacy of those companies, which, in turn, affects the general budget. For example, the under implementation activities in that company had a balance of 20.19 million dinars, which were included in the stock.
6. The explicit balances in the general budgets didn't show that there is inconsistency between the values of items obtained before changes in prices due to shortage of resources and the values of items obtained after changes in prices. In sum, the financial lists didn't give a clear and accurate image, which entails that we should use the principle of complete disclosure (accounting rule number 6) since there are still domains that didn't gain the response of the accounting system applied in the company even though the designed system has the ability to respond to such a case.
7. The accounting information system related to costs didn't disclose the method of managing general and administrative expenses as if they were related to projects or contracts. If they were processed inaccurately, *i.e.*, the accounting information system did not respond to the requirement of item (f) of the accounting rule (6) related to disclosing the under implementation activities.

### **\*The Second Case**

#### **n. Al-Mo'tasim Contracting Company**

The company was established in 1987 with a capital of 25 million dinars. In first year, the company had profits that reached 5.3 million dinars. It used the method of mediated closure for the performed activities. In second year, the company had profits that reached 2.07 million dinars, while in third; the company faced a financial deficit that reached 381,000 dinars. However, in fourth year, the company gained profits that reached 2.9 million dinars. It immobilized a number of projects based on centralized decisions.



In fifth year, the company gained profits that reached 9.6 million dinars and kept 5.2 million dinars as maintenance expenses and expected losses. The company employed the method of pricing the performed action after implementation by adding the profit margin in coordination with the employer. Also, the company gained capital profits that reached 2.4 million dinars.

In seven year, the company had a financial deficit that reached 8.5 million dinars. It employed the method of cost plus the profit margin, while continuing the use of performed contract method. The company didn't have accurate future perceptions with regard to the degree of gaining profits or losses in the projects to which it is abided on order to assure the sufficient customization for that. It's worth mentioning that the company depended on the estimated bases in distributing the costs of the company residence and the automated division without attempting to find out a suitable loading rate

In eight year, the company faced a financial deficit that reached 36.812.157 dinars, even though it gained profits that reached 96.5 million dinars; in that year, the company didn't have competitive work opportunities, as it only depended on private delegation contracts.

After this review of the company activity, we introduced the impact of external environment variables on the application of the accounting information system used in the company.

1. The effects of governmental interaction through the governmental laws and legislations, which is demonstrated as:
  - a. The company was established in 1987 with a capital of 25 million dinars restricted by law.
  - b. The company employed the method of pricing the performed action after implementation, adding the profit margin in coordination with the employer in order to avoid the non-pricing of private delegation contracts due to the consequences of this method on the accounting system activity in terms of delaying the processing the entries and documenting them in the records until implementation. Indeed, this leads to inaccuracy in documenting the dues correctly since the accounts aren't recorded at the time of occurrence
  - c. The content of article (b) has other implications on the accounting information system since the company has no future perceptions about the events that will take place due to its inability to prepare the planning budget well (because of the private delegation contracts). This leads to losing several benefits provided by the accounting information system since the documented information provided by that system will be useless and can't be adapted to development. Moreover, there will be miscalculation to the allowances, which will be only based on estimations and not sufficient for the requirements. This implies paying more attention to the main events in order to avoid them, as well as giving more flexibility to the details of events so that the financial position of the company won't be affected negatively. For example, even though it gained profits that reached 96.5 million dinars in eight year, it wasn't able to cover the deficit in its activity and faced a deficit of 36.8 million dinars since the company in that year was authorized to contracts by governmental parties and didn't obtain competitive work opportunities during that year.

Details	First year	Second year	Third year	Fourth year	Fifth year	Sixth
Fixed assets	4061	3937	369	4214	6033673	10020577
Ander implementation						
Projects	79	79	79	79	79256	79256
Inventory	42746	50742	119993	77439	173659735	419714578
Credits	406	294	292	235	108443	108443

Debtors	20778	18618	40577	59996	64493139	169456583
Cash	4165	11830	8176	5617	25892427	69885903
Total	72235	85490	172814	147580	270266673	65965320
Capital(5) million	2191	2191	5327	1131	1129912	1131428
reserves	5545	8111	10487	16035	1782168	22759563
Long-term allowance	3108	642	642	642	522852	522802
Long-term loans	21069	220588	20179	20375	19809307	19809307
Short-term allowance	- - - - -	3684	6950	8184	14057206	63130182
creditors	40322	39576	129229	91213	215688129	86547046
Deficit					(8522901)	44635057
Total	72335	85490	172814	147580	270266673	59265320

- The company adopted the estimation bases in distributing the costs of the company residence and the automated division without attempting to find out a suitable loading rate. In this regard, we refer to the accounting rule (6) related to the complete disclosure that didn't gain the response of the operating system.
- As for the effects of the shortage of financial resources, what was suggested in the previous case also applies to this case. Therefore, there is no justification to repeat the same analysis or display the relevant tables.

## CONCLUSION

This topic addresses the most important conclusions that the researchers found in relation to the theoretical and practical domains related to the subject matter, as follows:

- The external environmental variables vary in impact and timing. Its impact is either negative on the accounting information systems and appears as a challenge or positive in the form of opportunities and require treatment and processing based on the type of the impact.
- The scarcity of financial resources as an external environmental variable represented a negative impact on the activities of companies and the standardized accounting system. This increased the level of complication and consequently increased the procedures and methods employed by the applied accounting system; hence, it represented a serious challenge for the system, particularly in relation to the quantity and quality of the information provided by the system.
- The accounting systems in the contracting companies responded well to the accounting rule (1) issued by the Iraqi accounting standards council while there wasn't enough clarity in response to the other rules
- A clear defect in the companies' accounting systems was evident in their non-response to the governmental regulations represented by the private delegation contracts. This deficit resulted from not preparing these systems well, and the lack of preparing a planning budget resulted in a deficit in the supervision and planning domains as well as the processes of evaluating performance as the alternative methods used for doing that weren't as efficient as the alternatives provided by the planning budget.
- The factor related to increasing the prices wasn't considered by researchers. However, due to the relationship of that with the variable of financial resources scarcity, the researcher noticed that the system wasn't able to respond to that variable in order to demonstrate the impact of variables on prices.
- Since the standardized accounting system is characterized by its comprehensive nature and is currently applied in the contracting companies, the system wasn't able to sufficiently demonstrate some of the private domains characterizing these companies, particularly those related to under implementation projects.
- The environmental impact on the activities and events of the company has both positive and negative relationships with accounting information system. When there are negative effects on the productive activity, there will be negative effects on the activities of accounting information system.

8. The financial lists did not disclose the huge amounts of money employed in the working capital. Since this amount of money resulted from the increased prices, it could be interpreted as evidence for a development in the company position, and such an interpretation would be in contradiction with the real status in certain domains.

## RECOMMENDATIONS

The researchers cited some recommendations as follows:

1. The researchers recommend the accounting governmental authorities at all the levels to consider the current and prospective impact of external environmental variables on the accounting information system in order to increase its efficacy and support it to be more effective to face changes.
2. The external environmental variables with their impact on the accounting systems urge us to recommend developing the reality of managerial accounting information systems with all dimensions as well as developing all the possible methods and contexts in order to utilize the reports issued by that system to serve decision-makers

By applying that system, we can deal with the following issues:

- a. The shortage of planning budget.
  - b. The lack of responsibility positions.
  - c. The lack of important supervising domains.
  - d. The ineffective evaluation of performance.
  - e. The law cases that impose creating serious potentials.
  - f. Ineffective prediction processes.
  - g. Avoiding the urgent events.
  - h. Doing a planned change in the current accounting system.
  - i. Assigning a position for the managerial accountant in the organizational structure.
  - j. Facing challenges and taking advantage of opportunities.
3. Obliging the companies to implement the accounting rules issued by the Iraqi accounting standards council due to the positive impact of that on the information related to cost and financial lists.
  4. Giving general basics and instruction by a specialized accounting group in that domain in relation to the procedures and methods that should be followed in order to adapt the financial accounting information in a way that makes them understandable and suitable for decision-makers.
  5. Involving the accountants in the contracting sector in courses that aim at giving them training to using the modern tactics and methods, particularly in managerial accounting in order to serve decision-makers.
  6. Urging the companies to seek assistance from the specialized accounting consultation centers in order to improve the cost accounting systems and the management managerial accounting information systems so that they are more efficient in facing the urgent changes due to include and provide the necessary information that enables management to utilize them effectively.

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