

## **An Examination of the Effects of Information Technology on Managerial Accounting in the Turkish Iron and Steel Industry**

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### **Abstract**

*Economic and technological changes and especially the developments in information technologies have significantly changed work environments and the management of businesses. The objective of this study was to examine the effect upon managerial accounting and managerial accountants in the iron and steel businesses, which closely follow and adopt the information technologies and operate in Turkey. The study examined the technological developments that have led to changes in managerial accounting and the extent of these changes. Examining the effects upon the managerial accounting applications and managerial accountants theoretically, a field work was performed using the survey method. These changes were determined using the responses to surveys that had been administered to managerial accountants in Turkish iron and steel production companies.*

**Keywords:** Information Technologies, Managerial Accounting, Managerial Accountants, Iron and Steel Industry

**JEL Classification:** M41, L61

### **1. Introduction**

The developments, which occurred especially in science and technology during the previous century continue at an increasing rate today. These developments have significantly affected and are still continuing to affect not only the whole life, but also the science of business administration and management. All these developments and the progress made have created a much more competitive environment for the business world. In this environment of ever-increasing competition, accounting systems have also had to keep pace with this change. Integrated information systems, which accurately and simultaneously present information using current technology, and advanced reporting devices which support management, have led to more realistic costs in advanced production systems and thus advanced budgeting has caused significant changes to managerial accounting applications and managerial accountants.

Managerial accounting has been affected by technological developments in many respects, either directly or indirectly. The primary changes include the change of financial structures as a result of the effect of developing technologies upon the production systems and consequently, the change of financial systems. Especially, the changes which have occurred in information technologies (IT) within the last twenty years, have significantly decreased the costs of information collecting and processing.

Another effect is that integrated systems such as enterprise resource planning (ERP) affect managerial accounting applications. ERP systems have radically changed the nature of managerial accounting. The need for employed managerial accountants has dramatically decreased together with collecting and processing the data and preparing the reports with the automation and regression structure, which constitutes the ERP systems.

The objective of this study was to examine the effect of changes in information technologies upon managerial accounting and managerial accountants in iron and steel businesses that operate in Turkey.

## **2. Effects of Technological Developments on Managerial Accounting**

The main objective of managerial accounting is to assist the business manager in decision making. The business world and economies of today have become more dynamic and competitive, due to the rapid developments of recent years. In such a competitive environment, it has become inevitable for managers to make consistent, logical and strategic decisions and develop instruments and models that provide financial information. As a consequence, the expectations of managerial accounting, which provides this benefit for the business, have differentiated. These expectations could not be met by conventional accounting systems and changes became inevitable for the managerial accounting as well. These expectations and related problems have been reported as follows (Hacıüstemoğlu and Şakrak, 2002, ss.6-7).

- Managers think that financial outcomes do not correctly and accurately reflect the activities. Therefore, they have started to collect their own cost data and develop their own cost models.
- Managers can not use the reports received from the accounting department and they create their own reports.
- Managers of functional units perform studies in an attempt to constitute their own accounting systems, in parallel with the business accounting system.
- Activity data in the reports of managerial performance do not show consistency with the activity data that are used for the recording of financial information and this fact causes some problems.

The change of managerial accounting applications progresses slowly. This stationarity could be explained through economic reasons, such as the concept that the suggested changes can not yield a clear profit for the business. Some authors, on the other hand, have emphasized that this stationarity is a requirement of the nature of accounting. Institutionalized applications of organization routines also decelerated the change and these changes generally encountered a resistance. Therefore, strict structure of managerial accounting practices could be explained through its institutional structure (Burns and Scapens, 2000, pp. 3-25).

Before the use of information technologies, a good deal of information was in written format on paper and the information that was required to be used in managerial decisions was collected and processed by managerial accounting specialists manually. Therefore, the information that was of vital importance for the company was collected from hand to hand.

In addition to this, rapid progress in information technologies during the 1990s caused important turnovers in information processing procedures. The progress of large-scale data storage systems and procurement of effective information access have also increased the efficiency of managerial accounting systems. Today, information technologies are at the center of business processes and they provide a profit for companies in the competitive business world. Investments made by companies in technology are rapidly increasing worldwide. When information technologies are integrated with managerial accounting, a chief financial officer (CFO) who uses IT can use managerial accounting practices more effectively than a CFO in an environment which lacks such an integration.

Additionally, considering today's managerial accounting publications, there is a wide gap regarding vital issues in IT, which is used in business life applications, such as data collection and data mining. Text books of managerial accounting still focus on pre-IT manual processes. Managerial accounting specialists are criticised for being unable to keep pace with changes in both the educational phase, and in business life.

## **3. Literature Review**

Many researchers have observed the changes in managerial accounting in recent years (Pierce and O'Dea, 2003; Yazdifar and Tsamenyi, 2005). The configuration of large-scale integrated information systems was specified as the primary factor of this change (Granlund and Malmi, 2002; Scapens and Jazayeri, 2003). Automation and computerization have changed the roles of managerial accountants in business. According to Collier (1984), managerial accountants abandoned the work of information collection, preparation, analysis and started to take part in the functions of control, interpretation, assessment and decision-making. Studies in these areas have generally been published in journals of accounting and accounting information systems or managerial information systems.

In a study of Finnish companies, Granlund and Lukka (1998) determined that managerial accounting applications recede from centralization and responsibilities are distributed to departments.

Booth et al. (2000) studied the relationship among the use of modern managerial accounting applications of ERP systems (ABC, BSC, benchmarking, customer satisfaction survey...) and indicated that there is no significant relationship in this direction. Andersen and Segars (2001) examined the effect of information systems upon the decision-making functions of companies. Researchers determined that in businesses, as the use of information technologies increases, the process of decision-making transforms into a more centralist structure. Granlund and Malmi (2002) stated that ERP systems do not change the logic of managerial accounting and they enable deeper profit analyses. Caglio (2003) indicates that ERP systems provide standardization in managerial accounting applications. Hyvönen (2003) determined that ERP systems increase the use of advanced managerial accounting techniques, such as ABC and Balanced Scorecard. Scapens and Jazayeri (2003) stated that the ERP system causes a change in managerial accounting practices, in terms of providing global information flow and standardization, and that conventional managerial accounting procedures are eliminated after ERP. In his study, Andersen (2005) indicated that the processes of decision-making recede from centralization in a competitive business environment and he studied its relationship with information technologies.

According to Andersen, as computerized communication increases among directors, the efficiency of decision-making functions also increases. Tin Yu Ho (2006) specified that ERP and OLAP systems cause a change in issues of budgeting and reporting, which are among the managerial accounting applications, and enable the increasing use of advanced managerial accounting techniques. Demir and Bahadır (2006) indicated that information systems decrease the costs of obtaining information about the activities of employees and the costs, which are borne for the dissemination of information within the company. Yereli (2007) indicated that ERP systems have positive effects upon planning, budgeting, reporting, analysis, and applications of modern managerial accounting.

Joplin (1966) stated that the roles of managerial accountants have changed together with the development of information systems. Caglio (2003) indicated that the conventional roles of accountants have gradually decreased. Granlund and Lukka (1998) determined that the duties of managerial accountants showed a change from register persecution to the control of operational work. Siegel and Sorensen (1999) indicated that managerial accountants play a more significant role in managerial decisions now. Tin Yu Ho (2006) also stated that ERP and OLAP systems cause changes for managerial accountants. Jack and Kholeif (2008) indicated that ERP systems change the role of managerial accountants within the business. Neumann (2010) stated that together with technological developments, the expectations of managerial accountants have changed. Sulaiman et al. (2008) indicated that managerial accountants have gained a more efficient role within the business, as a result of the changes they experienced. Yereli (2007) specified that ERP systems facilitate the work of managerial accountants and decrease their routine duties.

#### **4. Methodology of the Study**

This chapter gives some information about the objective, population and sample of the study, as well as the methods and techniques that are used in the study.

##### **4.1. Objective of the Study**

The objective of the study was to examine whether the technological developments have caused a change in managerial accounting and managerial accountants in iron and steel businesses, which operate in Turkey.

##### **4.2. Extent and Restrictions of the Study**

The survey was administered to employees working in iron and steel firms that operate in Turkey and who fulfilled the missions of managerial accounting. The total number of businesses that operate in Turkey is 27. Selecting 4 of these firms with the maximum employee number, production amount and endorsement and choosing 11 firms by random selection, a sample was constituted from a total of 15 businesses. The fact that the study was performed on iron and steel businesses that operate in Turkey poses a sectoral restriction. There is no restriction in terms of time and cost.

##### **4.3. Hypothesis of the Study**

In the study, two hypotheses were constituted and their accuracy was researched. The hypotheses were constituted by considering the possible effects of information technologies, that were observed as a result of the literature study.

**Hypothesis 1:** Information technologies have caused some changes to managerial accounting applications in iron and steel businesses that operate in Turkey.

In order to research the accuracy of this hypothesis, the sub-hypotheses regarding the changes that are indicated in the method part of the study are as follows.

**Hypothesis 1-a:** Information technologies caused changes in terms of budgeting and reporting.

**Hypothesis 1-b:** Information technologies have caused a change in terms of the application of advanced managerial accounting techniques.

**Hypothesis 2:** Information technologies have caused changes to managerial accountants who work in iron and steel businesses that operate in Turkey.

In order to research the accuracy of this hypothesis, the hypotheses regarding the variables that are indicated in the method part of the study are as follows.

**Hypothesis 2-a:** Information technologies have enabled the managerial accountants to attain new skills.

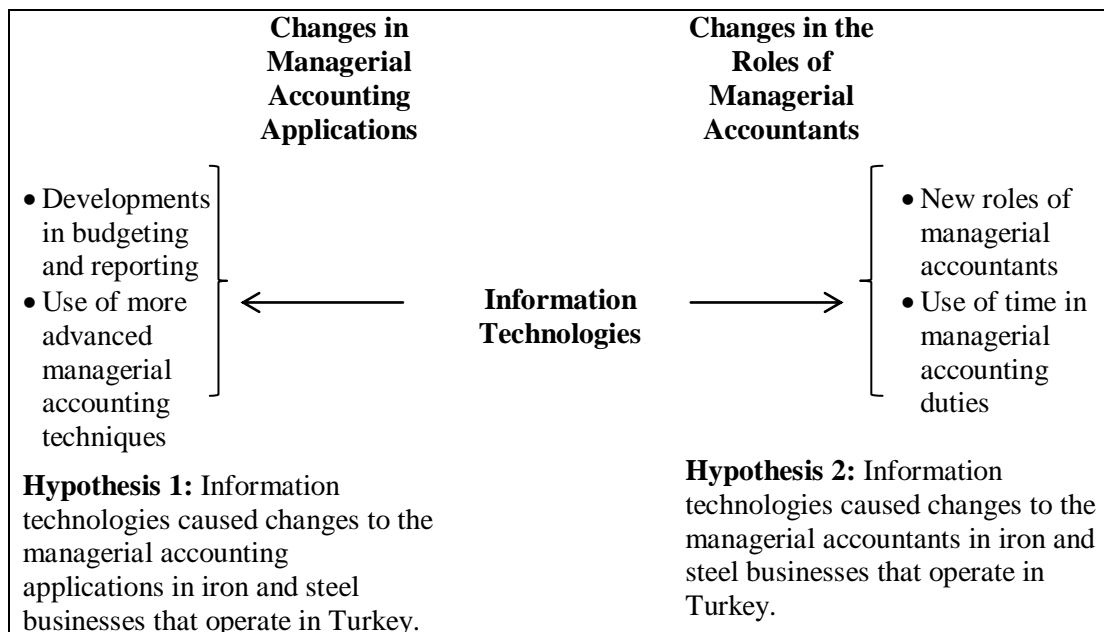
**Hypothesis 2-b:** Information technologies have caused a change in terms of the time spent by managerial accountants on their usual duties.

**4.4. Method of the Study**

A survey was conducted in the study part; firstly some information was given regarding this survey and then the results of the survey were explained. The survey was conducted in accordance with the methodology in the study of Tin Yu Ho, which was performed in 2006 and analysed the effects of ERP and OLAP systems on managerial accounting. In his study, Tin Yu Ho (2006) examined whether the ERP and OLAP systems cause a change in advanced managerial accounting techniques such as ABC, BSC or on the applications of reporting and budgeting. Tin Yu Ho (2006) also examined the effects of these systems on the roles of managerial accountants. Tin Yu Ho (2006) indicated that considering the reporting systems, ERP systems have positive effects upon the data analysis and quality of reports.

A diagram of a research model as in Figure 4.1. was created for the survey study. This diagram was prepared by taking the diagram in the study of Tin Yu Ho as an example. In this study model, two dependent variables were defined to examine whether the ERP and OLAP affect the managerial accounting or not. In order to examine whether there is such an effect for information technologies, the participants were asked questions via the dependent variables indicated by Tin Yu Ho in this study.

**Figure 4.1: Model of the Study**



**Hypothesis 1:** Information technologies caused changes to managerial accounting applications in iron and steel businesses that operate in Turkey.

While examining Hypothesis 1, Tin Yu Ho (2006) used two variables in his study, in an attempt to assess the effect of ERP and OLAP technologies.

These variables are as follows:

- Change in budgeting and reporting
- Use of more advanced managerial accounting techniques

In his study, Tin Yu Ho (2006) examined whether OLAP and ERP have an effect upon these two variables or not. On condition that these technologies caused a change on these variables, he reported a change on the managerial accounting, as well.

In line with the study of Tin Yu Ho (2006) that was taken as the base, participants were asked questions on a 5-point Likert scale, regarding these two variables. On condition that the average value of responses was above three, an assessment was made in relation with the fact that information technologies develop the functions of budgeting and reporting. As the average value increases, this effect also increases.

The second dependent variable examines whether the information technologies are effective upon the use of more advanced managerial accounting techniques, such as activity-based costing, balanced scorecard, benchmarking, customer satisfaction surveys, financial and non-financial indicators, target costing and costing during manufacturing.

On the condition that participants had encountered at least one of these techniques by means of information technologies, an assessment was made regarding the fact that information technologies are effective upon the company in adopting advanced managerial accounting techniques (Tin Yu Ho, 2006).

**Hypothesis 2:** Information technologies have caused changes to managerial accountants in iron and steel businesses that operate in Turkey.

Two variables that were defined by Tin Yu Ho (2006) in his study were used for Hypothesis 2, as well.

These variables are as follows:

- New roles of managerial accountants
- Use of time in managerial accounting duties

In his study, Tin Yu Ho (2006) examined whether OLAP and ERP were effective upon these two variables. On condition that these technologies caused a change to these variables, he also reported a change to managerial accountants. Participants were asked questions about these two variables, in line with the study of Tin Yu Ho (2006), that was taken as the base.

Regarding the effect of the use of information technologies, which is the first of two variables, upon the managerial accountants in attaining new roles and skills, participants were asked questions on a 5-point Likert scale, in such a way to include the following subjects (Tin Yu Ho, 2006):

- Skills of information technologies
- Accumulation of knowledge about other functional units
- Performing team work with other functional units
- Comprehending the financial and managerial accounting as a whole

This hypothesis examines whether the second dependent variable changes the time that is spent on managerial accounting duties. Regarding this variable, the users were asked questions about how the information technologies affect their time, in terms of the following subjects ( Tin Yu Ho, 2006):

- Data analysis and interpretation
- Cost accounting
- Performance assessment
- Budget and report preparation

#### **4.5. Data Collection Method**

This study was conducted with a survey application, which was created using the form tools of Google and prepared in the web environment. The web address of the survey was sent to participants via e-mail and they were asked to respond. In order to access the participants, assistance was requested from the Association of Iron and Steel Producers (AISP), of which the businesses where the survey would be applied are members. The reason for this was to provide immediacy and sensitivity in terms of responding to the survey.

The survey was administered to employees who fulfill the functions of managerial accounting in iron and steel firms that operate in Turkey. The total number of businesses that function in Turkey is 27. Selecting 4 of these firms with the maximum employee number, production amount and endorsement and choosing 11 firms by random selection, a sample was formed from a total of 15 businesses. In that context, the sample is able to represent the groundmass.

Comprising a total of 35 questions, the survey consisted of two parts. In the first part, questions were prepared to obtain more perceptible and quantitative information about the participants and businesses. In the second part, data were collected regarding the opinions of participants using a 5-point Likert scale.

#### **5. Findings of the Study**

In this chapter, the results obtained from the participants from the survey are presented. Firstly, the response rates of the survey and the reasons that could affect them were discussed. Then definitive statistics regarding the results were explained. Following this phase, the validity of the study hypotheses was tested through statistical tests.

The survey was administered to the participants during the last week of May, 2011. While direct contact was made with 3 out of 15 businesses, the remaining 12 businesses were communicated with via the Association of Iron and Steel Producers (AISP). The survey was administered to 60 people in 15 businesses. A total of 51 people responded to the survey.

The data that were collected within the scope of the study were analysed using the packaged software of SPSS 15.0 in the computer environment. The one-sample t test and independent sample t test were applied for the evaluation of the survey questions, which were prepared on a 5-point Likert scale, in line with the hypotheses of the study. Having a test value of “3”, the one-sample t test was performed to determine whether there was any difference among the opinions of participants. Independent sample t test, was performed to determine whether there was a difference between ERP and other specialist software, in terms of the responses of participants. The results of these tests were examined in detail in the section where the analyses were assessed.

Cronbach Alpha reliability analysis was performed to examine the internal consistency of the survey results and thus the responses. The Cronbach Alpha value of the survey was found to be 0.801. The analysis of the study according to the dependent variables, which are indicated in the hypothesis part, in terms of the responses of participants is as follows.

##### **5.1. The Relationship Between Information Technologies and Managerial Accounting Applications**

Study and test hypothesis regarding the subject are as follows.

**Hypothesis 1:** Information technologies have caused some changes to managerial accounting applications in iron and steel businesses that function in Turkey.

The sub-hypotheses of the dependent variables that were defined to test this hypothesis are as follows.

**Hypothesis 1-a:** Information technologies have caused some changes to budgeting and reporting.

**Hypothesis 1-b:** Information technologies have caused some changes to the application of advanced managerial accounting techniques.

In order to test the accuracy of Hypothesis 1-a and Hypothesis 1-b, the one-group t test was applied. The reason for this was the comparison of the responses of participants on a 5-point Likert scale with the value of “3”. On condition that the averages show a significant difference compared to 3, the hypothesis will be concluded to be accurate.

The results of the one-group t test regarding the survey questions which were asked in relation to Hypothesis 1-a, are indicated in Table 5.1.

**Table 5.1: Results of the One Group t-Test, Information Technologies- Budgeting and Reporting**

	Test Value = 3					
	T	df	Significance Level	Average Difference	Confidence Level of 95%	
					Lower	Upper
Increased the accuracy and reliability of information that is used by accountants.	17.087	49	.000	1.360	1.20	1.52
Decreased the costs of managerial reporting.	11.026	49	.000	1.120	.92	1.32
Enabled the preparation of more realistic budgets.	11.513	49	.000	1.140	.94	1.34
Removed the excessive labour force by supporting the functions of planning, budgeting, control and analysis.	10.359	49	.000	1.160	.93	1.39
Enabled every department in the business to create their own budgets.	9.901	48	.000	1.020	.81	1.23
Created a budgeting system that could be updated in concordance with strategic plans.	8.535	48	.000	.980	.75	1.21
Increased the accuracy of reports.	17.490	50	.000	1.392	1.23	1.55
Enabled the reports to be prepared in real time.	12.674	50	.000	1.294	1.09	1.50
Enabled the acquisition of real-time information.	12.432	50	.000	1.333	1.12	1.55

As seen in Table 5.1, P (Significance Level) is = 0.000 < 0.05 in all questions. There is a significant difference between the test values (3) and the averages of the responses. According to these results, we can claim that information technologies have caused a change to budgeting and reporting.

**Hypothesis 1-b:** Information technologies have caused a change to the application of advanced managerial accounting techniques.

The results of the one-group t test regarding the survey questions, which were asked in relation to Hypothesis 1-b, are indicated in Table 5.2.

**Table 5.2: Results of the Single Group t-Test, Information Technologies – Contemporary Costing Methods**

	Test Value = 3					
	t	df	Significance Level	Average Difference	Confidence Level of 95%	
					Lower	Upper
Increased the use of contemporary costing methods.	16.000	50	.000	1.255	1.10	1.41

As seen in the table, P (Significance Level) is = 0.000 < 0.05. There is a significant difference between the test value (3) and the average of the responses. According to this result, we can claim that information technologies have increased the use of contemporary costing methods.

According to the results of Hypothesis 1-a and Hypothesis 1-b, information technologies have caused a change in terms of budgeting and reporting, as well as the use of advanced managerial accounting. According to the methodology of Tin Yu Ho (2006), since Hypothesis 1-a and Hypothesis 1-b are accurate, Hypothesis 1 is also accurate.

## 5.2. The Relationship Between Information Technologies and Managerial Accountants

The relevant study and test hypothesis are as follows.

**Hypothesis 2:** Information technologies have caused a change to managerial accountants, who work in iron and steel businesses that function in Turkey.

The sub-hypotheses of dependent variables that are defined for the test of this hypothesis are as follows.

**Hypothesis 2-a:** Information technologies have enabled managerial accountants to attain new skills.

**Hypothesis 2-b:** Information technologies have caused a change in terms of the time spent by managerial accountants on their usual duties.

One-group t test was applied to test the accuracy of Hypothesis 2-a and Hypothesis 2-b. The reason for this was the comparison of the responses of participants on a 5-point Likert scale with the value of “3”. On condition that the averages show a significant difference compared to 3, the hypothesis will be concluded to be accurate.

The results of the one-group t test regarding the survey questions, which were asked in relation to Hypothesis 2-a, are indicated in Table 5.3.

**Table 5.3: Results of the One-Group t-Test, Information Technologies – Managerial Accountants 1**

	Test Value = 3					
	t	df	Significance Level	Average Difference	Confidence Level of 95%	
					Lower	Upper
Contributes to managerial accountants to play a more efficient role in administrative organs.	13.355	49	.000	1.240	1.05	1.43
Increased the importance of managerial accountants in businesses.	13.839	50	.000	1.314	1.12	1.50
Enabled managerial accountants to take the task of some kind of internal consultancy.	8.250	49	.000	1.000	.76	1.24
Enabled managerial accountants to take part in interpretation and analysis processes of the collected information, apart from the party that collects information.	11.270	48	.000	1.102	.91	1.30
Enabled managerial accountants to dominate the production process.	8.269	47	.000	.896	.68	1.11
Increased the work performance of managerial accountants.	13.179	50	.000	1.294	1.10	1.49

As seen in Table 5.3, P (Significance Level) is = 0.000 < 0.05 in all questions. There is a significant difference between the test value (3) and the averages of responses. According to this result, we can claim that information technologies have enabled managerial accountants to attain new skills and change their roles.

**Hypothesis 2-b:** Information technologies have caused a change in terms of the time spent by managerial accountants on their usual duties.

The results of the one-group t test regarding the survey questions, which were asked in relation to Hypothesis 2-b, are indicated in Table 5.4.

**Table 5.4: Results of the Single Group t-Test, Information Technologies – Managerial Accountants 2**

	Test Value = 3					
	t	df	Significance Level	Average Difference	Confidence Level of 95%	
					Lower	Upper
Decreased the time spent by managerial accountants on usual accounting functions.	12.246	49	.000	1.240	1.04	1.44
Decreased the time of decision making and costs.	13.106	48	.000	1.224	1.04	1.41



As seen in Table 5.4, P (Significance Level) is  $= 0.000 < 0.05$  in all questions. There is a significant difference between the test value (3) and the averages of responses. According to this result, we can claim that information technologies have caused a change in terms of time spent by managerial accountants on their duties.

According to the results of Hypothesis 2-a and Hypothesis 2-b, information technologies have caused a change in managerial accountants attaining new skills and in terms of the time they spend on their duties. According to the methodology of Tin Yu Ho (2006), since Hypothesis 2-a and Hypothesis 2-b are accurate, we can claim that Hypothesis 2 is also accurate.

### 5.3. The Relationship Between the ERP and Special Softwares in Terms of Managerial Accounting

This part of the study will examine whether there is a difference between the ERP and other special software that is used by businesses, in terms of managerial accounting applications and managerial accountants.

Independent sample t test was used to analyse whether there is any difference between the ERP and other special softwares, in terms of the change that is procured on the managerial accountants for the applications in iron and steel sector. The reason for this was to examine whether there was a difference between the responses of two different groups regarding the same questions. The results of the independent sample t test, that was applied in accordance with the responses given by participants on a 5-point Likert scale are indicated in Table 5.5 and Table 5.6.

**Table 5.5: Results of the Independent Sample t-Test, ERP – Other Special Softwares 1-a**

	Levene's Constant Variance Test		t-Test for the Equality of Meanings							
	F	Sig.	t	df	Significance Level	Average Difference	Std. Error	Confidence Level of 95%		
								Lower	Upper	
Contributes to managerial accountants to play a more efficient role in administrative organs.	Equal variances	1.075	.308	-.139	32	.890	-.041	.298	-.648	.565
	Non-equal variances			-.106	4.678	.920	-.041	.389	-1.063	.980
Increased the work performance of managerial accountants.	Equal variances	1.032	.317	1.055	33	.299	.287	.272	-.267	.841
	Non-equal variances			1.195	8.317	.265	.287	.240	-.263	.838
Increased the significance of managerial accountants in businesses.	Equal variances	1.116	.299	.189	33	.851	.057	.304	-.560	.675
	Non-equal variances			.232	9.310	.822	.057	.248	-.500	.615
Increased the accuracy and reliability of information used by managerial accountants.	Equal variances	3.294	.079	-.726	32	.473	-.167	.230	-.634	.301
	Non-equal variances			-.719	7.242	.495	-.167	.232	-.711	.378

**Table 5.6: Results of the Independent Sample t-Test, ERP – Other Special Softwares 1-b**

		Levene's Constant Variance Test		t-Test for the Equality of Meanings						
		F	Sig.	t	df	Significance Level	Average Difference	Std. Error	Confidence Level of 95%	
									Lower	Upper
Decreased the time spent by managerial accountants for usual accounting functions.	Equal variances	3.006	.092	.193	33	.848	.063	.327	-.602	.728
	Non-equal variances			.150	6.007	.885	.063	.420	-.965	1.092
Enabled the managerial accountants to take the task of some kind of internal consultancy.	Equal variances	5.820	.022	.869	32	.391	.345	.397	-.464	1.154
	Non-equal variances			1.413	18.543	.174	.345	.244	-.167	.857
Enabled the managerial accountants to take part in interpretation and analysis processes of the collected information, apart from the party that collects information.	Equal variances	.384	.540	1.132	31	.266	.370	.327	-.297	1.038
	Non-equal variances			1.444	10.482	.178	.370	.256	-.197	.938
Enabled the managerial accountants to dominate the production process.	Equal variances	.316	.578	- 1.783	30	.085	-.500	.280	-1.073	.073
	Non-equal variances			- 1.955	8.391	.085	-.500	.256	-1.085	.085

As seen in Table 5.5. and Table 5.6, P (Significance Level) is > 0.05 in all questions. According to this result, we can claim that there is no significant difference between the ERP and other special software, in terms of the change to managerial accountants.

Whether there is a difference between the ERP and other special softwares, in terms of the change procured by the managerial accounting applications in iron and steel sector was examined. Independent sample t test was used to analyse this difference. The reason for this was to examine whether there was a significant difference between the responses given by two different groups regarding the same questions. The results of the independent sample t test, that was applied in accordance with the responses given by participants on a 5-point Likert scale are indicated in Table 5.7.

**Table 5.7: Results of the Independent Sample t-Test, ERP – Other Special Softwares 2**

		LeveneConstant Variance Test		t-Test for the Equality of Meanings						
		F	Sig.	t	df	Significan ce Level	Average Difference	Std. Error	Confidence Level of 95%	
									Lower	Upper
Increased the use of contemporary costing methods.	Equal variances	3.546	.069	-.394	33	.696	-.109	.277	-.674	.455
	Non-equal variances			-.531	11.056	.606	-.109	.206	-.562	.343
Decreased the time of decision making and costs.	Equal variances	.859	.361	.000	31	1.000	.000	.296	-.604	.604
	Non-equal variances			.000	6.344	1.000	.000	.354	-.855	.855
Decreased the costs of administrative reporting.	Equal variances	2.073	.160	-.176	32	.861	-.048	.270	-.598	.503
	Non-equal variances			-.232	10.879	.820	-.048	.205	-.499	.404
Enabled the preparaion of more realistic budgets.	Equal variances	.159	.693	1.228	32	.228	.393	.320	-.259	1.044
	Non-equal variances			1.491	9.375	.169	.393	.263	-.200	.985
Created a budgeting system that could be updated in concordance with strategical plans.	Equal variances	.000	.989	-.447	33	.658	-.167	.373	-.926	.592
	Non-equal variances			-.483	7.853	.642	-.167	.345	-.965	.632
Decreased the time of budget and report preparation.	Equal variances	8.291	.007	1.249	32	.221	-.369	.295	-.971	.233
	Non-equal variances			-.887	5.757	.410	-.369	.416	-1.397	.659
Enabled the reports to be prepared in real time.	Equal variances	5.334	.027	.203	33	.841	.052	.255	-.467	.571
	Non-equal variances			.146	5.780	.889	.052	.354	-.823	.927
Increased the accuracy of reports.	Equal variances	.001	.974	.627	33	.535	.155	.248	-.348	.659
	Non-equal variances			.631	7.271	.548	.155	.246	-.422	.733
Enabled the acquisition of real-time information.	Equal variances	.366	.549	-.062	33	.951	-.017	.279	-.584	.550
	Non-equal variances			-.068	8.042	.947	-.017	.253	-.599	.565

As seen in Table 5.7, P (Significance Level) is  $> 0.05$  in all questions. According to this result, we can claim that there is no significant difference between the ERP and other special software in terms of managerial accounting applications and managerial accountants in the iron and steel sector. This result confirms the determination of “there is no significant difference between ERP and other special software”, which is indicated in the studies of Booth et al. (2000), Hyvönen (2003), Granlund and Malmi (2002), Tin Yu Ho (2006) for the iron and steel sector.

## **6. Conclusion**

The attainment and use of knowledge has always been a privilege for both people and businesses, from the past to the present.

However, nowadays, these concepts have become indispensable rather than a privilege, because of the availability of information technology. The technological developments which have developed around the knowledge that is one of the basic instruments of managerial accounting, have inevitably affected managerial accounting and managerial accountants.

Managerial accounting has been influenced by technological developments in many respects, either directly or indirectly. Of these effects, the most important is that cost structures and consequently cost systems have changed, as a result of developing technologies in production systems. Another effect is related to the fact that integrated systems such as ERP affect managerial accounting practices.

Information technologies have enabled managerial accountants to attain new skills and changed their roles in the business. Since operational tasks are imposed on systems, managerial accountants use most of their time assisting the management more actively. Managerial accountants serve as consultants in the business. This new duty has brought along the necessity for managerial accountants to also have information about other departments of the business. In addition to this, departments outside of accounting can obtain any information from the system, without the need for an accountant. This condition has brought managerial accountants into competition with other employees. It has also required an obligation for managerial accountants to create a difference using their occupational knowledge more efficiently with the help of information technologies.

Managerial accounting applications and managerial accountants have been affected by information technologies in iron and steel businesses that function in Turkey. Information systems and reporting instruments are used in these businesses, where a rich production process and various processes are performed, in an attempt to support the managerial accountants and directors. While some of these businesses use integrated information systems such as ERP, others use independent systems that are integrated with one another. These systems have considerably decreased the time spent by managerial accountants collecting and gathering information.

Together with the constant development of technology and more efficient use of information technologies by managerial accountants, more changes will occur in managerial accounting in the forthcoming years.

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