

## PERSPECTIVES AND OPPORTUNITIES FOR THE IMPLEMENTATION OF THE ACTIVITY-BASED COSTING SYSTEM IN REPUBLIC OF MACEDONIA

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### **Abstract:**

*Dynamic competitive conditions are characterized with increased business internationalization, augmented development of the information, communication and computerization production technologies, forcefully competency impact, flexibility organization structure and developed relations between the partners. Consequently, the contemporary enterprises confront with completely changed and new business environment with amplified management information requirements which impose need for credible information and information on time in function of quality decision making.*

*It provides the activity-based costing system (ABC) which is designed to provide more accurate information regarding the expenditures required by the management, allocating the costs based on the activities as their main carriers.*

*ABC has become a challenge for implementation in Macedonian business entities too. Considering the above, the aim of the research in this paper is to provide information on costing system applied by Macedonian business entities, as well as how many of them are familiar with the system and how much they implement its. There was also an analysis conducted regarding the knowledge of the ABC system and the characteristics of the companies that were subject of the research.*

*The data were obtained by means of a survey. Details of the results are discussed within the paper.*

**Key words:** activity based costing, costs, costs systems, costs, activities

*JEL Classification:* M40, M41

### **1. Introduction**

Intense global competition, technological innovations, companies with huge capital investments and rapidly changing needs of consumers represent relevant features of current business conditions, which lead to a drastic increase in general costs compared to direct.

Therefore, the significant increase in general costs in total costs of the company contribute their covering to become a central issue of accounting and management costs. Traditional concepts of covering concentrate on costs made in the production phase and allocate the general costs based on keys for distribution related to the physical volume of production. However, this allocation of production costs is not adequate to the modern business environment and results in erroneous cost information on products and services.

Appropriate solution to the problem associated with the accounting procedures of general costs would be timely and reliable informing the management regarding the company's expenses. It is provided by the activity-based costing system which is designed to provide more accurate information required by the management allocating the costs based on activities as their carriers.

Namely, ABC – system provides clear marking of the process or the activity that creates expenses, whereas in order to accumulate the costs of a product, the cost of activities needed for its production are accumulated. Therefore, in focus of attention are the activities as carriers of costs, because it is managed with activities, not with costs.

## **2. Body of the Paper**

### **2.1.Literature review**

The beginnings of the practical application of this system date back to 1980. The credit for the introduction of a activity-based costing system belongs to the American authors, Dr. Robert Kaplan and Tom Johnson, who first have proven shortcomings of traditional accounting system.

The increased interest and tendency of the system based on activities argues with comparative advantage which companies receive as a result of superior information derived from ABC system.

Managers armed with the ABC system were able to reduce costs, identify opportunities for improvement, and determine a more profitable product mix [1]. Because of its perceived superiority, ABC was expected to gradually replace traditional methods.

Anand et al. (8) in their study of cost management practices in India confirmed that firms which have adopted ABC were significantly more successful in capturing accurate cost information for value chain analysis and supply chain analysis vis-à-vis the firms which had not adopted ABC.

The activity-based costing system first applied in producing companies in the United States. The research conducted at the Institute of managerial accountants in 1991, showed that 11 % of companies implement this system. In 1993, this percentage increased to 36 %, and this trend continues in the beginning of the 21st century, when 40 % represented the number of users of the system [2]. Surveys conducted by two renowned consulting companies also confirmed that more than 60 % of U.S. companies intend to implement ABC system and only 8 % continued to apply the traditional absorption methods.

While ABC system was adapted by many companies with varying degrees of enthusiasm, today there is a presence of increased realization of this system and is increasingly proving that this system is the critical part of the business decision making of modern companies. Lead analyst [3] comments:

*“There is a growing interest in the system based on activities. Although many companies in the eighties and nineties saw that this system is too complicated, many companies felt that it was necessary to support the better planning and better support the analysis of profitability.”*

The widespread application of this improved methodology imposed the necessity of exploring the benefits of the implementation of the activity-based costing system and their impact on corporate financial performance.

Many researches confirm the positive correlation between financial performances and implementation of the activity-based costing system. For example, the research by the authors Cagwin D. and Bouwman M. provide a proof (confirmation) that ABC system improves financial performances [4].

In a report by the consultancy organization Accenture [5] on the influence of ABC system over financial performances, the following is mentioned:

The system based on activities may reduce total costs for 2 to 5 %. The increased focus on higher profit margin and market share growth may result in increased profits by 5 to 15%.

In the report on the potentials of ABC system in the journal Harvard Business Review, authors Ness and Cucuzza, reveal that the experience of Chrysler in the United States, the savings in cost can be very high, i.e. 50 to 100 times in some areas. [6]

DHL Worldwide Express, which has long used activity – based costing system to support decision-making on service prices, suggests that every 1% increase in profit margin generates \$ 5 million profit. [7]

Studies related to implementation of the activity-based costing system in the early nineties of the twentieth century have shown increased interest among managers but in highly developed market economies. The situation is markedly different in developing countries where in the nineties of the twentieth century, the implementation was more incidental than planned. Increased interest in adapting the activity-based costing system in developing countries can be noticed in the beginning of the twenty-first century.

## 2.2. System based on operational activities of management and cost control

The activity-based costing system (ABC- System) represents an accounting system of managing costs and focuses on activities as the fundamental expenditure object. Practically, the emergence of accounting activities is associated with technical and technological development and automation of operations, which created a need for a new way of allocating costs. The beginning of the practical application of this system dates back to 1980. The credit for the introduction of a system based on activity belongs to American authors, Dr. Robert Kaplan and Tom Johnson, who first has proven shortcomings of traditional accounting system. In fact, traditional methods for allocation of general production costs are not adequate to improve global competitiveness. [9] Since traditional accounting system was not able to meet the demands of the modern business environment, both authors offered the activity-based costing system, which was developed and adapted as the basis for strategic decision-making and improvement of the profit performance. In the late eighties of the twentieth century, the system based on activities attracted the attention of many academic researchers, consultants, managers, and professional and academic journals in the field of managerial accounting, as concept which enhances cost information on products / services and it helps managers to better understand how to spend resources to achieve strategic results. At that time the system has been implemented in many manufacturing companies.(10) Experience has shown that the managers who implement this system were able to reduce costs, identify opportunities for improvement and determine profitable production mix. And, as Kaplan predicted back in 1990, today information based on ABC system is widely used to evaluate continuous improvement and to monitor process performance.

The essence of this system (Activity-Based Costing System) is that it helps the management to monitor his organization as a collection of activities and thus provide useful information on how costs apply. This system provides a clear demarcation process or activity that entails costs. The activity is an event, a whole or working unit with a specific purpose. ABC- system uses the cost of these activities as the basis for allocation of costs to other cost objects such as products, services or customers. The characteristics of the ABC system are based on the concept that for production of products there are different activities established and that the activities mean spending of resources. Therefore if managers are interested in the product competing, they must own information on: (1) activities required for production of the product or service providing, (2) costs i.e. resources that use these activities. Thereto, in order to reduce production costs, managers must change activities required for production.

It can be concluded that information on costs per unit of product that are derived from a system based on activities are more reliable in terms of the information obtained from traditional cost driver systems that give a misleading picture of the costs, because these systems are not suitable especially when participation general costs to total costs is great. The gathered information system based on activities represent quality surface for arguing business decisions of management. The key to improving corporate productivity and quality through continuous improvement is to understand the interdependence of activities. The corporate coherence must be based on actions, not on hierarchies. The activities must be managed to minimize waste and activities that do not add value. They represent a powerful basis for business management because they enable the management to take timely action to improve business processes or activities. [11]

Such organizational advantage of the ABC system is due to its ability to provide more accurate records on costs, while due to opportunity to use feedback, better control of costs is provided. The main benefits from implementing the ABC system are as follows: [11]

1. Support for strategic decision making - providing more accurate and more objective information that lead to improved support for strategic pricing strategies, managing product lines, decisions to buy or produce on their own, streamlined production;
2. Transferring information to carriers of work activities - the work carrier represents a measure that generates activity and starts the process of consuming resources from activities. Examples of work holders are the number of orders, number of inspections, number of preparations, etc... ABC uses carriers work to identify the activities that cause the work, in order the resources to be transferred and then product activities or services;
3. Operational efficiency is improved by prioritizing efforts to improve operations, identifying activities that add versus those that do not add advantage, redesign processes, etc... The ABC encourages continuous improvement and total quality management for planning and control of costs associated with the level of business activity;
4. Objective information - ABC system informs on the work of management providing objective and timely information about the processes, the carriers of the activities, operations, products, product lines, customers, services and staff performance;
5. Improved profitability - as a result of higher levels of management to provide accurate information in order to choose the products and services that will be more profitable. It also helps in effectively managing cash flows. The sources of cost are precisely determined by identifying the holders of the activities that generate work and it links corporate strategy to operational decision making;
6. Improved costs control – in order better control to be provided managers in separate functions need to focus their attention towards the source of costs instead towards organizational units in which they appear, and that is what exactly provides the system based on activities;
7. Timely business decisions based on timely cost information.

As a consequence of all these advantages, the system based on activities attracted the attention of many theorists and practitioners in the management of accounting. It resulted in organizing numerous seminars and trainings on this issue and at the same time more software was developed, i.e. specific ABC programming packages.

### 3. Research methodology

There are almost no surveys in Republic of Macedonia that have examined the issue related to the level of knowledge and implementation of an activity-based costing system. The lack of research of this kind in the country was actually the main reason for the Macedonian businesses entities to become targeting group for research.

For this purpose it was set up a representative instance of 76 companies from the manufacturing and service sectors, while respecting the fundamental principles of representativeness (risk of 5 % or threshold or reliability of 0.95 as standard in statistical survey).

The survey was conducted through a questionnaire consisting of two parts. The first part of the questionnaire referred to the general information about businesses that were targets of the research, while the second part was about the costing system that applied or there is a plan to be applied.

The main objective of this survey was to obtain information about costing system applied by Macedonian business entities, as well as about how many of them are aware of and how they implement the activity-based costing system. In fact, there was an analysis of the factors affecting the implementation of the system conducted and analysis of the relationship between knowledge of the ABC system and the type of activity of the company, size of company, and the relationship between the position of the respondent company and its information system.

All that, including processing and presentation of the data will be realized with appropriate software support.

- descriptive statistical analysis
- for the testing of the statistical hypotheses the non- parameter test is applied ( $\chi^2$ )

#### 4. Descriptive statistic analysis

Selected respondent who were targets of the survey are broadly representative of different sizes and from different economic sectors (manufacturing and services) i.e. 24% of managers of surveyed companies are employed in companies with more than 250 employees, 42% of companies numbered 50 to 249 employees, and the remaining 34% were businesses entities with fewer than 49 employees. Moreover, 59% of the companies were from the manufacturing sector, as opposed to 41% of the service sector.

The focus of the research was the costing system that applied or is planned to be applied by the surveyed enterprises, knowledge of activity-based costing system, as well as its applicability.

The majority of respondents said they keep separate records of the cost per unit of product, using the method of real costs.

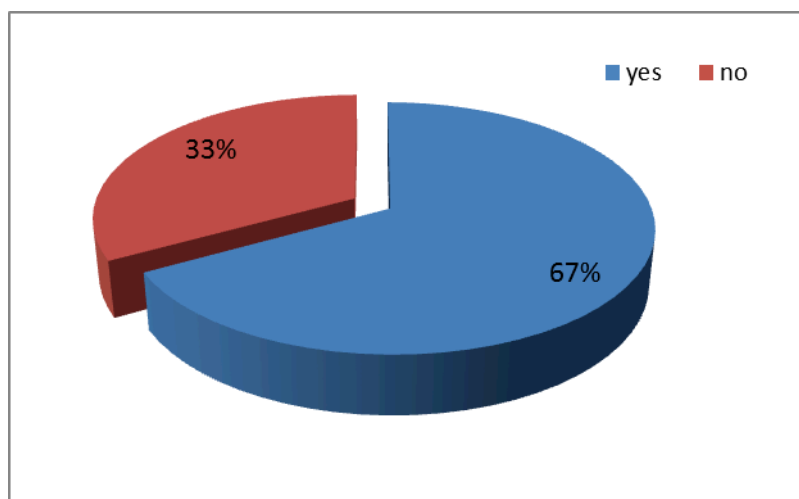


Figure 1: Do you keep separate records of the cost per unit (product)

Notably, 67% of respondents confirmed they keep separate records of the cost per unit of product.

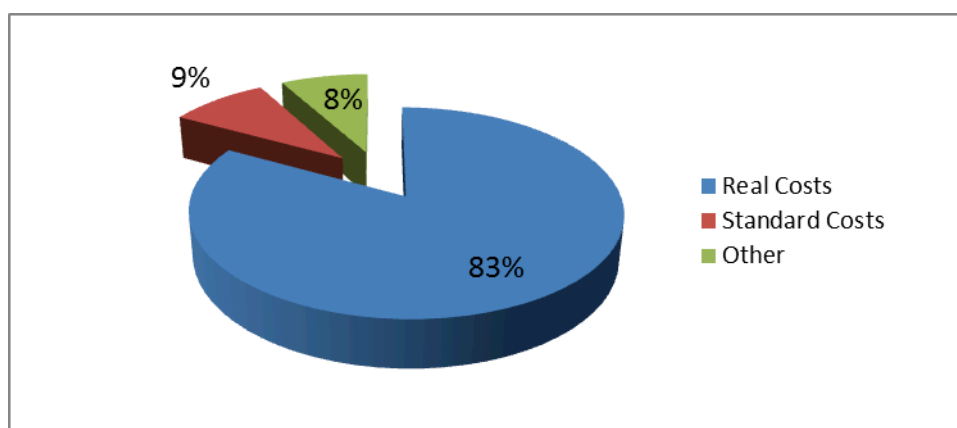
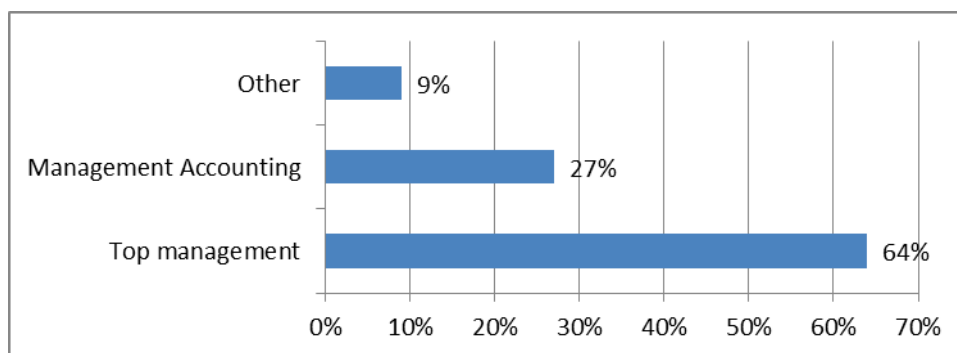


Figure 2: Which method of calculating costs do you apply

On the question which system of calculating the costs they apply, 83% of respondents said they used the method on real costs.

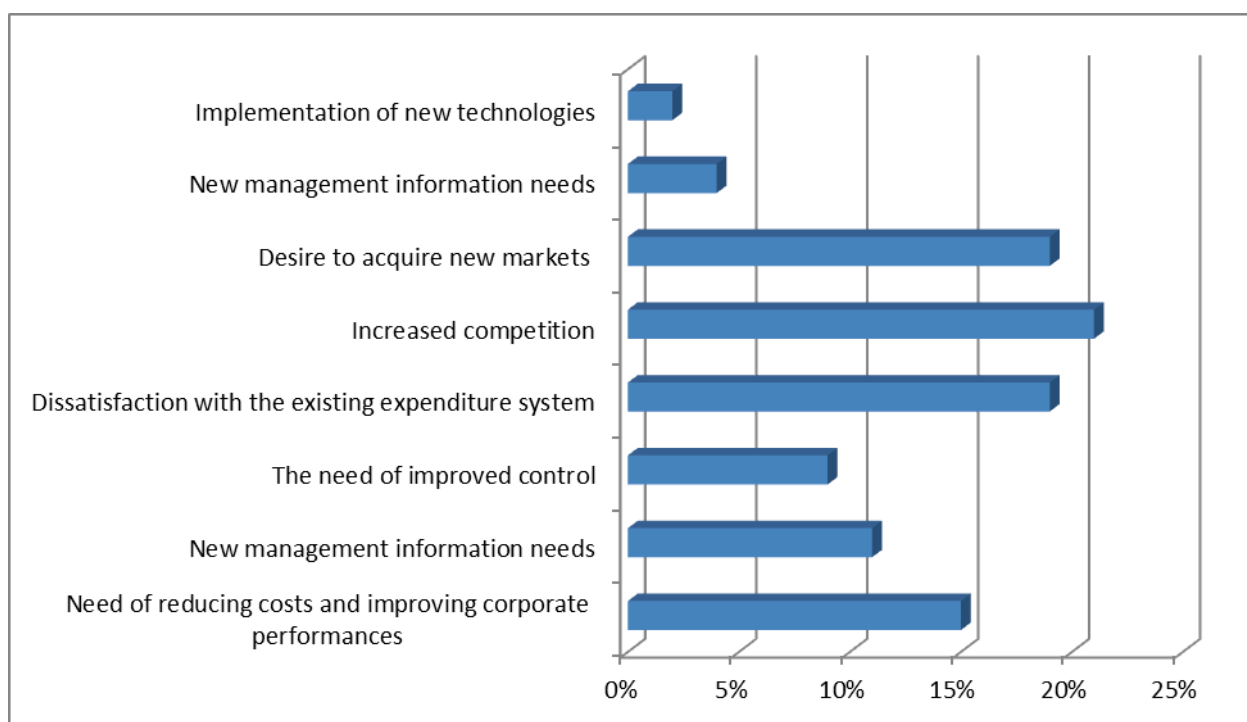
The other part of the questions related to knowledge and implementation of the activity-based costing system, factors affecting the implementation and adaptation of the initiators of the system.

The results showed that 34% of respondents are familiar with the ABC system and that only 16% of them implemented the system. Those companies that implement the system confirmed that the implementation of the new expenditure system was mostly initiated by top management and this as a result of dissatisfaction with the application of existing expenditure model.



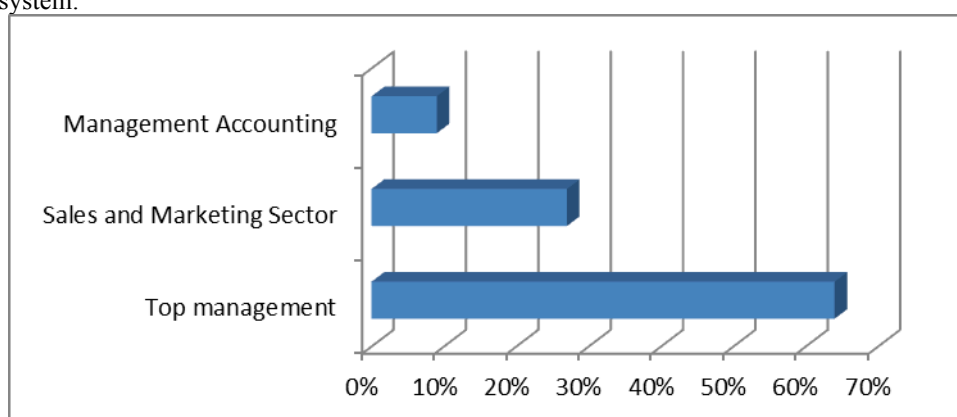
**Figure 3: Who initiated the need of implementing the ABC system**

The need to implement a new expenditure pattern is caused by several factors that are presented in the following graph:



**Figure 4: Factors affecting the implementation of the ABC system**

The majority of respondents, i.e. 60% of them claimed that the implementation of the ABC system was mainly affected by increased competition, the desire to acquire new markets and dissatisfaction with the existing expenditure system.



**Figure 5: Users of the information obtained from the ABC system**

Companies that implement the system provided more precise information on costs and profitability by product, product groups, customers, and customer groups that aimed at making the quality product range and pricing. The gathered information about the cost per product unit is commonly used by the top management and the departments of sales and marketing.

### 5. Statistical processing of data obtained with the research

Besides the descriptive statistical analysis, a statistical testing was done in order to discover the links between knowing and implementation of a system based on the activities as a modern costing method and the characteristics of the companies that were subject of the research.

Considering the object, goals, motives and objectives of the research in this paper, the following hypothesis can be defined: Various business characteristics of the companies affecting to the familiarity and the implementation of Activity Based Costing System.

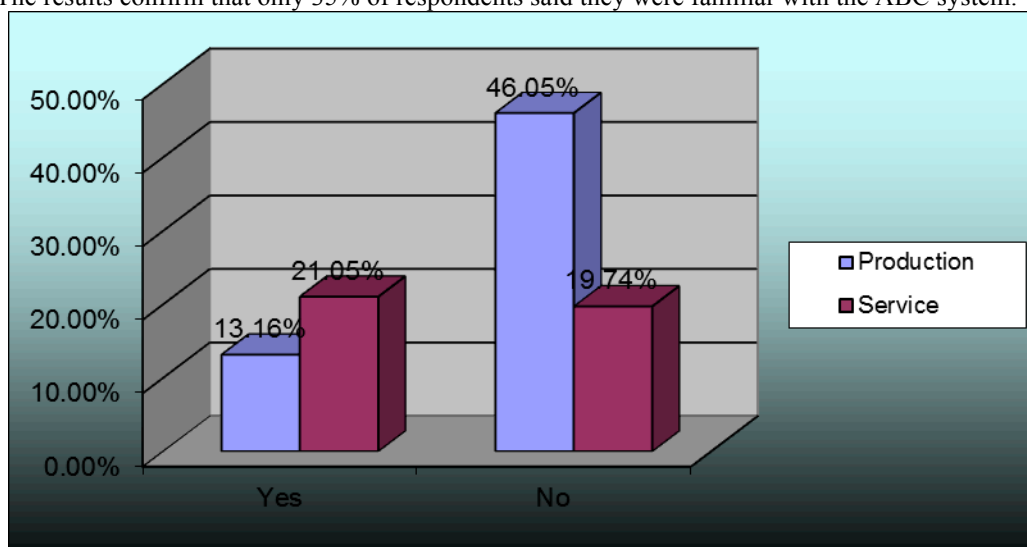
Based on the above-defined general hypothesis the following individual hypotheses can be differentiated:

**Hypotheses 1: Knowledge of activity-based costing system does not depend on the type of the activity of the company**

	Yes	No
Production	10	35
Service	16	15

**Table 1.1. Empiric frequencies of variables: type of activity (business) of the company (in rows) and bimodality of the responses on the familiarity with the activity-based costing system (in columns).**

The results confirm that only 35% of respondents said they were familiar with the ABC system.



**Figure 1.1 : Bimodality of responses related to the knowledge of activity-based costing system depending on the company's activity type.**

Respondents who said they know the system based on activities, 62% are from the service sector, while 38 % of them are from production sector. It can be concluded that the service sector has growing interest in the adaptation and implementation of a system based on activity, although the initial implementation of this system began in large manufacturing companies with huge costs in which structure there is a domination of the share of general production costs. This is primarily due to the differentiated range of services offered by businesses from the service sector, leading to an increase of their overheads (general costs).

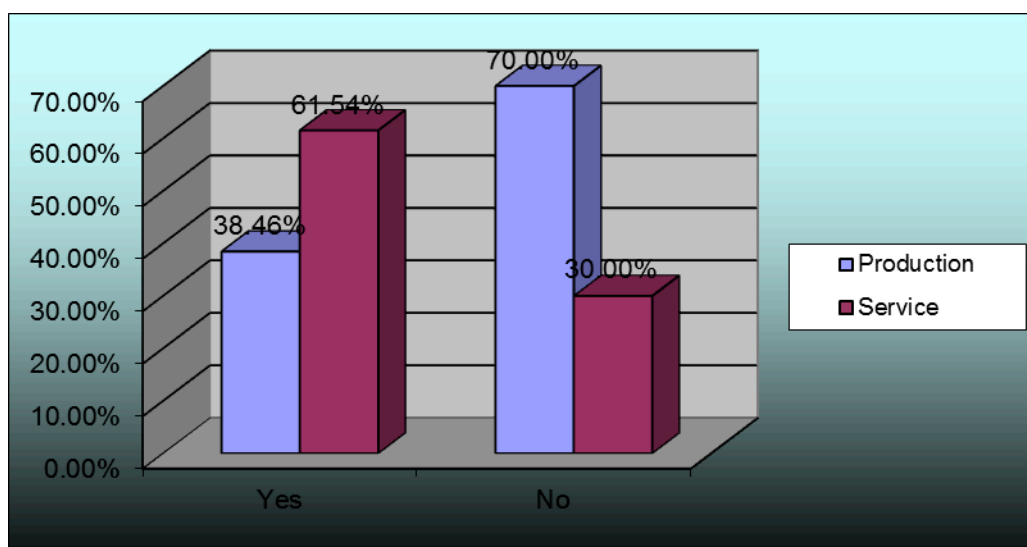


Figure 1.2. : Bimodality of responses related to the knowledge of activity-based costing system depending on the company's activity type.

Chi square 7,0450
Df 1
P< 0.0080
Cases(n) 76

Table 1.2. : Results  $\chi^2$  - test

Calculated value of the test :  $\chi_{pr}^2 = 7,0450$ .

The risk of error of 0.05% and the number of degrees of freedom  $r = (m - 1)(n - 1) = (2 - 1)(2 - 1) = 1$ , the theoretical (critical) value of the test is:  $\chi_{(0,05;1)}^2 = 3,84$ .

Since the calculated value of the test ( $\chi_{pr}^2 = 7,0450$ ) is greater than the theoretical value ( $\chi_{(0,05;1)}^2 = 3,84$ ) the hypothesis is rejected and we can conclude that the knowledge of activity-based costing system depends on the activity of the company. This is also confirmed by the fact that the defined risk of error  $1 - \alpha$ , i.e.  $p = 0,05$  is greater than the value of the realized level of risk of error, which equals  $p = 0,0080$ .

**Hypothesis 2: The knowledge of the activity-based costing system does not depend on the size of the company, i.e. the total number of employees in the company.**

	Yes	No
Large enterprise (over 250 employees)	9	4
Medium enterprise (50-249 employees)	13	28
Small enterprise (0-49 employees)	5	17

Table 2.1. Empiric frequencies of variables: size of the company (in rows) and bimodality of responses related to the knowledge of the activity-based costing system (in columns).



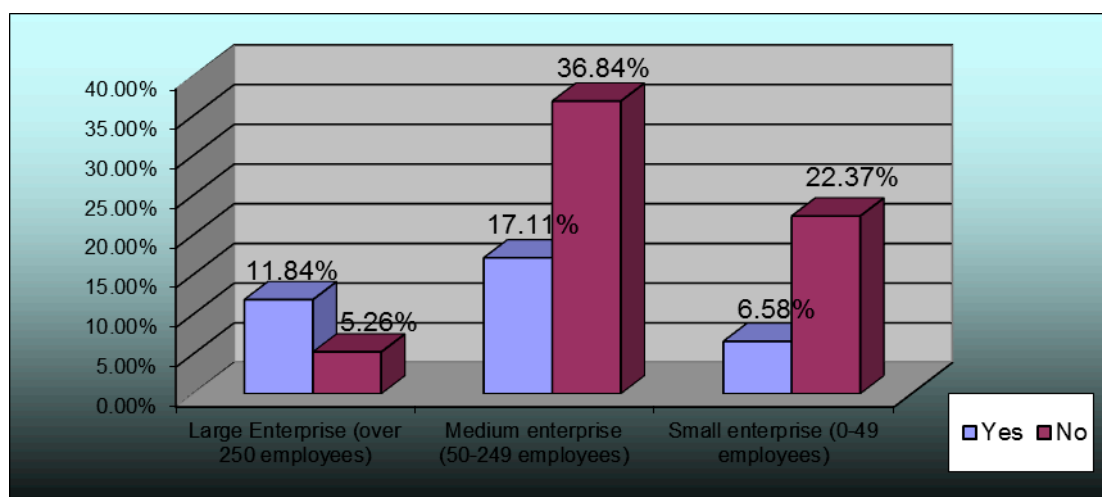


Figure 2.1.: Bimodality of responses related to knowledge of the activity-based costing system depending on the size of the company, i.e. total number of employees.

Chi square 8,2820
Df 2
P< 0.0160
Cases(n) 76

Table 2.2. Results of  $\chi^2$  - test

Calculated value of the test is:  $\chi_{pr}^2 = 8,2820$ .

For risk of error of 0,05% and number of degrees of freedom  $r = (m - 1)(n - 1) = (3 - 1)(2 - 1) = 2$ , the theoretical (critical) value of the test is:  $\chi_{(0,05;2)}^2 = 5,99$

Since the calculated value of the test ( $\chi_{pr}^2 = 7,0450$ ) is greater than the theoretical value ( $\chi_{pr}^2 = 8,2820$ ) the hypothesis is rejected and we can conclude that the knowledge of activity-based costing system depends on the size of the company. This is also confirmed by the fact that the defined risk of error  $1 - \alpha$ , i.e.  $p = 0,05$  is greater than the value of the realized level of risk of error, which equals  $p = 0,0160$ .

In this way, the results confirmed that as the number of employees increases, so has the knowledge of the activity-based costing system. This is due to the fact that large companies deal with great expenditures, where the dominant part have the general production costs, thus the most adequate solution for their allocation is actually the ABC system. On the other hand, small businesses have a more limited range of products, i.e. their production range is not as diversified and therefore their managers who often are also their owners are afraid to experiment with the cost system. Their indifference results in fear of something new and unfamiliar so they act repulsive, and as a result they still apply traditional cost systems. Fear of failure in terms of limited resources with which small and medium sized businesses operate is the main reason for such determination. However the advantages that can be gained by implementing the ABC system in young entities is of an extremely importance in terms of investment required to adapt the system. Namely, the smaller companies will not require major investments in sophisticated systems for collecting data and there is no need of some serious organizational transformations.

**Hypothesis 3: The knowledge of activity-based costing system does not depend on the position of the respondent who works in the company.**

	Yes	No
Accountant	16	45
Top manager	6	3
Manager-Owner	4	2

Table 3.1 Empiric frequencies of variables: position of the respondent (in rows) and bimodality of responses related to the knowledge of the activity-based costing system (in columns).

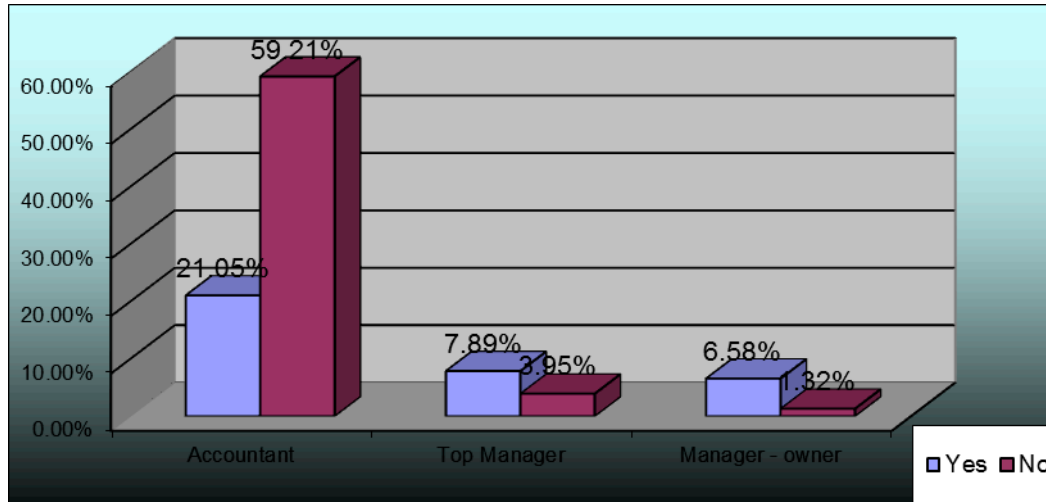


Figure 3.1.: Bimodality of responses related to the knowledge of the activity-based costing system depending on the position of the respondent in the company.

Chi square 12,0990
Df 2
P< 0.0020
Cases(n) 76

Table 3.2. Results of  $\chi^2$  - test  
Chi-Square Test of Independence

Calculated value of the test is:  $\chi_{pr}^2 = 12,0990$ .

For risk of error of 0,05% and number of degrees of freedom  $r = (m - 1)(n - 1) = (3 - 1)(2 - 1) = 2$ , the theoretical (critical) value of the test is:  $\chi_{(0,05;2)}^2 = 5,99$

Since the calculated value of the test ( $\chi_{pr}^2 = 12,0990$ ) is greater than the theoretical value ( $\chi_{(0,05;2)}^2 = 5,99$ ) the hypothesis is rejected and we can conclude that the knowledge of activity-based system depends on the size of the company. This is also confirmed by the fact that the defined risk of error  $1 - \alpha$ , i.e.  $p = 0,05$  is greater than the value of the realized level of risk of error, which equals  $p=0,0020$ .

As was expected, accountants are those most familiar with the system investigated. The results showed that 35% of all respondents are familiar with the activities-based costing system, however it is extremely important to highlight that 68% of them were accountants. This in turn is due to the fact that accounting management is the most familiar with the modern techniques and systems of managerial and practically its knowledge and competence should be the initial factors for practicing these methods and techniques.

## 6.CONCLUSION

The results of the survey confirm that the actual situation of enterprises in the Republic of Macedonia in the field of development and application of modern systems for coverage and cost management has not kept track with the advances of serious achievements in the field of management accounting. Namely, based on the research it can be concluded that the implementation of a system based on activities in enterprises in the country is still very low.

This condition is caused by a number of factors among which are the following:

- insufficient knowledge of the benefits of implementing the ABC system
- rejection of accountants' initiatives to implement the system by top management
- insufficient cooperation between the academic community and the sector of the economy.

To overcome this situation and to encourage the application of modern systems to cover the costs there is a necessity of:

- organizing various seminars and trainings that will help companies in the perception of the values of modern cost systems and encouraging their active practice in the operation,
- raising the position of accountants at the top management, i.e. greater participation of accounting management in the strategic decision-making, precisely because accounting management is one of the most important sectors that can provide a reliable basis for the successful operation of business entities,
- continued cooperation between academic community and business entities
- greater media propaganda of companies that implement the system
- organizing debates in which there will be experts from academic community and managers of businesses related to the necessity of implementation of the ABC system.

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