

## IMPACT OF ACCOUNTING INFORMATION SYSTEMS ON INTERNAL AUDITORS IN TURKEY

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### Abstract

The increasing sophistication of technology has opened up the use of accounting information systems (AIS) to companies. These systems are important because they enable all levels of management to access comprehensive information that goes into the planning and controlling of activities within business organizations. In addition, AIS provide quality information to internal and external users and typically cover six main aspects: people, procedures, data, software, information technology infrastructure, and internal controls. This study uses a questionnaire survey to examine the influence of AIS on internal auditors in Turkey. AIS are vital for internal auditors because they process the transactions, that is, they maintain financial records. It is, to the best of my knowledge, the first study to do so. In all, I put 12 questions and 106 internal auditors were agreed to participate the survey and found that internal auditors in Turkey believe that AIS contribute positively to their work.

**Keywords:** Accounting Information Systems, Internal Auditors, Questionnaire Survey.

## MUHASEBE BİLGİ SİSTEMLERİNİN TÜRKİYE'DEKİ İÇ DENETÇİLER ÜZERİNDEKİ ETKİSİ

### Öz

Teknoloji kapsamında meydana gelen gelişmeler, muhasebe bilgi sistemlerinin (MBS) şirketler bünyesinde kullanımına ivme kazandırmıştır. Söz konusu sistemler, bütün idarî seviyelere, ticarî teşebbüsler dahilinde gerçekleştirilen faaliyetlerin planlanmasına ve denetlenmesi-

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ne yönelik kapsamlı bilgilere erişim olanağı sunması nedeniyle önem arz etmektedir. Buna ek olarak, MBS, dahili ve harici kullanıcılara kalite bilgisi sunmakta ve genellikle kişi, prosedür, veri, yazılım, bilgi teknolojisi altyapısı ve dahili denetim olmak üzere altı ana başlığı kapsamı içerisine almaktadır. Bu çalışmada, muhasebe bilgi sistemlerinin Türkiye'deki iç denetçiler üzerindeki etkisini incelemek amacıyla anket yönteminden faydalanılmıştır. Muhasebe bilgi sistemleri, işlemlerin gerçekleştirilmesini, diğer bir deyişle mali kayıtların tutulmasını sağlamalarına bağlı olarak iç denetçiler açısından ciddi öneme sahiptir. Söz konusu çalışma, bu konuyu ele alan ilk çalışmadır. Ankette toplam 12 soruya yer verilmiş, 106 iç denetçi çalışmada yer almayı kabul etmiştir. Çalışma sonucunda Türkiye'deki iç denetçilerin, muhasebe bilgi sistemlerinin çalışmalarına katkıda bulunduğu görüşünde oldukları görülmüştür.

**Anahtar Kelimeler:** Muhasebe Bilgi Sistemleri, İç Denetçiler, Anket Çalışması.

## I. INTRODUCTION

Today's business managers operate in a competitive and rapidly changing global business environment. Many corporations rely on computers and software programs to deliver accurate and timely information to efficiently manage their business [1]. Information technology has become a crucial requirement for business success [2]. Accounting information systems (AIS), one of the most critical systems in an organization, have changed the way they capture, process, store, and disseminate information. AIS are indispensable to managing an organization and implementing internal control systems [3]. AIS are defined as computer-based systems that process financial information and support decisions taken in the context of coordination and control of organizational activities [4]. They undertake the functions of processing, categorizing, data gathering, and reporting financial events to deliver relevant information for score keeping, attention drawing, and decision making [5]. These systems are seen as crucial for efficient decision-making and control in organizations [6]. They typically cover six aspects: people, procedures, data, software, information technology infrastructure, and internal controls. People are the users of the systems, such as consultants, accountants, managers, and business analysts. Procedures comprise the methods for storing, collecting, and retrieving data. Data refers to all financial information related to the business practices of organizations. Software alludes to the computer-based program used to retrieve, store, process, and analyze the company's financial data. Information technology infrastructure is the hardware for operating AIS. Internal controls refer to the protection of data against unauthorized access and limiting it to users within the company. Therefore, AIS contribute to all business modules, amid the rising complexity and volume of financial and operational transactions. In today's business world, auditors should be knowledgeable about both accounting and technology.

According to the Institute of Internal Auditors (IIA), internal auditing is an independent consulting activity whose objective is to enrich and advance an organization's operations. It helps organizations reach its objectives by bringing a systematic and disciplined approach

to the assessment of the effectiveness of risk management, control, and governance [7]. In addition, IIA defines certain attributes that internal auditors should have, such as integrity, objectivity, confidentiality, and competence, so they can establish the trust that will help organizations rely on their judgment. With respect to objectivity, internal auditors should exhibit the highest level of professional objectivity in gathering, evaluating, and communicating information. [8] Confidentiality is about internal auditors respecting the information they receive while competence means they should be able to apply their knowledge, skills, and experience in performing their role. Further, AIS are vital for internal auditors because they process the transactions, that is, they maintain financial records. Such systems identify, assemble, analyze, classify, record, summarize, and report transactions and other events [9]. In order to analyze the usefulness of accounting information systems for internal auditors in Turkey, it is used questionnaire survey method and asked 12 questions to participants and a total of 106 internal auditors are agreed to participate the survey. AIS are vital for internal auditors because they process the transactions, that is, they maintain financial records. To the best of my knowledge this is the first study that investigates the impact of AIS on internal auditors.

## II. LITERATURE REVIEW

Sajady, Dastgir and Nejad [6] analyzed the effectiveness of accounting information systems of finance managers of listed companies at Tehran Stock Exchanges. According to results, AIS could lead to better decision-making by managers, more effective internal control systems, improvement of the quality of financial reports and enabling financial transaction process.

Mndzebele [10] examined the importance of accounting information systems for internal controls in hotels. A quantitative methodology was implemented in the study. The study revealed that AIS has positive effect on internal controls. Thanks to effective internal controls, hotels were able to reach their goals.

Sambasivam and Assefa [3] examined the impact of accounting information systems on Ethiopian Manufacturing Industries. According to their survey with professionals, accounting information systems enrich the quality of financial reports. Also, accounting information systems are affected by the system design and lead to more effective internal control system.

Alsharayri [11] analyzed the accounting information systems performance used in the Jordanian private hospitals. It was found out that the existence of modern equipment contributes positively accounting information systems' performance and skills of human staff are important for using effectively accounting information systems within organizations.

Neogy [9] evaluated to efficiency of accounting information systems of the selected telecommunication companies in Bangladesh. According to survey with professionals, AIS can help take effective decision making and absolutely necessary for decision-making in every functional area of organizations and businesses.

### III. RESEARCH METHODOLOGY

Although there have been many studies on the impact of AIS, none of them have examined the link between AIS and internal auditors. To the best of my knowledge this is the first study that investigates the impact of AIS on internal auditors. This study is based on a questionnaire survey, whose questions are similar to the ones used by Mndzebele [10], who conducted a questionnaire survey about the usage of AIS for effective internal controls in hotels. I used LinkedIn—a business-oriented social networking service that is used for professional networking—to contact people who work as internal auditors and whose companies use AIS. I asked 12 questions about the impact of AIS on internal control and auditing. In all, 106 internal auditors agreed to participate and completed the questionnaire. The respondents were drawn from approximately 30 different industries as shown in Table 1. I believe the industry coverage was broad enough for the purpose of this study. Table 2 shows the educational level and work experience of the participants. All participants had a bachelor's degree and were mostly from the management and economics departments of universities in Istanbul or Ankara, followed by those studying international relations, political science, and public finance. Approximately 40% of participants had a master's degree, mostly in business administration, finance, economics, and auditing and accounting. Approximately 5% of respondents had a PhD in banking, finance, or accounting.

Years of experience refer only to the years the respondents worked as internal auditors. The years they spent working in capacities other than as internal auditor are disregarded in this study. The average work experience of the survey participants ranged between six and eight years.

**Table 1.** Industrial Breakdowns of Respondents

Textile Industry	Glass and Chemical Production Industry
Banking industry	Food and Beverages Production Industry
Financial Services industry	White Good Production Industry
Construction industry	Real Estate Industry
Insurance industry	Airline Industry
Energy industry	Aerospace Industry
Oil industry	Insurance Industry
Construction Equipment industry	Ceramic Industry
Cement industry	Clothing Industry
Telecommunication industry	Fleet Leasing Industry
Automotive Production industry	Home Appliances Industry
Automotive Supply industry	Wholesale and Retail Sale
Transportation, Cargo and Logistic Industry	Furniture Industry
Pharmaceutical Industry	Carbon Fiber Industry

**Table 2.** Educational Level and Work Experience of Participants

Bachelor's Degree	Master's Degree	PhD.	Average work experience (internal auditors)
Management	Master of Business Administration	Accounting (Finance)	Between 6 and 8 years (average for all participants)
Economics	Master of Finance	Economics	
International Relations and Political Science	Master of Economics	Management	
Public Finance	Auditing and Accounting	Banking	

#### IV. EMPIRICAL RESULTS

Table 3 presents the survey results. More detailed information can be found in Appendix A. This study uses the Likert scale, where 5 stands for “strongly agree,” 4 stands for “agree,” 3 for “neutral,” 2 for “disagree,” and 1 for “strongly disagree.”

For the first question, the average of the answers was 4,415, which means that most of the participants strongly agreed that AIS contributed to internal controls and auditing. For the second question, participants agreed that AIS were integrated with other management systems, such as enterprise resource planning (ERP) systems, considered one of the most important management information systems. For the third question, participants agreed that AIS keep track of all events in an efficient manner, but 32 people (shown in Appendix A) were neutral about it. The fourth question was whether AIS provided a computer-based database system to store and retrieve data; most of the participants strongly agreed with it. The advantage of AIS lies in storing and retrieving data for auditors to access information at their convenience. Further, AIS contribute to reliability of financial reporting such as generally accepted accounting principles (GAAP) and international financial reporting standards (IFRS). Most of the participants said the benefits of AIS were that they offered a reasonable guarantee that transactions were recorded to facilitate the preparation of financial statements in accordance with GAAP or IFRS. For the sixth question, participants agreed that AIS encouraged efficient and effective use of resources and operations. This contributed to control over the reliability of financial information, allowing managers to gain an in-depth understanding of business operations. Most of the participants agreed that AIS enhanced compliance with the law and accounting standards. This compliance helped prevent illegal or fraudulent behavior and ensured an operational system. For the question of eight, whether AIS improved controls by limiting access to company data, most of the participants agreed that AIS were integrated with other management information systems and that if every employee could use the system without any restrictions, it could create risks for internal auditors. Auditors require internal control systems and security authorization to conduct effective auditing. For the next three questions,

which are all closely related, most of the respondents agreed with the point raised. AIS have policies, procedures, organizational designs, and physical barriers that contribute to the control structure. They provide preventive controls designed to discourage errors or irregularities and include detective controls, which are designed to identify errors or irregularities after they have occurred. For the last question on whether, or not, AIS contributed to internal controls, most of the participants agreed that the systems, by raising awareness of the need for internal controls, increased the budget of the company but also increased the success of these controls.

**Table 3.** Results of Questionnaire Survey

	Number of Part.	Mean	Std. Dev.	Variance
1) AIS have contributed to internal controls and auditing.	106	4,415	0,63946	0,397
2) AIS are integrated with other management information systems.	106	4,2075	0,62818	0,395
3) AIS keep track of all events in an efficient manner.	106	3,8679	0,75688	0,573
4) AIS provide a computer-based database system to store and retrieve data.	105	4,4000	0,70165	0,492
5) AIS contribute to the reliability of financial reporting i.e., GAAP and IFRS.	104	4,2404	0,71727	0,514
6) AIS encourage efficient and effective use of resources and operations.	105	4,0190	0,82019	0,673
7) AIS enhance compliance with laws and accounting standards.	105	4,000	0,82041	0,673
8) AIS improve controls by limiting access to company data.	104	4,1538	0,77296	0,597
9) AIS have policies, procedures, organizational designs, and physical barriers that contribute to the control structure.	106	4,0755	0,81297	0,661
10) AIS provide preventive controls, which are designed to discourage errors or irregularities.	105	4,0476	0,77684	0,603
11) AIS comprise detective controls, which are designed to identify errors or irregularities after they have occurred.	104	3,8462	0,86764	0,753
12) AIS results increase awareness of the need for internal controls, which increases the budget and success.	106	3,9717	0,89929	0,809

5= Strongly Agree, 4 = Agree, 3= Neutral, 2= Disagree, 1= Strongly Disagree

## V. CONCLUSION

Accounting Information Systems are one of the most crucial systems in the organization and have changed the way information is captured, processed, stored, and disseminated. This study is based on a questionnaire survey aimed at examining the influence of AIS on internal auditors in Turkey. According to the results, most of the respondents agree that AIS contribute to internal control and auditing. AIS can be integrated with other management information systems, such as enterprise resource planning. They help keep track of all events in an efficient manner and encourage an effective use of resources and operations by providing a computer-based database system to store and retrieve data. They also contribute to the reliability of financial reporting i.e., GAAP and IFRS. AIS enhance compliance with laws and accounting standards and improve controls by limiting access to company data; they raise awareness of the need for internal controls, which increases the budget but also the success of such controls. AIS cover policies, procedures, organizational designs, and physical barriers that contribute to the control structure and provide preventive controls, which are designed to discourage errors or irregularities, and comprise detective controls, which are designed to identify errors or irregularities after they have occurred. According to results, there is a positive relationship between accounting information systems and internal auditing. Internal auditors in Turkey believe that AIS contribute positively to their work. This study is not only beneficial for internal auditors, but also for other professionals for recognizing the significant of usage information technology in business world. This study has limitation, which only considers internal auditors. For future studies, it should be analyzed the impact of AIS on other business groups like accountants, managers, IT auditors and so on.

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**Appendix A****Question 1****AIS have contributed to internal controls and auditing.**

	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	1	0.9	0.9	0.9
Neutral	5	4.7	4.7	5.7
Valid Agree	49	46.2	46.2	51.9
Strongly Agree	51	48.1	48.1	100.0
Total	106	100.0	100.0	

N	Valid	106
	Missing	0
Mean		4.4151
Std. Deviation		.63046
Variance		.397

## Question 2

AIS are integrated with other management information systems

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Neutral	12	11.3	11.3	11.3
Valid Agree	60	56.6	56.6	67.9
Valid Strongly Agree	34	32.1	32.1	100.0
Valid Total	106	100.0	100.0	

N	Valid	106
	Missing	0
Mean		4.2075
Std. Deviation		.62818
Variance		.395

## Questions 3

AIS keep track of all events in affective and efficient manner.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Disagree	2	1.9	1.9	1.9
Valid Neutral	32	30.2	30.2	32.1
Valid Agree	50	47.2	47.2	79.2
Valid Strongly Agree	22	20.8	20.8	100.0
Valid Total	106	100.0	100.0	

N	Valid	106
	Missing	0
Mean		3.8679
Std. Deviation		.75688
Variance		.573

**Question 4**

**AIS provide computer based database system to store and retrieve data.**

	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	3	2.8	2.9	2.9
Neutral	4	3.8	3.8	6.7
Valid Agree	46	43.4	43.8	50.5
Strongly Agree	52	49.1	49.5	100.0
Total	105	99.1	100.0	
Missing System	1	.9		
Total	106	100.0		

N	Valid	105
	Missing	1
Mean		4.4000
Std. Deviation		.70165
Variance		.492

**Question 5**

**AIS contribute to reliability of financial reporting i.e. GAAP, IFRS.**

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	0.9	1.0	1.0
Disagree	1	0.9	1.0	1.9
Valid Neutral	8	7.5	7.7	9.6
Agree	56	52.8	53.8	63.5
Strongly Agree	38	35.8	36.5	100.0
Total	104	98.1	100.0	
Missing System	2	1.9		
Total	106	100.0		

N	Valid	104
	Missing	2
Mean		4.2404
Std. Deviation		.71727
Variance		.514

### Question 6

AIS encourage efficient and effective use of resources and operations.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	0.9	1.0	1.0
	Disagree	2	1.9	1.9	2.9
	Neutral	22	20.8	21.0	23.8
	Agree	49	46.2	46.7	70.5
	Strongly Agree	31	29.2	29.5	100.0
	Total	105	99.1	100.0	
Missing	System	1	0.9		
Total		106	100.0		

N	Valid	105
	Missing	1
Mean		4.0190
Std. Deviation		.82019
Variance		.673

**Question 7**

AIS enhance compliance with laws and regulations of accounting standards.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	1	0.9	1.0	1.1
Disagree	1	1.9	1.9	2.9
Neutral	23	21.7	21.9	24.8
Agree	49	46.2	46.7	71.4
Strongly Agree	30	28.3	28.6	100.0
Total	105	99.1	100.0	
Missing System	1	0.9		
Total	106	100.0		

N	Valid	105
	Missing	1
Mean		4.0000
Std. Deviation		.82041
Variance		.673

**Question 8**

AIS improve controls by limiting access to company data.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Disagree	2	1.9	1.9	1.9
Neutral	18	17.0	17.3	19.2
Agree	46	43.4	44.2	63.5
Strongly Agree	38	35.8	36.5	100.0
Total	104	98.1	100.0	
Missing System	2	1.9		
Total	106	100.0		

N	Valid	104
	Missing	2
Mean		4.1538
Std. Deviation		.777296
Variance		.597

### Question 9

**AIS have policies, procedures, organizational design and physical barrier that contribute to the control structure.**

	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	2	1.9	1.9	1.9
Neutral	25	23.6	23.6	25.5
Valid Agree	42	39.6	39.6	65.1
Strongly Agree	37	34.9	34.9	100.0
Total	106	100.0	100.0	

N	Valid	106
	Missing	0
Mean		4.0755
Std. Deviation		.81297
Variance		.661

**Question 10**

**AIS provide preventive controls, which are designed to discourage errors or irregularities.**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Disagree	5	4.7	4.8	4.8
Neutral	14	13.2	13.3	18.1
Agree	57	53.8	54.3	72.4
Strongly Agree	29	27.4	27.6	100.0
Total	105	99.1	100.0	
Missing System	1	0.9		
Total	106	100.0		

N	Valid	105
	Missing	1
Mean		4.0476
Std. Deviation		.77684
Variance		.603

**Question 11**

**AIS comprise of detective controls, which are designed to identify errors or irregularities after they have occurred.**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Disagree	8	7.5	7.7	7.7
Neutral	24	22.6	23.1	30.8
Agree	48	45.3	46.2	76.9
Strongly Agree	24	22.6	23.1	100.0
Total	104	98.1	100.0	
Missing System	2	1.9		
Total	106	100.0		

N	Valid	104
	Missing	2
Mean		3.8462
Std. Deviation		0,86764
Variance		0,753

### Question 12

**AIS results increase awareness of the need for internal controls, which increases budget and success.**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	1.9	1.9
	Disagree	5	4.7	6.6
	Neutral	17	16.0	22.6
	Agree	52	49.1	71.7
	Strongly Agree	30	28.3	100.0
	Total	106	100.0	100.0

N	Valid	106
	Missing	0
Mean		3.9717
Std. Deviation		.89929
Variance		.809



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