TOMASZ WNUK-PEL

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the Case of ABC in Poland

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To my beloved wife Renata

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INTRODUCTION

At the turn of the eighties and nineties of the 20th century management accounting was criticized (e.g. Johnson, Kaplan, 1987; Bromwich, Bhimani, 1989; Innes, Mitchell, 1990). The usefulness of methods used from the beginning of the century was questioned. It was claimed that the methods were inadequate in terms of changing business environment, which was mainly influenced by technological development, global competition and development of IT. In a monograph *Relavance Lost* Johnson and Kaplan (1987) proved that new times demanded new methods of management accounting, and these methods included activity-based costing – ABC.

Activity-based costing emerged in the United States in the late eighties of the 20th century and, subsequently, after a series of articles by Cooper and Kaplan, spread among companies all over the world. In the nineties, both practitioners dealing with implementation of ABC and researchers studying the implementations observed that activity-based costing was something more than just an improved cost evaluation system. They additionally noted that ABC may be a basis for activity-based management – ABM. In the late eighties, but also in the nineties of the 20th century, numerous questionnaire research and research in the form of case studies (among them *action research*) were carried out. They aimed to analyze the process of activity-based costing implementation mainly in the North American and European countries. Some of the research analyzed factors which influence activity-based costing implementation. Anderson (1995), Gosselin (1997) and Krumwiede (1998) studied factors which influence ABC implementation on different stages of the implementation process. Shields (1995), Swenson (1995), Foster and Swenson (1997), McGovan and Klammer (1997) as well as Anderson and Young (1999) analyzed the problem of perception of ABC implementation satisfaction. Kennedy and Affleck-Graves (2001), Cagwin and Bouwman (2002) as well as Ittner *et al.* (2002) studied the influence of activity-based costing on the company's performance.

Since the popularization of activity-based costing and activity-based management in the nineties of the 20th century, the two concepts have been

extremely popular among companies all over the world. However, implementation of the ABC system proved not to be a simple task. Implementation of activity-based costing is regarded to be technically complex and it requires adequate human and financial resources. Research carried out by Innes and Mitchell (2000) proved that great amount of labour input needed for activity-based costing implementation is a significant factor on the stage of decision-making about implementation, but it is additionally one of the five key problems raised by companies in which activity-based costing functions (remaining problems are: difficulties in collecting data about resource and activity drivers, necessity to treat costs in the cross-section of processes going through numerous internal organizational units, other priorities and great amount of labour from financial section). Numerous research on activity-based costing proved that information generated in companies by the system is used in decision-making processes in such areas as pricing, activity-based budgeting, product and service development, customer profitability analysis and cost modelling. Research on activity-based costing diffusion in different countries (e.g. Ask, Ax, 1992; Lukka, Granlund, 1996; Cinquini *et al.*, 1999; Innes, Mitchell, 2000; Bescos *et al.*, 2002; Pierce, 2004) enables to formulate a statement that the percentage of companies which use ABC varies, however, in most of the research it is between zero and more than 20% (it should be noted that majority of the research studied medium-sized and large companies). The differences between countries in the percentage of companies using activity-based costing stems from the difference in the development of management accounting methods in those countries, the way the research sample was selected (large and small companies, production and non-production companies, financial institutions etc.) but most of all from the time of collecting information (in general, earlier studies show significantly lower percentage of companies using ABC).

Due to historical conditions, the development of management accounting in Poland was less intense and delayed in comparison to the theory and practice in highly-developed countries[1], this trend is also noticeable in the case of activity-based costing implementation. Polish companies mainly use different traditional systems of cost accounting, whereas modern systems, including ABC, are used sporadically. Diffusion of ABC in Poland is lesser than in the United States, Great Britain or in other highly-developed countries, and despite the fact that the gap is closing, it still remains significant. The first study which proved that ABC is present in the practice of Polish companies was carried out by Sobańska and Wnuk (2000a). Studies conducted by other authors revealed single cases of activity-based costing or its elements use (Jarugowa, Skowroński, 1994; Szychta, 2001,

[1] Modern concepts of management accounting were known in Poland among academics, and what is more, there were cases of their practical use. However their use in theory and in practice was significantly lesser than in the western countries (see: Jarugowa, Skowroński, 1994; Sobańska, Szychta, 1995, 1996; Sobańska, Wnuk, 1999a).

2002; Karmańska, 2003; Januszewski, Gierusz, 2004; Januszewski, 2005d; Wnuk-Pel, 2006a; Szychta, 2006a, 2007a), sometimes they signalized that researched companies were implementing or were considering implementation of ABC (Dyhdalewicz, 2000, 2001; Szychta, 2001, 2002; Karmańska, 2003; Januszewski, Gierusz, 2004; Januszewski, 2005d; Szychta, 2006a, 2007a). Some of the hitherto studies did not notice any single company which used activity-based costing or was considering its implementation. Yet, it should be stressed that such findings came mainly from earlier studies (Kinast, 1993; Sobańska, Szychta, 1995, 1996; Gierusz *et al.*, 1996; Radek, Schwarz, 2000; Szadziewska, 2002, 2003).

A more detailed research on the use of activity-based costing in Polish practice was carried out by Karmańska (2003), Januszewski and Gierusz (2004), Januszewski (2005d) and by the author of this work (Wnuk-Pel, 2006b). The studies analyzed such issues as knowledge of ABC, benefits ensuing from ABC implementation, problems connected with the process of implementation anticipated by companies considering implementation and companies which quit implementation and problems that occurred during implementation.

In Poland, research on activity-based costing implementation in the form of case study are becoming more frequent (including action research). The pioneer case studies carried out by means of surveys and interviews were conducted in 2000 (Wnuk, 2000; Kujawski, Ossowski, 2000) and the first action research was conducted in 2001 (Świderska, Pielaszek, 2001). In the course of time, the number of such research grew, they especially intensified from 2004 when the number of companies using or implementing or considering implementation of activity-based costing systematically increased. Empirical research provided valuable information on the practice of activity-based costing in Polish companies. The research dealt with various problems and they mainly embraced the issues of activity-based costing implementation and the use of information generated by the system.

As far as activity-based costing is concerned, so far questionnaire research examining both the degree of diffusion as well as the usage of ABC in Polish companies have been carried out. Case study method (including surveys and interviews and action research), which is also used in Poland, enables a more detailed analysis of the problem. Bearing in mind all the research, it can be concluded that the number of companies using or implementing ABC or considering its implementation in the future is still growing.

Hitherto research on activity-based costing in Poland was considerably limited; it mainly came down to a statement whether the analyzed companies implemented/are implementing ABC in full/classic form or whether they only use certain elements of ABC. So far, there have been no wide-spectrum research on functioning of activity-based costing in Polish companies (apart from a few case studies) nor detailed research on the attitude of companies to activity-based costing and factors influencing the attitudes. Additionally, there were no research on

activity-based costing implementation success nor analysis of development of literature about ABC/ABM in Poland. The author's preoccupation with the issue of activity-based costing functioning in Polish companies mainly stems from the following:

1) despite the fact that activity-based costing is a concept which has been known and used in companies since the late eighties of the 20th century, it is not widely spread and therefore it is still perceived as innovation. Presentation of the concept's development may seem interesting;

2) one of the most interesting issues connected with the degree of activity-based costing diffusion in Poland, which has not been discussed in previous research, is the analysis of ABC/ABM literature development, in particular analysis of such issues as volume, authorship, research method, focus, and content of the publications;

3) so far, questionnaire research which studied diffusion of activity-based costing in Poland, has not presented in detail the notion of a problem and what companies considering implementation of ABC understand by a problem. It seems that sometimes companies use the term ABC inadequately i.e. they use the term in a situation when a new and better cost accounting system is implemented which has many cost centres and a bigger, than previously, number of cost drivers. In such case, only thorough analysis may help to conclude what ABC really stands for, whether it is the real activity-based costing or maybe just its elements or whether it is a developed form of traditional cost accounting;

4) another issue, which has not been studied in Poland in a more detailed form, is the attitude of Polish companies towards activity-based costing and identification of factors which positively influence implementation of ABC, as well as reasons underlying quitting implementation or reasons behind not considering ABC implementation;

5) apart from sporadic case studies (including action research) so far there have been no research which would look into the way ABC is implemented, especially the issue of initiative behind implementation or responsibility for implementation and occurrence of problems during implementation process;

6) ABC systems which function in Polish practice have different structure than ABC systems in foreign companies. Therefore, it may seem interesting to analyze the functioning of activity-based costing systems in terms of e.g. their size (e.g. number of objects, activities, resources, drivers) or information structures which function in the companies (e.g. division of costs into fixed and variable, identification of costs of unused capacity, identification of value-added and non-value added activities);

7) information obtained from activity-based costing may be and is used in companies in many different ways. Numerous people use it in many different decision-making processes – therefore, it seems interesting to determine the main addressee of this information and in what decision-making processes it is mainly used;

8) another yet interesting aspect of activity-based costing diffusion in Polish companies is the attempt to evaluate implementation success and benefits ensuing from the process, particularly analysis of the quality of ABC information, its usefulness and its influence on the company.

In the light of presented facts, fulfilling the previously identified research gap i.e. analysis of extent and way of use of activity-based costing in Polish companies seems important.

The main objective of this work is analysis of development and diffusion of activity-based costing, as well as evaluation of extent and way of activity-based costing use in Polish companies. Attaining the main objective will be possible by achieving the following partial objectives:

1) presentation of activity-based costing concept development as point of reference for further and detailed research into functioning of activity-based costing systems in Polish companies;

2) analysis of ABC/ABM literature in Polish journals in the dimension of: volume, authorship, research method, focus, and content of publications;

3) analysis of ABC implementation extent in Polish companies at the beginning of the 21st century in the light of ABC diffusion in the world;

4) presentation of factors conditioning the attitude of Polish companies towards activity-based costing (companies which implemented ABC, those which consider its implementation in the future and companies which do not consider implementation or quit the process after cost and benefit analysis);

5) examination of activity-based costing implementation process in Polish companies, examination of ABC systems structure and way the information generated by the systems is used;

6) analysis of the satisfaction and benefits ensuing from ABC implementation in Polish companies, particularly analysis of the attitudes of preparers and users of ABC information, and also the quality of ABC information, its usefulness and its influence on the company.

In order to attain the main objective of this work as well as its partial objectives, it has been attempted to prove the main thesis and the following specific theses. The main research thesis sounds: diffusion of activity-based costing in Polish companies, although delayed in comparison to highly-developed countries' practice, is conditioned by the same factors and develops in the same direction as in those countries.

In order to prove the main thesis and, additionally, to prove specific theses as well as to verify specific hypotheses, the following research methods have been applied: literature study, surveys, case study (including action research).

1. In terms of literature study, both Polish literature and foreign publications have been analyzed. Such extensive literature studies enabled the author to formulate own findings and to compare the findings with other research carried

out in Poland and other countries. On the basis of literature study, it has been attempted to prove the following specific theses of the work:

a) the concept of activity-based costing, since its emergence in the late eighties of the 20th century, has evolved from the measurement system of resource costs, activity costs and cost of products into the activity-based management system;

b) the development of ABC/M literature in Poland is considerably delayed (by 6–8 years) in comparison to the publications from the United States, Great Britain and other highly-developed countries;

c) there are more publications on the ABC/M concept in the journals for practitioners than in the university publications, and the authors of those publications are mainly university researchers;

d) the percentage of the ABC/M enthusiasts among consultants is close to the highest possible level, yet the ratio among practitioners and university researchers is only slightly lower;

e) among research methods used in the publications, it is more common to encounter descriptive works, surveys and case studies than literature reviews and analytical papers;

f) the subject area of the publications evolved from the activity-based costing in production companies and only in the main area of activity, into ABM in production and service companies in the main and supporting processes with reference to other concepts and tools of management accounting.

2. In order to attain the main objective of this work, three surveys have been carried out. The first survey (survey A) examined the attitude of Polish companies towards the notion of activity-based costing. The surveys were distributed among representatives of 1267 companies; 495 correct surveys were sent back which constitutes 39.1%. The second survey (survey B) analyzed the way activity-based costing operated in Polish companies. In general, 71 companies which used this type of cost accounting system have been identified; 33 correct surveys were sent back which constitutes 46.48%. The third survey (survey C) examined satisfaction and benefits ensuing from activity-based costing implementation. This survey was carried out among 28 respondents from 7 companies where activity-based costing was used. On the basis of conducted surveys, the following specific hypotheses have been verified:

a) companies operating in Poland mostly use traditional systems of cost accounting; modern systems such as target costing or activity-based costing are used sporadically and their diffusion is significantly lesser than in Western countries;

b) implementation of activity-based costing is influenced by various factors; the most important are: headquarters' demand (e.g. parent company), rise of competition and the drive to expand into new sales markets, dissatisfaction with the previous cost accounting, change of organizational structure or strategy, implementation of new technologies, desire to reduce costs and improve results, change-oriented attitude of employees, accessibility of financial and human resources;

c) among the most important problems related to the process of activity-based costing, which companies are afraid of, one could mention: lack of management support, high implementation and maintenance costs, significant labour input during ABC implementation and maintenance, other priorities, insufficient knowledge of ABC, difficulties with system structuring, lack of adequate resources;

d) lack of interest in implementation of activity-based costing or resignation from ABC implementation are conditioned by: satisfaction with current cost accounting system, low indirect costs, lack of management support, high costs of ABC implementation and maintenance, high labour input during ABC implementation and maintenance, other priorities, insufficient knowledge of ABC among employees, difficulties with system modelling, lack of adequate IT resources;

e) the most important factors which positively influence ABC implementation are: high direct costs, high competition, foreign capital share in the company and size of the company;

f) the structure of activity-based costing systems which function in Polish companies is consistent with the structure of systems functioning in foreign companies;

g) in companies, which implemented activity-based costing, information obtained from the system is used in different ways by particular departments and it enables making various decisions;

h) companies, in which activity-based costing operates, simultaneously use other modern methods of management;

i) managers and employees are positively oriented towards ABC implementation;

j) managers and employees rank the information from ABC higher than from the traditional cost accounting system;

k) managers and employees evaluate positively the usefulness of the ABC information;

l) managers and employees are convinced that ABC implementation influenced their company in a positive way;

m) opinions of preparers and users of ABC information on implementation benefits will differ considerably.

3. Research in the form of case study (including action research) aimed to verify the same hypotheses, which were verified by means of survey B, however the case study research, in comparison to the questionnaire research, was extended and more detailed. Another reason underlying the application of this type of research method was the analysis and explanation of methodological and organizational changes which occurred after activity-based costing implementation in the analyzed companies. Representatives of three companies, to which case study method by means of surveys and interviews was applied, were asked to fill in

surveys A and B. Subsequently, numerous direct interviews with employees and managers were conducted. Then the author analyzed gathered information and that enabled him to gain in-depth knowledge about conditioning of design and implementation of activity-based costing in Polish companies. By action research the author means his participation in the design, implementation and evaluation of activity-based costing in a production and trading company. This kind of research enabled (in comparison to case study by means of surveys and interviews) a more detailed analysis of activity-based costing operation in the company: (a) the author cooperated for a few months with company's employees at the stage of implementation, and later he also cooperated at the stage of ABC evaluation, (b) the author co-developed the ABC system, therefore he had unlimited access to the system's documentation, (c) the author had access to all information generated by the cost accounting system and he could observe how the information was used by the company's management. Based on the case study, the following specific hypotheses have been verified:

c) the process of activity-based costing implementation is positively influenced by three groups of factors: motivators, catalysts and facilitators; during the implementation process, the factors work jointly and they promote the process of change;

d) among obstructors, factors which negatively influence activity-based costing implementation, one should mention: attitude not favouring changes, substantial labour input needed for implementation and insufficient knowledge of activity-based costing;

e) implementation of activity-based costing in the companies caused many methodological changes, especially improvement in accuracy of calculating indirect costs and improvement in accuracy of profitability analyzes;

f) implementation of activity-based costing triggered institutional/ organizational changes in the company, especially nearing the function of management accounting to operational functions and improvement in the significance of information from the management accounting and its more frequent use especially in the decision-making process.

4. Additionally, apart from the above research methods, a comparative analysis of the author's own research in the form of surveys and case studies (including action research) with similar research conducted both in Poland and in the world has been carried out.

It needs to be highlighted that the author is aware of the fact that the findings of empirical research should be interpreted with great caution. Particularly, due to sample choice, they cannot be treated as research on activity-based costing in all the companies operating in Poland. Although in the questionnaire research, the sample was large, it was not representative; in case studies, the choice of companies was deliberate. According to the author, these limitations were partially

reduced due to triangulation of various research methods and comparison of own findings with research conducted by other authors.

This work is an outcome of a-few-years long literature studies and empirical research carried out by means of questionnaires and case studies. It is also a product of author's own cogitation resulting from cooperation with professor Alicja Jaruga, who was author's doctoral thesis supervisor, and cooperation with professor Irena Sobańska, with whom the author collaborates both on professional and academic level – therefore I would like to thank Them and express my great gratitude for Their support. Moreover, I would like to thank my all Colleagues from the Accounting Department of Łódź University and hundreds of respondents, who participated in the research.

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CHAPTER 1

ORIGIN AND DEVELOPMENT OF ACTIVITY-BASED COSTING

1.1. Precursors of activity-based costing

The earliest traces of activity-based concept may be found in the works of Schmalenbach, who already in 1899 indicated a possibility of isolating cost of processes and calculating them for products (Szychta, 2007a). Some pioneer studies on *activity accounting* appeared in the thirties of the 20th century and in Kohler's works, who worked out guidelines for *activity accounting* concept and put them into practice in Tennessee Valley Authority (the United States). Kohler assumed that all costs, including depreciation costs, should be allocated to people responsible for transactions (activities) taking place in the company. Each manager was in charge of an *activity account* where all incomes, costs and profits were allocated and which the person controlled.

Drury stresses that ABC is not an 'invention' of the eighties of the 20th century and that its origins date back to the late forties in Goetz's works (1949, p. 142, [in:] Drury, 2000, p. 340), who introduced principles of accounting based on activities, "Each basic (indirect costs) class should be homogenous in terms of every significant dimension of a management problem related to planning and control. Some of those significant dimensions, along with which (overheads) may change, are number of production units, number of orders, number of operations, company's capacity, number of provided catalogue items".

Horngren sees the origins of ABC concept in the fifties of the 20th century. According to him ([in:] Robinson, 1990, p. 23), a form of activity-based costing called *functional cost accounting* may be already found in a work entitled *Practical Distributions Cost Analysis* by Longman and Schiff from 1955. In Kaplan's opinion, who referred to Horngren's viewpoint, "it is not important who wrote the articles a few dozen years ago. The articles must have been

extremely unconvincing or our teaching must have been very ineffective, since the articles had little influence on the practice. Our works are not based on articles or books but on systems which function in practice" ([in:] Robinson, 1990, p. 29).

Johnson (1991) sees the origins of practice, similar to activity-based costing, in the cost accounting which functioned in the sixties of the 20th century in General Electric. In this system, different indirect production activities were assigned to departments (technological, quality control etc.) and it was analyzed how the work of one department influenced the work of other departments. The number of units of performed activities, costs of those activities and cost rates per unit of activity were also defined. In the course of time, cost accounting in General Electric was developed and improved; it included creation of list of standard activities (activity dictionary) or improvement in gathering data about activities.

The drive to take the structure of processes into consideration was also evident in cost accounting systems of German companies. Jaruga (2001) mentions Böhrs (1968) and his attitude to grouping indirect costs as one of the pioneers of activity-based costing. Böhrs perceived costs through the prism of certain range of activities seen as elementary functions (Jaruga names the concept as functional cost accounting). Böhrs's concept claims that in order to meet the company's objective it is necessary to use its potential in the most optimal way. To do that, it is essential to differentiate company's functions and work out accounting procedures which would be in compliance with the activities performed within these activity functions. In the functional cost accounting system three groups of functions have been distinguished (each function has a particular range of activities):

- direct functions: a function coordinated with the degree of used capacity, material supply, servicing of production orders, development, expanding sales market, servicing of consumers, company management;
- indirect functions necessary to perform direct functions: management and administration of personnel, preparation of new workplaces, supply with energy sources;
- indirect functions – services: improvement of work process, maintaining technical equipment on stand-by, information services, legal advice, administration services, transport and storing.

In Böhrs's concept, in order to calculate costs of product, first costs of indirect functions to the benefit of direct functions should be calculated and then one should calculate costs of direct functions for products[1]. According to Jaruga (2001, p.108), "Böhrs's concept dating back to the late sixties constitutes a pioneer solution with

[1] In Böhrs's concept eight blocks of costs of direct functions have been distinguished: „(a) costs of raw materials, (b) production costs for particular level of production capacity time use, (c) company's stand-by costs, (d) costs of product research and product development, (e) costs of raised production volume (additional orders), (f) costs of advertising and marketing, (g) costs of customer service, (h) costs of management" (Jaruga, 2001, p. 108).

relation to later variations and modifications called concepts based on activities. It is evident that it helps to control costs of used capacity of particular functions (activities), it takes into account the significance of cost measurement of different orders (the size of order) which employ only some of the functions. Therefore, it fosters accommodation of information to decisions taking place in the changing conditions of the environment (market)".

Johnson sees the origins of activity-based costing system in Staubus's (1971) works, who emphasized the significance of activities in cost accounting[2]. It was Staubus's idea to have accounts for each function, operation, task or process, which provided information required by management of the company. In Staubus's *activity costing*, activities and not products constitute cost accounting objects (production process constitutes a cost object and not a product itself). According to Johnson (1992, p. 27), the concept of activities advocated by Staubus and Shilinglaw "has not had any influence on academic thought (until recently) and it seems that it also did not influence the development of activity-based costing in practice".

Johnson (1992) looks for some pioneering solutions in terms of activity-based costing in the achievements of two consulting companies Bain & Co. and Boston Consulting Group (BCG) in the seventies and eighties of the 20th century. This opinion is also shared by Kaplan, who thinks that Bain & Co. and BCG have in-depth knowledge about cost accounting.

In Polish literature the concept of costs of production factors worked out by Skowroński (Jarugowa, Skowroński, 1982) is also known; the concept heads in the same direction as the later concept of activity-based costing. Skowroński's concept aims to rationalize administration of limited resources and it takes elimination of constraints characteristic of full costing and disadvantages of variable costing as a starting point. Instead of dividing costs into direct and indirect ones and treating fixed costs as a time function, the concept of production factor costs assumes that common product costs may be individual unit costs of reference, which are expression of important, for the process of planning and control, production factors in three stages: acquisition and possession, maintenance on stand-by, exploitation with different intensity. As production factor, a set of activities related to securing possession, maintenance on stand-by and exploitation of a certain group of resources which determine production (e.g. management of work resources, management of work tools, management of materials, management of energy, sales) is meant here. In Skowroński's concept (Jarugowa, Skowroński, 1982) the emphasis was put onto effective use of resources whereas relation to the environment (market) was ignored. This concept enables then to acquire information which is significant in making decisions about the change of production scale, expansion of resources or their more intensive use, influence on the readiness of capacity or efficiency of resources.

[2] The idea of *activity accounting* was also analyzed, in terms of standard cost accounting system, by Solomons (1968, [in:] Innes, Mitchell, 1998, p. 1).

Different works which included elements of *activity accounting* concept had been published a few decades before the publications by Cooper, Kaplan, Johnson or CAM-I (Consortium for Advanced Management – International)[3] reports, however they did not come into practice. Attempt to find the reasons seem extremely interesting. Well, in the first decades of the 20th century, accounting systems of organizations concentrated on issues of financial accounting and taxes and cost accounting became a separate and less significant system (Johnson, Kaplan, 1987). The focus on tax issues and financial accounting stemmed from the fact that the two areas were obligatory. In many companies the function of cost accounting was limited to providing data for the needs of financial and tax accounting[4]. It seems that there were three reasons for such status quo (Hicks, 1999, p. 3):

- firstly, many experts on cost accounting were previously related to financial and tax accounting. They were oriented towards the needs of external users and not the needs of managers; most of the time they were not aware of the fact that using financial accounting information in making managerial decisions was inappropriate;
- secondly, overwhelming majority of managers were convinced that maintenance of two separate cost accounting systems (one for external needs and the other for internal needs) was extremely expensive and unjustified in terms of cost and profit. This conviction and necessity to use financial and tax accounting systems led to a situation in which systems oriented towards external needs were used in terms of management needs;
- thirdly, managers were aware that implementation of IT systems which supported management was difficult and that cost accounting in the systems was very simplified. Therefore, if implementation, in case of a simplified cost accounting, was difficult, then would it be possible to implement it in case of a more complex system, and how difficult would it be?

Emergence and diffusion of activity-based costing in the eighties of the 20th century was possible thanks to inaccuracy of cost accounting systems and, on the other hand, thanks to the decrease of costs related to maintenance of more sophisticated systems.

1.2. Development of activity-based costing in 1984–1989

At the beginning of the eighties of the 20th century, the criticism of management accounting was accompanied by search of innovative practices in cost accounting in American companies. The most eminent representatives of this research stream

[3] CAM-I, originally, it was Computer Aided Manufacturing – International, then it changed to Consortium for Advanced Manufacturing – International and recently to Consortium for Advanced Management – International.

[4] In the thirties of the 20th century, representatives of London School of Economics pointed out that "arbitrary system used by accountants to allocate costs to products made product costs literally useless in terms of decision making" (Johnson, Kaplan, 1987, p. 156).

were Kaplan, Cooper and Johnson – Johnson worked at Portland State University and Kaplan and Cooper worked at Harvard University.

In the mid-eighties (1985), Kaplan began his research on the practice of management accounting in American companies. He selected a group of innovative firms. He assumed that companies which used advanced production technologies and innovative methods of management such as JIT and TQM would probably use innovative methods of management accounting. He hoped to find innovations in the fields of quality measurement, supply reduction, flexibility of manufacture, employees' morale, productivity etc.; instead he identified a gap (delay) in diffusion of management accounting innovative methods. Kaplan (1985, p. 78) claimed that "the key to explanation of the delay in diffusion of accounting methods is that top management did not emphasize the need to improve the significance of management accounting systems". In the course of his research, Kaplan found no use of 'first versions' of activity-based costing but he also failed to identify any innovative methods of management accounting.

The first example of innovative approach to cost accounting in practice was the case study of Schrader Bellows studied by Cooper (Cooper, Montgomery, 1985a, b; Cooper, Weiss, 1985). The company offered a wide range of products in many versions which led to manufacturing of more than 2700 products. In the beginning, product costs were calculated as a sum of material costs and direct remuneration costs and indirect costs. Costs of auxiliary departments (setups, quality control etc.) were calculated for primary departments, and indirect costs for each department were calculated as a quotient of indirect costs and the number of man-hours. In 1983 a product profitability analysis was carried out in the company. The analysis was conducted by means of a new method of indirect cost allocation. Changes appeared in auxiliary departments' costs calculation, calculation of sale costs and administration costs – in the new system they were directly accountable for products by means of different rates. The case study proved to be important because all indirect costs were calculated for products, not only indirect costs of manufacture, but also costs of sales, administration and overheads were calculated in the way.

Two years after the case study of Schrader Bellows was worked out by Cooper (1985), Kaplan (1987a) found an innovative example of cost accounting use in John Deere Component Works. Initially, the company used a similar standard cost accounting to the one used in Schrader Bellows (indirect costs were accountable for products proportionally to man-hours, subsequently, proportionally to machine hours, the company used two cost pools). In 1985 a new system of cost accounting, called ABC[5], emerged in the company; within the system,

[5] A new form of cost accounting based on activities began to appear in literature in the late eighties of the 20th century. In Johnson and Kaplan's work (1987) the method still has not been named; the authors only talked about a new system of cost accounting. One of the first publications, which implied the abbreviation of ABC, was Cooper's article (1988a), where he related to his earlier

seven activities have been distinguished: employees' support, production on machines, setups, production management, material management, administration of components and management. From the two initial cost pools (employees' support and production on machines) 40% of costs were allocated to five new pools (setups, production management, material management, administration of components and management). In the first stage, general ledger costs were allocated to relevant activities and then the activity costs were accounted for products. The new cost accounting in John Deere Component Works was used in product pricing, profitability evaluation of long-series production, making decisions about choosing products to be manufactured on automatic machines, and it also aided the process of decision-making in terms of production departments. Similarly to the new cost accounting system in Schrader Bellows, in John Deere Component Works it was mainly used to account indirect costs for products and to make business decisions.

In parallel to Cooper and Kaplan's works, yet another case study was researched by Johnson and Loewe; the case study of Weyerhouser (1987) turned out to be crucial for the formulation of ABC method. In the company, a new system of accounting costs of auxiliary departments for customers has been created. It not only embraced traditional auxiliary departments, but it additionally related to other departments previously treated as general e.g. Financial Department. However, the most interesting practice observed by Johnson was the fact that managers of departments, which were recipients of services, could question the rate for services of auxiliary departments, they could even purchase similar services outside the company if the cost was lower (auxiliary departments could also sell their services outside). The system of internal settlements operating in Weyerhouser, outsourcing of certain services, lowering rates for other services, staff reduction in auxiliary departments and sales of those departments' services outside the company made the employees aware of who the customer is, what kind of services are provided to that customer and what sort of costs are associated with those services. The new system made the managers of operational departments realize how their departments generated demand for work in auxiliary departments and that forced them to manage activities instead of costs. The case of Weyerhouser is simultaneously similar and different to the cases of Schrader Bellows and John Deere. As far as similarities are concerned, the procedure of cost calculation i.e. costs were first allocated to internal recipients or products, was comparable. In terms of differences, Johnson paid less attention to improvement of accuracy

work where the term of *activity-based costing* was used (Cooper, Kaplan, 1988a). However this article related to an even earlier work (Cooper, Kaplan, 1988b), in which the term of *transaction accounting* was used. Some researchers (Jones, Dugdale, 2002) think that the term ABC/activity-based costing was not coined by Cooper or Kaplan, but they claim that it was the name for the cost accounting system functioning in one of the companies visited by Kaplan (John Deere Component Works).

of indirect costs calculation for products, whereas he emphasized the necessity to manage the activities.

The cost accounting systems researched in practice by Cooper, Kaplan and Johnson were very similar even identical, as Kaplan (1994b, p. 248) claimed, "After prefatory observations of the new transaction accounting, Robin Cooper and I saw, in fact, identical systems, which were used in other manufacturing companies: John Deere, Hewlett-Packard and Tektronix in the USA, Siemens in Germany or Ericsson and Kanthal in Sweden". Interestingly, in the meantime, manufacturing companies in many other countries in the world began to use innovative systems of cost accounting and the systems turned out to be extremely similar, even identical. The implementations were undertaken not only by manufacturing companies, but also service companies operating in such sectors as banking, insurance, transport, health service and public sector started to be interested in the method of cost accounting based on activities. Examples of ABC implementation case studies published in the late eighties of the 20th century are presented in table 1.1.

Table 1.1. Case studies of ABC implementations published in the late 1980s

Company	Type of business	Author
Schrader-Bellows	pneumatic control systems	Cooper (1985)
Mueller-Lehmkuhl GmbH	clothing	Cooper (1986)
John Deere	mechanics	Kaplan (1987a)
American Bank	retail banking	Kaplan (1987b)
Weyerhouser	woodworking industry	Johnson, Loewe (1987)
Winchell Lighting Inc.	lighting distribution	Cooper, Kaplan (1987a, 1987b)
Monarch Paper	paper manufacture	Shank, Govindarajan (1988)
Tektronix	measurement and control electronics	Cooper, Turney (1988)
Siemens Electric Motor Works	electric motor manufacture	Cooper (1988b)
The Rossford Plant	glass manufacture	Colson, MacGuidwin (1989)

At the same time as Cooper, Kaplan and Johnson became interested in the new methods of management accounting, CAM-I (Berliner, Brimson, 1988) followed their footsteps. CAM-I is a research organization sponsored by a group of several large companies, government agencies, consulting companies and professional associations. The organization constituted of employees of the above companies, as well as researchers from leading universities.

CAM-I's main aim was to promote IT use in production companies and becoming interested in cost accounting was a *by-product* of their operation. Within the organization, Cost Management System group (CMS) operated, which was formed in 1986, and it dealt with cost management systems. CMS's preoccupation with cost accounting stemmed from problems with procedures of investment evaluation in numerical control machines and devices. The problems were related to the means of indirect costs calculation because benefits ensuing from the use of computerized control machines meant savings in those costs. CMS's task was to create, on the basis of CAM-I member companies' experience, a unified system of cost management, which would be accessible to all the associates of the organization. Creation of *activity accounting* concept was a result of CMS's operation. The concept aimed to "measure costs of resources used in crucial activities of the company" (Berliner, Brimson, 1988, p. 85). *Activity accounting* focused on provision of information for calculation of costs of products, measurement of costs in the dimension of products' life cycle and non-value activities. The information was taken into consideration while pricing, products' life cycle management, evaluation of performance and investment decision-making. One of the most important conclusions stemming from CMS's work, was the fact that products did not directly cause cost formulation but costs were generated by activities, which are used by products. Despite the fact that CAM-I, in terms of the new cost accounting, used a term of *activity accounting*, the concept is concurrent with ABC and even members of CAM-I used expressions of *activity accounting* and *activity-based costing* interchangeably (Jones, Dugdale, 2002).

It seems rather impossible to provide an answer to the following question: who 'invented' *activity accounting*/*activity-based costing*? The concept itself mainly developed due to practices implemented by the member companies of CAM-I. However, undeniably, researchers such as Cooper, Kaplan and Johnson, but also Foster or Brimson, hugely contributed to the development of the concept. These researchers spent a lot of time working in CMS (Cooper, Kaplan, Foster), leading project works (Brimson) or developing ABC outside the structures of CAM-I (Johnson). Although, the terms *activity accounting* and *activity-based costing* vary, they are both used to describe concepts which are technically concurrent. It needs to be mentioned that Cooper and Kaplan, on the one hand created the term *activity-based costing*, and on the other hand, they participated in the works of CMS group, which worked out the concept of *activity accounting*. Yet, it seems that objectives which made these concepts emerge, were slightly different. *Activity accounting* was devised to manage activities whereas the concept of *activity accounting* was perceived as a method of performance measurement. *Activity-based costing*, on the other hand, was mainly a tool used in strategic management and was meant to facilitate making decisions in such fields as pricing or resource management. A simplified diagram presenting development of the first generation of activity-based costing is shown in figure 1.1.

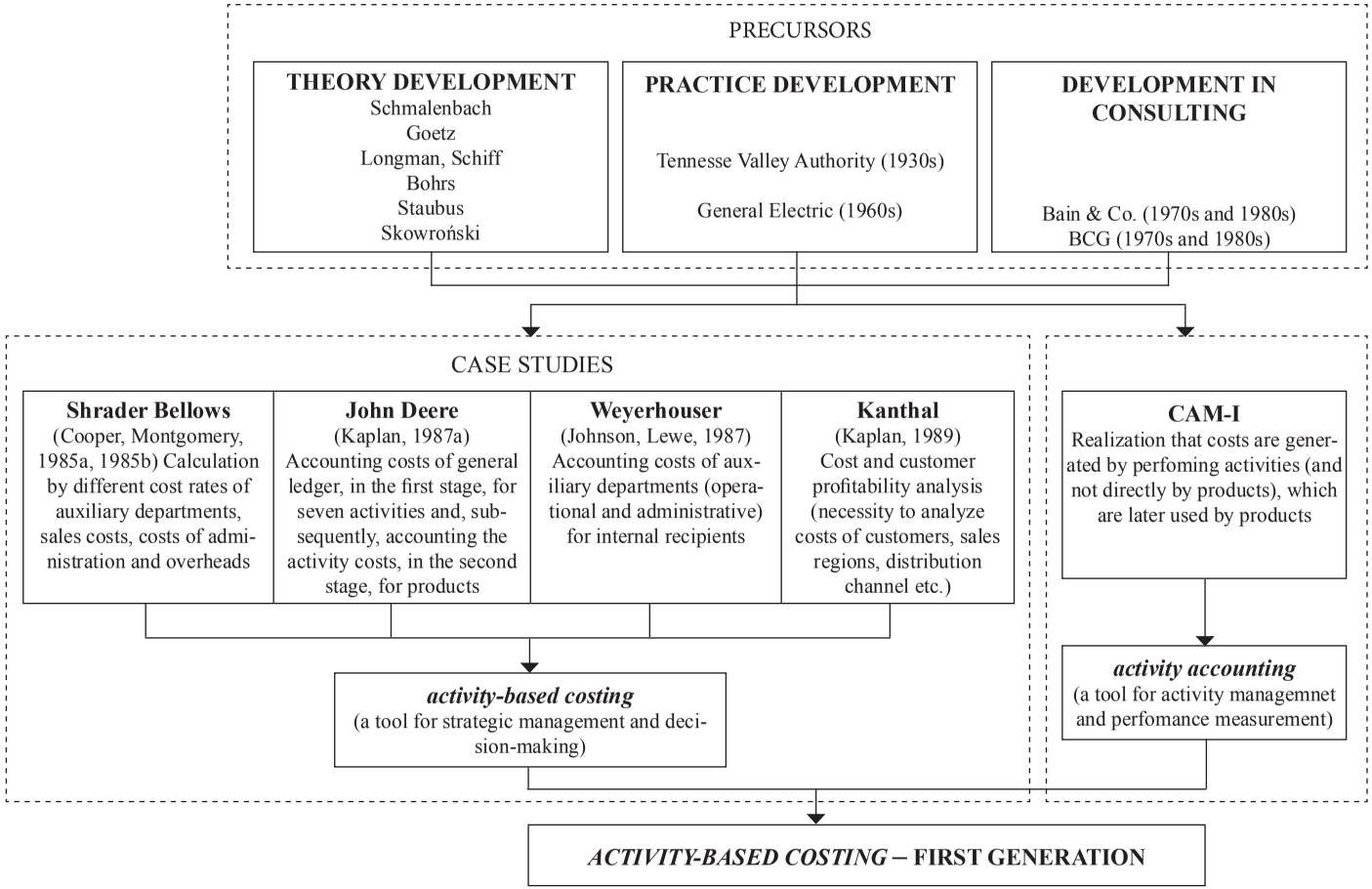

Figure 1.1. The development process of ABC's first generation

The principles of the new cost accounting based on activities, created in the late 1980s, had to be diffused. Interestingly enough, publications about ABC did not appear in university periodicals at that time, but rather in publications oriented towards practitioners. Majority of works on activity-based costing was published in three American journals: *Harvard Business Review*, *Management Accounting* and *Journal of Cost Management*. These periodicals, between 1988 and 1999, published numerous articles, which presented the first generation of activity-based costing: Cooper (1987a, b, 1988a, b, 1989a, b), Kaplan (1988), Cooper, Kaplan (1988a, b), Johnson (1988).

The new method of cost accounting used some common terms (CAM-I, 1992): resource, activity, cost object, resource driver, activity driver, cost driver. An attempt to formulate a general structure of activity-based costing, which can explain the concept of ABC, was undertaken by CAM-I (see figure 1.2).

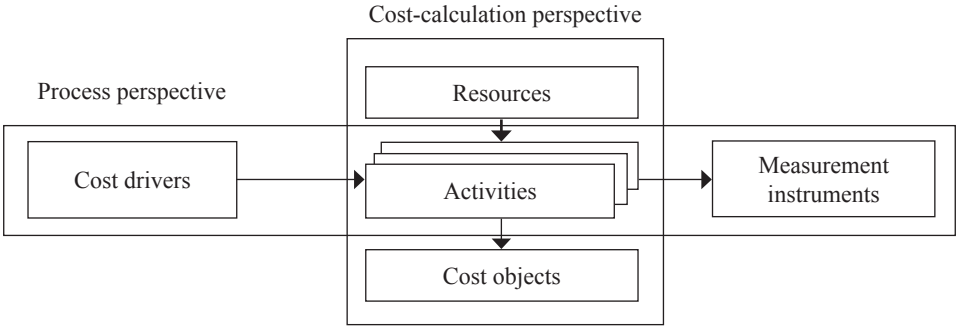

Figure 1.2. Basic model of activity-based costing
Source: CAM-I (1992), p. 22

The model shall not be treated as a full illustration of cost flow in activity-based costing, but rather as a general pattern, which may be accustomed for the needs of an individual company. As it is shown in figures 1.2 and 1.3 which illustrate an extended version of activity-based costing, the model has two axis – vertical one represents cost-calculation perspective and the horizontal represents process perspective[6]. In the cost-calculation perspective, resources, activities and cost objects should be identified consecutively. In the first turn, costs of resources, identified in the company are calculated for activities isolated within the company with the use of resource cost drivers. Subsequently, such activities are calculated for cost objects isolated in the company i.e. products, customers etc. with the use of

[6] In the general model of activity-based costing structured by CAM-I, cost-calculation perspective from the early works by Cooper and Kaplan, was accompanied by the perspective (dimension) of processes. CAM-I model, therefore, constituted a developed model of the one by Cooper and Kaplan.

activity cost drivers. Cost perspective, in other words, is a set of rules which help to calculate costs within the company. The horizontal ax i.e. process perspective illustrates what happens in the company and it initiates with an incident which is called a cost driver. Cost driver causes activity to use resources necessary to achieve a certain result (activity provides a certain result). The effectiveness of activities, in the process perspective, is measured both before and after performing an activity, and measurement instruments are such criteria which enable the company to define performance and activity effectiveness. Control and analysis of activities facilitate improvement of realized processes e.g. designing products which are easy to manufacture or easy to service and repair.

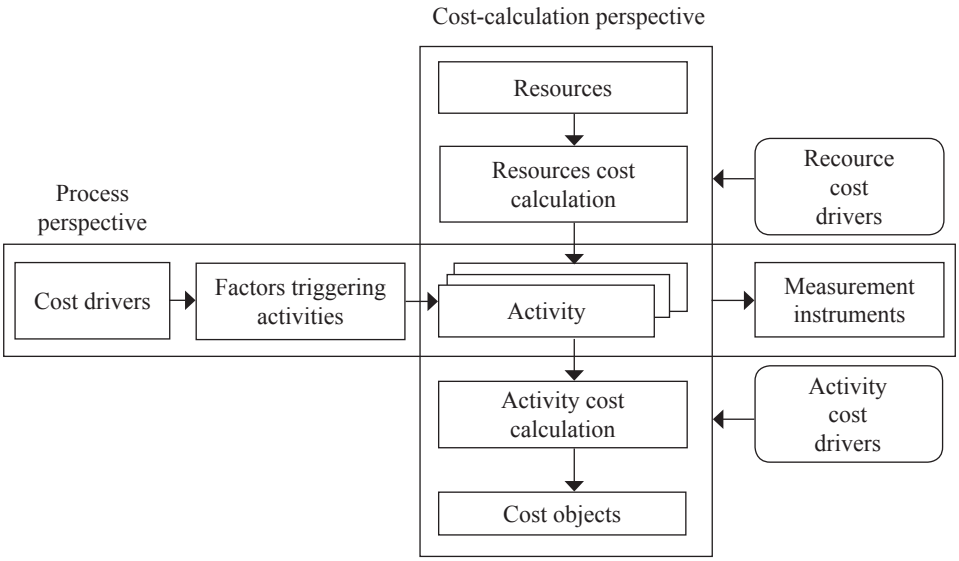

Figure 1.3. Developed model of activity-based costing
Source: CAM-I (1992), p. 24

In the developed model of activity-based costing, which is presented in figure 1.3, all the elements from the basic model have been enclosed (figure 1.2) and additionally:

- data bases of resource cost drivers and activity drivers (they collect information from different systems in the company; the information is used for resource costs calculation for activities and calculation of activities for cost objects);
- a factor triggering an activity (it sometimes links the emergence of cost driver to the beginning of a certain activity e.g. in case when quality control identifies a faulty finished product, it does not automatically mean that the product must be mended – it is the manager who makes such a decision about repair or disposal);

- in the developed model, the moment of resource costs calculation and the moment of activity costs calculation has been directly identified.

The developed model of activity-based costing devised by CAM-I is presented in figure 1.3.

According to Kaplan, practically all activities within a company are performed to support operational activities and provide products and services, and, therefore, these activity costs may be treated as product costs. Activity-based costing relates to all costs of a company, not only to production costs, and thus practically all costs should be accounted for products. In the first generation of activity-based costing only two categories of costs, which should be accounted for products, have been distinguished:

- excess capacity costs should not be accounted for products – the costs constitute period costs and should be separately accounted for profit and loss account (despite the fact that already the first generation of ABC stressed the necessity to isolate and account for the result of excess capacity costs, the problem was solved in the second generation of ABC systems);
- research and development costs, related to working out entirely new products, also should not be calculated for products.

In accordance with the first generation of activity-based costing, all costs in a company (excluding costs of unused capacity and research and development costs) constituted product costs, thus it was possible, even necessary, to calculate them for products. A simplified diagram of cost calculation in the first generation of activity-based costing is presented in figure 1.4. The figure does not take into consideration isolation of excess capacity costs because, although some publications emphasized such necessity, the first-generation ABC systems operating in practice, ignored the problem. The figure additionally does not present calculation of costs for such objects as customers, sales regions or distribution channels – despite the fact that the first generation of ABC systems allowed cost calculation for such objects (e.g. Kaplan, 1989), yet in most of practical implementations, the objects were not isolated.

The first generation of activity-based costing was supposed to be a more suitable tool for managers than the traditional standard cost accounting. ABC was more suitable not only because it was more precise and objective, but additionally it linked cost objects with activities they use, and activities with used resources in a more realistic way. According to Kaplan (1988), the first generation of activity-based costing was not supposed to replace the traditional cost accounting systems, but the systems were supposed to exist and function in parallel – traditional cost accounting was meant to satisfy external needs, whereas activity-based costing was to satisfy the internal ones. Yet it needs to be stressed, that not everyone agreed with Kaplan e.g. managers of John Deere Component Works, a company researched by Kaplan, rejected the idea of two cost accounting systems coexistence.

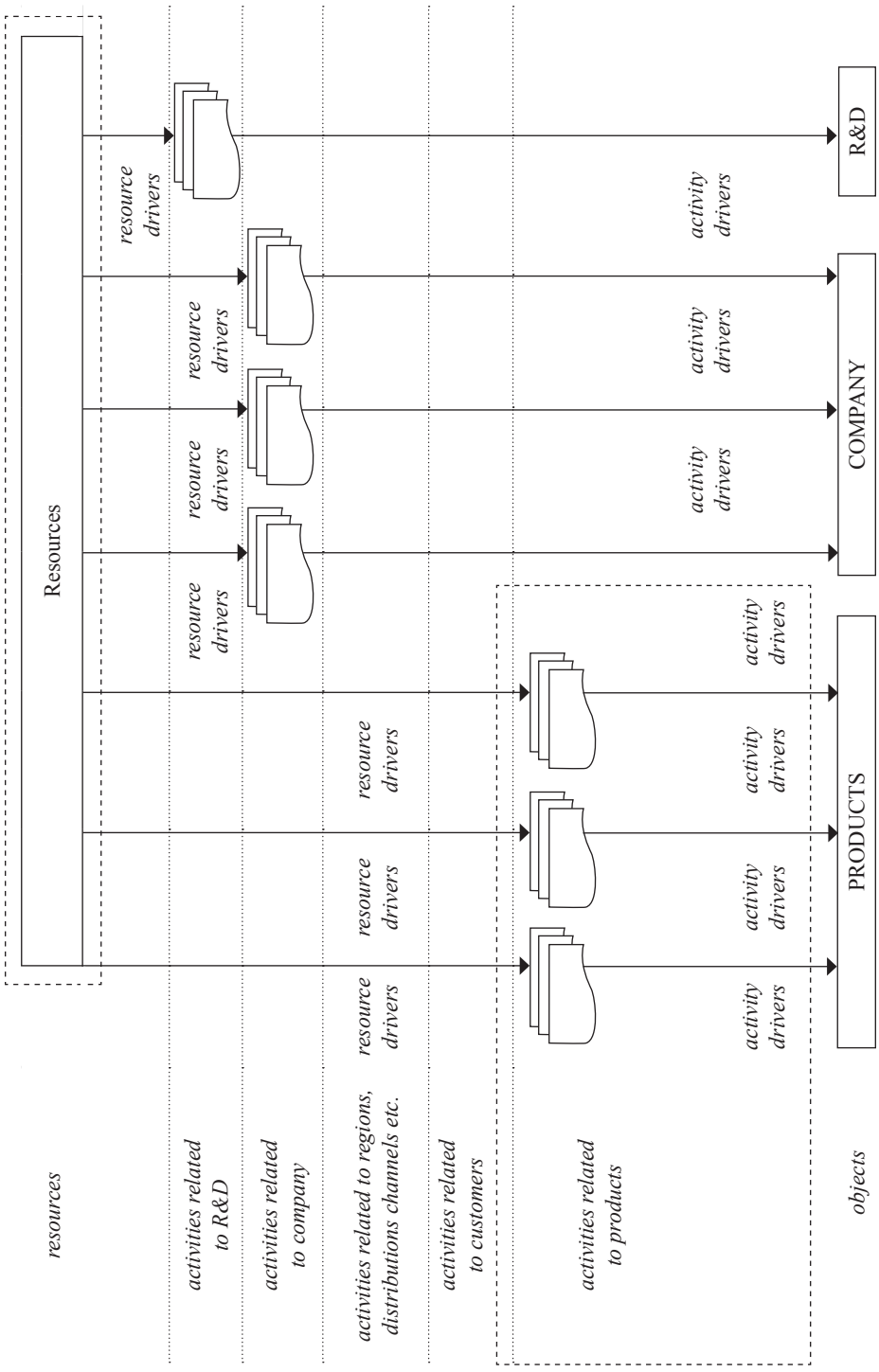

Figure 1.4. Simplified diagram of the first-generation ABC systems

They claimed that maintenance of two systems would be too expensive, and they wanted their previous standard cost accounting to be replaced by the new ABC system (Kaplan, 1988).

Unlike traditional standard cost accounting system, activity-based costing used more bases of allocation in accounting indirect costs for products, which led to substantial changes in product costs. In the analyzed company Schrader Bellows (Cooper, Montgomery, 1985a, b; Cooper, Weiss, 1985), changes in cost of products ranged from minus 10% to plus 1000%. Cooper and Kaplan (1988a, p. 25) interpreted the changes as "serious, systematic and (generally) impossible to avoid without using bases for indirect costs calculation based on the number of conducted transactions and not the number of products". Differences in product costs, both in case of Schrader Bellows and other companies, were to prove the superiority of the first-generation of activity-based costing over the traditional cost accounting system – interpretation was straightforward – ABC provides a more accurate product calculation. Cost of products, evaluated on the basis of activity-based costing, should be taken into consideration while making decisions about quitting products, raising prices of products, redesigning production and distribution processes etc.

According to Cooper (1989c, p. 1), "activity-based costing systems are more accurate than the traditional systems of cost accounting […] they are based on a two-stage cost allocation procedure, which enables accounting indirect costs of resources used in the production process for finished products". In the late 1980s cost objects, other than products, for which calculation and analysis were prepared, have been noticed. In case of a Swedish company Kanthal (Kapalan, 1989), ABC enabled ranking of customers in terms of their profitability. It became evident that, apart from employing ABC for analysis of manufacturing indirect cost for redesigning production processes, the system could also be used as a tool for marketing costs analysis, sales and distribution cost in customers' cross-section analysis, sales region cost analysis or distribution channels cost analysis.

In the late eighties of the 20th century, the first generation of activity-based costing was supposed to improve accuracy of cost accounting and provide information necessary for making decisions. According to Cooper and Kaplan, ABC was supposed to be a parallel system, which simultaneously functioned with traditional cost accounting systems, and ABC was to provide managers with key information needed for strategic cost management[7].

[7] Cooper's and Kaplan's views on the issue of management accounting in the late 1980s and early 1990s were concurrent. Kaplan appreciated Cooper's dedication in creation of the technical aspect of activity-based costing; Cooper also participated in preparation of ABC software (Kaplan was also deeply involved in marketing of the software). Later, when Cooper (1996a, b) anticipated

Johnson had a slightly different approach to activity-based costing than Cooper and Kaplan. In his article written in 1988 (p. 23), he stated that, "companies, in order to be competitive, must manage activities – not costs". Johnson was aware of the usefulness of information generated by the system of activity-based costing in terms of long-term product management, however he concentrated more on activity management, which he perceived as a key factor to achieving competitive advantage. Unlike Cooper and Kaplan, who stressed the meaning of accurate cost calculation, Johnson focused on activities, which generate these costs. He identified four steps in managing waste in operating activities (Johnson, 1988, pp. 28–29): "chart the flow of activities throughout the organization, identify the sources of customer value in every activity and eliminate any activities that contribute no value, identify the causes of delay or other unevenness in all activities". Johnson thought that managers for proper management need information which enables identification and elimination of non-value activities. Johnson argued that information about activity costs would not be necessary for that, managers should rather use non-financial information e.g. elapsed time, distances moved, space occupied, number of parts etc. For Johnson activity-based information was purposeful when it could be used for elimination of non-value activities because that enabled companies to gain competitive advantage.

To sum up the development of activity-based costing at the end of 1980s, it should be concluded that the system consisted of several related components: joint analysis of activities with departments' managers, identification of resource cost and activity drivers and allocation of resource costs to activities and activity costs to objects (products, customers etc.). It was assumed that the system of activity-based costing would provide data on full product costs or customers, various data needed in decision-making (e.g. in terms of products and customers), and that it would attract managers' attention to customer non-value activities. The system's terminology, structure and objectives were influenced by CAM-I, in particular by three authors – Cooper, Kaplan and Johnson. The first generation of activity-based costing emerged due to cooperation of researchers and practitioners, who were involved in the works of CMS, and due to case studies of Schrader Bellows, John Deere Component Works, Weyerhouser, Kanthal. Companies, which use activity-based costing developed in the late 1980s concentrate on:

- accuracy improvement of product cost calculation by means of higher accuracy in indirect costs calculation – this objective was mainly emphasized by Cooper and Kaplan, who perceived ABC as a system which could be used in management in parallel with traditional cost accounting systems;

changes in the profession of management accounting specialists, his point of view was not supported by Kaplan.

- cost reduction by means of waste elimination – this objective was highlighted in Johnson's works, who thought that activity-based costing was mainly to eliminate non-value activities;
- improvement of operational management by means of a better performance measurement – this ABC objective was emphasized by CAM-I.

1.3. Development of activity-based costing in 1989–1992

In the very late eighties and early nineties of the 20th century, the concept of activity-based costing underwent two crucial changes – firstly, provided resources and resources used were differentiated, secondly the concept of cost hierarchy was introduced. The changes had substantial influence on the shape of activity-based costing, thus they will be discussed in more detail.

As it was mentioned in the previous section, publications on ABC, which appeared in the late 1980s, were mainly published in journals for practitioners (e.g. *Management Accounting* (United States), *Harvard Business Review* and *Journal of Cost Management*). University researchers became interested in the concept of activity-based costing with delay. Once ABC became a point of their interest, it provoked strong criticism. The most severe critical standpoint was expressed by Goldratt, who was an author of *theory of constraints* – TOC, a concept which competed with activity-based costing. Goldratt (1990) questioned precise product cost calculation, he called activity-based costing a mistake and, in general, questioned its adequacy. Introduction of provided resources and resources used was, to some measure, Cooper's and Kaplan's answer to Goldratt's criticism. Cooper and Kaplan claimed that there was some discrepancy in the definition of resource costs within activity-based costing and theory of constraints – in TOC, a cost represents costs of provided resources, whereas in ABC it represents the cost of resources used. Earlier, Cooper and Kaplan (1992) used a term of *excess capacity*, which was replaced by *unused capacity*. It was not just a minor change in nomenclature, the concept of unused capacity was the key to distinguish between provided resources and resources used. According to Kaplan (1992, p. 1), „activity-based costing systems estimate costs of resources used by processes performed in an organization to manufacture products […] costs of provided resources or available ones are revealed in periodic financial reports of the organization".

Apart from differentiation between provided resources and used resources, there was another change in the second generation of activity-based costing systems i.e. introduction of cost hierarchy. Cooper and Kaplan (1991) distinguished four levels of activities:

- unit-level activities, which are a function of production volume for every unit that is being produced. Unit-level activities are for example production on press and manual assembly;

- batch-level activities, which are not directly dependent on the production volume but rather on number of batches, in which the product is being produced (costs of those activities change when the number of batches alternates, but remain unchanged regardless of the number of units in a given batch). Examples of batch-level activities are machine setups or batch quality control;
- product-level activities, which are not directly dependent on the volume of production nor the number of batches, in which the product is produced, but they depend on the number of types of manufactured products (these activity costs change when the number of types of manufactured products changes, yet they remain unchanged regardless of the number of units in a given batch or the number of batches manufactured). Product-level activities are e.g. technical specification of products or construction of prototypes;
- facility-level activities, which are not directly dependent on the volume of production nor the number of types of products being produced – these activities are common for all products manufactured in the facility. Examples of facility-level activities are e.g. company management or safety management.

Distinction of activities on the level of product series, type of product and facility made the list of costs, which should not be counted among costs of unit, expand. Apart from costs of excess capacity or costs of research and development, which, with reference to the first generation of ABC, should not be calculated for products (units), in the second generation of activity-based costing these costs were accompanied by costs on the level of batches, type of product and costs on the level of a facility. Cooper and Kaplan (1991, p. 132) claim that, „calculation of costs on units may convey signals which will be wrongly interpreted by managers. If costs of batch-level activities or product type costs are divided by the amount of products, you may be left with a bad impression that those are the costs which change along with the of number of products". In the second generation of activity-based costing, costs of products manufactured in a particular period of time are a total of direct costs and indirect activity costs on the level of a unit, series and type of product. However, facility-level activity costs will not be included in the costs of products perceived in that manner. These costs should be seen as fixed costs of a company because none of the activities related to products have influence on their level.

Distinction of activities on the level of a unit, batch and type of product, as well as activities on the level of the entire company constitutes a crucial change in the second generation of ABC. Systems of activity-based costing from the first generation, in contrast to traditional cost accounting, were advertised as a tool, which enabled accurate calculation of all cost for products. However, precise calculation of product costs was not the main objective of ABC systems from the second generation (in general, Cooper and Kaplan ceased to discuss the issue of accurate product costing as an objective of ABC). In the early 1990s, understanding of cost

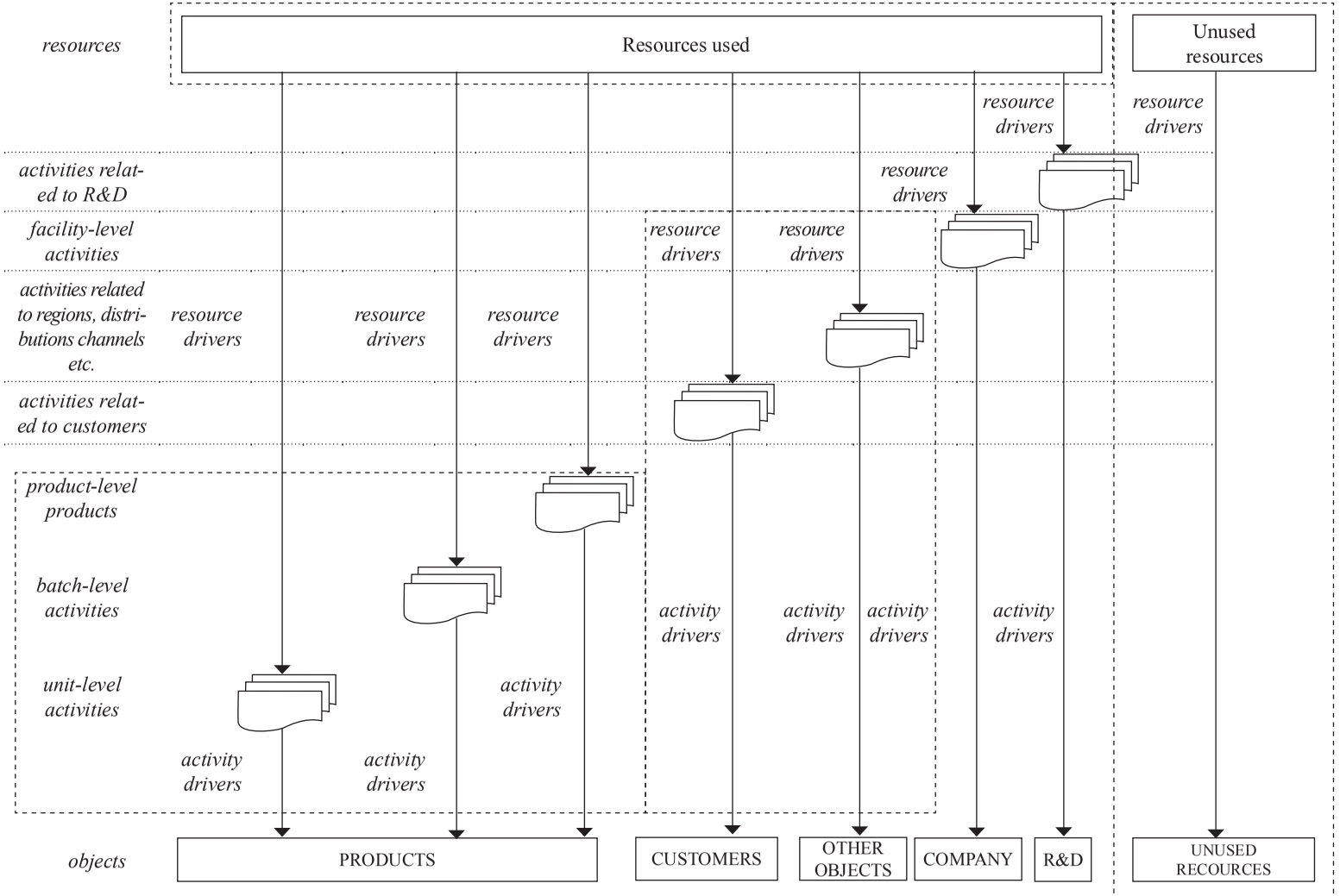

Figure 1.5. Simplified diagram of cost calculation in the second generation of ABC

hierarchy in the company and identification of important incomes and costs, as well as provision of information needed for the process of decision-making became the main focal point of activity-based costing[8]. A simplified diagram of cost calculation in the second generation of activity-based costing is presented in figure 1.5.

Replacement of the first-generation activity-based costing with its second generation meant changes of two extremely important concepts – the first one was a concept of cost allocation and the second one was an approach to variable costs. In terms of the first issue, Kaplan (1992) claimed that instead of *cost allocation*, it is more proper to use a term of *cost estimates*. Yet it needs to be stressed, that the change had far more serious consequences than it might seem at first glance. Along with the change of nomenclature from *allocation* to *estimate*, a shift of emphasis in the whole concept of activity-based costing occurred; the objective of ABC from the second generation was no longer identification of a more precise full costs of products, but provision of data *accurate enough* for managers to use them in the decision-making process[9]. It is also worth noting that the second generation of activity-based costing was supposed to provide information which was *accurate enough* and not "more precise than traditional systems of cost accounting" (this type of information was required from the first generation of ABC). The change is significant due to the fact that the first generation of activity-based costing was built around the system's ability to calculate product costs in a more accurate manner, in comparison to the traditional cost accounting.

Besides the concept of *cost allocation*, approach to the issue of variable costs also changed in the second generation of ABC. The first generation of activity-based costing perceived almost all costs as variable on the level of a product (Johnson, Kaplan, 1987; Cooper, Kaplan, 1988a). The approach changed in the second generation of ABC. Costs are not treated in that concept as variable or fixed, but instead, the concept helps managers to understand causes of cost variability. Attention is focused on the idea that, in order to reduce costs, it is not enough to reduce demand for resources available within the company. Reduction of resource demand itself will cause emergence of unused capacity resources, and, subsequently, only reduction of that capacity, or its alternative use, will cause cost decrease or profit increase. The change in approach to variable costs was accompanied by changes in approach to variable costing. In the late 1980s (the first stage of ABC), authors of activity-based costing criticized traditional full costing along with usefulness of variable costing (Cooper, Kaplan 1988b). They claimed that variable costing system, although correctly implemented, will not be useful

[8] Interestingly, in 1990, Kaplan stated for the first time that neither he nor Cooper coined the term of ABC; he claimed, „we did not invent the name: it was already used in John Deere company" (Robinson, 1990, p. 5).

[9] Costs, which were *accurate enough*, were calculated on the basis of estimations that used interviews with managers, employees' evaluations and other accessible operational data (Kaplan, 1992).

in terms of pricing products in the current market and technological environment. After a few years, in the early 1990s (the second generation of ABC), Kaplan's attitude to variable costing underwent changes. He stated that after introduction of activity cost hierarchy to the concept of ABC "we understood that ABC was a concept based on gross margin, and not a concept which attempted to calculate full unit costs in a more accurate manner" (Kaplan, 1992, p. 59).

To sum up, it needs to be emphasized that by 1992 formulation of the second generation of activity-based costing had finished, and it turned out that the second generation considerably varied from the first one. Instead of a concept based on full costing and concentration on calculation of more accurate unit costs, another concept emerged, which was based on gross margin with two types of resources (provided and used) with a hierarchy of activities, in which calculation of unit cost was disparaged[10]. It is worth noting that the changes which appeared in the second generation of ABC system, in comparison to the first generation, were authored by Cooper and Kaplan; Johnson did not take part in the construction of the second generation of activity-based costing. In the late 1980s, when foundations of activity-based costing were established, Johnson had extremely high expectations towards the system of ABC, however, in the early 1990s his views changed. At first Johnson (1991) doubted if activity-based costing could provide operational managers with information, which would be useful in terms of cost reduction and profitability improvement. Later, his point of view became even more radical, he claimed that (Johnson, 1992, p. 26), "as the one, who contributed to activity-based costing diffusion, I feel obliged to warn you, that in my opinion, it went too far. I am convinced that the concept should be changed and its diffusion slowed down, if not ceased". He justified his criticism by claiming that information generated by accounting systems, in terms of current global business environment, is unable to facilitate, in the long run, competitiveness and profitability of companies.

1.4. Development of activity-based costing after 1992

Activity-based costing which shaped between 1984–1989 became the first generation of ABC, crucial changes in the concept, which occurred between 1989–1992 are called the second generation of ABC. Modifications in the system of activity-based costing, which took place after 1992 are called the third, and even the fourth generation of ABC. As far as structure of ABC systems is concerned,

[10] The key differences between the two generations of activity-based costing brought about emergence of at least two attitudes. One group of researchers and practitioners ignored the changes and still perceived ABC system as a tool, which enabled accurate calculation of full unit cost. The other group of academics and practitioners recognized the second generation of ABC as a better and developed version of the first generation systems. It is still quite common to encounter, both in university textbooks and in practice, ABC systems from the two generations.

Mecimore and Bell (1995) distinguished three generations of activity-based costing. They additionally claimed that emergence of the fourth generation was possible in the future. Consecutive generations of ABC, differentiated by the two authors, accentuate different areas:

- the first generation of ABC accentuates activities and cost of product calculation;
- the second generation stresses importance of processes and activities related to them;
- the third generation focuses on the value chain within a company (department);
- the fourth generation accentuates relation between activities and processes among different departments of a given company.

Table 1.2. Comparison of three generations of activity-based costing

Items compared	Generations		
	first	second	third
Structure	cost centre	cost centre	business unit
Activities	product orientation	process orientation	firm orientation
Costs	manufacturing	process – both manufacturing, administration and selling	internal and external
Focus	product costing	process costing	value chain costing
Relationship between activities	no linkage	linkage	linkage
Cost drivers	internal	internal	internal and external
Planning	cost centre	cost centre	business unit
Controlling	cost centre	cost centre	business unit
Cost analysis	tactical	tactical	strategic
Hierarchy	product	process	firm

Source: Mecimore, Bell (1995), in: Szychta (2007b), p. 283.

The first two generations distinguished by Mecimor and Bell correspond to the development of ABC presented in the previous sections respectively between 1984–1989 and 1989–1992. Foundations of activity-based costing which had been laid by 1992 constitute a model of ABC that is well-known and wide-spread in practice to date. After 1992, the concept, however, underwent further changes, and that enables formulation of other generations of ABC. The third generation (Mecimore, Bell, 1995) concentrates on linking activities to processes and then linking those processes to the complete business unit. Focus is on the way

a company adds value to manufactured products or offered services. In the third generation of ABC, the values, which influence the level of activities, are used to gain competitive advantage by means of value chain analysis. According to Mecimore and Bell (1995), in order to gain competitive advantage, it is necessary to analyze all internal activities within a company and also external ones, which have influence on the business unit. While constructing third-generation activity-based costing system, it is important to design such a process structure, so that it complies with the value chain in the company. In order for the implemented system of ABC to support formulation and realization of strategy, it is crucial to include measuring instruments in the system, which enable measurement of achievement level. Apart from focus on adding value to products and stressing the significance of the value chain concept, in terms of formulation and realization of competitive strategy, the third generation of ABC characterized of a special category of activities i.e. support activities. Support activities are often very expensive and important for a business unit; the third generation of ABC emphasized the need to improve them, and that in the long run, could have influence on improvement of company's competitiveness. Comparison of the most important features of those three generations of activity-based costing systems is presented in table 1.2.

Summarizing the three consecutive generations of activity-based costing, which are presented in table 1.2, it may be concluded that the first one concentrates on improvement of product costs calculation, the second one focuses on providing information needed to improve effectiveness and measure achievements, and the third one stresses the importance of value chain concept in formulation and evaluation of competitive strategy. According to Mecimore and Bell (1995), in the future the fourth-generation ABC may emerge, which would integrate cost accounting system of multiple branches or plants of one company or even multiple companies belonging to one corporation. Creation of such cost accounting systems, which will be integrated in terms of one, big international corporations are possible, especially in the era of globalization, yet implementation of such systems may be extremely difficult.

Development of activity-based costing which took place at the turn of the 20th and 21st century led to differentiation of the basic model of ABC that was known at the turn of 1980s and 1990s. This model contained a simple two-stage procedure of cost calculation i.e. first, resource costs were allocated to activities and later activity costs were allocated to products, customers etc. However, this simple procedure did not take into consideration complexity of all the problems, which occur during construction and implementation of ABC systems in companies operating in various lines of business. Besides such previously analyzed modifications as distinction of activity hierarchy and recognition of a concept of provided and used resources, the first-generation activity-based costing also has other extensions to the basic model of cost calculation e.g.:

- identification of unusual cost objects – cost accounting systems of some companies have objects, to which costs are assigned, other than the usual ones. In one of the biggest telecommunication companies in Poland, apart from resources, activities and cost objects, to which activity costs are allocated (e.g. motion fractions, products, customers), there are such objects as telecommunication network elements or technical network layers (it should be noted that in ABC of that company, these objects are defined differently than resources);
- cost classification rules – it sometimes happens that in activity-based costing systems functioning in practice, costs are directly allocated not only to resources or products, customers etc., but occasionally they are directly assigned to activities, omitting resources. In ABC system functioning in an average-size manufacturing and trading company costs are allocated to objects, however the following rules must be taken into account: (a) costs (identified in the accounting system according to type of costs and cost centres) are first directly traced to a certain product, customer etc. (b) if the cost cannot be directly traced to a given product, customer etc., then, secondly, it should be attempted to directly trace it to a certain activity, (c) however, if such allocation is impossible, then the cost should be allocated to a given resource;
- calculation of support activities for other activities or resources – apart from basic activities (on the level of a unit, batch or type of product), which may be calculated for products, customers etc., and general activities (activities related to the whole business unit), which cannot be calculated for products, customers etc., support activities have been distinguished. Support activities are defined as those which either support performance of other activities (basic, support or general) or are performed in relation to resources. Thus, in cost accounting systems of some companies, one may find activities (support) whose costs are calculated: (a) for resources, and later from those resources, for example, for basic activities, (b) for basic activities, and later for products, customers etc.;
- calculation of the same activities for different cost objects – it sometimes happens that in activity-based costing systems functioning in practice, calculation of the same activity for different types of cost objects, depending on the needs, occurs. It means that e.g. costs of *considering a complaint* activity will be calculated for products for the purpose of product profitability analysis (depending on the number of complaints related to a product), and for the purpose of customer profitability analysis, these activity costs may be calculated for customers (depending on the number of complaints filed by a certain group of customers);
- calculation or non-calculation of unused capacity costs – ABC systems which operate in practice may sometimes treat costs of unused capacity in a different manner. These costs, for the purpose of different needs, could be, for instance, demonstrated as a separate item in the profit and loss account (it does not charge products), which is in compliance with the second generation of activity-

based costing, or they could be calculated for products, which is in agreement with the first generation of ABC.

The above examples of the classic activity-based costing modification illustrate but do not exhaust the problem of system's complex use (and accommodation). The examples also highlight that the concept of classic activity-based costing may be developed and adapted for the purpose of different company needs. Although, probably in all the systems of activity-based costing functioning in practice (at least those in Polish companies which were analyzed by the author of this work) there is this two-stage cost calculation from resources to activities and from activities to products, customers etc., details of the structure and functioning of those systems differ considerably. The issue will be further analyzed in chapters 4 and 5.

1.5. Activity-based management

Foundations of activity-based costing were laid between 1984 and 1992, however, it may seem interesting to investigate into what happened to the concept in the following years. In the 1990s, Cooper and Kaplan continued their research on activity-based costing implementation in different companies all over the world (Kaplan, Cooper, 1998). They also got involved into cooperation with a supplier of IT management support systems and participated in creation of activity-based costing module functioning in terms of ERP system[11]. Johnson, in turn, focused on the management concept based on activities, stressing the fact that activity management, instead of cost management, is the key to company's success. Many people and companies involved in CMS operation limited or quit collaboration with CAM-I and took up consulting activity. Also Cooper and Kaplan, along with global service companies such as KPMG Peat Marwick or Ernst & Young began their consulting activity[12].

In the process of activity-based costing evolution from cost calculation to management philosophy, consulting companies emphasized the connection between ABC and ABM (without distinguishing the concept as suggested by Johnson). In practice of consulting companies and organizations implementing ABC/ABM, ABC/M (activity-based cost management) is used as a synonym for ABM. The relation between ABC – ABM is quite often perceived as follows: ABC, as a cost accounting system, provides information, which is further used by ABM, a management concept, for continual improvement of processes in the company

[11] Activity-based costing was recognized as a module in ERP systems, just as standard costing was previously incorporated into modules of MRP II integrated systems. Apart from being a separate module in ERP systems, activity-based costing is very often implemented on the basis of systems exclusively dedicated to ABC.

[12] Ernst & Young even created its 'own version' of *activity-based costing*, which is called *total cost management* – TCM. In practice, the model did not vary from the well-known concept of ABC (Ostrenga, 1990).

(Turney, 1992). When analyzing ABC/ABM publications in English-speaking journals on business and management, Jones and Dugdale (2002) noticed that ABM was more frequently discussed irrespective of ABC. Until 1995, excluding a few exceptions, there had been no publications on ABM without reference to ABC, however, in 1998 the number of such publications was similar to the number of works about ABM itself[13]. Information received from the systems of activity-based costing led to emergence of next concepts i.e.:

- activity-based cost management – ABCM – it is a concept in which activity-based costing is a source of information necessary in the decision-making process (in means that, in order to use ABCM in the company, first activity-based costing must be implemented);
- activity-based management – ABM – it is a concept in which decision-making about efficiency improvement and effectiveness of performed activities is fed on information about activities and their costs (it means that, in order to use activity-based management, first activities and their costs must be identified, however calculation of product costs, customer costs etc. is not essential).

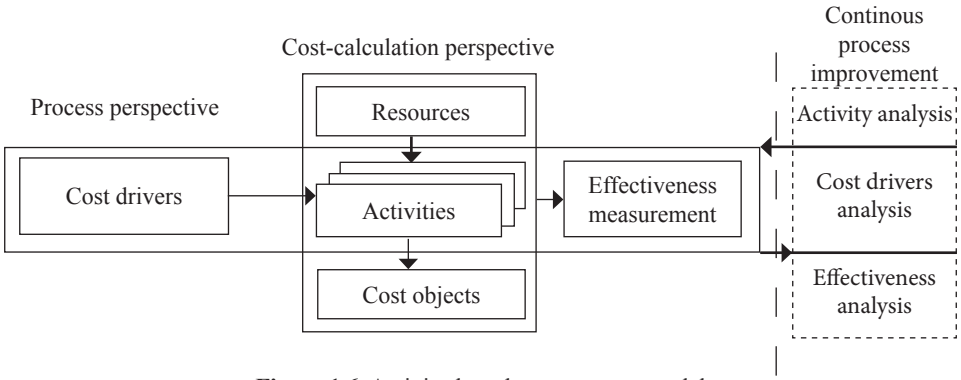

Figure 1.6. Activity-based management model
Source: CAM-I (1992), p. 20

[13] In the light of publications, which appeared in the leading journals for practitioners, in the late 1990s, ABM emerges as a method that accentuates identification and elimination of no-value adding activities. Interestingly, numerous publications associate no-value adding activities with support processes, instead of operational processes (e.g. production process) and identification, as well as elimination of waste in those processes. Association of no-value adding activities with support processes (e.g. administration, management) stems from the views of operational managers, who perceive many activities performed within those processes as no-value adding; in their opinion, the activities only increase company's indirect costs. According to the ABM concept, all activities may be analyzed in terms of their value adding or no-value adding properties. Gradually, ABM became a tool for management control, which was supposed to help managers limit and eliminate no-value adding activities, mainly within the bureaucratic structures of a company (Armstrong, 2002).

According to Szychta (2007a, p. 266), "the development of management accounting, which takes activities into account, started with ABC, evolved into ABCM and then into ABM, and that means evolution of ABC system uses – from focus on the unit product cost calculation to process and activity management". Activity-based management concentrates on improvement of value for customer (external or internal), as well as profits for the organization, which are generated after value increase for a customer (CAM-I, 1992). Activity-based management incorporates: activity analysis, activity cost drivers analysis, activity capacity analysis, effectiveness measurement tools analysis, cost drivers analysis. ABM focuses on: (a) analysis of activity costs causes and factors, (b) analysis of crucial strategic, organizational and operational implications, (c) identification of improvement in organizational, operational and strategic functions, (d) creation of solutions which generate profit. Activity-based management model is presented in figure 1.6.

Figure 1.6 shows elementary relations between activity-based costing, presented on the left, and analytical instruments, on the right, which are necessary for a company implementing activity-based costing to fully benefit from the implementation. Activity-based costing functioning within a company generates a lot of important management data e.g. information about cost drivers, activities, resources and effectiveness measurement instruments, however, activity-based management is a tool, which focuses on value improvement of manufactured products and provided services (CAM-I, 1992). Within the activity-based management system (ABM) a whole range of methods and tools can be distinguished: costs of products, customers etc., profitability analysis by products, customers etc., activity-based budgeting (ABB), activity analysis, continuous process improvement, benchmarking, business process reengineering.

With time, the systems of activity-based costing and activity-based management, which are used by experienced users, become a part of the key information systems within the organization. There are a few tendencies evident in the phenomenon (Cookins, 2001):

- integration of ABC/ABM output information with decision support systems such as future cost estimating system, activity-based budgeting, customer relationship management (CRM) or balanced scorecard;
- learning how to make the structure of ABC/ABM systems more detailed, general and, on the whole, modify it when problems within or outside the company occur;
- automatization of financial and non-financial data collection from different information systems to feed activity-based costing and activity-based management;
- automatization of ABC/ABM information export to users from different levels of an organization.

It is assumed that, in the years to come, the tendency to integrate information systems of a company into a set of tools indispensable for every manager and

analyst will become even more evident. The use of ABC/ABM also changes – instead of just being an accounting tool, ABC/ABM becomes an instrument which supports operational and strategic decisions. Thus, the nature of information used by the systems changes; apart from information about costs, the systems are fed on non-financial information, as well as information needed for performance evaluation.

1.6. Summary and conclusions

On the basis of investigation presented in chapter one, it is possible to formulate the following, general conclusions, which support the main research thesis and specific theses:

1. The concept of ABC emerged in the late 1980s as an answer to Johnson's and Kaplan's criticism of traditional management accounting. Activity-based costing relatively fast became one of the key concepts in theory and practice of management accounting. Undoubtedly, creation and diffusion of ABC triggered improvement of management accounting significance in practice in companies all over the world. Although, it is probably the most important general consequence of ABC's development and diffusion, the influence of activity-based costing, and the concept of management accounting based on activities in general, was multifaceted:

a) implementation of activity-based costing in many companies all over the world, numerous publications on ABC and ABM and incorporation of that concept into university and vocational curriculums, as well as textbooks about management accounting greatly influenced the process of cost accounting new logics formation. Cost objects, activities and cost drivers are the key terms of this new cost accounting logics;

b) before the concept of ABC was created, estimation of product costs was the main objective of cost accounting in manufacturing companies (it was done for the purpose of inventory pricing for financial accounting). When the concept of activity-based costing emerged and developed, manufacturing companies, on a larger scale, started to calculate costs of other objects than products e.g. customers and groups of customers, distribution channels, sales regions, projects, internal services, activities and processes. Wider understanding of the cost object notion would probably happen anyway even if the activity-based costing concept had never emerged. However, creation of the concept definitely accelerated the process;

c) development of activity-based costing changed the way costs of a company were perceived – prior to ABC emergence, costs within a system of cost accounting in an average company were classified according to their types (economic categories) and cost centres (department, section). Thanks to ABC, costs were seen from the perspective of processes and activities, thus not from the

perspective of what cost it was and where it was generated, but it was rather more important which process generated it and why;

d) the concept of cost drivers and activity drivers, which diffused thanks to ABC diffusion, turned out to be extremely useful in cost management because it drew attention of management accounting specialists to the significance of other drivers than those based on production volume or sales. The concept of activity hierarchy was especially important; it drew attention to the significance of activities and activity cost drivers not only on the level of a product unit, but also on the level of a batch or a type of products and company as a whole;

e) development of the ABC concept resulted in its wider range of use, outside manufacturing companies. ABC methods entered other organizations, especially service companies (e.g. financial firms and telecommunications companies), trading companies and non-profit organizations (e.g. healthcare, administration, education);

f) development of activity-based costing and management accounting based on activities fostered emergence and development of such methods as cost analysis and customer profitability analysis, distribution channel analysis or sales regions analysis. Development of activity-based costing made the focus move from cost calculation onto cost management;

g) despite the fact that emergence and development of activity-based costing concept require change of the paradigm in terms of such crucial issues as cost classification, cost behaviour analysis, activity definition, cost object definition and cost driver definition, activity-based costing should be seen as an extension of traditional full-costing system;

h) emergence and development of activity-based costing also influenced the way management accounting specialists were perceived by management and personnel. Traditionally, management accounting specialists were perceived through the techniques and procedures they used. Numerous implementations of activity-based costing as well as publications on ABC and ABM made people come to realization that management accounting specialists, in order to implement ABC effectively, should also be interested in resources and their drivers, performed processes and activities and their drivers. The specialists became aware of the fact that cooperation with other managers in multifunctional teams is necessary for successful implementation of activity-based costing. ABC implementation is only possible when people with extensive knowledge of logistics, marketing or operational activity take part in the implementation process. The necessity of cooperation between management accounting specialists and management fosters changes in the image of specialists, and, additionally, improves their position within the organization;

i) development and diffusion of ABC and ABM required from management accounting specialists, as well as from other managers to deepen their knowledge of cost accounting and management accounting. For an effective ABC implementation in an organization, a better understanding of processes, activities, resources, drivers and objects within the company is necessary. The process of understanding

different aspects of company's operation is difficult and time-consuming, yet it is a prerequisite for a successful activity-based costing implementation.

Although, activity-based costing has not diffused in the degree as expected in the late 1990s, yet majority of both practitioners and theoreticians agree that the emergence and development of this concept improved significance of management accounting and, thanks to it, management accounting specialists improved their image and position within organizations.

2. The concept of activity-based costing, since its creation in the late 1980s, evolved from a cost measurement system of resources, activities and products into a management system based on activities. The stages of its evolution are as follows:

a) the concept's development between 1984 and 1989 was a result of collaboration between university researchers and practitioners, who worked in CMS group; scientific description of case studies such as Schrader Bellows, John Deere Component Works, Weyerhouser and Kanthal also contributed to its development. The first-generation ABC system, which was shaped at that time, focused on improvement of product costing accuracy by means of greater accuracy of indirect costs calculation. Additionally, the system emphasized cost reduction by means of waste elimination and operational activity management by means of better performance measurement;

b) the second generation of ABC, which significantly differed from the first one, formed between 1989 and 1992. Instead of a concept which focused on accurate calculation of full product costs, the second generation of ABC offered two types of resources (provided and used) and activity hierarchy structure where significance of unit product cost calculation was lesser. Substantial differences between the two generations of ABC systems made some of the researchers and practitioners ignore these changes; they still perceived ABC systems as a tool which enabled accurate full unit product costing. Another group of researchers and practitioners regarded the second generation of ABC as a more developed version of the previous concept;

c) after 1992, the ABC concept underwent further changes and that enabled distinction of next generations of ABC. In the third-generation ABC, values influencing the level of activities are used for the purpose of competitive strategy by means of value chain analysis. Apart from being focused on adding value to products and accentuating the importance of value chain for making and implementing competitive strategy, the third generation of ABC characterizes of a special type of activities i.e. support activities;

d) various uses of information received from activity-based costing led to creation of activity-based management, in which data about activities and their costs provide information for making decisions in such areas as improvement of efficiency and effectiveness of activities performed in the company. It meant an evolution of activity-based costing, which evolved from product costing system into activity management system.

CHAPTER 2

MODIFIED VERSIONS OF ACTIVITY-BASED COSTING

2.1. Time-driven activity-based costing

In the late 1990s and at the beginning of the 21st century, practitioners along with consultants and university researchers began to embrace that implementation of activity-based costing in its current form was troublesome. Among the main problems, they enumerated high costs incurred and the fact that implementation of the method was time-consuming, which was manifested at the stage of management interviews and surveys, as well as at the stage of gathering, processing and presentation of data. Activity-based costing is difficult in terms of updating and modification and the input data is subjective and hard to verify[1]. In most of its practical uses, ABC systems are relatively constrained, which means that their use makes it impossible to get a real and full picture of the company's profitability (only such picture enables effective profitability management and improvement). Yet another important, and a separate problem related to the activity-based costing system, is insufficient solution to the problem of resource unused capacity.

As a reaction to the above problems, Kaplan and Anderson (2004) came up with a new form of activity based costing which is called *time-driven activity-based costing* – TD ABC. Although the first traces of the new concept are to be found in 1998 (Kaplan, Cooper, 1998, 2000), the full version and its name was created in 2004[2] (Kaplan, Anderson, 2004). In 2007 Kaplan and Anderson

[1] It is quite uncommon in companies which are using activity-based costing that e.g. employees show that idle time constitutes a part of their worktime. If the idle time is not identified, then the rates for a unit of activity cost driver will be calculated for the assumption that the capacity has been fully used and that level is definitely too high (Szychta, 2007a, p. 369).

[2] Kaplan and Anderson (2008, p. 10) claim that the term *time-driven activity-based costing* was used for the first time in 2001. Before, Anderson and the consulting company Acron, which had been using the new concept since 1997, applied a term *transaction-based ABC*.

published a book, in which they presented the new method along with description of six case studies illustrating various aspects of TD ABC, as well as its use in companies from different business lines (Polish translation of the book appeared in 2008). The authors see the concept as an independent structure and not an extension of ABC, and they call the previously known activity-based costing *rate base ABC*, *traditional ABC*, *conventional ABC*. One of paragraphs in Kaplan's and Anderson's book (2008) entitled "Time-driven ABC: old wine in new bottles?" even questions all relationships between duration drivers in ABC and TD ABC.

Time-driven activity-based costing is not frequently used in practice. Most of its implementations were conducted by a consulting company Acron, which was founded by Anderson whereas Kaplan has been a member of Acron's board since 2001. From that year on, Kaplan and Anderson worked on improvement of ABC effectiveness. The cooperation has led to integration of capacity costs calculation, which was suggested by Cooper and Kaplan (1998), with time equation algorithms modelling complex transactions, which were authored by Anderson. This has shaped TD ABC in its current form (Kaplan, Anderson, 2008). Acron, run by Anderson and Kaplan, is said to have implemented more than 200 TD ABC systems (Kaplan, Anderson, 2008, p. 10), both in its initial form with the time equations used but without taking into account the degree of capacity use (1997–2001), as well as in its older variation when implementation of time equations was extended by the problem of capacity use degree (after 2001).

According to the authors of TD ABC, their method's basic advantage is the lack of necessity to interview and survey people, which was crucial in the initial form of ABC to allocate resource costs to activities. Resource costs in TD ABC, by means of time equations, are directly allocated to cost objects (products, customers etc.) using two types of data: cost rate per unit of resource capacity (stage one) and resource capacity use consumed by each activity performed in an internal unit (stage two).

In the first stage of the procedure, costs of all resources in a given internal unit (or a process) are calculated – for example costs of an internal unit (process) such as management, employees, space, IT resources, vehicles etc. must be calculated. Then, the practical resource capacity of a given unit is estimated[3]. There are two methods of practical resource capacity calculation – simplified and analytical. When calculating the practical resource capacity by means of the simplified method, it should be assumed that practical capacity constitutes 80% of theoretical capacity (Kaplan, Anderson, 2008). Knowing the

[3] Although, in most of cases, resource capacity of a given internal unit is expressed by means of workers' time, this is not permanent. Capacity can be expressed by means of e.g. number of machine hours (in a production department), number of pallets (in a warehouse), mileage (in a transport department) etc. Kaplan and Anderson (2008, p. 59) suggest that capacity-driven activity-based costing would be a more appropriate term for time-driven activity-based costing.

theoretical capacity, it should be multiplied by 80% to get the practical capacity. In the analytical method, it must be taken into account that not entire time, for which an employee is paid, is actual work performance, since personnel allow for breaks, trainings, education, repairs, maintenance, startups and downtime. Thus, this time should be subtracted from the time, for which personnel receives remuneration e.g.:

worktime for which personnel is paid
– time for break, training, education etc.
= practical resource capacity of a given internal unit.

Estimated practical resource capacity of a given internal unit does not have to be precise (Kaplan, Anderson, 2008, p. 24) and a few percent mistake is not important (major mistakes can be detected and corrected when unexpected shortages or surpluses of resource capacity of a given internal unit come up). Estimates of resource costs in a particular internal unit and estimates of practical resource capacity of a given internal unit enable calculation of cost rate per resource capacity unit:

cost rate per resource capacity unit =
= resource costs / practical resource capacity.

In the second stage of cost calculation according to the concept of TD ABC, cost rates per unit of resource capacity are used to assign resource costs of an internal unit to cost objects (products, customers etc.). This procedure starts with estimation of how much time from the practical resource capacity of a particular internal unit is needed to perform each activity within the unit. These estimates may be done by means of interviewing and surveying managers and employees or by means of direct observation and measurement. Similarly estimates of the total resource capacity of a given internal unit, do not have to be extremely precise, in most of uses approximate calculations are enough. Kaplan and Anderson (2008) claim that, in opposition to the time structure subjectively estimated by employees for the purpose of classic ABC, in TD ABC the degree of use of total resource capacity of a particular internal unit is easy to evaluate and verify. Once the time needed to perform each activity in a given internal unit is estimated, cost drivers rates of all types of activities performed in the given unit are calculated. To do that, cost rate per resource capacity unit of a given internal unit are multiplied by time estimates necessary to perform each activity. Alternatively, multiply activities performed within a particular internal

unit in the conventional activity-based costing may be replaced by a single time equation for a given department:

time related to products =
  time of performing activity 1 * number of performed activities 1
+ time of performing activity 2 * number of performed activities 2
…
+ time of performing activity n * number of performed activities n.

It is worth noting that cost drivers rates in TD ABC are slightly lower than similar rates estimated in the classic ABC. It stems from the fact that classic activity-based costing overestimates costs of performed activities because it takes into account both costs of used and unused resources. Through estimation of time needed to perform each activity within the TD ABC system, the company receives information about costs and efficiency of activity performance, as well as about time and costs of unused resource capacity. Unused capacity costs constitute period costs (they should not be calculated for products, customers etc. but they should be allocated to a profit and loss account of a given period).

According to creators of time-driven activity-based costing, the system overcomes difficulties in the implementation process of classic ABC and has the following advantages (Kaplan, Anderson, 2008, pp. 31–32):

- it can be easily and inexpensively constructed, maintained and updated (the system does not require interviewing and surveying and integrates well with existing IT systems);
- it enables identification of unused resource capacity (both in terms of quantity – minutes, and quality);
- it exploits time equations which enable incorporation of a certain type of activity, different from the standard activity, into cost calculation;
- it can be more easily than the classic ABC implemented in an entire, large and complex organization (trading, service or production company);
- TD ABC can be used for forecasting future resource demands, which facilitates resource capacity budgeting on the basis of quantity projections and the degree of activity complexity.

Time-driven activity-based costing may be regarded as a step forward in the development of cost accounting methods based on activities (i.e. the classic ABC). However, the system does not provide solutions for all the problems characteristic of the classic activity-based costing; among the most important problems one could enumerate:

- problem with actual costs use. Despite the fact that Kaplan and Anderson (2008) postulate the use of standard resource costs, in most of practical uses actual costs are used. There are a few reasons for that (Gervais *et al.*, 2009, p. 6). Firstly,

actual costs are perceived as more credible by managers using cost accounting. Secondly, the use of actual costs, instead of standard costs, makes the connection between financial accounting and management accounting clearer. Thirdly, some companies cannot use information about standard costs because they do not draw up budgets. Replacement of standard costs with actual costs causes well known problems and it may distort results of calculations. The common use of actual costs in TD ABC system is not a *fault* of the method itself, but a *fault* of people implementing it, however, to diminish the problem, costs estimates should not refer to periods which are too short, longer periods should improve accuracy;

- problem with definition of a normal level of capacity use. Isolation of unused capacity costs in TD ABC is not something new[4], however, defining normal level of capacity use is not simple. Kaplan and Anderson (2004, 2008) claim that practical capacity is appropriate when it constitutes 80% of theoretical capacity[5]. The authors also ensure that little errors in its estimates are permissible, yet they will not have practical significance. Probably, in most of cases, Kaplan and Anderson will not be mistaken. However, it must be taken into consideration that 'in most of cases' does not mean 'in all cases' and that the percentage of 80% is simply intuitive;
- problem with activity homogeneity. Kaplan and Anderson (2008) emphasize that activities performed within a single unit should consume resources proportionally (homogeneity assumption). An example of a car garage, which specializes in trucks and owns specialist equipment that suits repairs of only one make of vehicles, illustrates and explains the problem. In that case, this specialist equipment must be taken into account separately from other garage resources because it is used for a completely different purpose than the remaining resources. Despite the fact that Kaplan and Anderson know how to tackle the problem, other consultants and managers implementing TD ABC may not know how to do it. If the activities are not homogenous, it might lead to essential inaccuracies in calculations;
- problem with time measurement. TD ABC is mostly based on management's estimates (time of individual activity performance is estimated in that way). It may be claimed that the estimate's inaccuracy of labour time spent on individual activities in the traditional ABC has been replaced by the estimate's inaccuracy of unit time spent on individual activities performance within TD ABC[6]. Additionally,

[4] According to Garner (1954, p. 235), Gantt, who dealt with the issue of unused capacity at the beginning of the 20th century, stated that he was preoccupied with that problem not because it was new but rather because it had great significance in practice and, on the other hand, it was little understood by practitioners – Gantt claimed that in 1915.

[5] As it has been previously mentioned, Kaplan and Anderson allow for practical capacity estimates as a disparity between theoretical capacity and idle time.

[6] Kaplan and Anderson (2008) criticize a popular practice during ABC implementation when employees estimate the time percentage they spend on performing individual activities. The percentage often equals 100%, or even exceeds 100%, which is of course impossible due to unused

the use of hours to measure resource capacity is not appropriate in every case; sometimes the use of e.g. machine hour, space or mileage would seem more suitable[7]. On the one hand, this may be questioned because Kaplan and Anderson condition the choice of capacity measurement on the type of activities performed within the unit. However, on the other hand, it should be taken into account that majority of companies, where the concept of TD ABC is used, use hours. Using time as activity measurement was also possible in the classic ABC system, yet Kaplan and Anderson (2008) suggest that in TD ABC its use is different (in the classic ABC it is used at the first stage of calculation i.e. to calculate resource costs for activities, whereas in TD ABC time is used to calculate resource costs directly for products or customers[8]).

Figure 2.1 illustrates development of the three basic generations of activity-based costing, which are used in practice: first-generation ABC, second-generation ABC and TD ABC. The third and fourth-generation ABC (see chapter 1.4) systems have been deliberately omitted, since they bear little significance in terms of practice.

As it is shown in figure 2.1, the first generation of activity-based costing (1984–1989) created a basic pattern of cost calculation including calculation of resource costs for activities and activities for objects (products, customers etc.). The second-generation ABC (1989–1992) isolated activity hierarchy, which changed the rules of product costs calculation. It also differentiated provided and used resources, which enabled calculation of unused resource capacity costs. The origins of time-driven activity-based costing may be found in Anderson's works, who in 1997 used time equations in his work for a consulting company Acron. TD ABC method was later supplemented by capacity costs calculation (Kaplan, Anderson, 2004).

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capacity. Instead of such approach, Kaplan and Anderson suggest a different one, which is based on standard unit time estimates needed to perform a given activity. This type of approach creates two problems – firstly, assignment of such time is very difficult and, secondly, unit times, which have been already assigned, may be very unstable in longer periods, and their frequent updates will be necessary (especially in area of support and general activities). Research by Cardinaels and Labro (2008) showed that activity time estimates in minutes are inflated, and estimates expressed by means of percentage give better results; it contradicted the theory by Kaplan and Anderson (2004). The research by Cardinaels and Labro revealed that activity time overestimates reached up to 35%. A research of a small distribution company using TD ABC, conducted by Gervais *et al*. (2009), proved that the differences between declared standard times and the real times were as high as 20%, thus they were definitely not insignificant.

[7] Due to the fact that almost all TD ABC systems use in practice hours as a cost driver, it may be concluded that worktime is a category which is controlled thanks to the system.

[8] In time-driven activity-based costing there is no stage of calculating resource costs for activities, which is possible thanks to the use of standard time rates for performing individual activities.

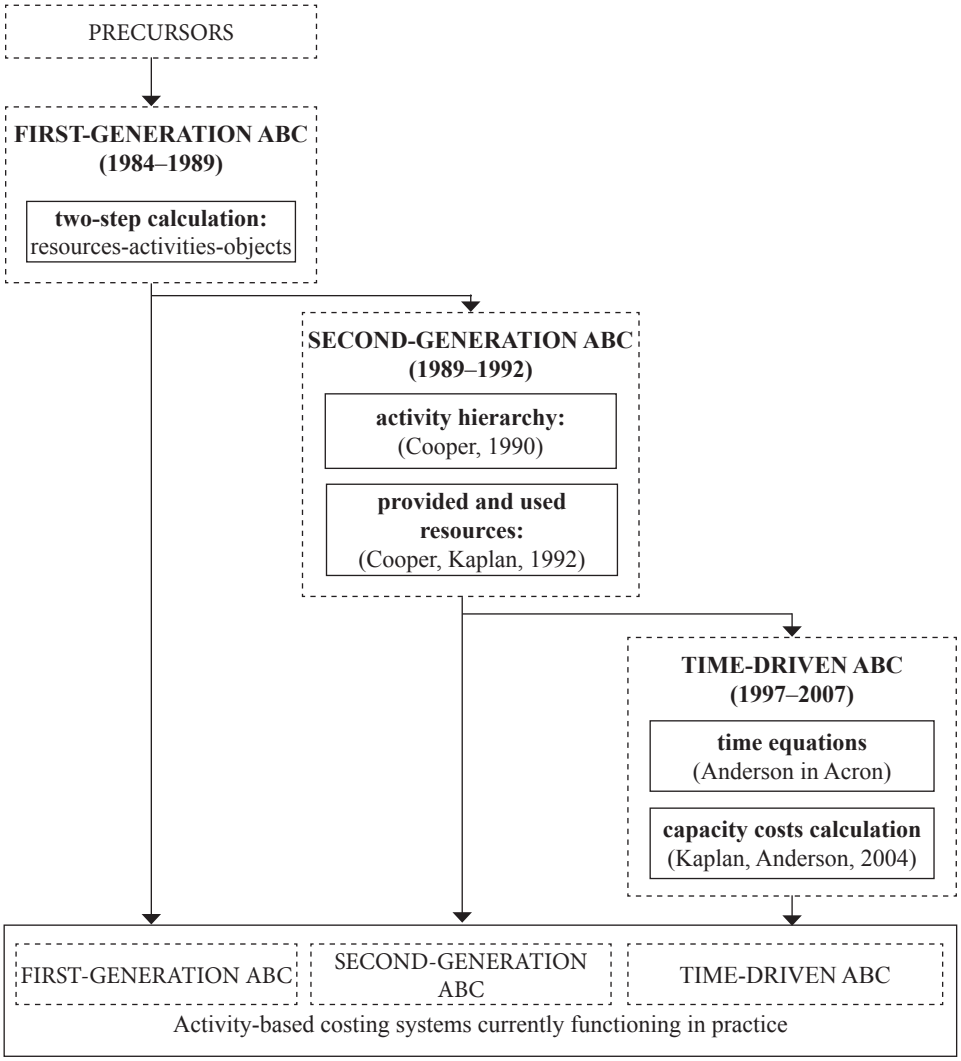

Figure 2.1. Development of ABC's basic generations

2.2. Resource consumption accounting

Resource consumption accounting − RCA emerged at the turn of the 20th and 21st century (around year 2000). At the end of 2001 CAM-I established a group interested in and devoted to development of RCA (the group was a part of CAM-I Cost Management Section). From then on the career of new management

accounting technique began, the idea developed, it was validated and popularized through articles and case studies of its use in professional journals (at the beginning) and also research papers in academic publications (latter). The development of resource consumption accounting method and its growing popularity resulted in establishing of RCA Institute (2008) which became a platform for refinement of the technique and also its popularization by educational and consulting activities. One year latter (2009) International Federation of Accountants recognized RCA as a costing method which attains higher level of accuracy than traditional activity-based costing method and supported RCA as a method with positive cost/benefit ratio. According to IFAC's Professional Accountants in Business Committee the incremental value of information provided by resource consumption accounting outweighs additional costs of establishing and maintaining the system. In view of International Federation of Accountants, RCA can help organizations to improve understanding of costs in their costing systems and can also support better decision making in the companies (IFAC, 2009a). IFAC stresses that RCA offers companies possibility to build proper cost allocation directly in their costing system and allows improvement of their performance.

Resource consumption accounting is a costing system (management accounting tool) based on two concepts – activity-based costing used from late eighties of the 20th century in many countries all over the world and *Grenzplankostenrechnung* (GPK which means 'flexible cost planning and control') used for decades primarily by German companies but to some extent by companies in other European countries (especially but not only companies in German speaking countries). RCA combines (at the resource level) information on resources capacities and influence of input/output relationships on cost behaviour with ABC. Resource consumption accounting just like activity-based costing and time-driven activity-based costing has its supporters both in practice and in academia and has sound theory which supports the method.

Resource consumption accounting as stated by IFAC (2009b, p. 17) is "a sophisticated approach at the upper levels of the continuum of costing techniques (which) provides the ability to derive costs directly from operational resource data, or to isolate and measure unused capacity costs. For example, in the resource consumption accounting approach, resources and their costs are considered as foundational to robust cost modelling and managerial decision support, because an organization's costs and revenues are all a function of the resources and the individual capacities that produce them".

Resource consumption accounting has three building blocks – it takes comprehensive view of resources, unambiguous view of cost behaviour and is a quantity-based cost model.

The first core element of RCA, the foundation of RCA is company resources such as materials, employees, machinery, buildings. Resources are the source of

company costs and revenues and information on resource capacity, utilization and efficiency is crucial for cost allocation and managerial decision making. Resource consumption accounting recognizes reciprocal resources allocation and drivers of the resources pools. For all resources capacity[9] is defined with respect to the manner in which resource is consumed – the utilization of fixed costs for cost assignment is determined based on theoretical output and proportional costs are assigned based on budgeted output. In resource consumption accounting costs can be assigned through cost centres (vertically) like in traditional costing and also through activities (horizontally) like in activity-based costing. For all resources idle/excess capacity is separated and is not allocated to cost objects (products, clients etc.) but is separately shown in profit reports. In resource consumption accounting capacity is defined not in relation to activities but in relation to resources (the main idea of such a treatment of idle/excess capacity in RCA is to show it to managers responsible for utilization of resources capacity and resource acquisition and to help them with decisions concerning resources).

The second element of RCA, quantity-based modelling, means that the whole model is built with the operational quantities use (values follow quantities). In each resource pool quantifiable output is measured allowing for decoupling of monetary and output valuation which facilitate variance as well as capacity analysis (by providing a distinction between cost assignment and resource consumption). In resource consumption accounting valuation occurs only when quantities consumed are multiplied by output rates which allow managers to analyze improvements in efficiency (quantity used) separately from output rates (prices). Resource consumption accounting model is quite detailed and sophisticated even in comparison to ABC or TD ABC. There are hundreds and in some cases thousands of cost drivers rates for resource pools in the model of cost assignment. Companies considering implementation should take into account high degree of complexity in RCA models together with the high potential of the method in precise cost allocation (this means that the rate of RCA diffusion could be slow).

The third building block of RCA, unambiguous view of cost behaviour is the answer for debate about variable and fixed cost and their suitability in decision making (cost behaviour in RCA is determined by changes in quantities of resources as they are applied to organizations operations). RCA makes a distinction between fixed and proportional costs in terms of resource consumption allowing for situations when proportional costs change to fixed costs. The idea of *different costs for different purposes* recognized in resource consumption accounting means that

[9] In resource consumption accounting capacity is broken into three elements: (a) productive capacity – resource is producing goods or providing service, (b) non-productive capacity – resource is engaged in maintenance, set-up, standby, waste, (c) idle/excess capacity – resource is not working because there is no work to do (idle/excess capacity includes time that management or law require that no work be done).

the method uses various cost concepts to support decisions in different situations. RCA delivers information on throughput, contribution and gross margin for products, customers, market segments and other objects of manager's interest. It is necessary to stress that costs that originate in resource cost centre (e.g. machinery) are primary costs of the resource and costs which are assigned to the resource cost centre from another resource (e.g. employees) are secondary costs of the resource (allocated costs of employees are secondary cost of machinery). Total costs of the resource (primary and secondary costs) are then separated into proportional and fixed element depending on the correlation between the input quantities and output quantities from the resource. Often used notion of *proportional* except *variable* costs in RCA terminology is to stress the difference between costs that are *variable* with total production/sales volume and the costs that are *proportional* at the resource level. Separation of costs into proportional and fixed elements could by subjective and what is more resource costs that change proportionately to the output of a supplying resource may change classification and be named as fixed if they are consumed in the fixed manner. To improve decision usefulness of information from resource consumption accounting some companies using the method employ replacement costs of the resources rather than historical costs.

In addition to three building blocks of resource consumption accounting, the approach allows for better profitability reporting by tracing all direct costs to products and assigning indirect costs at causal and decision relevant levels to products and product groups, clients and client groups, market segments and so on (separation of proportional and fixed costs is maintained in profitability reports and fixed costs include planned use of otherwise proportional resources in a fixed manner, e.g. use of labour for planned maintenance). Profitability reports in RCA present multiple contribution margins by deducting from revenues firstly direct costs of products and secondly various pools of indirect costs of different cost objects (product groups, clients etc.). An important element of RCA is activity based resource planning (ABRP). This planning and budgeting tool assesses unit standards for each resource pool, determines unit standards of resource consumption for consumers, estimates budgeted demand for resource output and converts budgeted resources output into dollar items.

Resource consumption accounting although based on activity-based costing approach (and GPK), is considerably different both from ABC and its extended version TD ABC – main differences are shown in figure 2.2. Panel A of the figure presents a simplified ABC model for a production department. Four resource pools were identified in the model (energy, depreciation, salaries and overtime wages) and linked to two activity pools: assembly (unit level activity) and setup (batch level activity). After allocating resources costs to activities and establishing activity cost pools, costs of each activity are allocated to three final cost objects (products). Panel B presents TD ABC model established for the same production department.

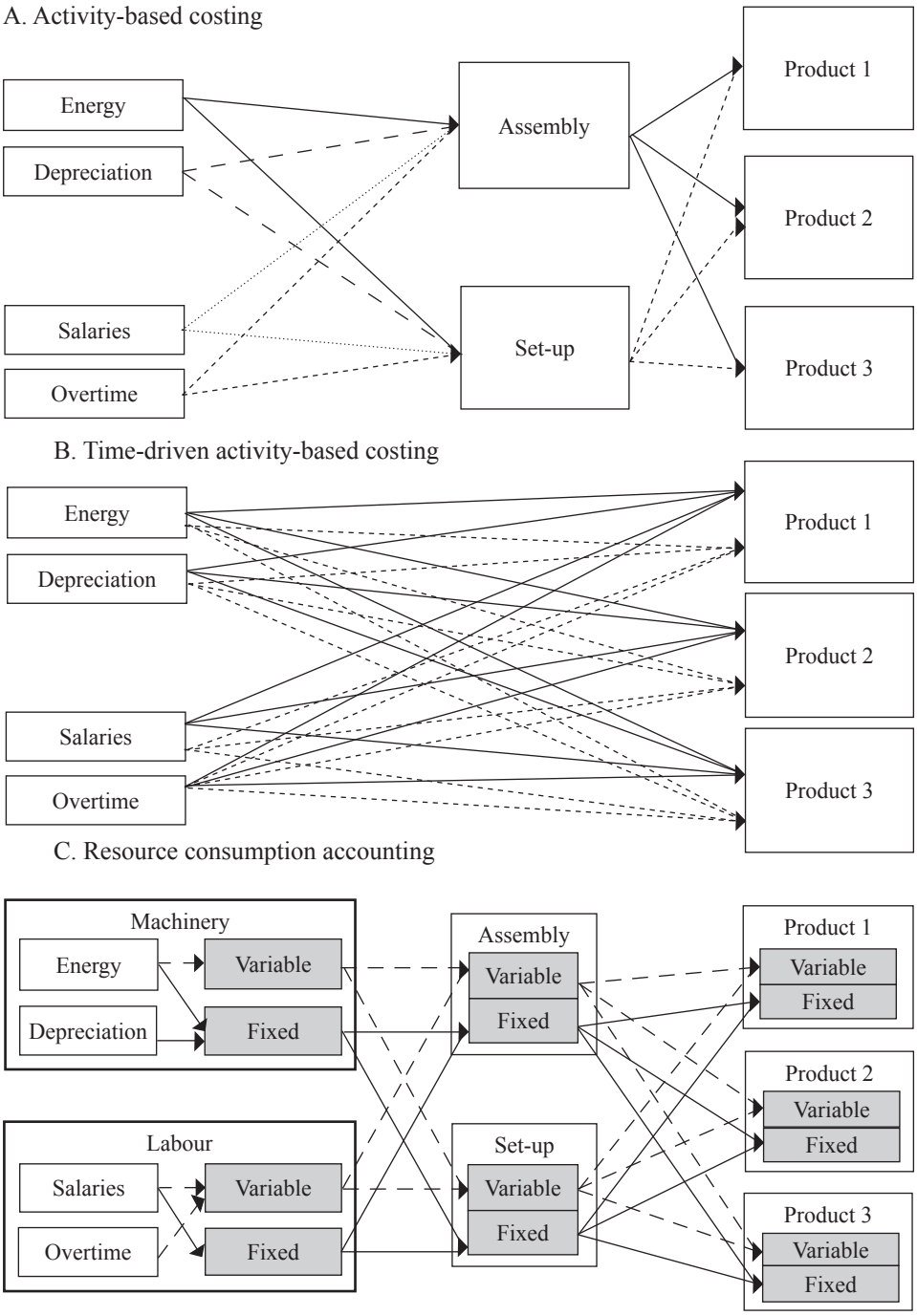

Figure 2.2. ABC, TD ABC and RCA comparison

Although the model looks similar to the ABC model in panel A (both models have the same resources and cost objects), it does not have activities. In TD ABC resources are directly linked to cost objects (products) through resource-activity cost drivers (Kaplan, Anderson 2004). Each driver represents a link between a resource and a cost object that consume an activity. The number of activities that consume the same resource, determines the number of resource-activity cost drivers between a resource pool and a cost object (it was assumed in the example that each resource is consumed by both activities – assembly and set-up). The value of resource-activity cost driver is determined by multiplying the number of hours for an activity and the resource cost per hour. Resource consumption accounting model for production department is presented in panel C. In this model two resource pools – machinery and labour, were established, each containing two resources (machinery pool included energy and depreciation and labour pool included salaries and overtime). In opposition to ABC or TD ABC, in resource cost pools in RCA proportional and fixed costs are separated (salaries and energy were divided into proportional/variable and fixed element whereas depreciation was classified as fixed and overtime wages as proportional/variable). In RCA, similar to ABC, resource costs are allocated to cost objects under the two-stage procedure – at first resources costs are allocated to activities and then activity costs are allocated to cost objects, but it should be stressed that under RCA proportional and fixed cost are allocated separately and idle/excess capacity is eliminated from product costs. Treatment of idle/excess capacity costs in TD ABC and RCA is different. Whereas in TD ABC model consumption of resources is driven by time spent on different activities only, in RCA there are different (multiple) drives which drive resource consumption. If the resources used in operations are homogenous (and proportional to hours), the picture of unused capacity in TD ABC and RCA would be similar but if the resources used in operations are heterogeneous, RCA offers a better picture of unused capacity costs.

Keys and van der Merwe (2002) point out that resource consumption accounting could be a tool of control concentrating on comparisons of budgeted and actual results which may surpass ABC. The authors specify four control mechanisms within resource consumption accounting:

- management planning and control tiers – presenting an alternative to CAM-I cross, RCA cube recognizes strategic, tactical and operational levels of management (three levels) and also four tiers: (a) resource tier, (b) activity tier, (c) product tier and (d) market segment tier (figure 2.3);
- authorized reporting – based on flexible budgeting concept, RCA provides much better basis for variance analysis than ABC does (authorized reporting compares actual results with standard costs for actual output whereas typical reporting in activity-based costing compares budgeted with actual results); authorized reporting when combined with resource, activity, product and market segment tiers provides various areas of the company with better information on performance measurement;

• a reflective view of operations – focusing on real-time measures of performance, RCA provides better information for operational control which enables managers to concentrate on present and not historical data (focusing on costs and profitability of products or market segments in real-time allows for quick and effective actions);

• extensive variance analysis – presenting primary and secondary cost information for four tiers simultaneously (resource, activity, product and market segment tiers), RCA allows for very detailed variance analysis; what is more RCA enables to classify variances as controllable or uncontrollable (it is necessary to stress that variance could be controllable in one tier e.g. resource tier and in the same time uncontrollable in the other tier e.g. product or market segment); for the variance analysis to be the tool for better company management accurate determination of responsibility for variances, especially with respect to excess capacity is necessary (it is necessary though that the costing system in the company is well understood by managers); resource consumption accounting could not only be a method of variance calculation but also means of variance analysis resulting in corrective actions taken by company managers.

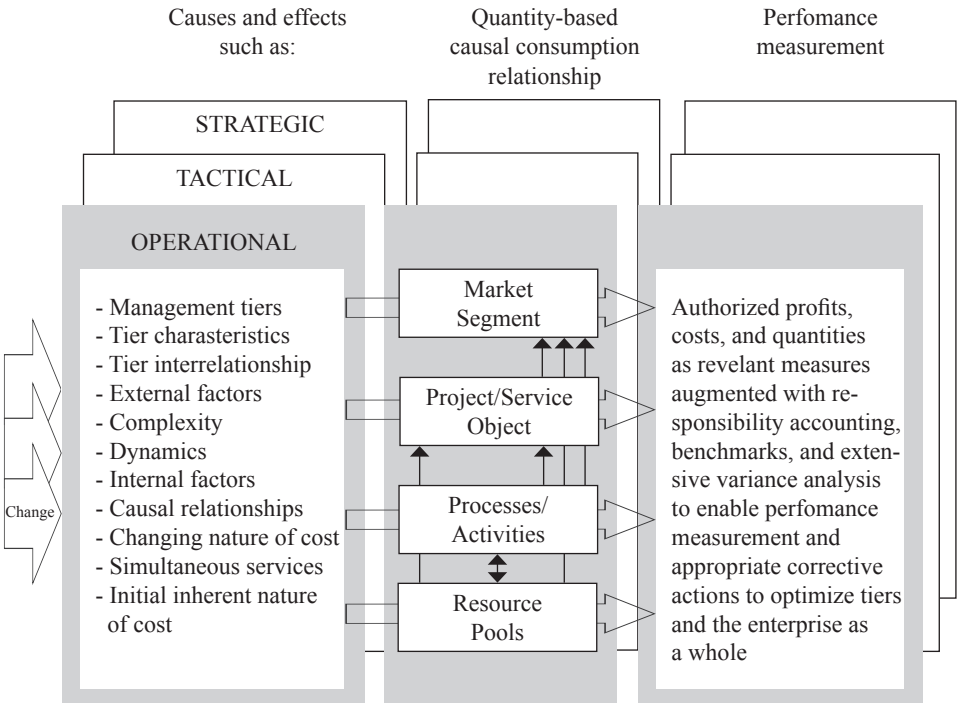

Figure 2.3. The RCA cube – basis for planning and control system

Source: Keys, van der Merwe (2004), p. 42

RCA approach separating proportional from the fixed costs seems to be suitable for planning and control decisions relying on reliable information about cost behaviour patterns (flexible budgeting). Flexible budgeting in the traditional format used factory-wide or department-wide denominator volume and divided costs into variable and fixed elements based on production/sales volume (expressed usually in units or hours). The same concept (flexible budgeting) used in resource consumption accounting environment is much more detailed and precise as it allows for flexible budgeting application on the resources level. The use of flexible budgeting as a tool for planning and control at resource level (not factory or department level as in traditional methods) enable managers to isolate variances in the rate and quantity of resources used in organization. Resource consumption accounting budget presents for each resource difference between theoretical and budgeted capacity and also budgeted costs of idle/ excess capacity (higher or lower than budgeted demand for a resource directly influence costs of unused capacity). Presenting unused capacity and its costs, allows managers to take actions to utilize or eliminate excess capacity, or shows them possible shortages of resource capacity when future demand exceeds their supply.

Resource consumption accounting offers many benefits over traditional cost accounting systems – most important are presented in table 2.1.

Implementation of resource consumption accounting should be considered by companies having problems with unplanned wasted resources and excess capacity costs which result in inadequate product decisions, shortage and undercosting of resources in cost budgeting and also distorted information for performance management. RCA can be implemented in different ways: (a) it can serve as a complete costing system (changing current costing system), (b) it can be implemented in one area first with subsequent implementation in other areas, (c) it can be developed and used in parallel to existing systems and if it proves its validity it can exchange the current costing system, (d) it can be implemented in a general manner (not very detailed) and if provides enough benefits, modification to a more detailed version could be done.

Implementation of resource consumption accounting is possible in ERP environment because these systems provide data for strategic, tactical and operational decisions (some ERP systems, e.g. SAP provide RCA functionality). Implementation of resource consumption accounting in ERP environment could enable collecting of more relevant information for decision making and could allow organization to achieve its objectives.

Table 2.1. Benefits of resource consumption accounting over traditional costing systems

Resource consumption accounting	Traditional costing
Attributes the cost of excess/idle capacity to the person or level responsible for influencing the resource but does not allocate it to products	Excess/idle capacity is not identified and thus can not be associated with the appropriate person or level and is routinely allocated to products
Facilities capacity analysis by using theoretical volume for cost rates and making excess/idle capacity visible to managers	Obscures capacity analysis by using master-budget volume for cost rates and not accounting for excess/idle capacity
Uses replacement cost depreciation to provide useful internal cost decision support information	Uses depreciation prescribed by the external reporting system that often does not reflect economic reality
Pulls cost of resources consumed to cost objects by using nondollar, quantified output-consumption relationships based on causality	Pushes cost of resources supplied to cost objects by spreading all costs incurred over finished goods units produced
Identifies and assigns costs as innately fixed or variable (proportional) at the resource level, accurately specifying the nature of costs	Identifies and assigns costs as innately fixed or variable at the product level, obscuring true cost consumption patterns
Recognizes that innately proportional costs can be consumed in a fixed manner and provides required treatment	Provides no recognition of cost consumption patterns at the resource level
Provides decision makers the ability to track and group cost information at virtually any level – from the resource level to the organization level	Groups costs at a department or product level with little or no provision for tracking or accessing costs at lower levels
Facilitates operations management with quantified actual nonfinancial information to compare to planned or standard quantities	Nonfinancial information is often sparse or unavailable since costs are frequently allocated based on percentage relationships without tracking resource quantity consumption

Source: Clinton, Webber (2004), p. 21.

2.3. TD ABC and RCA compared

In reaction to low level of activity-based costing adoption caused on the one hand by unsolved problems inherent in ABC method and on the other by complex nature of ABC implementation process, two approaches emerged as the possible solution – time-driven activity-based costing and resource consumption accounting. Both systems were developed as response to shortcomings of activity-based costing but represent different philosophies on the development of cost allocation and management systems.

Cost management systems like TD ABC and RCA must meet cost/benefit criterion meaning that benefits from the systems should be greater than cost of operating the systems. Whereas cost of the costing systems consists of costs of its implementation, modification and operation, benefits from the system can be measured by the quality of information provided by the system especially for decision making. It seems that both time-driven activity-based costing and resource consumption accounting offer three main benefits in the context of decision making:

- improvement of cost allocation which is achieved by not allocating unused capacity costs to cost objects;
- linkage between resource pools and cost pools which is done by applying activity-based costing paradigm in both models;
- separation of idle/excess resources which is achieved by providing information on unused resources and their costs which enable managers to address the problem of efficiency in the organization.

The purpose of TD ABC was to simplify the process of activity-based costing implementation and operation. It was achieved by use of single measure of resource capacity (time) and quantity-based resource-activity cost drivers (activity pools were removed from the model). Kaplan and Anderson (2004) maintain that time-driven activity-based costing could provide more relevant cost calculations while making unnecessary employee surveys to maintain the allocation model and enabling separation of unused capacity costs. TD ABC approach to cost management could be beneficial for organizations with standardized, homogenous operations especially for these with large proportion of employee costs in their cost structure (e.g. service organizations with a lot of human costs).

The second method which developed in response to shortcomings of activity-based costing was resource consumption accounting. The method was based on principles of traditional activity-based costing model and also German *Grenzplankostenrechnung* (focusing on resource cost management and quantity-based modelling in the environment of enterprise resource planning systems, e.g. SAP). In opposition to TD ABC, the purpose of RCA was to recognize complex relationships between resources and cost objects by relying on integration with enterprise resources planning models to capture organizations' complex processes. RCA is thus a more universal system suitable to use in organizations with heterogeneous resources driven by multiple drivers and not only by time e.g. by complex manufacturing organizations where time is only one of the resource drivers.

Although there are some differences between the models (TD ABC and RCA), there are also some similarities as they are built on activity-based costing fundament, may be the most important difference is separation of unused capacity costs. Both models do not allocate costs of unused capacity to cost objects (products, clients, market segments etc.) but separate them and present in the profitability reports. The difference between TD ABC and RCA allocation of the resources is that in

time-driven activity-based costing model, resource cost allocations are driven by activity levels which in turn are driven by output level. In resource consumption accounting, resource cost allocation is driven by usage of each resource separately (usage of resources is not necessarily related to the level of output). RCA users can manage unused capacity on the level of individual resources. Comparison of time-driven activity-based costing and resource consumption accounting systems is presented in table 2.2.

Table 2.2. Comparison of TD ABC and RCA

Feature	TD ABC	RCA
Relationship with other information systems	System independent	ERP-compliant
Organization of resource pools	Cost-based resource pools	Technology-based resource pools
Composition of resource pools	All resource costs are variable	Resource costs can be either fixed or variable
Cross-allocation of resource costs among resource pools	No cross allocation among resource pools	Cross allocation among resource pools is allowed
Allocation of resource costs to cost objects	Activity-based cost allocation	Both activity-based and volume-based cost allocation are allowed

Source: Tse, Gong (2009), p. 45.

As the time frame of the decisions is concerned TD ABC (just like traditional ABC) could provide useful information for long-term decisions, but may be not suitable for short-term decisions. In contrast for this kind of decisions (short term) resource consumption accounting seems most appropriate, it is suitable for all situations when distinction between proportional and fixed cost could be made. RCA could also provide meaningful information in long-term horizon. That kind of decisions rely on capacity requirements and resource consumption accounting is suitable in such situations as it provides insights to resource capacity.

Advanced cost management methods like TD ABC or RCA may not be suitable in simple production environment e.g. in companies using lean management. In these organizations sophisticated cost accounting methods are not necessary but when complexity increases information from TD ABC or RCA may meet cost/benefit criterion and may enhance companies' efficiency. When the organization makes decision to choose appropriate cost management system, managers should understand what alternatives are available (see figure 2.4), what the strengths and weaknesses of the alternatives are and what the conditions for successful implementation of the choosen system are. To choose correctly, an understanding of concepts and mechanics of each system is necessary.

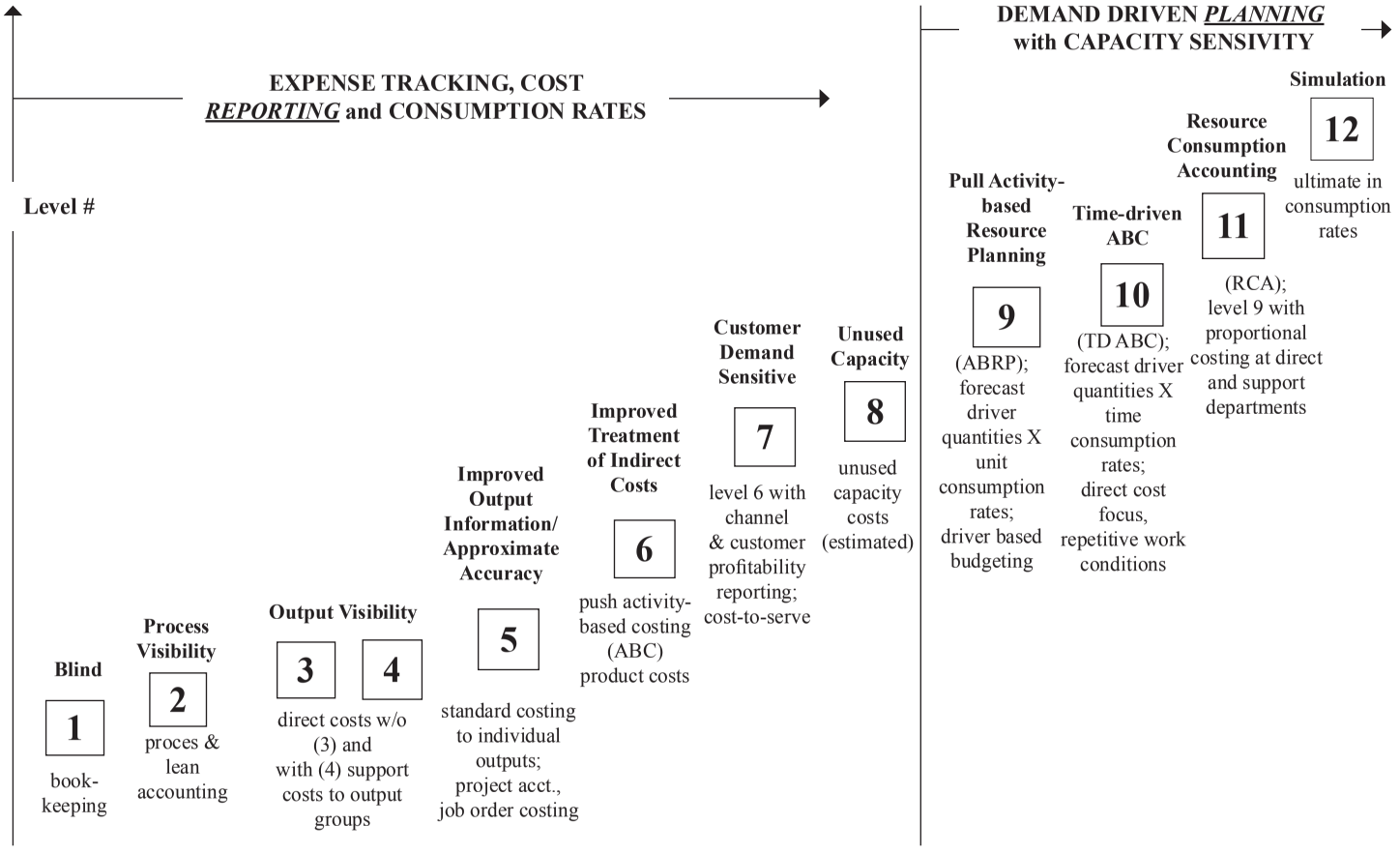

Figure 2.4. Levels of costing systems maturity
Source: IFAC (2009b), p. 19

2.4. Summary and conclusions

On the basis of investigation presented in chapter two, it is possible to formulate the following, general conclusions, which support the main research thesis and specific theses:

1. TD ABC as well as RCA emerged as possible solutions to shortcomings of activity-based costing but represent different philosophies on the development of cost allocation and management systems. The purpose of time-driven activity-based costing was to simplify the process of ABC implementation and operation whereas the purpose of RCA was to recognize complex relationships between resources and cost objects by relying on integration with ERP systems.

2. The origins of time-driven activity-based costing may be found in Anderson's works, who in 1997 used time equations in his work for a consulting company Acron. TD ABC method was later supplemented by capacity costs calculation (Kaplan, Anderson, 2004). According to creators of time-driven activity-based costing, the system overcomes difficulties in the implementation process of classic ABC.

3. Resource consumption accounting emerged around year 2000. The concept developed and in 2009 International Federation of Accountants recognized RCA as a costing method which attains higher level of accuracy than traditional ABC. RCA is a costing system based on two concepts – activity-based costing and *Grenzplankostenrechnung*. Resource consumption accounting concentrates on resources with the use of activity-based costing, activity-based resource planning, absorption costing, variable costing, actual costs, standard costs, segmented profitability reports, primary and secondary costs and is usually a part of organizations' enterprise resources planning system. Resource consumption accounting integrates the best cost management concepts to create information set to support management decision making in a company.

4. The most important differences between TD ABC and RCA are cost behaviour patterns they employ and separation of unused capacity costs. It should be stressed that in TD ABC there is no distinction between variable and fixed costs whereas in RCA costs of resources are separated into proportional and fixed components. Both models do not allocate costs of unused capacity to cost objects but in TD ABC model, resource cost allocations are driven by activity levels which in turn are driven by output level whereas in RCA, resource cost allocation is driven by usage of each resource separately.

5. TD ABC approach to cost management could be beneficial for organizations with standardized, homogenous operations especially for those with large proportion of employee costs in their cost structure (e.g. service organizations with a lot of human costs). RCA is thus a more universal system suitable to use in organizations with heterogeneous resources driven by multiple drivers and not only by time e.g. by complex manufacturing organizations where time is only one of the resource drivers.

CHAPTER 3

THE DEVELOPMENT OF ACTIVITY-BASED COSTING/MANAGEMENT JOURNAL LITERATURE IN POLAND 1994–2011[1]

3.1. Introduction

Companies all over the world have been interested in the concept of activity-based costing and activity-based management and have implemented it for more than twenty years. Enormous preoccupation with the concept is also mirrored in literature. There are many publications on ABC/M, especially for practitioners (e.g. *Journal of Cost Management*, *Management Accounting* – the United States, *Management Accounting* – the United Kingdom etc.) but also, although to a lesser extent, there are academic publications[2] (*Management Accounting Research* and *Journal of Management Accounting Research*). Interestingly, vast number of publications was written by practitioners, precisely two groups of practitioners: those working for companies where activity-based costing is used, or those working in consulting companies specializing in ABC/M.

The analysis of ABC/ABM literature published in professional and scientific accounting journals, in the United States and in the United Kingdom, between 1987 and 2000 was presented by Björnenak and Mitchell (2000). The research shows that the majority of articles were published in professional journals (89% of all articles published). Björnenak and Mitchell research shows a loss of interest in ABC/ABM in the late 1990s (measured in the volume dimension of

[1] This chapter is a modified and enhanced version of the paper by Joanna Domagała and Tomasz Wnuk-Pel (2011).

[2] Shields (1997) observed the phenomenon; he noticed that the number of professional publications on ABC/M was incomparably higher than the number of academic publications.

the publications). The maximum level of publications in the United States and the United Kingdom journals was reached in the years 1996–1997, when more than 180 articles per year on ABC/ABM were published, from that time the volume of articles decreases and reaches about 50 articles per year in years 1999–2000. After the year 2000 the number of publications in the journals seems to further decrease which confirms the decline in ABC literature in the last years of the 1990s.

The decline in the volume of ABC/ABM literature in scientific journals is evident from the mid-1990s and it appeared in advance to the number of publications in the professional journals. While in 1991, 12% of the articles published in scientific journals dealt with ABC, it dropped to 4.2% in 1996 (Carmona, Gutierrez, 2003). The results of the studies by Björnenak and Mitchell (2000, 2002) and Carmona and Gutierrez (2003), by decline of the number of articles published on the subject, show the evolution in the interest for ABC/ABM in the United States and the United Kingdom.

The research examining the same phenomenon of ABC/ABM literature diffusion in France was presented by Alcouffe (2004). His paper aim was to generate evidence which can enrich and support the studies of communication structures in accounting research by Björnenak and Mitchell (2000, 2002), Lukka and Granlund (2000) and Carmona and Gutierrez (2003). The paper presents an analysis (quantitative and qualitative) of activity-based costing literature in French accounting journals. Results of Alcouffe's (2004) research show a volume dominance of the output of consulting and basic genres and their location primarily outside the academic research literature. The results of the literature research in France were different than in the United States and the United Kingdom, because it demonstrated that academics have not been the critics of ABC/ABM but rather focused on propagation of the idea (method).

The birth and development of ABC/M concept greatly influenced academic and professional literature on management accounting. The number of ABC/M publications shows that not many concepts have raised so far comparable interest among practitioners and theoreticians. Numerous publications on management accounting, presenting the subject of ABC/M, undoubtedly popularized the concept and the knowledge of it among practitioners, consultants, researchers and students. The publications have also shed some light on the problems with activity-based costing systems in companies and have spread the concepts based on activity-based costing in practice. It can be stated that publications on activity-based costing and activity-based management have greatly influenced the development of education, research and practice of management accounting equally in Poland and in the world. One can consider the literature as a chronological record of ABC/M development and its influence on companies' practices.

The majority of activity-based costing literature in developing countries was published during the last decade, research on that phenomenon and comparative

analysis of ABC literature in those countries and the highly-developed countries was only possible in the last years. The problem, similarly to other developing countries, is evident in Poland. Due to historical conditions, the development of management accounting literature in Poland was less intense and delayed in comparison to highly-developed countries; the trend is also noticeable in the ABC literature.

So far, however, there was no research in Poland aiming to create evidence which could support and broaden studies of communication structures in management accounting research (Lukka, Granlund, 2000; Björnenak, Mitchell, 2000, 2002; Alcouffe, 2004). Additionally there is a clearly expressed need for replication, extension and refinement of studies on ABC diffusion which were done so far in more developed countries. In the light of presented facts, it is important to fill in the identified research gap i.e. to analyze journal literature on ABC/ABM accumulated in Poland during the last eighteen years since the first article on ABC emerged.

In the context of ABC/M literature the aim of the chapter has been formulated – it aims to analyze existing Polish literature on ABC/M, especially its amount and structure, subject area and research methods, as well as to analyze views presented by authors. In order to realize the aim of the study, the research has been divided into three parts. The first part presents the research method i.e. justification of the sample choice, justification of the variables choice and presentation of the research hypothesis. The results of the research are presented in the second part i.e. the analysis of publications' distribution over time, views expressed by the authors, research methods and subject areas. The last part presents short recapitulation and conclusions.

3.2. Characteristics of the research method

The research concerning Polish literature on the subject of ABC/M was based on a selected set of articles published in the key journals and cyclical publications on accounting. One have excluded from the study:

- textbooks[3], specialist books[4], books which have been translated[5] (including even those which, to some degree, deal with the subject of ABC/M);
- published academic dissertations (including collections of articles or PhD theses and postdoctoral dissertations published by universities and colleges[6]);

[3] See e.g. Jaruga *et al.* (2001); Sobańska (2009).

[4] See e.g. Leszczyński, Wnuk-Pel (2004); Piechota (2005); Wnuk-Pel (2006c).

[5] See e.g. Kaplan, Cooper (2000); Miller (2000).

[6] To the authors' knowledge (source SYNABA), up to now in Poland three postdoctoral dissertations (Karmańska, 2001; Piosik, 2002; Mielcarek, 2008), and eight PhD theses on ABC/M have been written.

- specialist journals dealing with the area of accounting and taxes (e.g. *Monitor Księgowego*, *Rachunkowość Finansowa i Audyt*, *Serwis F-K* etc.);
- specialist journals not dealing with the area of accounting where some articles on ABC were published (e.g. *Gazeta Prawna*, *Businessman Magazine* etc.);
- daily papers (for example *Rzeczpospolita* where, in the time period considered, one would find a few popular science articles on activity-based costing and activity-based management).

The above-mentioned journals have been excluded from the research as they do not deal with the subject of management accounting. Articles on ABC/M published in those journals were sporadic therefore their contribution to the development of ABC/M literature in Poland was minor. Exclusion of the books from the research is motivated by the fact that they are not published consistently but they appear at a certain moment in time (majority of the book publications on ABC/M emerged in Poland between 2000 and 2003) therefore it is impossible to follow the track of changes in the issue of presentation of ABC/M. From the research aim point of view, books have yet another drawback – the latest theoretical and practical issues are usually first presented in articles and subsequently in book publications.

It needs to be emphasized that the majority of writers whose literature has been excluded from the research, are simultaneously authors of articles which are analyzed here, hence one can know their standpoint on the issue of ABC/M. It has been decided to limit the research to three main sources (see table 3.1).

Table 3.1. Journals used in the research

Title	Profile	Time of research
Controlling i Rachunkowość Zarządcza (*Controlling and Management Accounting*)	practice (management accounting)	1998–2011
Rachunkowość (*Accounting*)	practice (accounting)	1994–2011
Zeszyty Teoretyczne Rachunkowości (*Bulletin of Theoretical Accounting*)	theory (accounting)	1994–2011

Controlling and Management Accounting (CMA) has been included in the study since it is the sole journal in Poland on management accounting for practitioners. However, the journal has not been published in the whole period of time analyzed in the research but between the years 1998 and 2011. Despite the fact that *Accounting* is mainly a journal dealing with the issue of financial accounting, it was chosen for the study because: (a) according to author it is the most prestigious and opinion forming journal among accountants i.e. its publications reach a wide group of accountancy practitioners who hold high positions in their companies,

(b) it quite regularly publishes articles on management accounting and finance. *Bulletin of Theoretical Accounting* (BTA) constitute the third periodical included in this research. This title deals in general with the subject area of accounting, yet the issue of management accounting is extremely important there. This research analyzed the typical editions (usually four) as well as some special issues published mainly because of annual, country-wide conferences of departments of accounting.

The time frame of the research has been set for the years 1994–2011. The beginning of the analyzed period of time is marked by the publication of an article dedicated to the concept of activity-based costing written by Jaruga and Szychta (1994) – it was the first article on that subject in Poland. Year 2011 (September) closes the period, as it was the latest possible date of collecting information for the research.

Four basic groups of variables have been used:

- variables characterizing specific publication in terms of quantity;
- variables characterizing the author of the publication and his views;
- variables characterizing the research method;
- variables characterizing the subject area of the publications.

Having in mind the aims of the research, the specific variables were chosen; they were selected in order to reliably characterize the analysis of literature on ABC/M in terms of content, structure and significance. Presentation and justification of the choice of individual variables follows below.

The quantitative characteristics of the publications in the researched period of time are the most evident area of the analysis. It will enable general presentation of the literature on ABC/M from selected journals in terms of e.g. prevalence of certain subject areas. In the quantitative characteristics of the literature, the number of ABC/M publications in the given time period, in terms of individual journals and in general, will be presented. The simplest quantitative characteristic of the publications on ABC/M together with the other researched variables will make the analysis more extensive and will enable identification of the possible trends.

Determining the author of the ABC/M publication is yet another research variable which allows to identify the professional group being the most interested in the concept of ABC/M; it also enables identification of the professional group which helped to spread the idea in Poland. In the management accounting research, usually three groups of professionals are distinguished: university researchers, consultants and practitioners.

The ratio between the enthusiasts and objectors to the ABC/M concept is another research variable used in the study. Authors' points of view have been grouped into three categories: (a) ABC/M enthusiasts, (b) its objectors, (c) neutral. The authors were allocated to individual categories on the basis of the content of the publication, author's conclusions and evaluations as well as their opinions expressed

in the literature. Enthusiasts of the ABC/M concept emphasize its technical advantage over conventional methods of cost calculation and economic impact ensuing from the use of the new method. One can observe such opinion in the works of Cooper (1988a), Shank and Govindarajan (1988), Cooper and Kaplan (1991) or Dolinsky and Vollman (1991). Opposing expert opinion stating that the ABC/M concept is not new and that it is only a fashionable trend in management accounting can be found in publications by Horngren (1990), Staubus (1990) or Malmi (1997). The analysis of the publications in terms of positive and negative opinions towards the ABC/M concept will enable to determine whether Polish publications are enthusiastic or pessimistic about the method. The ratio between enthusiasts and objectors to the concept, bearing in mind the professional group they come from, might seem interesting. One might assume that consultants are advocates of the idea, whereas the academics should be more sceptical about the method.

The used research method is another variable which has been taken into account in this study; it helps to determine the way the information on the ABC/M concept is acquired. Classifications of the research methods are different yet they mainly agree[7]. The research methods in this study have been classified as follows:

- review (of literature, history etc.) – this type of research usually analyzes literature to determine who writes about ABC/M, to determine the subject area and the use of research methods (Björnenak, Mitchell, 2000; Lukka, Granlund, 2000);
- research (survey, questionnaire etc.) – this type of research concentrates on: (a) the analysis of the prevalence degree of the ABC/M method, (b) the analysis of the ABC/M systems' structure, (c) opinion examination among companies using ABC/M systems, (d) the analysis of positive implementations of ABC/M systems[8];
- case study – this research relies on examination of individual companies, reasons for their interest in the concept of ABC/M, comparison between the ABC/M and the system which has been previously used, analysis of the consequences ensuing from the ABC/M implementation which influence the decision-making process in the company or analysis of the factors behind the positive or negative implementations of the systems[9];

[7] In the research of accounting, different authors, depending on the subject of the analysis, use different classifications (see: Prather, Rueschoff, 1996; Shields, 1997).

[8] Examples of the analysis of the ABC/M diffusion degree, the analysis of the ABC/M systems' structure or the opinion examination among the companies which use the ABC/M system are e.g. Bescos, Mendoza (1995); Innes, Mitchell (1995). The issue of analysis of the positive implementations of ABC/M is treated in the works of Shields (1995) or Foster, Swenson (1997).

[9] In the case study research movement, one can distinguish two directions. The first one focused on the influence of ABC/M on the product cost, pricing policy, process and product design, make or buy decisions, transfer prices. Examples of such works are: Foster, Gupta (1990); Kovac, Troy (1989); Spicer, (1992). The second direction of the research, in the form of case studies, addresses

- descriptive research – it typically presents general rules of functioning of activity based costing or activity based management;
- analytical research (mathematical modelling) – the research is based on the mathematical analysis of the cost behaviour as a reaction to the change of the activity drivers; the research aims to analyze systematically the cost behaviour and to construct mathematical models used for forecasting the cost behaviour[10].

Distinguishing the above research categories will constitute the basis for the analysis of how different research methods have been used in time including the shift from the descriptive research to survey research or the case study analysis.

In order to explain the significance of Polish and international publications on ABC/M, additional variable has been taken into consideration – the number of Polish and foreign publications listed in the bibliography of the researched articles.

Characteristics of the subject area of ABC/M publications provide further possibilities for analysis. An attempt to characterize the birth and the process of changes in the ABC/M publications in Poland will be based on this analysis. In order to specify the subject area of publications on the issue of ABC/M concept, a division into strictly activity-based costing publications (usually earlier ones) and publications extended by the activity-based management subject (usually published later) has been made. This evolution in the ABC/M publications has been observed in American and western literature since the late eighties, through the nineties of the 20th century until the beginning of the 21st century.

Another variable which has been taken into account in this research was the type of business sector. It has been decided not to distinguish the industries (e.g. telecommunications, construction etc.) but to make distinction between production and services.

The third variable used in this research of the detailed subject areas was the type of process (e.g. logistics) where the concept of ABC/M could be used. According to Porter (1985) two groups of processes in a company can be distinguished i.e. main processes and supporting processes. In the group of the main processes Porter itemized: internal logistics, main business activity, external logistics, sales and marketing and post-sales service. Whereas in the group of supporting processes he listed: infrastructure maintenance, human resources management, technological

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the problem of ABC/M in more detail and focuses on the factors which influence the process of ABC/M implementation in a positive or negative way. Examples of such works are: Gietzmann (1991); Cobb, Mitchell (1993); Cobb, Helliar, Innes (1995); Anderson (1995).

[10] Research in the form of a mathematical modelling is typically theoretical, though it is possible to find some research based on empirical material. Journals constitute majority of such literature: *The Accounting Review*, *Journal of Accounting and Economics*, *Journal of Accounting Research* or *Journal of Management Accounting Research*. Examples of this type of research are e.g. Noreen (1991); Foster, Gupta (1990); Babad, Balachandran (1993); Datar, Gupta (1994); Dillon, Nash (1978); Zimmermann (1979); Lere (1986).

development and buying. For the purposes of this research, Porter's list has been modified and following processes or their groups were distinguished:

- main activity process (e.g. manufacturing goods or providing services);
- logistics process (internal and external);
- sales and marketing process;
- remaining processes (post-sale process, infrastructure maintenance, human resources management, technological development and buying).

The connection between ABC/M and other concepts and tools of management accounting constitute another variable[11]. This type of publications typically appears later than the first activity-based costing publications and usually later than the ABM literature. This relation displays a wider perspective, in which one could observe the possibilities ensuing from using all the innovative management accounting concepts i.e. ABM.

A detailed characteristic of the subject areas of ABC/M publications will provide answers to such questions as: (a) do the publications' subject areas only restrict to ABC or do they treat the issue with wider perspective?, (b) what sectors and processes do they apply to?, (c) are other innovative concepts and tools of management accounting linked to the concept of ABC/M? The characteristics of the subject area will enable further analyzes e.g. connection between the subject and author's affiliation and placing it in time. In turn, it may lead to interesting findings about the evolution of publications as well as authors' and readers' interests and knowledge.

Five hypotheses have been suggested in order to analyze the quantity and structure, subject areas, research methods and authors' views contained in the Polish publications on ABC/M between the years 1994 and 2011.

Due to historical conditions, the development of management accounting in Poland was less intense and delayed in comparison to the theory and practice in highly-developed countries; the trend is also noticeable in the ABC/M literature. Hypothesis 1 – The development of ABC/M literature in Poland is considerably delayed (by 6–8 years) in comparison to the publications from United States, Great Britain and other highly-developed countries.

The study conducted in the United States, the United Kingdom and in France (Lukka, Granlund, 2000; Björnenak, Mitchell, 2000; Alcouffe, 2004) claims that vast majority of ABC/M articles is published in journals for practitioners. The notion is also evident in Poland. Hypothesis 2 – There are more publications on the ABC/M concept in the journals for practitioners than in the university publications, and the authors of those publications are mainly university researchers.

[11] Björnenak and Mitchell (2000) have researched the link between the ABC/M publications in professional British and American journals with such concepts and tools of management accounting as the theory of constraints, continuous improvement, global quality control, just in time, business process reengineering, economic value added, transfer pricing, product life cycle management, financial reporting, environmental accounting, product attributes, zero based budgeting, functional analysis, benchmarking, capital budgeting, target costing.

Author's viewpoint on the concept of ABC/M may depend on his professional interests. There exists a confirmed hypothesis, which has been presented in numerous articles, that for or against attitude towards the ABC/M concept is strictly related to one of the professional groups the author represents – academic researchers, consultants or practitioners[12]. It has been proved that university researchers were sceptical about the ABC/M concept, consultants appeared to be boundless enthusiasts and practitioners' opinions seemed moderate. This research formulates a hypothesis that the views presented by academic researchers, consultants and practitioners will not be diverse to such an extent. Hypothesis 3 – The percentage of the ABC/M enthusiasts among consultants is close to the highest possible level, yet the ratio among practitioners and university researchers is only slightly lower.

As it has been already mentioned, due to the delays in familiarity and application of the modern management accounting methods in Poland, the research concerning this issue is simultaneously less advanced. The notion also applies to the research methods in use. Hypothesis 4 – Among research methods used in the publications, it is more common to encounter descriptive works, surveys and case studies than literature reviews and analytical papers.

In accordance with the world trends, the subject area of publications on the concept of ABC/M also evolved in Poland. The last research hypothesis claims that the direction of changes in Poland was similar to the world tendencies. Hypothesis 5 – The subject area of the publications evolved from activity-based costing in production companies and only in the main area of activity, into ABM in production and service companies in the main and supporting processes with reference to other concepts and tools of management accounting.

3.3. The analysis of the research findings

3.3.1. Quantitative characteristics of the publications

The study shows that the number of the ABC/M publications, in the researched time, was so high that each reader of the analyzed journals must have come across them (see figure 3.1). After the initial stage, when the ABC/M publications were sporadic (1994–1998), a noticeable increase in their number can be observed. It was mainly related to the birth of the first, and so far the only one, Polish journal fully dealing with the issue of management accounting – a monthly *Controlling and Management Accounting* (CMA). In Poland, as well as in the United States and United Kingdom, the majority of publications on ABC/M appeared in a specialist journal for

[12] The notion about the role of consultants and consulting companies in the process of ABC/M publicizing is presented by e.g. Macintosh (1998) and Noreen (1987).

practitioners, a journal dealing with the subject of management accounting (CMA). In general, in the time given, 145 articles on ABC/M were published; 112 of them (77.3%) appeared in *Controlling and Management Accounting*, 5 of them (3.4%) were published in *Accounting* and 28 of them (19.3%) in *Bulletin of Theoretical Accounting* (BTA). Over the years 1999–2009, the number of publications on ABC/M has been stable, somewhere in the 8–16 bracket annually, from the year 2010 it dropped.

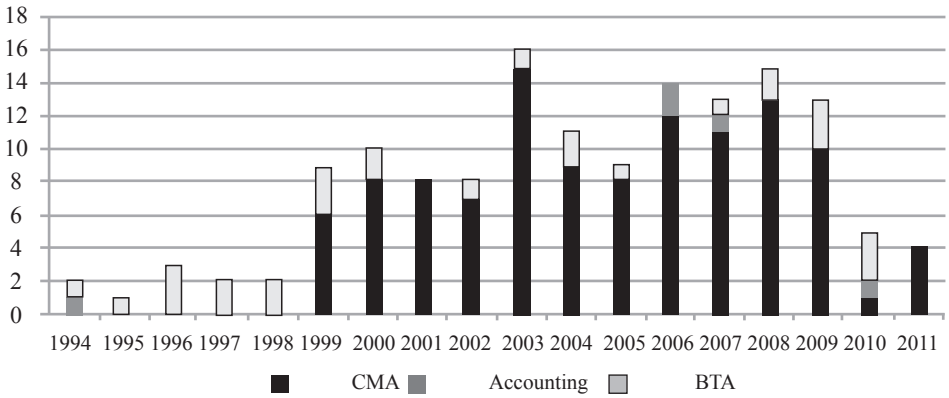

Figure 3.1. Publications on ABC/M

On the basis of conducted research, one may distinguish certain differences in the time arrangement of the ABC/M publications in Poland and in such countries as the United State or Great Britain (Gosselin, 2007):

- the first publications on the concept of ABC/M appeared in the *United States* and Great Britain in 1988, and in Poland six years later i.e. in 1994;
- in the United States and the United Kingdom, the majority of publications on ABC/M, appeared between 1993 and 1997 (the number of publications was up to 170–190 per year), whereas in Poland the noticeable increase in the number of publications was evident six years later in 1999;
- similarly to the United States and the United Kingdom, where after the increase period (1993–1997) a significant fall in the number of publications could be observed (70–90 publications in 2000), Poland also witnessed the phenomenon and the number of publications dropped from the year 2010.

3.3.2. Characteristics of the authors of the publications

The analysis shows that ABC/M publications are mainly written by academic researchers. The percentage of their works reaches annually 55.9%, whereas, in the case of consultants, the percentage equals 31% and in the case of practitioners

13.1%. The arrangement of publications in time (see figure 3.2) shows that during the first five-year period (1994–1998) only academic researchers published papers on the ABC/M concept; in the following years they also constituted the largest professional group among authors. Publications by consultants appeared in 1999 and became large part of publications with the special year 2007 when they comprised the majority. Excluding 2000 when only one publication by practitioners appeared, their works started to be published more regularly commencing from the year 2003, but more often from the year 2006. The analysis of the authors of the publications in the time given, shows that consultants, but mainly practitioners, started writing about the concept of ABC/M later which stands in opposition to the American and British trends. A research conducted by Björnenak and Mitchell (2000) proved that publications by consultants and practitioners started to appear in 1988 and from that time they constituted a substantial percentage of all publications on ABC/M.

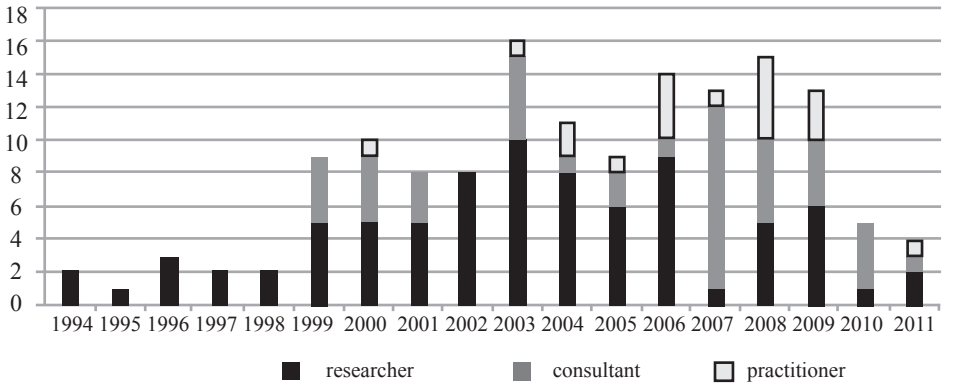

Figure 3.2. Authors of the publications on ABC/M

Publications by consultants have recently become a very important source of information about the new management accounting concepts especially about ABC/M. The tendency stems from the fact that consulting companies, which specialize in the area of management accounting, have gained importance and they have also become means of promoting the development of management accounting practices (Granlund, Lukka, 1998). Such companies often treat magazines as a way of advertising their services[13]. The publications by consultants are seen as means of promotion and advertising of a certain consulting company's services rather than

[13] Macintosh (1998) presents quite an extreme opinion that the advertisements of consulting companies are the main reason behind the popularity of ABC/M. A similar view is expressed by Noreen (1987) who claims that one can read the ABC/M publications as if they were 'advertisements of consulting companies'.

means of promotion of the new management accounting tools and concepts. In order to address practitioners, who constitute the most important group of readers, this type of publications characterizes a simplified approach towards the subject area. Research methods presented in those publications are not their strongest advantage; the publications also lack critical arguments and appropriate empirical evidence. The publications by consultants express their professional and practical interests in the subject of ABC/M, therefore one may expect that their works will only emphasize the positive aspects and implementation successes, neglecting the possible problems and failures in certain implementation processes. Despite the tendentiousness of the publications, it is worth stressing that if it had not been for the consultants' papers and works, academic researchers would not have had many new concepts to investigate into (Lukka, Granlund, 2000).

Publications on the subject of ABC/M by practitioners are rare. It probably ensues from the fact that people who are controllers or management accounting experts in companies are busy, and secondly, they are disinclined to disclose the solutions which make their companies more competitive (especially the detailed information, potential problems and ways of avoiding them and results of implementations). On the other hand, those scarce publications by practitioners, stress their personal successes and present the company's achievements. Despite the very few publications by practitioners, the concept of ABC/M was developed by practitioners themselves, before it was widely presented by Cooper and Kaplan (1988a, b; Cooper, 1985) in the *Harvard Business Review*. Due to the previously presented restrictions (lack of time and reluctance to disclose the sources of competitive advantage), the contribution of practitioners' publications to the development of ABC concept may be underestimated in the research.

One may agree with the opinion of Bromwich (1998) that recently all the new concepts of accounting (including management accounting) come from practitioners and consultants. Undoubtedly, academic researchers come up with a smaller amount of new ideas and concepts, although Lukka and Shields (1999) draw our attention to the fact that more and more university researchers participate in the process of designing and implementing the latest management accounting innovations.

The conducted research helped to notice that the percentage of academic researchers, consultants and practitioners publishing in individual magazines was diverse (see table 3.2). As anticipated, the largest percentage of consultants and practitioners writes for journal addressed to practitioners (*Controlling and Management Accounting*), whereas the publications from the journal addressed to the academic community (*Bulletin of Theoretical Accounting*) were almost exclusively authored by university researchers. It should be stressed that the percentage of publications by consultants and practitioners in the *Controlling and*

Management Accounting exceeded 50%, similarly to the American and British journals dedicated to the area of management accounting (45%)[14].

Table 3.2. Authors of ABC/M publications in individual journals

Specification	CMA		Accounting		BTA		Overall	
	n	%	n	%	n	%	n	%
Researcher	55	49.1	3	60.0	22	91.7	80	56.7
Consultant	38	33.9	2	40.0	2	8.3	42	29.8
Practitioner	19	17.0		0.0		0.0	19	13.5
Overall	112	100.0	5	100.0	24	100.0	141	100.0

Additional and detailed analysis proved that publications in individual journals were substantially diverse in terms of length. Articles published in *Controlling and Management Accounting* and in *Accounting* were rather short (respectively 4.9 and 6.6 pages long) whereas publications from *Bulletin of Theoretical Accounting* were significantly longer (average length reached 16 pages), which might imply their more thorough character.

Table 3.3. Examples of opinions expressed by the ABC/M enthusiasts, and those who were neutral

Enthusiasts	Neutral
• "a modern concept of cost control may enable improvement in hospitals' performance […], activity-based budgeting is a concept which will help to improve cost management in hospitals" (Kludacz, 2006, pp. 48–50) • "activity-based costing eliminates all the defects of conventional accounting systems in terms of correct cost calculation and customer and product profitability; it is a managerial cost accounting which logically helps to support management of budgeting processes in a company" (Zieliński, 2007, p. 36) • "the use of activity-based costing will enable correct calculation of actual costs instead of calculating them through arbitrary allocation of overheads" (Ozgowicz, 2008, pp. 4–5) • "activity-based costing […] helps to correctly allocate costs to certain objects which need different activity inputs" (Ossowski, 2009, p. 28)	• "accountants cast some doubt on efficiency of the activity-based costing, activity-based costing was too complicated […], there were difficulties in forecasting and forecast evaluation [...], activity-based costing does not overcome problems connected with the inefficiency of current registration systems and cost calculation" (Ohl, 1995, pp. 113–114) • "the method is used in cases when the cost units do not change, primarily in multi-series and mass production" (Polak, 2003, p. 41) • "activity-based costing is difficult to maintain, update and extend [...], it is extensively static so its utility is restricted in companies working in a dynamic and changeable environment" (Przytuła, 2007, p. 27) • "activity-based costing needs large financial expenses, time and labour […], the use of ABC is not always necessary" (Widera, 2008, pp. 19–20)

[14] See: Björnenak, Mitchell (2000).

The research revealed that overwhelming majority of the authors were ABC/M enthusiasts (similarly to France, see Alcouffe, 2004). Having analyzed 145 publications, 139 of their authors were activity-based costing and activity-based management enthusiasts and only 6 of them remained neutral in their views. According to the authors of the article, none of the analyzed writers expressed a firm critical opinion. The profession of the authors did not influence their approach towards the ABC/M issue, yet practitioners, in 100% of cases, turned out to be ABC/M enthusiasts (probably because they implemented the ABC/M system in their own companies). Examples of opinions expressed by the ABC/M enthusiasts, and those who were neutral, are presented in table 3.3.

3.3.3. Research method used in the publication

The analysis proved that different research methods i.e. descriptive works, literature reviews, analytical works, surveys and case studies, have been used in the publications on ABC/M (see figure 3.3). The methods were implemented in different manners. Descriptive works, presenting the general rules behind activity-based costing and activity-based management, were the most common (98 articles, 67.6%). The second method, most commonly used, especially from 2006, was case study (32 articles, 22.1%). The first survey researches on the subject of ABC/M appeared in 2002. Over the following years, approximately every second year, from one to three articles using this method were published. Generally, this research method has been used 11 times which constitutes 7.6% of all the publications. Publications in the form of a literature review and analytical work were published sporadically – respectively three times and once. The study shows that there is similarity between the use of research methods in Poland and in the United States and the United Kingdom – in all the countries such methods as surveys and case studies were implemented in a later period (Björnenak, Mitchell, 2000).

The analysis of research methods used in the publications may be difficult due to the fact that exact determining of the research method in the journals for practitioners (especially *Controlling and Management Accounting*) was sometimes difficult. Additionally, articles from *Bulletin of Theoretical Accounting* have been analyzed. Their more theoretical and formal character (the process of reviews) helped to determine the research method in a more precise manner.

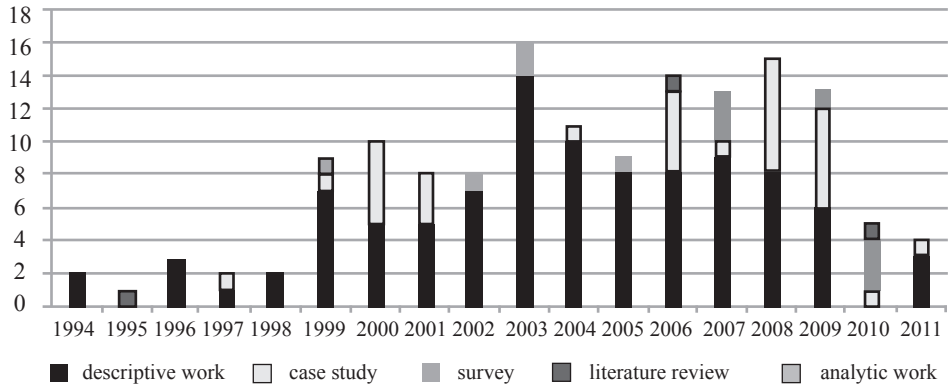

Figure 3.3. ABC/M research methods

The percentage of the research methods used in the publications is displayed below:

- descriptive (17 articles, 60.7%);
- literature review (2 articles, 7.1%);
- analytical (1 article, 3.6%);
- survey (3 articles, 10.7%);
- case study (5 articles, 17.9%).

The study showed substantial differences in bibliography references, depending on the type of journal and author's affiliation. As one might expect, the biggest number of bibliography references (20 on average, 6.8 national and 13.2 foreign) was found in the articles published in *Bulletin of Theoretical Accounting*. In *Controlling and Management Accounting* and *Accounting*, the number of bibliography references was respectively 2.4 and 4. Regardless of the type of journal, the largest number of bibliography references prevailed in the articles by academic researchers (7), and the least number in the works by consultants and practitioners (2).

The publications by academic researchers seem better in terms of methodology and arguments which support the presented theses. The publications are also more objective, as their authors are not pressured to present views compliant with the character of their working environment (unlike consultants). Yet, it needs to be emphasized that at least some part of university researchers who publish ABC/M articles are simultaneously consultants. Thus it may lead to conflict of interests and it burdens their publications with problems specific for the works of consultants.

3.3.4. Subject area of the publications

One of the most interesting phenomena characteristic of the ABC/M diffusion is the fact that there are substantially more and more publications which fall outside the activity-based costing (ABC) and focus more on the activity-based management (ABM). In the researched articles, 71.7% was devoted to ABC and 28.3% to ABM (see table 3.4). Interestingly, the area of ABM was presented more often in *Controlling and Management Accounting* (33.9% of publications) rather than in *Bulletin of Theoretical Accounting* (7.1%).

Table 3.4. Subject area of ABC/M publications, depending on the journal

Specification	CMA		Accounting		BTA		Overall	
Problem	n	%	n	%	n	%	n	%
ABC	74	66.1	4	80.0	26	92.9	104	71.7
ABM	38	33.9	1	20.0	2	7.1	41	28.3
Overall	112	100.0	5	100.0	28	100.0	145	100.0

The diffusion of activity-based costing and activity-based management can be observed in their spreading across various fields of business activity as well as processes realized by companies. Bearing in mind the distinction of companies into production and service firms (see figure 3.4), the ABC/M concept, in the early years (1994–1999) was almost exclusively presented in the context of production companies, whereas later (2000–2009) large number of publications was devoted to companies offering services. A similar pattern i.e. writing about production companies in the first stage and later about services companies (both private and public sectors), can be observed in the analysis of American and British publications (Björnenak, Mitchell, 2000).

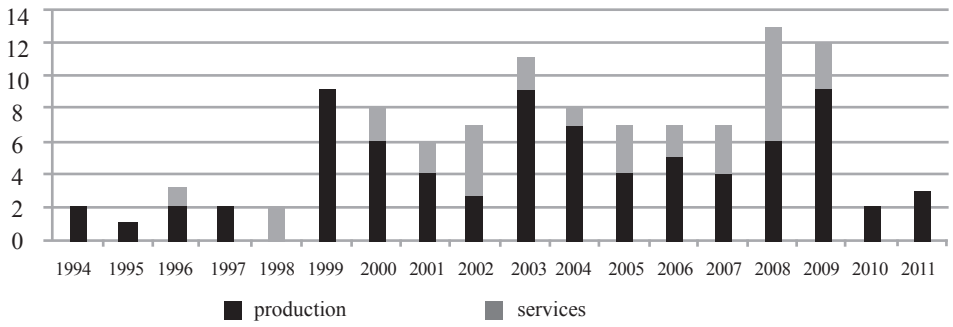

Figure 3.4. ABC/M publications in the context of production and service companies

A detailed analysis proved that the subject of ABC/M, in terms of production companies, was more often covered in the journals for practitioners (32.1% of publications) rather than in *Bulletin of Theoretical Accounting* (19.2% of publications).

In terms of processes realized in companies, it is worth noticing that from the beginning (1994) the ABC/M publications related to all the significant processes realized, starting from main processes through logistics, sales and marketing and ending with other remaining processes (see figure 3.5). The analysis showed that the publications frequently did not focused on only one process but presented ABC/M in the context of a few processes, often in the context of all the processes realized in companies. A detailed anlysis proved that the ABC/M subject in the context of various processes was presented in journals for practitioners (*Controlling and Management Accounting, Accounting*) and in *Bulletin of Theoretical Accounting* with similar frequency. An analysis of publications from the United States and the United Kingdom resulted in different findings (Björnenak, Mitchell, 2000); it showed that the issue of ABC/M in the context of many processes and management functions was mainly discussed in articles from journals on management accounting and addressed to practitioners.

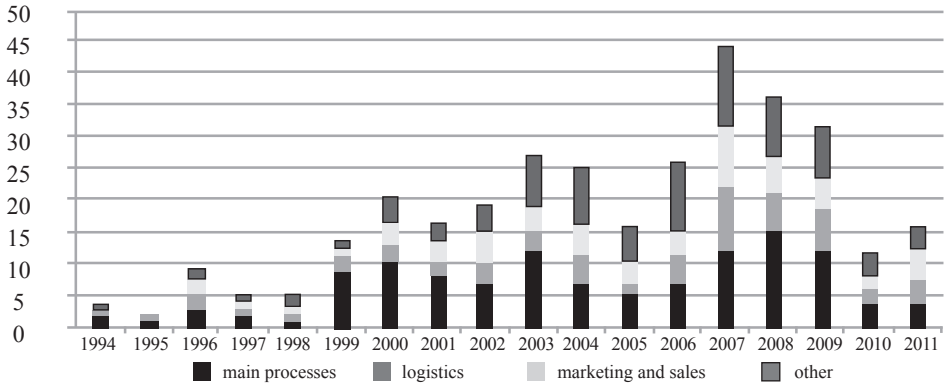

Figure 3.5. ABC/M publications in the context of processes

The study helps to form a statement that, over time, the growing number of ABC publications was accopmanied by the rise in the number of articles on ABM. Between 1994–1999 there were no publications on ABM but between 2000–2002, their number almost equaled the number of ABC publications and later between 2003–2011 it dropped in relation to ABC publications. It should be stressed here that the growth in the number of publications about ABC and ABM was accompanied by the growth in the number of references of ABC/M to other management accounting tools e.g. budgeting, transfer pricing etc. The vast number of references to other management accounting methods indicates innovative manner of ABC and ABM applications as well as enthusiasm for the use of the methods (see figure 3.6).

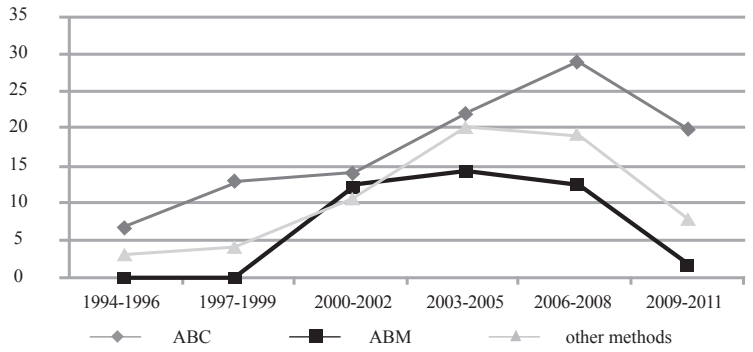

Figure 3.6. Diffusion of ABC and ABM and connections with other management accounting techniques and tools

A detailed analysis of ABC/M connections in the researched publications revealed that the references to other tools of management accounting are more frequent in *Controlling and Management Accounting* (51.9% of articles contain such references) than in *Bulletin of Theoretical Accounting* (29.2% of articles relate to other tools). Academic researchers more often refer to other methods of management accounting. Such references are evident in 51.3% of their articles whereas the percentage of publications by consultants and practitioners is 39.3%.

3.4. Summary and conclusions

ABC/M is undoubtedly one of the most important innovations in the field of management accounting in the 20th century. Diffusion of activity-based costing and activity-based management was observed in practice in many countries, as well in Poland. In order to understand better the process of ABC/M diffusion, 145 articles published in three Polish journals (*Controlling and Management Accounting*, *Accounting*, *Bulletin of Theoretical Accounting*) between 1994–2011 have been analyzed. On the basis of carried out research, bearing in mind the hypotheses formulated at the beginning of the study, following conclusions can be drawn:

1. The emergence and the significant rise in the number of ABC/M publications in Poland is approximately 6 years delayed in comparison to American or British publications. Similarly to the United States or the United Kingdom, the number of ABC/M publications in Poland, after the growth phase (8–16 articles a year between 1999–2009), dropped from the year 2010.

2. In Poland, similarly to the United States, the United Kingdom and France, the largest number of ABC/M publications appeared in specialist magazines for practitioners (80.7%) but they were mainly authored by academic researchers (55.9%).

3. Overwhelming majority of the authors can be described as enthusiasts of ABC/M (95.9%). None of the articles was written by ABC/M objectors and only 6 authors remain neutral. The author's approach to the issue of ABC/M is not influenced by the fact that they are academic researchers or consultants (practitioners were enthusiasts in 100% of cases). In this respect the research has similar results like the research in France (Alcouffe, 2004).

4. Descriptive works prevail among the research methods (67.6%), case studies are in the second place (22.1%). Research in the form of surveys, literature reviews or analytical works are sporadic.

5. The growing number of ABC publications was accompanied by the growth in the number of ABM publications as well as references and connections with other tools of management accounting. Huge number of connections with other methods of management accounting indicates innovative character of the concept and manifests enthusiasm for it.

As in developing countries the majority of ABC/M literature was published during the last decade, research on that phenomenon and comparative analysis of ABC literature in those countries and the highly developed countries was only possible in the last few years. In Poland due to historical conditions, the development of management accounting literature and especially ABC/M literature was less intense and delayed in comparison to the United States, the United Kingdom or France. As there were no so far any research in Poland aiming to analyze ABC/M literature, the study attempted to fill in the identified research gap i.e. to analyze journal literature on ABC/ABM accumulated in Poland during last seventeen years since the first article on ABC emerged. This research results support and broaden the studies of communication structure in management accounting research (Björnenak, Mitchell, 2000, 2002; Lukka, Granlund, 2002; Carmona, Gutierrez, 2003; Alcouffe, 2004). It may be continued so as to examine the diffusion of different innovative methods of management accounting in Poland e.g. balanced scorecard, target costing etc.

CHAPTER 4

DIFFUSION AND USE OF ACTIVITY-BASED COSTING IN POLAND IN THE LIGHT OF QUESTIONNAIRE RESEARCH

4.1. Introduction

At the turn of the 20th and the 21st century research into activity-based costing became extremely popular. As empirical studies reveal – the diffusion of ABC in companies in different countries varies significantly. On the one hand, the research is descriptive and shows degree of diffusion as well as characteristic features of ABC systems in practice in different countries. On the other hand, empirical research concentrates on the influence of such factors as company size, cost structure, competitive strategy or level of competiveness on the implementation, shape, functioning and use of activity-based costing systems.

However, most of the empirical research investigated the percentage of companies in different countries which: use activity-based costing, consider its implementation in the future, rejected activity-based costing implementation after analyzing its pros and cons, or never thought of implementing ABC system. Table 4.1 presents the results of the key research into the diffusion of ABC carried out both in developed countries (the United States, Canada, Australia, New Zealand, Great Britain, Ireland, Norway, Sweden, Finland, Germany, France, Italy) and in developing countries (China, India, Saudi Arabia, the Czech Republic and Slovakia).

Table 4.1. Comparison of results of questionnaire research into activity-based costing use

Research	Companies (in %)			
	using ABC	considering implementation of ABC	which rejected ABC implementation	which never considered ABC implementation
US				
NAA (1991)[a]	11.0	19.0	–	70.0
IMA (1993)	36.0	14.0	–	50.0
IMA (1995)	41.0	24.0	–	35.0
IMA (1996)	49.0	–	–	–
IMA (1997)	39.0	–	–	–
Grott (1999)[b]	17.0	–	–	–
Ho, Kidwell (2000)[c]	50.0[d]	15.0[e]	–	–
Kianni, Sangeladij (2003)	11.8	40.0[f]	0.0	48.2
Lawson (2005)[g]	14.0	–	–	–
Kennett *et al*. (2007)	16.0	24.0[h]	–	–
Canada				
Armitage, Nicholson (1993)	14.0	15.0	4.0	67.0
Gosselin (1997)	30.4	–	–	–
Bescos *et al*. (2002)	23.1	9.3	13.9	53.7
Australia				
Clarke *et al*. (1997)[i]	10.0	–	–	–
Askarany, Yazdifar (2007)[j]	14.0	11.0	–	–
Askarany, Yazdifar (2007)	28.0[k]	21.0	13.0	38.0
Baird *et al.* (2004)	41.9	–	–	–
New Zealand				
Love, Brader (1994)	17.0	21.0	–	–
Hoque (2000)	41.0	–	–	–
Cotton *et al.* (2003)	20.3	11.1	10.8	42.2
Great Britain				
Innes, Mitchell (1991)	6.0[l]	33.0	9.0	52.0
Davies, Sweeting (1991)	60.0[m]		–	–
Nicholls (1992)	10.0	18.0[n]	–	62.0
Bright *et al*. (1992)	32.0	62.0	–	–
Drury, Tyles (1994)	4.0	46.0[o]	5.0	45.0
Innes, Mitchell (1995)	21.0	29.6	13.3	36.1
Innes, Mitchell (1997)	54.0[p]	–	–	–

Table 4.1 (cont.)

Research	Companies (in %)			
	using ABC	considering implementation of ABC	which rejected ABC implementation	which never considered ABC implementation
Innes *et al*. (2000)	17.5	20.3	15.3	46.9
Kennedy, Affleck-Grave (2001)	20.1	–	–	–
Al-Omiri, Drury (2007)	15.0	–	–	–
Ireland				
Clarke *et al*. (1999)	11.8	20.6	12.7	54.9
Clarke, Mullins (2001)	19.0	13.0	5.0	63.0
Pierce (2004)	27.9	9.0	10.7	52.4
Norway				
Björnenak (1997)	56.6[r]	–	20.8	22.6
Sweden				
Ask, Ax (1992)	23.0[s]	–	–	–
Finland				
Lukka, Granlund (1996)	5.0[t]	25.0	–	–
Laitinen (1999)	15.0	–	–	–
Kallunki, Silvola (2008)	28.0	–	–	–
Germany				
Hauer (1994)	3.2	–	–	–
Horvath *et al*. (1998)	46.6	14.2	–	39.2
France				
Bescos *et al*. (2002)	23.0	22.9	11.9	42.2
Italy				
Cinquini *et al*. (1999)	10.7	31.0[u]	11.9	46.4
Cinquini *et al*. (2008)	17.9	23.9[w]	20.2	38.0
China				
Firth (1996)	17.2	–	–	–
Nanjing (2001)	9.0	–	–	–
Chow *et al.* (2007)	52.2	–	–	–
Parkinson (2009)	29.4	–	–	–
India				
Anderson, Lanen (1999)	0.0	–	–	–
Joshi (2001)	20.0	–	–	–
Anand *et al.* (2005)	28.3	–	–	–
Saudi Arabia				
Khalid (2005)	33.3	7.7	23.0	35.9

Table 4.1 (cont.)

Research	Companies (in %)			
	using ABC	considering implementation of ABC	which rejected ABC implementation	which never considered ABC implementation
Czech Republic and Slovakia				
Novák (2009)[y]	5.0	–	–	–
Novák (2009)	6.0	–	–	–

[a] Research of NAA from 1991, as well as all the following IMA research were conducted among the members of NAA and IMA.

[b] The research investigated only companies operating in the food industry.

[c] The research by Ho and Kidwell (2000), as well as the later one by Kennett *et al*. (2007), they were carried out on a sample of large cities.

[d] Among the companies, 20% used ABC globally, and 80% used it at least in one area of their operation.

[e] Those were the companies, which considered ABC implementation.

[f] The research embraced companies which had already begun the process of activity-based costing implementation.

[g] The research by Lawson (2005) involved companies operating in the healthcare sector.

[h] Among the companies, one-third was planning implementation and two-thirds were considering implementation in the future.

[i] The research was carried out in 1991.

[j] The research conducted in 1997.

[k] Two-thirds of the companies used activity-based costing on daily basis and one-third used it from time to time.

[l] In the research by Innes and Mitchell, this category embraced both companies which were implementing ABC and those which were supposed to implement it soon.

[m] Those were the companies which used activity-based costing as well as those which planned its implementation within the next three years.

[n] Those were the companies which experimented with ABC implementation.

[o] In Drury's and Tyles' research, this category embraced both companies that were planning to implement ABC (9%) and those which were considering ABC implementation (37%).

[p] This research was conducted on a sample of the biggest financial institutions.

[r] Companies which were implementing ABC but also firms which intended to implement ABC were listed among companies that were using activity-based costing.

[s] Those were the companies which were planning activity-based costing implementation.

[t] Those were the firms, which during the research, were implementing activity-based costing.

[u] Companies which were planning implementation and those which considered it were listed here.

[w] Companies which were planning implementation and those which considered it were listed here.

[y] The research was carried out in 2007.

The analysis of empirical research which is presented in table 4.1 helps to notice that the early research on activity-based costing investigating its diffusion in the early 1990s indicated a great interest in ABC among managers in most

of the highly-developed countries (NAA, 1991; Innes, Mitchell, 1991; Davies, Sweeting, 1991; Ask, Ax, 1992; Nicholls, 1992; Bright *et al*., 1992; IMA, 1993; Drury, Tyles, 1994; Hauer, 1994; Love, Brader, 1994; IMA, 1995; Innes, Mitchell, 1995; Armitage, Nicholson, 1993). However, the percentage of companies which implemented and used activity-based costing was relatively low at that time. Some of the researched companies were implementing ABC, yet relatively a larger group of companies was planning or intending to consider implementation.

Research carried out in the late 1990s showed that activity-based costing was used in a larger group of companies (IMA, 1996; Lukka, Granlund, 1996; Björnenak, 1997; Clarke *et al.*, 1997; Gosselin, 1997; IMA, 1997; Innes, Mitchell, 1997; Horvath *et al*., 1998; Cinquini *et al*., 1999; Clarke *et al*., 1999; Grott, 1999; Laitinen, 1999; Ho, Kidwell, 2000; Hoque, 2000; Innes *et al*., 2000). What seems significant, more and more companies were planning implementation or were considering activity-based costing implementation. On the other hand, cases of quitting ABC implementation after analyzing costs and benefits or rare cases of quitting ABC after its implementation and use for some time were evident. Despite the fact that the percentage of companies using activity-based costing or companies interested in its future implementation was higher than a few years earlier, yet the diffusion rate of the new system was lower than expected. Interestingly enough, the tendency was noted at a time when a record number of articles on activity-based costing was published and when the issue of ABC was included into the leading academic textbooks, university curriculums and vocational courses for management accounting specialists, and when consulting and computer companies competed in promotion of the new system. The phenomenon was called the ABC-paradox.

The research into activity-based costing diffusion which was carried out in the highly-developed countries in the first decade of the 21st century revealed that the percentage of companies using ABC was not growing and it remained at an average level, lower than anticipated (Clarke, Mullins, 2001; Kennedy, Affleck-Graves, 2001; Bescos *et al.*, 2002; Cotton *et al.*, 2003; Kianni, Sangeladij, 2003; Baird *et al.*, 2004; Pierce, 2004; Lawson, 2005; Al-Omiri, Drury, 2007; Askarany, Yazdifar, 2007; Kennett *et al.*, 2007; Cinquini *et al.*, 2008; Kallunki, Silvola, 2008). Moreover, the percentage of companies planning activity-based costing implementation or thinking about it in the future lowered whereas the number of firms quitting the implementation after analyzing its costs and benefits rose.

Analyzing the results of questionnaire research, it should be stressed that the results differ significantly. The percentage of companies using activity-based costing varies from zero to several dozen percent, it may stem from the following:

- the inadequacy of ABC in some companies – adoption of ABC in many companies may not provide significantly better results than traditional cost accounting systems in such areas as: saving time, labour input, implementability (people making decisions about ABC implementation are not convinced whether

this method is better than traditional techniques). Such interpretation complies with Chenhall's and Langfield-Smith's conclusions who suggest that benefits ensuing implementation of modern methods of management accounting still do not surpass benefits resulting from implementation of traditional methods. Such interpretation also explains the behaviour of companies which began implementation of an innovation however at some point ceased it (Innes, Mitchell, 1991);

- different understanding of ABC – results of all the research into diffusion of activity-based costing should be analyzed carefully because there is not any single and commonly accepted, both in theory and in practice, definition of ABC. Gosselin (1997) and Baird *et al.* (2004) emphasize that respondents are not exactly sure of what activity-based costing really is. The conclusions are also mirrored in the research of companies using ABC – the research proves that activity-based costing systems functioning in those companies are significantly different (Gosselin, 2007);
- the level of management accounting development – in general, in countries which are economically more developed, the use of management accounting methods is higher than in countries which are less developed or are still developing;
- sampling method – the studies into diffusion of activity-based costing were carried out both among large and small companies, manufacturing and non-manufacturing companies, financial institutions etc.;
- time of collecting information – in general, earlier studies show a significantly lesser percentage of companies using ABC. In all the countries, where the research on the diffusion of activity-based costing was carried out, the percentage of companies using ABC was increasing until the end of the 20th century and it later stabilized in the first decade of the 21st century.

In general, the presented research into the diffusion of activity-based costing may overestimate the percentage of companies using ABC because there was a lesser percentage of answers among companies which were not using ABC. Companies that do not adopt activity-based costing more often tend not to respond to survey research in comparison to companies using activity-based costing. The overestimated percentage of companies using ABC may also stem from the fact that majority of the research was carried out among management accounting specialists – their perception of ABC might vary from the one expressed by other managers.

The situation was different in developing countries. In the 1990s, cases of activity-based costing implementation in those countries were incidental and apart from a few exceptions (e.g. Firth, 1996; Anderson, Lanen, 1999), no research on the diffusion of ABC was carried out there. The interest in activity-based costing in developing countries increased at the beginning of the 21st century when cases of ABC implementation became more frequent and, therefore, studies of ABC diffusion in companies operating in the countries started to emerge (Nanjing, 2001; Joshi, 2001; Anand *et al.*, 2005; Khalid, 2005; Chow *et al.*, 2007;

Novák, 2009; Parkinson, 2009). Unlike in highly developed countries, where the interest in activity-based costing decreased and the percentage of companies with functioning ABC stopped to grow (some studies stated that the percentage lowered), in developing countries companies implemented activity-based costing more often. Yet, it needs to be stressed that the percentage of companies using ABC in developing countries (including Poland) is significantly lower than in companies operating in more developed countries.

The first study which proved that ABC was present in the practice of Polish companies was conducted by Sobańska and Wnuk (2000). Other research carried out by different researchers revealed rare cases of activity-based costing use or its elements (Jarugowa, Skowroński, 1994; Szychta, 2001, 2002; Karmańska, 2003; Januszewski, Gierusz, 2004; Januszewski, 2005[1]; Wnuk-Pel, 2006a; Szychta, 2006, 2007a). Sometimes, the studies signalized that the researched companies were implementing or were considering implementation of ABC (Dyhdalewicz, 2000, 2001; Szychta, 2001, 2002; Karmańska, 2003; Januszewski, Gierusz, 2004; Januszewski, 2005; Szychta, 2006, 2007a). Carried out studies quite often proved that not even a single company used activity-based costing or was planning its implementation, however those were the findings of some earlier research (Kinast, 1993; Sobańska, Szychta, 1995, 1996; Gierusz *et al.*, 1996; Radek, Schwarz, 2000; Szadziewska, 2002, 2003). The summary of the previous research investigating the diffusion of ABC in Polish companies is presented in table 4.2.

More detailed studies on the popularity of activity-based costing in Poland were carried out by Karmańska (2003), Januszewski and Gierusz (2004; Januszewski, 2005) and Wnuk-Pel (2006a). These studies explored, among others, the knowledge of ABC concepts, perceived benefits of ABC adoption, problems anticipated by companies considering ABC implementation, reasons for rejecting this system, and problems which occurred in the implementation process.

The study by Karmańska (2003), in a form of a survey, examined a sample of 342 companies to find out the level of knowledge of activity-based costing among Polish managers. Nearly half of the respondents (48%) reported fairly good or limited understanding of the concept of ABC (only 20% declared very good knowledge). The rest of the respondents (52%) admitted never having heard of it or having heard but knowing nothing about it. These findings are consistent with the results of a survey of 101 large companies in northern Poland, conducted by Gierusz and Januszewski (2004; Januszewski, 2005): 44% of the interviewees declared good or very good knowledge of activity-based costing, 47% said to have only some vague information about it, and 9% – to have never heard of it. Gierusz and Januszewski also found that familiarity with the concept of ABC is much greater among managers in companies with foreign capital and privatised companies rather than in private companies with Polish capital.

[1] See Januszewski (2004a, b).

Table 4.2. Diffusion of activity-based costing in Poland based on the previous research

Authors	Research method	Number of companies studied	Companies			
			using ABC	using elements of ABC	implementing ABC	considering implementation of ABC
Kinast (1993)	case studies	9	0	–[a]	–	–
Jarugowa, Skowroński (1994)	case studies	1	0	1	–	–
Sobańska, Szychta (1995, 1996)	survey	20	0	–	–	–
Gierusz *et al.* (1996	survey	60	0	–	–	–
Sobańska, Wnuk (1999, 2000, 2001); Sobańska (2002)	survey and case studies	104	2	–	–	–
Radek, Schwarz (2000)	survey	200	0	–	–	–
Dyhdalewicz (2000, 2001)	case studies	10	0	–	–	1
Szychta (2001, 2002)	survey and case studies	60	0	3	1	–
Szadziewska (2002, 2003)	survey	246	0	–	–	–
Karmańska (2003)	survey	342	1	–	3	–
Januszewski, Gierusz (2004); Januszewski (2005)	survey	101	3	5	1	29
Wnuk-Pel (2006a)	survey	6	6	0	0	0
Szychta (2006, 2007)[a]	survey	90	9	–	–	13

[a] „–"symbol means that the given feature was not analyzed in the research.

The study carried out in 2003 by Karmańska (2003) revealed that managers in the companies surveyed see the need for detailed analysis based on indicators other than accounting criteria, which they consider to be an argument in favour of adoption of ABC. Other factors conducive to ABC adoption were: (a) urgent

need to examine what we do in our company and how it is done (26.7%), (b) availability of sufficient funds and qualified personnel (21.9%), (c) ambitious, committed employees (10.3%), (d) management support (8.2%), (e) employees' capacity for quick learning (7.5%).

The research by Gierusz and Januszewski (2004; Januszewski, 2005) found that more than half of the respondents (55%) believed activity-based costing to be useful in managing a company, 17% regarded it as rather not useful, and 4% – as quite useless. Among potential uses of ABC system in a company the respondents named: (a) measurement of efficiency of activities and processes (45 companies), (b) measurement of product cost and profitability (44 companies), (c) measurement of customer cost and profitability (43 companies), (d) cost budgeting (42 companies) (e) identification of non-value adding activities (23 companies).

The number of ABC implementations in companies operating in Poland is relatively low. Some of the companies gave up the idea of implementing this costing model after weighting the costs and benefits of its undertaking. A considerable part of the companies are considering ABC adoption. Major reasons for rejecting ABC adoption (13 of the 101 companies surveyed) were found to be, in order of importance: (a) very high cost in relation to anticipated benefits, (b) labour-intensity of the project, (c) lack of adequate knowledge of ABC, (d) lack of management support, (e) shortage of qualified staff, (e) lack of adequate information technology (Gierusz, Januszewski, 2004; Januszewski, 2005).

The same research (Gierusz, Januszewski, 2004; Januszewski, 2005) found that reasons for non-consideration of ABC adoption were (in order of importance): (a) satisfaction with information generated by the currently used costing system (26 companies), (b) lack of sufficient knowledge of ABC (5 companies), (c) lack of funds for a new information system implementation and for employee training, (d) consistency of existing cost system with the corporation's policy and standards (2 companies).

The study by Karmańska (2003) identified the problems that were expected in ABC implementation by companies considering adoption of this costing model. Major barriers mentioned by the respondents included: (a) insufficient knowledge of ABC concept (31.4%), (b) resistance to change (18.6%), (c) lack of sufficient financial resources (17.4%), (d) absence of need for change because the company's performance is satisfactory (5.8%).

The application of activity-based costing systems in Polish companies was also examined on the basis of six ABC implementations (Wnuk-Pel, 2006a). The study identified, among others, major problems that were encountered during ABC implementations in the companies examined and their perceived importance. The problems included: (a) high labour input in ABC implementation and operation (important), (b) problems with model construction (e.g. selection of activities, drivers) (moderately important), (c) insufficient knowledge of ABC

among employees (moderately important), (d) lack of management support (little importance), (e) high cost of ABC implementation and operation (little importance), (f) other priorities, e.g. implementation of ISO, TQM, ERP (little importance), (g) lack of adequate information resources (little importance).

In sum, there is a considerable body of research on the popularity of ABC in Poland, the extent of its adoption and the functioning of ABC systems in Polish companies. Overall, it has been found that the percentage of companies using, installing or considering instalment of ABC is growing. Empirical research makes it possible, though to a limited degree, to identify factors affecting adoption/ rejection of this costing model and problems in its implementation.

4.2. Research method

In terms of activity-based costing, so far in Poland there have been some questionnaire research carried out, which investigated, on the one hand, the degree of diffusion, and on the other hand, the way ABC systems functioned. The studies prove that the percentage of companies using activity-based costing, implementing it or considering its future implementation is growing. To some extent, the research allows to analyze the way ABC functions and how the information generated by the system is used. The author of this work with his research (surveys, case studies and action research) fits into the trend of such empirical studies.

Two questionnaires (A and B) have been used in the research on the diffusion and use of activity-based costing. Survey A aimed to verify the hypothesis about the degree of modern methods of cost accounting diffusion in Polish companies, including in particular activity-based costing. The survey also aimed to investigate factors influencing the fact that most of the companies operating in Poland did not even consider implementation of activity-based costing or thought about it, or after analyzing its potential costs and benefits rejected its implementation. Survey B was carried out to verify the hypotheses about the reasons underlying the implementation, as well as the ways of activity-based costing functioning in Polish companies (survey B was carried out only among companies which used activity-based costing). In particular, this survey was supposed to define the basic causes of ABC implementations and it aimed to identify the main problems related to activity-based costing implementation. The questionnaire additionally was to analyze the structure of activity-based costing and its functioning in Polish companies. What is more, the research carried out by means of survey B aimed to investigate the areas in which information from activity-based costing was used, and to define whether the implementation of activity-based costing was accompanied by the use of other modern methods of cost accounting and management accounting.

Within the empirical research project, carried out by means of questionnaires, several stages have been isolated: formulation of hypotheses, selection of research methods and objects, research design, making sure that the study is credible and reliable, data collection, evaluation and analysis of data[2]. As it has been previously mentioned, in order to reach the main objective of the work and to prove the main research thesis, two surveys have been carried out. The surveys aimed to verify the following specific hypotheses:

a) companies operating in Poland mostly use traditional systems of cost accounting; modern systems such as target costing or activity-based costing are used sporadically and their diffusion is significantly lesser than in Western countries;

b) implementation of activity-based costing is influenced by various factors; the most important are: headquarters' demand (e.g. parent company), rise of competition and the drive to expand into new sales markets, dissatisfaction with the previous cost accounting, change of organizational structure or strategy, implementation of new technologies, desire to reduce costs and improve results, change-oriented attitude of employees, accessibility of financial and human resources;

c) among the most important problems related to the process of activity-based costing, which companies are afraid of, one could mention: lack of management support, high implementation and maintenance costs, significant labour input during ABC implementation and maintenance, other priorities, insufficient knowledge of ABC, difficulties with system structuring, lack of adequate resources;

d) lack of interest in implementation of activity-based costing or resignation from ABC implementation are conditioned by: satisfaction with current cost accounting system, low indirect costs, lack of management support, high costs of ABC implementation and maintenance, high labour input during ABC implementation and maintenance, other priorities, insufficient knowledge of ABC among employees, difficulties with system modelling, lack of adequate IT resources;

e) the most important factors which positively influence ABC implementation are: high direct costs, high competition, foreign capital share in the company and size of the company;

f) the structure of activity-based costing systems which function in Polish companies is consistent with the structure of systems functioning in foreign companies;

g) in companies, which implemented activity-based costing, information obtained from the system is used in different ways by particular departments and it enables making various decisions;

[2] Stages of the study are compliant with the stages of empirical research in management accounting (see: Ryan *et al.*, 2002).

h) companies, in which activity-based costing operates, simultaneously use other modern methods of management.

The pilot survey, conducted on a relatively small sample of 50 companies, helped to create questionnaires, which were later used in the research (questionnaires A and B). Initially, the author was aiming to conduct the research investigating the degree of activity-based costing diffusion in Polish companies by means of a questionnaire sent by mail to a group of 3000 large companies. However, the author came across an extremely important problem during the research – out of 3000 companies, to which the questionnaire was sent, only 15 sent it back and that constituted 0.5% of all surveyed companies. The situation made the author change the way the questionnaire A, were distributed. Participants of MBA and postgraduate studies, as well as candidates for chartered accountants (during the trainings, the issue of cost accounting and management accounting, especially activity-based costing were discussed) and participants of various specialist courses on cost accounting and management accounting and activity-based costing were asked to complete the questionnaire. Such distribution of questionnaires made the sample unrepresentative. In order to analyze the way activity-based costing functioned in Polish companies (by means of questionnaire B), it was necessary to identify companies which had implemented ABC. According to the author's knowledge, the population of companies using activity-based costing is small, therefore, in order to reach as many companies using activity-based costing as possible, the author made use of every potential source he knew, especially:

- findings of his own questionnaire research (questionnaire A), in which companies declared ABC use;
- ABC projects and implementations, which the author completed during his consulting activity;
- every publication describing companies using activity-based costing known to the author;
- conference papers and training materials which mentioned companies using ABC;
- information from IT and consulting firms, which participated in ABC implementations.

To analyze the degree of ABC diffusion in Polish companies (questionnaire A), three basic groups of variables have been used: variables characterizing the researched company, variables characterizing the cost accounting system used within the company and variables characterizing the company's attitude towards ABC. In order to analyze the activity-based costing systems functioning in Polish companies (questionnaire B), three basic groups of variables have been used: variables, which generally characterize ABC in the researched company, variables characterizing the structure of ABC in the given company and variables characterizing the use of ABC within the researched company. The choice of

groups and individual variables in both questionnaires (A and B) was made in compliance with the objectives of the study, and it was important to analyze the systems of activity-based costing functioning in Polish practice in its most competent and reliable way.

During preparations and conducting the surveys, the author undertook numerous activities, which were to ensure the structural reliability of the research, internal and external reliability, as well as validity of the study. The activities may be summarized as follows:

- structural reliability – the conducted research was preceded by extensive literature studies, which enabled the choice of adequate theoretical concepts and proper research methods to the analyzed phenomenon (research into activity-based costing in Polish companies). The literature study included the use of survey method for analysis of activity-based costing diffusion and its functioning in Poland and in the world;
- internal reliability – in order to maintain the internal reliability of the research, it was ensured that the respondents, who answered the questionnaire, had knowledge of the analyzed phenomenon i.e. cost accounting functioning within the researched companies; conducting the studies in such way was to prove the existence of a cause-and-effect relationship between the data and the findings;
- external reliability – in order to maintain the external reliability, the results of the conducted research were compared to the results produced by other authors (from Poland and other countries). Due to the fact that the choice of a sample was non-random, the findings of the research cannot be statistically referred to all the companies within the investigated population (companies operating in Poland);
- validity – to ensure the validity of the study, adequate procedures and means of documenting (filing of the reviewed surveys, entering data to the data base etc.) had been established prior to the research.

The research into the diffusion of activity-based costing in Polish companies (survey A) included 1267 respondents. The author received 531 questionnaires, out of which 495 qualified for further research (incomplete surveys were rejected and repeated questionnaires – two or more from the same company were also not taken into consideration). The percentage of correctly filled in surveys (questionnaire A) was 39.1%. For the purpose of the analysis of activity-based costing implementation process and ABC functioning in Polish companies (by means of questionnaire B), 71 companies were identified, which used activity-based costing (46 companies were identified by means of the author's own questionnaire research, and 25 by other means). The author contacted the companies in person, by the telephone or via e-mail, he sent them detailed questionnaire investigating the problems related to the ABC implementation process, the structure of ABC systems and ways of ABC use (questionnaire B). The companies responded with 33 correctly filled in questionnaires. The author checked to make sure that the

respondents had practical knowledge of activity-based costing use – the persons were responsible for the process of ABC implementation and modifications of activity-based costing in their companies. The percentage of correct surveys received in the research (questionnaire B) was 46.5%. The percentage of correctly filled in surveys (questionnaire A – 39.1% and questionnaire B – 46.5%) was quite high because the author had direct, personal contact with the respondents.

The analysis and evaluation of the gathered documentation, in the form of questionnaires (A and B), constituted the last stage of the empirical research. The amassed research material was verified in terms of cross-compliance. The questionnaire research verified the surveys in terms of internal integrity, it was analyzed e.g. if a respondent marked in one of the questions that the company used activity-based costing, and in another question that the company was just considering ABC implementation. Both descriptive analysis and tests of statistical significance for average values, as well as chi-square tests were applied[3]. The results of the research are presented in sections 4.3 and 4.4.

4.3. Diffusion of ABC in Poland

4.3.1. General description of the companies covered by the survey

The survey respondents (questionnaire A) represented both manufacturing and non-manufacturing companies, with a slight predominance of non-manufacturing firms (268, i.e. 54.1% of the 495 companies covered by the survey). The manufacturing firms made up 45.9% (227). Nearly a half of surveyed companies (46.6%) pursued the cost strategy, supplying mass-produced goods to their customers, while the rest (53.4%) followed the differentiation strategy, providing their customers with special products. 46.7% of the survey respondents regarded competition in their companies' main area of activity as strong, while other respondents believed it to be moderate (31.9%) or weak (21.3%). As far as the source of equity capital in the companies in question is concerned, in 299 firms (60.5%) it is solely domestic capital, 77 firms (13.6%) have mixed capital, and 128 (25.9%) have only foreign capital. Nearly a half of the companies (45.8%) sell their products in domestic markets only, and the remaining companies (54.2%) – both in the country and abroad. It is worth noting that for 16.4% export sales constitute more than a half of their total sales, and 12 companies (2.5%) are solely engaged in export sales. The number of employees – a variable used in this research project to define the size of the companies – is presented in table 4.3.

[3] Such statistical tools are quite often used when the diffusion of activity-based costing and evaluation of cost accounting systems are studied (e.g. McGowan, 1998; Byrne *et al.*, 2009).

Table 4.3. The number of employees in the companies surveyed

Specification	n	%
1–100 employees	185	37.4
101–500 employees	192	38.8
501–1000 employees	51	10.3
More than 1000 employees	67	13.5
Total	495	100.0

It should be noted that small entities were the dominant group among non-manufacturing enterprises (48.5%), as compared with 24.2% for manufacturing companies. In the remaining size categories (medium, large and very large companies) manufacturing entities dominated – 45.8% employed 101–500 persons, 14.5% had 501–1000 employees and 15.4% had more than 1000 employees. In the group of non-manufacturing companies 32.8% were medium-sized entities (101–500 employees), 6.7% were large entities (501–1000 employees) and 11.9% were very large entities (more than 1000 employees).

4.3.2. Characteristics of cost accounting systems used in the companies

The findings of the questionnaire survey suggest that the actual shape of the cost accounting systems used currently in these enterprises is defined by their management in more than half of the cases – of the 486 companies which provided answers to this question, as many as 270 (55.5%) responded in this way. In 114 enterprises (23.5%) the shape of cost accounting is determined in part by the management and in part by the headquarters (e.g. parent company), and in 102 (21%) it practically depends on the head office (e.g. parent company).

As regards the time that existing cost accounting systems were implemented, there are considerable differences among the sample enterprises. In 188 (39.7%) of them the systems used currently are relatively „young" – they had been implemented not earlier than three years before this questionnaire. In nearly half of the enterprises (229, 48.3%) costing systems had been implemented 4 to 10 years earlier, and in 57 (12%) they are „older" than 10 years. It is interesting to note that in as many as 88% of cases there was a change of the costing system in the last ten years. In the majority of the companies surveyed the proportion of indirect costs in total costs grew in the last ten years – in 52 cases (36.4%) the rise was insignificant, and in 79 (18.9%) it grew significantly. In 96 enterprises (23%) no change in the proportion of indirect costs was observed, and in 91 (21.8%) it was reported to have decreased. The majority of the enterprises (392, 79.2%) apply actual cost accounting (full or variable),135 (27.3%) use standard costing (full or variable), and 60 (12.1%) use multi-step and multi-bloc costing. More

advanced costing methods are applied to a rather limited extent – target costing was reported to be used only in 9 companies and ABC in 46.

It has to be stressed however that the question about companies using activity-based costing is not an easy one to answer because there is some confusion around ABC and the concepts that are relevant to it. ABC systems used in practice differ one from the other, for example the research conducted by Gosselin and Mevellec (2004) which interviewed managers from 42 companies from France and Canada revealed that none of the ABC systems analyzed were similar[4]. Because there is no single definition of ABC, results of present survey and all the surveys on ABC have to be analyzed cautiously (Gosselin, 1997; Baird *at al.*, 2004). What is even more important it is possible that in most of ABC surveys (this one not being an exception), the rate of ABC implementation could be overestimated because (a) respondents from companies not using ABC may not be inclined to answer ABC surveys and (b) sample was based on companies which were taking part in accounting courses which could cover firms interested more than average in new costing techniques. Similarly Baird *et al.* (2004) stressed that questionnaire surveys were overstating the level of ABC implementation and that there was the gap between the leading edge practices described in literature and current practices within organizations.

4.3.3. Analysis of attitudes towards ABC

The first question in this section of the questionnaire asked respondents about their companies' attitude to activity-based costing. As anticipated, the majority of the companies (302, 65.1%) has not so far considered adopting ABC, and 19 (4.1%) have considered its adoption and decided against it, so 69.2% of the examined companies has not implemented ABC and is not planning to do so. 46 firms (9.3%) have implemented activity-based costing and 97 (20.9%) are considering its adoption in the future. The subsequent part of the chapter analyzes, successively:

1) problems envisaged by companies which have never considered ABC adoption or rejected it after cost-benefit analysis;

[4] Confusion is even greater because academics and practitioners use the multiplicity of expressions and abbreviations for activity-based costing methods and models: activity accounting (Brimson, 1991), ABM – activity-based management (Turney, 1992; Reeve, 1996), AA – activity accounting (Gosselin, 1997), ACA – activity cost analysis (Gosselin, 1997), CDA – cost driver analysis (Gosselin, 2007), some authors use also the term of ABCM – activity-based cost management (Foster, Swenson, 1997). Companies using ABC, use more or less complex system, Gosselin (1997) distinguished four levels of complexity: activity analysis, activity cost analysis, pilot ABC and full ABC which is the ultimate level of activity-based costing implementation meaning the costing system in which all products are valued on the basis of the output of the ABC system, ABC information is used both for managerial purposes and financial reporting as well as for the purposes of transfer pricing, make or buy decisions, performance measurement or strategic decisions. There is no evidence in the research that such a system exists in practice.

2) problems envisaged by companies considering ABC adoption;
3) problems encountered by companies during ABC implementation;
4) reasons for ABC implementation.

Table 4.4. Reasons for non-consideration or rejection of ABC

Specification	Mean[a]	Standard deviation	Variability coefficient	Dominant value
Other	4.31	1.18	0.27	5
Insufficient knowledge of ABC among employees	4.05	1.09	0.27	5
High labour input in ABC implementation and operation	3.99	0.96	0.24	4
High cost of ABC implementation and operation	3.82	1.00	0.26	4
Difficulty with model construction (e.g. selection of activities)	3.64	1.06	0.29	4
Lack of adequate IT resources	3.29	1.41	0.43	5
Lack of management support	3.17	1.46	0.46	5
Other priorities (e.g. implementation of ISO, ERP)	2.87	1.47	0.51	1
Low levels of indirect costs	2.49	1.21	0.49	3
Satisfaction with existing cost system	2.46	1.31	0.53	1

[a] The respondents evaluated the importance of reasons for non-consideration or rejection of ABC using the following scale: 1 – unimportant, 2 – little importance, 3 – moderately important, 4 – important, 5 – very important.

The next question asked the respondents to evaluate the importance of possible reasons for lack of interest in ABC implementation or its rejection (see table 4.4). Five top ratings among factors (these factors statistically and significantly (more than the average rating 3) impeded ABC implementation) believed to be important in this respect were given to:

1) other – the respondents listed here lack of guidelines from headquarters abroad, the need to measure profitability at the level of headquarters' (located abroad), too small scope of activity, fast and not completely predictable growth of the company, inadequate financial resources, lack of awareness of the need for proper cost calculation, negative attitude of the accounting department (average rating 4.31; t = 3.99 statistical significance 0.01);

2) insufficient knowledge of ABC among employees (average rating 4.05; t = 9.47 statistical significance 0.01);

3) high labour input in ABC implementation and operation (average rating 3.99; t = 10.03 statistical significance 0.01);

4) high cost of ABC implementation and operation (average rating 3.82; t = 7.78 statistical significance 0.01);

5) difficulty with model construction (average rating 3.64; t = 5.55 statistical significance 0.01).

The factors regarded as moderately important include lack of adequate IT resources (3.29), lack of management support (3.17) and other priorities (2.87). Low levels of indirect costs (2.49) and satisfaction with the costing system used currently (2.46) were considered to be the least important. Previous research among companies in Poland (Gierusz, Januszewski, 2004; Januszewski, 2005) found similar reasons for rejecting ABC adoption – three major were very high cost in relation to anticipated benefits, labour-intensity of the project, and lack of adequate knowledge of ABC. The same research (Gierusz, Januszewski, 2004; Januszewski, 2005) found that major reasons for non-consideration of ABC adoption were satisfaction with information generated by the currently used costing system, lack of sufficient knowledge of ABC, and lack of funds for a new information system – the same reasons were identified in present research.

Similar problems to those anticipated by the companies considering activity-based costing implementation and identified in this research, can be found in other studies conducted in different countries e.g.:

1) in Great Britain (Cobb *et al.*, 1992), the lack of decision about implementation of activity-based costing was caused by high labour input in ABC implementation and existence of other priorities than the ABC implementation;

2) in Sweden (Ask, Ax, 1992), the key problems related to implementation of new systems of costs accounting included other management priorities, familiarity with the current cost accounting system, lack of knowledge and understanding of the alternative methods of cost accounting and lack of adequate data;

3) in Saudi Arabia (Clarke, Mullins, 2001), the analysis of companies not using ABC enabled to define the reasons for rejection or non-consideration of ABC implementation – among the basic causes one may find satisfaction with the existing cost systems, as well as the lack of sufficient knowledge required for implementation of activity-based costing;

4) in Australia (Askarany, Yazdifar, 2007), the variables which condition the slow diffusion of ABC are: the lack of adequate IT resources, high cost of ABC implementation and operation, high cost of information gathering, lack of information about modern methods of cost accounting, management policy and priorities and lack of knowledge of cost accounting.

With regard to potential problems envisaged by companies considering ABC adoption (see table 4.5), three top ratings were assigned to[5]:

[5] Factors number two and three may according to respondents statistically and significantly (more than the average rating of 3) impede implementation of ABC. The influence of factor one on

1) other – the problems cited here by the respondents include telecommunications law and energy law requirements, corporate directives, implementation of an integrated information system, fear of novelty, and lack of teaching materials addressing ABC implementation in their particular industry (average rating 4.00);

2) insufficient knowledge of ABC among employees (average rating 3.97; t = 9.13 statistical significance 0.01);

3) high labour input in ABC implementation and operation (average rating 3.66; t = 5.73 statistical significance 0.01).

Table 4.5. Problems expected by companies considering ABC adoption

Specification	Mean[a]	Standard deviation	Variability coefficient	Dominant value
Other	4.00	0.71	0.18	4
Insufficient knowledge of ABC among employees	3.97	0.95	0.24	4
High labour input in ABC implementation and operation	3.66	0.97	0.27	4
Difficulty in model construction (e.g. selection of activities)	3.45	0.86	0.25	4
High cost of ABC implementation and operation	3.13	0.93	0.30	3
Lack of adequate IT resources	2.88	1.29	0.45	4
Other priorities (e.g. implementation of ISO, ERP)	2.51	1.27	0.51	1
Lack of management support	2.11	1.12	0.53	1

[a] The respondents indicated the perceived importance of the factors listed above by assigning ratings according to the following scale: 1 – unimportant, 2 – little importance, 3 – moderately important, 4 – important, 5 – very important.

Potential problems regarded as moderately important include difficulty with ABC model designing (3.45), high cost of ABC implementation and operation (3.13), lack of sufficient IT resources (2.88), and other priorities (2.51). Lack of management support for ABC implementation is believed to be the least important problem. Previous research among companies in Poland (Karmańska, 2003) identified that most important problems that were expected in ABC implementation by companies considering adoption were insufficient knowledge of ABC concept, resistance to change, and lack of sufficient financial resources – the same reasons were identified in present research (with an exception of resistance to change). Similar problems to those identified in present research and anticipated by companies considering activity-based costing implementation were observed in studies carried out in other countries, e.g. in Ireland (Pierce, 2004), among the

the ABC implementation is significant yet not statistically important.

main problems respondents enumerated insufficiency of resources needed for implementation and its high costs along with the vague implementation benefits, which were difficult to evaluate.

Table 4.6. Main problems during ABC implementation

Specification	Mean[a]	Standard deviation	Variability coefficient	Dominant value
High labour input during ABC implementation and operation	3.55	0.97	0.27	4
Insufficient knowledge of ABC among employees	3.42	0.99	0.29	4
Problems with model (selection of activities, drivers etc.)	3.25	0.92	0.28	3
Other	3.00	2.00	0.67	1
Lack of adequate IT resources	2.68	1.44	0.54	1
High cost of ABC implementation and operation	2.33	1.09	0.47	3
Lack of support from management/head office etc.	1.81	1.14	0.63	1
Other priorities (implementation of ISO, TQM, ERP etc.)	1.80	1.12	0.62	1

[a] The respondents assessed the significance of problems according to the following scale: 1 – no problem, 2 – insignificant, 3 – moderately significant, 4 – significant, 5 – very significant.

As far as problems with ABC implementation are concerned (see table 4.6), high labour input in implementation and maintenance were named as considerable problem (average grade – 3.55; t = 3.23 statistical significance 0.01). None of the problems listed in the survey questionnaire was assessed as significant or very significant. The respondents named four problems, assessed by them as moderately important:

1) insufficient knowledge of ABC among employees (average grade 3.42);

2) difficulties with model designing, e.g. choice of activities, drivers etc. (average rating 3.25);

3) other problems, such as resistance to change (foodstuffs manufacturing company) or mutual antagonism caused by disclosure of individual divisions profitability as a result of activity-based costing implementation (service company) (average rating 3);

4) inadequate IT resources (average rating 2.68).

Problems evaluated as insignificant included: high costs of ABC implementation and maintenance (2.33), lack of management/headquarters etc. support (1.81), and other priorities, e.g. adoption of ISO, TQM or ERP (1.80). Previous research

among companies in Poland (Wnuk-Pel, 2006a) identified major problems that were encountered during ABC implementations – the problems included: high labour input in ABC implementation and operation (important), problems with model construction (moderately important), insufficient knowledge of ABC among employees (moderately important), lack of management support (little importance), high cost of ABC implementation and operation (little importance), other priorities, e.g. implementation of ISO, TQM, ERP (little importance), and lack of adequate IT resources (little importance). Exactly the same problems and in the same order of importance were identified in present study.

Similar problems to those observed in present research, were also evident in other studies on the diffusion of activity-based costing carried out in different countries. In Great Britain, Innes and Mitchell (1998) observed that the high labour input related to the implementation process and later to the operation of the system is perceived as a problem. Apart from that, four other problems connected to the activity-based costing implementation were isolated: the difficulty with cost drivers data collection, problems with identification of processes performed by many organizational units, other priorities and substantial workload of financial and accounting employees. Nicholls (1992) observed that the companies enumerate among the key difficulties related to the implementation of ABC such issues as: little access to data, insufficiency of resources, negative attitude to changes and lack of trainings[6]. Friedman and Lyne (2000) noticed a variety of organizational consequences related to the implementation of activity-based costing, among them: behavioural problems stemming from the division of activities into value and non-value adding, the new way of discussion about companies' problems and the change of attitude and relationship between the management accounting specialists and operational managers.

In Ireland, the study by Clarke *et al.* (1999) showed that among the most important problems connected to the ABC implementation there were: defining activity costs (50%), identification of cost drivers (42%), inaccessibility of adequate software (38%) and difficulty in defining activities (33%). On the other hand, the study by Clarke and Mullins (2001) enabled identification of conceptual and institutional problems that companies implementing activity-based costing come across. The major conceptual problems were: problems with data collection about cost drivers (89%), problems with identification of drivers for calculation of costs for products (78%), difficulties in calculation of activity costs (56%) and problems with

[6] Research conducted among organizations operating within the healthcare sector in the United States (Lawson, 2005) showed that, similarly to other sectors of economy, the main problems related to the process of ABC implementation (according to companies which had implemented ABC) are: difficulties with the definition of activities, activity drivers and means of cost calculation for activities, and insufficiency of resources (including IT resources). The research also stressed that, dissimilarly to other sectors, there were problems with involvement and management support in the implementation process.

defining activities (56%). Among the main institutional problems, there were: poor education of managers and accountants (67%), lack of time (56%), insufficiency of adequate resources (44%) and lack of guidelines for ABC implementation (44%).

In research conducted in developing countries e.g. India (Anand *et al.*, 2005), companies implementing activity-based costing enumerated among the major problems such issues as: difficulties in gathering information about costs in new cross-sections (42.3%) and difficulties in defining activities (34.6%)[7]. In research carried out in Saudi Arabia (Khalid, 2005), the main problems with activity-based costing implementation included insufficient knowledge and difficulties in calculating cost drivers.

Analyzing problems related to the process of activity-based costing implementation, perceived from the point of view of companies which rejected the implementation or never considered it (table 4.4), or companies which are considering implementation (table 4.5) and companies which have already implemented ABC (table 4.6), one may notice that all the problems are similar. A more detailed analysis reveals that, in reality, the problems were less significant in companies that have already implemented ABC than the expected problems in companies that considered implementation or companies that did not consider implementation or those companies that quit implementation. In conclusion, it may be stated that companies, which do not use activity-based costing, overestimate the expected problems. Misunderstanding of problems related to the process of activity-based costing implementation by companies which do not use the system was identified by Clarke *et al.* (1999). The researchers, while studying Irish companies, noticed that the companies, which quit implementation, among the least important problems enumerated difficulties in calculation of costs and activity drivers, as well as insufficiency of IT resources, and that contradicts opinions of companies which had already implemented ABC.

The next question asked respondents to indicate which of the factors listed in the questionnaire had influenced the decision to implement ABC in their enterprises and to what extent. The results (see table 4.7) suggest that four factors were vitally important or important for ABC adoption (these factors are statistically significant and significantly (more than the average rating of 3) influenced ABC implementation):

1) other reasons – the respondents cited such factors as the need to value non-standard products and to obtain accurate information for managing activities, or application of an ABC system by the competitors (average rating 4.80; $t = 9.00$ statistical significance 0.01);

2) the need for cost reduction and performance improvement (average rating

[7] Studies on the diffusion of activity-based costing in a developing country i.e. China (Parkinson, 2009) enabled isolation of the key factors behind a successful ABC implementation; the factors were: management support, sufficient financial resources, quality of support information systems and knowledge as well as dedication of middle management. The lack of involvement from the top management was identified as the main difficulty.

4.03; t = 6.70 statistical significance 0.01);

3) changed management information needs (average rating 3.91; t = 5.91 statistical significance 0.01);

4) the need for improvement of management control (average rating 3.62; t = 3.56 statistical significance 0.01).

Table 4.7. Reasons for implementation of activity-based costing

Specification	Mean[a]	Standard deviation	Variability coefficient	Dominant value
Other	4.80	0.45	0.09	5
Need for cost reduction and performance improvement	4.03	0.94	0.23	4
Changed management information needs	3.91	0.90	0.23	4
Need for improvement of control	3.62	1.06	0.29	4
Dissatisfaction with existing cost system	3.25	1.13	0.35	4
Increased competition	3.19	1.13	0.35	4
Headquarters' demands	3.12	1.68	0.54	5
Desire to gain new markets	2.78	1.29	0.46	3
Change of strategy	2.48	1.44	0.58	1
Availability of financial resources	2.47	1.25	0.51	2
Change in organisational structure	2.47	1.35	0.55	1
Availability of human resources	2.35	1.20	0.51	1
Implementation of new technologies	2.30	1.31	0.57	1
Change of management	2.14	1.44	0.67	1
Favourable attitude among employees	1.91	0.96	0.50	1

[a] The respondents indicated the importance of the factors listed above by assigning the following ratings: 1 – unimportant, 2 – little importance, 3 – moderately important, 4 – important, 5 – very important.

The factors believed to have contributed to ABC adoption to a slightly lesser degree include dissatisfaction with the cost accounting system used currently (3.25), increased competition (3.19), headquarters' demand (3.12), and seeking to gain new markets (2.78) – the respondents rated the importance of these factors as moderate. The least importance was attached to change of strategy (2.48), availability of financial resources (2.47), change in organisational structure (2.47), availability of human resources (2.35), new technologies implementation (2.30), change of management (2.14) and favourable atmosphere among employees (1.91).

Analyzing the factors that encouraged companies to undergo the difficult process of activity-based costing implementation Nicholls (1992) identified the need for more accurate data about costs (65% of respondents), dissatisfaction

with the current cost system (65% of respondents), need for cost reduction (45% of respondents) and increase of indirect costs in the company's cost structure (32%). The research carried out by Innes and Mitchells (1995) revealed that respondents included the need for cost reduction, the need for profitability analysis, improvement of performance and improvement of cost management[8] among the main reasons for implementation of ABC. Similar reasons for activity-based costing implementation were identified in other countries, for example in Germany (Horvath *et al.,* 1998) the need for improvement of business processes, the need for a more reliable product cost calculation and the need to signalize the problem of unused capacity were mentioned. In developing countries like India (Anand *et al.,* 2005), the main motifs underlying ABC implementations were the need for precise information about value adding and non-value adding activities, the necessity to improve company competitiveness and usefulness in budgeting.

Available empirical research carried out around the world prove that the benefits ensuing from adoption of ABC observed in companies which use the system are higher than the benefits expected prior to implementation. The research carried out by Clarke *et al.* (1999) points out that respondents derived better benefits than expected in every of the areas analyzed (improvement of product cost calculation for pricing, improvement of control and cost management, better understanding of reasons for cost formation, better performance evaluation, more accurate analysis of customer profitability, positive influence on employees' performance). The observations were also proved by later studies (Clarke, Mullins, 2001).

4.3.4. Contextual factors influencing the implementation of ABC

The attitude of companies included in the research towards activity-based costing is one of the most important issues of the questionnaire research. It is worth analyzing then what kind of companies use ABC or consider its implementation in the future, and what companies, after analyzing the costs and benefits of

[8] The reasons for implementation of activity-based costing in different sectors of economy are quite similar. The research conducted among organizations operating in the healthcare sector in the United States (Lawson, 2005) showed that, similarly to other sectors, the main benefits expected in the process of ABC implementation included better understanding of realized processes and improvement of information about product costs as well as information used for improvement of processes. On the other hand, research carried out on American cities sample (Ho, Kidwell, 2000) showed that the basic benefits expected in terms of ABC implementation (both by the users of the system and organizations which do not use ABC) included its usefulness in decision-making in terms of external auxiliary units, business units, administrative units and units related to safety maintenance. It should be noted that the usefulness of activity-based costing in the areas above was ranked higher by the cities where the system was used than by the cities which do not have ABC.

implementation rejected it and what kind of companies never considered ABC implementation. Selected results of analysis of the relationship between the company's attitude towards activity-based costing and some characteristic features of the researched companies are presented in table 4.8.

Table 4.8. Attitude towards activity-based costing and selected features of the companies researched

Features	Uses or considers implementation of ABC (in %)	Rejected or non-considered ABC implementation (in %)
Type of operation		
Manufacturing company	33.1	66.9
Non-manufacturing company	28.8	71.2
Capital origin		
Non-foreign capital companies	27.3	72.7
Foreign capital companies	36.2	63.8
Number of employees		
1–100	23.8	76.2
101–500	29.2	70.8
501–1000	44.9	55.1
Above 1000	42.3	57.7

Analysis of information presented in table 4.8, enables formulation of the following observations in terms of the companies researched:

1. Comparable percentage of manufacturing and non-manufacturing companies implemented or considers implementation of activity-based costing (the differences are statistically insignificant). The findings are similar to those received by Innes and Mitchell (1995) as well as Innes *et al.* (2000), who noticed that the percentage of companies using ABC was actually the same among manufacturing companies and service companies – it seems interesting due to the fact that, initially, ABC was perceived as a method which was useful for manufacturing firms[9]. Some research (e.g. Cotton *et. al.*, 2003) prove that the diffusion of ABC is greater among manufacturing companies (25.5%) than among non-manufacturing companies (18.8%).

2. Companies with foreign capital used ABC or considered its implementation more often than companies with only domestic capital (because $\chi^2 = 4.10 > 2.71 = \chi^2_{0.1;1}$, significance level of 0.1 therefore it may be assumed that the relationship is statistically significant, however the relationship is weak (V Cramer coefficient

[9] Research conducted by Lawson (2005) in organizations operating in healthcare showed that ABC was used more often in profit-oriented enterprises (33%) than in non-profit-oriented organizations (8%).

= 0.094)). The findings of present research are confirmed by results of other research carried out in different countries. Clarke *et al.* (1999), who studied Irish companies sample claimed that international status (capital) of the company was one of the key variables conditioning implementation of activity-based costing. Joshi (2001) obtained similar results studying Chinese companies.

3. The larger the company, the more likely it is that the company adopts ABC or considers its use in the future (because $\chi^2 = 12.51 > 11.34 = \chi^2_{0.01;3}$, significance level of 0,01 therefore it may be assumed that the relationship is statistically significant, however the relationship is weak (V Cramer coefficient = 0.165)). The positive relationship between the size of a company and ABC implementation was shown by most empirical research (Armitage, Nicholson, 1993; Innes, Mitchell, 1995; IMA, 1996; Lukka, Granlund, 1996; Björnenak, 1997; Gosselin, 1997; Clarke *et al*., 1997; Van Nguyen, Brookes, 1997; Krumwiede, 1998; Clarke *et al*., 1999; Innes *et al*., 2000; Hoque, 2000; Joshi, 2001; Baird *et al*., 2004; Khalid, 2005; Kallunki, Silvola, 2008). Yet, there are studies, which did not observe such a relationship (Booth, Giacobbe, 1998).

4. The research did not prove any statistically significant relationship between the company's attitude to activity-based costing and the business sector the company operated in, competitiveness in the main area of operation and sales direction. With regard to the relationship between those factors and implementation of activity-based costing, the research carried out in the world does not provide firm results. Björnenak (1997) for example proved that companies operating in environment that characterizes of high competitiveness do not use activity-based costing (Van Nguyen and Brooks (1997) came to a similar conclusion). A positive influence of competitiveness on activity-based costing implementation was shown by e.g. research carried out by Anderson (1995), Innes and Mitchell (1995), Krumwiede (1998) or Malmi (1999). Booth and Giacobbe (1998) proved that there was no relationship between ABC implementation and the level of competitiveness. Björnenak (1997) noticed that the companies which rejected ABC implementation operated in a more competitive environment, in comparison to companies which had already implemented ABC, were implementing or were considering implementation (which was not compliant with the subject literature and hypotheses formed at the beginning of the research). His research additionally proved that differentiation of products, measured by the number of variants, was greater in the companies using activity-based costing than in the companies which did not adopt the system. Malmi (1999) showed that companies which offer a wide variety of products and those which sell most of their products abroad more likely tend to implement activity-based costing (Krumwiede (1998), Clarke *et al*. (1999) and Khalid (2005) proved similar results in terms of product differentiation). The lack of relationship between product differentiation and activity-based costing implementation was exhibited in the research by Lukka and Granlund (1996) as

well as Van Nguyen and Brooks (1997), however Clarke *et al*. (1997) observed a negative relationship in that matter[10].

The relationship between the company's attitude towards ABC and selected features of their cost structure was the last issue analyzed in present questionnaire research (questionnaire A). The results are presented in table 4.9.

Table 4.9. Attitude towards activity-based costing and cost structure in the companies researched

Features	Uses or considers implementation of ABC (in %)	Rejected or non-considered ABC implementation (in %)
Up to 20% of indirect costs	26.2	73.8
From 21% to 40% of indirect costs	34.8	65.2
From 41% to 60% of indirect costs	39.4	60.6
Above 60% of indirect costs	65.0	35.0

Analysis of data presented in table 3.9 enables formulation of an observation that, in case of the companies researched, the percentage of companies which had already implemented activity-based costing is directly proportional to the share of indirect costs in the cost structure of the company analyzed (because $\chi^2 = 14.69 > 11.34 = \chi^2_{0.01;3}$, significance level of 0.01, therefore it may be assumed that the relationship is statistically significant, however the relationship is weak (V Cramer coefficient = 0.199))[11]. The observations are compliant with the subject literature, which supports the positive relationship between implementation of ABC and the percentage of indirect costs in company's cost structure.

Some research carried out in the world proves the results of present study to be correct. For example Björnenak (1997), who investigated factors influencing implementation of activity-based costing in Norway stated that the only variable, which proved to be statistically significant in terms of ABC implementation, was the company's cost structure. Similar conclusion was drawn in research into the diffusion of activity-based costing in Saudi Arabia (Khalid, 2005). However, some research did not observe any significant relationship between the company's cost structure and implementation of activity-based costing (Van Nguyen, Brookes,

[10] Research carried out by Baines and Langfield-Smith (2003) on a sample of Australian companies, proved that replacing cost strategy with differentiation strategy has a positive influence on the use of advanced management tools in general, especially ABC – the findings are compliant with research conducted e.g. by Gosselin (1997).

[11] Out of companies which had no more than 20% of indirect costs, only 7.1% used ABC, among companies which had 21–40% of indirect costs the percentage was 10.9%, and among enterprises having 41–60% of indirect costs it was 15.2%. The highest percentage of companies using activity-based costing (20%) was among firms, whose indirect costs constituted more than 60% of total costs (it should be stressed that further 45% of companies with such a high share of indirect costs was considering implementation of ABC).

1997; Booth, Giacobbe, 1998; Clarke *et al*., 1999).

4.4. Functioning and use of ABC in Poland

4.4.1. General description of the companies covered by the survey

Out of the 33 enterprises (ABC adopters) that were surveyed (questionnaire B), 19 were manufacturing companies (57.6%), and 14 were non-manufacturing companies (42.4%). The companies covered by the survey served varying numbers of customers and pursued both cost strategy and product differentiation strategy. Classification of ABC adopters by these two characteristics is presented in table 4.10.

Table 4.10. Main areas of activity of the companies surveyed

Specification	n	%
Provision of mass-produced goods to many customers (cost strategy)	11	36.7
Provision of mass-produced goods to a small number of customers (cost strategy)	0	0.0
Provision of special products to many customers (differentiation strategy)	17	56.7
Provision of special products to a small number of customers (differentiation strategy)	2	6.7
Total	30	100.0

Table 4.11. Competition in the companies' main areas of activity

Specification	n	%
Weak competition	3	9.1
Moderate competition	7	21.2
Strong competition	23	69.7
Total	33	100.0

Nearly two-thirds of the companies (65.4%) followed product differentiation strategy, and slightly over one-third (36.7%) pursued cost strategy. As many as 93.4% sold their products to many customers and only 6.7% (2 companies) serve a limited number of customers. The companies also differed in respect of competition in their main areas of activity (table 4.11).

More than two-thirds of the companies surveyed (69.7%) described competition in their basic area of activity as strong (the percentages for manufacturing and non-manufacturing companies were similar – 68.4% and 71.4%, respectively), 7 companies stated that competition was moderate, and only three companies assessed it as weak. As regards the source of equity capital,

17 (51.5%) companies declared only domestic capital, 9 companies (27.3%) – mixed capital and 7 companies (21.2%) – only foreign capital. 13 companies (39.4%) in the sample of ABC adopters sold their products only in domestic markets, while the remaining 60.6% operated both in the country and abroad. It should be noted that for 15.2% of these companies exports constituted over a half of the total value of sales, and that none of them was engaged solely in export activity.

The number of employees – a variable used in this research project to define the size of the companies – is presented in table 4.12.

Table 4.12. The number of employees in the companies surveyed

Specification	n	%
1–100 employees	5	15.2
101–500 employees	13	39.4
501– 000 employees	7	21.2
More than 1000 employees	8	24.2
Total	33	100.0

The research has shown that in over a half of the companies the form of the activity-based costing system depended solely on independent decisions of management (18 companies, i.e. 54.5%); in 12 companies (36.4%) it was determined in part by the management and in part by the headquarters (e.g. parent company), and only in 3 cases it depended wholly on the headquarters.

Of the 33 companies surveyed, 100% use activity-based costing (which is self-evident because of the character of the sample); 26 companies (78.7%) also employed traditional actual cost systems (full or variable costing), 14 companies (42.4%) – standard costing (full or variable), and only 5 companies made use of target costing parallel with ABC. 9 companies stated that they applied activity-based costing only in a limited form, the comments expressed by the companies were as follows:

- "the company uses ABC in a limited form" (chemical industry);
- "the company uses ABC in a part of its operation" (pharmaceutical company);
- "ABC embraces only selected areas of company's operation" (construction company);
- "activity-based costing is used for preparation of ad hoc analyzes e.g. calculation of a minimal production batch, calculation of costs of transportation, logistics, bonuses etc." (food industry company);
- "ABC is exclusively used for profitability analysis of individual financial products" (financial services company);
- "activity-based costing functions in its very basic form, i.e. its structure is not well developed" (company manufacturing household goods);

- "company uses elements of ABC" (electronics industry company);
- "ABC is used in its simplified version – significantly limited number of activities" (bank).

The sample companies varied considerably as regards the cost structure (direct and indirect costs) – the proportions of indirect costs in total costs are shown in table 4.13.

Table 4.13. The share of indirect costs in cost structure of the companies surveyed

Specification	n	%
Up to 10% of indirect costs	4	14.8
From 11% to 20% of indirect costs	6	22.2
From 21% to 30% of indirect costs	5	18.5
From 31% to 40% of indirect costs	5	18.5
From 41% to 50% of indirect costs	2	7.4
From 51% to 60% of indirect costs	3	11.1
From 61% to 70% of indirect costs	2	7.4
Total	27	100.0

In the majority of the companies the proportion of indirect costs grew over the last 10 years – in 10 companies (37%) it increased only slightly, and in 5 companies (18.6%) the increase was quite significant. In 3 of the firms (11.1%) no change in the percentage of indirect costs was reported, and in 9 cases (33.3%) it was stated to have decreased. Several respondents did not give answers to this question.

4.4.2. General description of ABC systems

In response to the question whose initiative it was to adopt ABC more than a half of the respondents (54.5%) stated that the idea came from the owner/head office/management. In 13 cases (49.4%) it was the initiative of the economic section. In 2 companies adoption of ABC was stated: (a) to have been the consequence of implementing SAP/R3 (manufacturing company), (b) to have been postulated by the Purchasing Department (company producing household goods).

The activity-based costing systems functioning in the companies in question were implemented at various times. In 22 companies (66.7%) they had been functioning no longer than three years (in 7 of them – for less than a year, and in 15 – between 1–3 years). Only 11 companies (33.3%) had been using ABC for longer than three years. The mode of activity-based costing implementation is presented in table 4.14.

Table 4.14. The mode of ABC implementation in the companies surveyed

Specification	n	%
By employees without external assistance	14	42.4
By employees with external consulting	13	39.4
By employees with headquarters' assistance	6	18.2
Total	33	100.0

In most cases ABC was implemented by the companies' employees with outside assistance – 13 companies (39.4%) used the services of external consultants, and in 6 firms (18.2%) the head offices provided assistance. In 14 enterprises (42.2%) no outside help was needed. The key role of company's employees in the process of activity-based costing implementation was stressed by the research carried out in Great Britain (Innes *et al*., 2000) and New Zealand (Cotton *et al*., 2003). The analysis of activity-based costing implementation in New Zealand showed that accountancy professionals were the key to the implementation – 91.7% (90.3% in Great Britain), consultants' role was lesser in that respect – 28.3% (48.4% in Great Britain), then IT specialists – 30% (22.6% in Great Britain) and production personnel – 28.3% (16.1% in Great Britain). The role of marketing personnel, sales personnel and employees from other departments in the implementation of ABC was significantly limited.

The number of employees engaged in ABC implementation varied from company to company: (a) 1–3 employees in 9 companies (27.3%), (b) 4–10 employees in 16 companies (48.5%), (c) 11–30 employees in 5 companies (15.2%), (d) more than 30 employees in 3 companies (9.1%). The number of employees taking care of the systems maintenance and operation after completion of the implementation process is shown in table 4.15.

Table 4.15. The number of employees engaged in operation of ABC systems

Specification	n	%
1 employee as part of responsibilities	14	43.8
1 employee as main responsibility	2	6.2
2–3 employees	11	34.4
4 or more employees	5	15.6
Total	32	100.0

Research on companies which have adopted ABC in such countries as the United States or Great Britain indicates that it is extremely rare that activity-based costing thoroughly replaces the existing cost systems. The usual practice in such cases is to use the existing system for external reporting and ABC for management purposes (Armitage, Nicholson, 1993). Research into the relation between ABC and other cost accounting systems used in parallel with it will make it possible to establish whether the practices found in western countries are equally common

in Poland. Analysis of the sample population of Polish ABC adopters reveals that after ABC implementation 24 companies (72.7%) have not given up the formerly used costing system and are using it parallel with ABC. In 5 companies (15.5%) the old system continues to function, but has been marginalized (ABC has the primary importance). In only 4 cases (12.1%) the old system has been given up entirely.

The next of the selected variables, i.e. success of ABC implementation, was to indicate not so much the objective success or otherwise of this system implementation, but rather the way it is perceived by the employees – whether the 'climate' in the company is favourable to the new system. Shields (1995) has demonstrated a relationship between the perceived success of ABC implementation and six variables: management support, integration with strategic initiatives strengthening competitiveness such as TQM or JIT, performance evaluation and rewarding, project management by non-accounting personnel, training during ABC design, implementation and application, and availability of resources necessary for implementation. Shields also found that such variables as the type of software used or designing the ABC model without external assistance have no impact on implementation success. Research carried out by McGowan and Klammer (1997) confirms a connection between three variables identified by Shields with perceived success of ABC implementation. These factors are: management support, performance evaluation and rewarding, and training during ABC design, implementation and application. Foster and Swenson (1997) found that success of ABC implementation depended primarily on integration with the performance evaluation and reward system, links with quality improvement projects, management support, training during implementation, and availability of resources. The findings of the three research projects mentioned above roughly agree as to the factors that have the greatest impact on ABC implementation success. To identify factors conditioning successful implementation of ABC Friedman and Lyne (2000) conducted research in Great Britain using the long-term case study method. The results of this research coincide for the most part with results of research carried out in the United States – success of ABC implementation was found to depend on: recognized need for implementation, wide support for implementation, especially from management, close cooperation between accounting and non-accounting staff during ABC implementation and use, incorporation of ABC into organizational structure and practice, availability of resources, and links with other projects such as TQM. Innes *et al.* (2000) explored the importance for successful implementation of such factors as management support, engagement of consultants, involvement of accounting team and production personnel, and companies' prior experience with ABC models. The findings suggest that only management support had a significant influence on implementation success.

Respondents were asked in the present survey (questionnaire B) to assess the implementation of activity-based costing systems in their companies on a 5-grade scale, from total failure through partial failure, moderate success and success to great success. None of the companies considered implementation as a complete failure or partial failure. Only one company declared great success, and 31 (of the 32 companies which answered this question) evaluated ABC implementation as a moderate success (19) or success (12).

Table 4.16. Main problems during ABC implementation

Specification	Mean[a]	Standard deviation	Variability coefficient	Dominant value
High labour input during ABC implementation and operation	3.55	0.97	0.27	4
Insufficient knowledge of ABC among employees	3.42	0.99	0.29	4
Problems with model (selection of activities, drivers etc.)	3.25	0.92	0.28	3
Other	3.00	2.00	0.67	1
Lack of adequate IT resources	2.68	1.44	0.54	1
High cost of ABC implementation and operation	2.33	1.09	0.47	3
Lack of support from management/head office etc.	1.81	1.14	0.63	1
Other priorities (implementation of ISO, TQM, ERP etc.)	1.80	1.12	0.62	1

[a] The respondents assessed the significance of problems according to the following scale: 1 – no problem, 2 – insignificant, 3 – moderately significant, 4 – significant, 5 – very significant.

As far as problems with ABC implementation are concerned (see table 4.16), high labour input in implementation and maintenance were named as considerable problems (average grade – 3.55). None of the problems listed in the survey questionnaire was assessed as significant or very significant. The respondents named four problems, assessed by them as moderately important:

1) insufficient knowledge of ABC among employees (average grade – 3.42);
2) difficulties with model designing, e.g. choice of activities, drivers etc. (3.25);
3) other problems, such as resistance to change (foodstuffs manufacturing company) or mutual antagonism caused by disclosure of individual divisions profitability as a result of activity-based costing implementation (service company) (3);
4) inadequate IT resources (2.68).

Problems evaluated as insignificant included: high costs of ABC implementation and maintenance (average rating – 2.33), lack of management/headquarters etc. support (1.81), and other priorities, e.g. adoption of ISO, TQM or ERP (1.80).

Innes and Mitchell (1998) observed that high labour input is regarded to present a problem not only before but also after ABC implementation. It was named as one of five main problems encountered by companies using ABC, the remaining four problems being: difficulties with collecting data on cost drivers, processes crossing divisional boundaries, other priorities, and great time load placed on the accounting personnel.

4.4.3. Analysis of ABC systems structure

Activity-based costing systems employed in sample companies operate in various IT applications (see table 4.17).

Table 4.17. IT environment of ABC models in the companies surveyed

Specification	n	%
Spreadsheet or database (EXCEL, ACCESS etc.)	19	57.6
Specially written computer program	5	15.2
Ready-made specialized software adapted for specific needs of the company	4	12.1
Ready-made (adjusted for specific needs) module in an integrated system	5	15.2
Total	33	100.0

Lack of appropriate software is among the chief problems connected with ABC implementation in Poland, which has often been pointed out by practitioners. There are two kinds of tools most commonly used for this purpose: ready-made, customized for individual companies needs, specialized programs for ABC (this mode of ABC informatization is mostly adopted by large enterprises) and in-house designed models of ABC using spreadsheets and databases (this way is usually chosen by small enterprises, which on the one hand do not have sufficient resources to buy specialist software and on the other hand do not need very sophisticated systems, because the structure of ABC in such companies normally is relatively simple). Rather rarely are used such modes of informatization as individually developed information systems and ready-made, adapted for individual needs modules of integrated systems. The research carried out in Great Britain (Innes *et al*., 2000) and in New Zealand (Cotton *et al*., 2003) showed that respondents pointed out the use of diversified software for implementation of activity-based costing systems, however mainly specialized programs for ABC.

Such software was applied by 58% of companies in Great Britain, 47% in New Zealand and only 12.1% in Poland[12].

ABC includes five basic elements, i.e. resources, resource drivers, activities, activity drivers and cost objects. This is a simplified model, but it provides a good indication of ABC structure in particular companies and the degree of the model's complexity. Activity-based costing systems functioning in the companies covered by the survey vary widely in respect of the elements identified (see table 4.18).

Table 4.18. Number of elements identified in ABC systems

Elements	Number					
Resources	3 14.3%	12 57.1%	4 19.0%	1 4.8%	1 4.8%	21 100.0%
Resource drivers	6 28.6%	11 52.4%	3 14.3%	1 4.8%	0 0.0%	21 100.0%
Activities	4 13.8%	12 41.4%	9 31.0%	4 13.8%	0 0.0%	29 100.0%
Activity drivers	6 23.1%	12 46.2%	7 26.9%	1 3.8%	0 0.0%	26 100.0%
Cost objects (products, customers etc.)	2 6.9%	3 10.3%	8 27.6%	5 17.2%	11 37.9%	29 100.0%

Analysis of data presented in table 4.18 reveals that:

1) in most of the companies, activity-based costing systems have the following numbers of elements: 6–100 resources (76.1% of companies), 1–20 resource drivers (81% companies), 6–100 activities (72.4%), 6–100 activity drivers (73.1%) and over 500 cost objects (37.9%);

2) in 2 cases activity-based costing had more than 100 resources (101–500 and over 500);

3) only 1 company used more than one hundred different resource cost drivers;

4) only 4 companies (13.8%) identified more than 100 activities, and only 1 company (3.8%) – more than 100 various activity cost drivers;

5) the majority of the companies (55.1%) identified over 100 cost objects (products, customers etc.);

6) several respondents stated that their ABC systems used at the maximum 5 resources, resource drivers, activities, activity drivers or cost objects – it indicates that their systems' level of detail is rather low (it should be noted that 9 companies had declared earlier that they used activity-based costing to a limited extent).

[12] Research carried out on a sample of 552 companies using activity-based costing (Nair, 2000), showed that two-thirds of respondents stressed the necessity of integrating ABC/M systems with ERP systems, the percentage of such answers grew along with the size of the company.

Table 4.19. Number of calculations for different cost objects in the companies surveyed

Objects	Number					
Products	5 20.8%	3 12.5%	8 33.3%	2 8.3%	6 25.0%	24 100.0%
Groups of products	6 25.0%	12 50.0%	5 20.8%	1 4.2%	0 0.0%	24 100.0%
Customers	2 15.4%	3 23.1%	3 23.1%	3 23.1%	2 15.4%	13 100.0%
Groups of customers	7 43.8%	7 43.8%	1 6.3%	1 6.3%	0 0.0%	16 100.0%
Sales regions	7 46.7%	7 46.7%	1 6.7%	0 0.0%	0 0.0%	15 100.0%
Distribution channels	10 66.7%	4 26.7%	1 6.7%	0 0.0%	0 0.0%	15 100.0%
Organizational units	9 47.4%	4 21.1%	5 26.3%	1 5.3%	0 0.0%	19 100.0%
Projects	7 46.7%	5 33.3%	3 20.0%	0 0.0%	0 0.0%	15 100.0%

With respect to complexity of activity-based costing systems, empirical research carried out around the world provide different results. Research done in Great Britain (Innes *et al*., 2000) revealed that usually in the activity-based costing there were 40 cost objects isolated and 52 activities concentrated in 22 cost pools calculated by means of 14 activity drivers. According to empirical research conducted in New Zealand (Cotton *et al*., 2003), the systems of activity-based costing functioning there are less complex than the systems functioning in British companies. On average, there are 4 cost objects and 15 activities concentrated in 6 cost pools calculated by means of 5 activity drivers isolated within a New Zealand company. Additionally, research done in Italy (Cinquini *et al*., 2008) proves that, like in New Zealand, Italian systems of ABC are less complex than those in British companies. In 93.3% of cases (Cinquini *et al*., 2008), the system does not use more than 10 different drivers (research carried out in 1999 showed that 40% of companies used more than 10 drivers). The authors came to a conclusion that the systems of activity-based costing which have been implemented recently are less complex than the systems implemented before.

It needs to be emphasized that the differences in the minuteness of activity-based costing systems functioning in different countries stems from the fact that British research investigated larger companies than in other countries, and that, with time (British research was the earliest), the awareness of high implementation costs and maintenance of complex systems grew[13].

[13] The degree of complexity of cost systems (including ABC) may depend on variety of variables

The respondents were next asked about the number of cost calculations done for different objects (products, customers etc.) as part of activity-based costing (see table 4.19).

Analysis of data presented in table 4.19 reveals that:

1) the highest proportion of the companies (33.3%) calculate costs for 21–100 products; 25% for over 500 products;

2) 98.5% of the companies make cost calculations for up to 100 groups of products; only one company for between 101–500 groups;

3) cost calculations are made for 6–20 customers (23.1% of the companies), 21–100 customers (23.1%) or 101–500 customers (23.1%);

4) 87.6% calculate costs for 1–20 groups of customers;

5) costs are also calculated for 1–20 sales regions (93.4% of the companies);

6) 66.7% calculate costs for several (1–5) distribution channels;

7) calculations for 1–5 organisational units are done in 47.4% of the companies, and 46.7% calculate costs for several (1–5) projects.

The number of profitability analyzes based on ABC carried out in individual company cases was addressed in the next question. The answers showed that numbers of profitability analyzes coincided with the numbers of cost calculations, which means that, generally, profitability analyzes were prepared for those cost objects for which cost calculations were done.

Of the 33 sample companies, as many as 27 classify costs into fixed and variable; only 7 companies (18.2%) do not make such a division. Less than a half of the enterprises (13, 41.9%) identify unused capacity costs, of which a few use one of two alternative variants of cost allocation: (a) only indirect costs of used capacity are assigned to products, customers etc. and costs of unused capacity are charged directly to income, (b) all costs, including costs of unused capacity, are allocated to products, customers etc.

Table 4.20 shows how activity-based costing modifications are done in the companies concerned.

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such as importance of cost information for management, cost structure or product differentiation. Research carried out by Cinquini *et al.* (2008) on a sample of 84 Italian companies revealed that there was a statistically significant and positive relationship between the importance of cost data and cost structure and the degree of activity-based costing system's complexity. It means that the more important information about costs for management and the more indirect costs in the company's cost structure, the higher complexity of activity-based costing system. No earlier research (apart from the research by Björnenak, 1997) had proved the relationship between the cost structure and the degree of cost system complexity. On the other hand, the relationship between the importance of information about costs and the system's complexity was previously exhibited, although the relationship was statistically insignificant (Baird *et al.*, 2004; Drury, Tyles, 2005; Al-Omiri, Drury, 2007).

Table 4.20. Modifications of ABC systems in the companies surveyed

Specification	n	%
No modification so far	7	21.9
From time to time, as necessary	19	59.3
At regular intervals	6	18.8
Total	32	100.0

Nearly four-fifths of the companies (25, 88.1%) modify their activity-based costing systems: 6 do it on a regular basis and 19 – from time to time, as need arises. In 7 companies (21.9%) no modification had been done (it should be noted that in 66.7% of these firms ABC systems were not „older" than 3 years). In responding to this question several companies offered the following explanations:

1) „regular modifications are carried out once a year together with work on preparation of budget for the next year" (large foodstuffs manufacturing company);

2) „modifications are carried out regularly, but their frequency is largely connected with identification of new cost centres, projects or groups of projects; such modifications are done from two to five times per year" (medium-sized commercial company);

3) „modifications are done on an annual basis, although at times they were done more frequently, e.g. after introduction of a new division of sales segments, because of the profitability reporting to management requirement" (large telecommunications company).

4.4.4. Analysis of utilisation of information generated by ABC systems

The subsequent part of the survey was dedicated to the users of ABC information in the companies studied and the use that is made of it (see table 4.21).

Information from activity-based costing systems is used very frequently by such departments as the purchase department (company producing household goods) or engineering department (telecommunications company). Frequent use was reported to be made by management accountants (average rating 4.28) and top management (average grade 3.71[14]). Occasional use is made by: (a) marketing and sales department (3.41), (b) operational departments, e.g. manufacturing department (3.10), (c) accountants (2.63).

Activity-based costing has a number of various applications, as reported below on the basis of a literature review:

- research conducted by Innes *et al.* (2000) showed that, respectively, 24.2% (1994) and 16.1% (1999) of the companies which they studied used ABC for inventories valuation in financial statements – it is an area of the most limited of the ABC uses that were tested by these authors;

[14] The results are statistically significant at significance level of 0.01 for: management accounting specialists (t = 5.49) and top management (t = 3.25).

Table 4.21. Utilisation of ABC information in the companies surveyed

Specification	Mean[a]	Standard deviation	Variability coefficient	Dominant value
Other divisions	4.50	1.00	0.22	5
Management accountants	4.28	1.25	0.29	5
Top management	3.71	1.22	0.33	4
Sales and marketing departments	3.41	1.27	0.37	4
Operational departments (e.g. production)	3.10	1.21	0.39	3
Accountants	2.63	1.47	0.56	1

[a] The respondents were asked to assign a rating on a five-grade scale; 1 – information not used, 2 – information used sporadically, 3 – information used from time to time, 4 – information used frequently 5 – information used very frequently.

- ABC can provide a basis for determining long-term variable costs and for making decisions on the volume and structure of sales in the longer term (Johnson, Kaplan, 1987);
- budgeting by activities can be used for improving responsibility accounting in a company (Brimson, Fraser, 1991);
- information about costs of activities and demand for products can be used in the process of goods and services designing (Jonez, Wright, 1987; Dolinsky, Vollman, 1991);
- customer profitability analysis is one of the most frequently used types of ABC information; for instance, research carried out by Innes *et al.* (2000) in 1994 and 1999 revealed that the percentages of companies making use of customer profitability information were 51.4% and 51.6%, respectively for these years;
- traditional analysis of profit sensitivity, leverage analysis and breakeven analysis are based on the precept of classification of costs into fixed and variable; Cooper (1994) proposed an extension of this type of analysis by repartition of costs into four levels: unit of product, batch, type and company as a whole.

Information supplied by activity-based costing in the analyzed companies is used, to a varying extent, in various areas (see table 4.22[15]).

Activity-based costing information was found to be very important (average rating 4.50) in the following areas: (a) „making investment decisions, setting minimum batch size etc." (foodstuffs manufacturing company), (b) „management remuneration" (commercial company), (c) „establishment of break-even points in investment projects appraisal" (telecommunications company).

[15] The results are statistically significant at significance level of 0.01 for: cost reduction (t= 7,88), pricing decisions (t = 3.85), budgeting (t = 2.84), performance measurement and improvement (t = 2.86) and sales plan optimalization (t = 2.85).

Table 4.22. Significance (applicability) of ABC information in the companies surveyed

Specification	Mean[a]	Standard deviation	Variability coefficient	Dominant value
Other	4.50	1.00	0.22	5
Cost reduction	4.16	0.82	0.20	5
Price decisions	3.81	1.17	0.31	5
Budgeting (ABB)	3.75	1.29	0.35	5
Performance measurement and improvement	3.65	1.16	0.32	4
Sales plan optimization	3.56	1.01	0.28	3
Customer profitability analysis	3.52	1.37	0.39	5
Cost modelling (e.g. sensitivity analysis)	3.41	1.01	0.30	4
Goods and services designing	2.88	1.30	0.45	3
Inventories valuation (for financial reporting)	2.40	1.63	0.68	1

[a] The respondents were asked to assign a rating on a five-grade scale: 1 – information is insignificant, 2 – information is not very significant, 3 – information is fairly significant, 4 – information is significant, 5 – information is very significant.

Research into the diffusion of activity-based costing showed similar results with respect to the use of activity-based costing information:

- in the United States (IMA, 1996) companies used activity-based costing for making decisions in such areas as production and marketing (53% of companies using ABC). 32% used ABC for making operational and strategic decisions and 15% made use of activity-based costing in financial reporting (in these companies, traditional systems of costing were replaced by activity-based costing in financial reporting)[16]. Research conducted on a group of 552 enterprises using activity-based costing (Nair, 2000) revealed that the main areas where information from activity-based costing was used included: product pricing (58%), analysis of processes (51%), performance management (49%), profitability analysis (38%) and value management (18%). Later studies (Nair, 2000) showed that mangers noticed that information from ABC could be used in such areas as budgeting or performance management. Such use of information generated by ABC/M systems required integration of activity-based costing IT systems with ERP systems and data warehouses; the integration enabled effective data collection and its analysis and reporting within entire organization;
- in Great Britain (Innes *et al*., 2000) and New Zealand (Cotton *et al*., 2003) ABC was mainly used to reduce costs and manage costs, to price goods and services, to revise pricing policy, to measure and improve activities, in modelling costs and in budgeting. Another research (Friedman, Lyne, 2000) proved cost

[16] Another research carried out by IMA (1997) showed that companies mainly used information from activity-based costing in product pricing (54%), performance measurement (36%) and pricing policy (32%).

management (cost reduction), product pricing and budgeting to be the prevailing areas in which information generated by activity-based costing was used. The information was used on a moderate level in making make-or-buy decisions or decisions related to process reorganization. The information was less frequently used for product pricing, capital budgeting and financial reporting;

- in developing countries e.g. China (Parkinson, 2009), information from activity-based costing was basically used in such areas as product pricing and widely-understood decision-making (usefulness of the system's information was ranked high with respect to investment decisions and risk evaluation). Surprisingly, indirect cost allocation was an area where ABC information was not often used. Information provided by ABC systems is used in liquidation of investment expenditure, reduction of expenditure, expansion of expenditure or making new investments (see table 4.23).

Table 4.23. Types of decisions in which ABC information is used

Specification	Liquidation	Reduction	Expansion	New investment
Products	9	12	15	12
Groups of products	4	11	19	11
Customers	4	3	10	5
Groups of customers	2	7	12	3
Sales regions	2	9	14	5
Distribution channels	2	9	11	4
Organisational units (e.g. divisions)	2	11	8	7
Projects	3	5	7	8

Analysis of data from table 4.23 indicates that ABC information is mainly used for making decisions concerning expansion of expenditure (96) and, to a lesser extent, reduction of expenditure (67) and new investments (55). The least use is made of this information in decisions on liquidation (28).

The degree of application of ABC information in performance measurement and evaluation was the subject of the next question (see table 4.24).

According to the respondents, activity-based costing information is often used for valuation of activities and processes (average rating 3.59[17]) and performance measurement of the company as a whole (3.50). From time to time it is used for measuring the performance of responsibility centres (3.15) and of management and employees (2.93).

The complexity of activity-based costing systems depends, apart from the number of identified elements (resources, resource drivers, activities, activity

[17] The results are statistically significant at significance level of 0.01 (t = 2.74).

Table 4.24. Application of ABC information in performance measurement and evaluation

Specification	Mean[a]	Standard deviation	Variability coefficient	Dominant value
Measurement and evaluation of activities and processes	3.59	1.15	0.32	4
Company performance measurement and evaluation	3.50	1.21	0.35	4
Responsibility centres performance measurement and evaluation	3.15	1.52	0.48	4
Management and employee performance measurement and evaluation	2.93	1.46	0.50	4

[a] The respondents were asked to assign a rating on a five-grade scale: 1 – information is insignificant, 2 – information is not very significant, 3 – information is fairly significant, 4 – information is significant, 5 – information is very significant.

drivers and objects) on whether a given system includes activities with particular characteristics. The survey revealed that:

1) in 14 of the companies surveyed (42.4%) activities were classified into primary, supporting and general; this classification (Bellis-Jones, Hand, 1989) can be used for estimation and then reduction of costs of activities other than primary;

2) in 13 companies (39.4%) activities were identified at the level of product unit, batch, type of product and company as a whole (Cooper, Kaplan, 1991);

3) in 7 companies activities were divided into strategic and operational;

4) only 6 companies stated that they identified activities creating value to the customer and not creating value to the customer; this classification is related with a very important area of ABC application, namely cost reduction (Brimson, 1991).

17 of the 33 companies employ *activity-based budgeting*. The respondents were asked to state what benefits their companies derived from this type of budgeting[18] (see table 4.25).

Respondents, whose companies applied activity-based budgeting, stated that it significantly (considerable benefit): (a) improved variance analysis (average rating 3.88), (b) improved performance measurement system (average rating 3.87), (c) ensured relating costs to responsibility (average rating 3.87) and (d) enabled more realistic budgets (average rating 3.80)[19]. A moderate benefit of using activity-based

[18] Piosik (2002, p. 70) points out that "the main benefit of using activity-based budgeting is the integration of the system with strategic level of ABM, as well as integration with Genka Kikaku and Kaizen concept. It means that there is possibility of enclosing in the budgeting programs of reduction of expected demand for activities and costs of resources".

[19] The results are statistically significant at significance level of 0.01 for: improvement of variance analysis ($t = 3.42$), relating costs to responsibility ($t = 2.98$) and calculation of more realistic budgets ($t = 2.86$).

budgeting, the companies see in three areas: (a) better identification of demand for resources (average rating 3.43), (b) greater involvement of employees in budgeting (average rating 3.32) and (c) better acceptance of budgets (average rating 3.29).

Table 4.25. The benefits of using activity-based budgeting in the companies surveyed

Specification	Mean[a]	Standard deviation	Variability coefficient	Dominant value
Improved variance analysis	3.88	1.02	0.26	4
Improved performance measurement system	3.87	1.46	0.38	5
Relating costs to responsibility	3.87	1.13	0.29	4
More realistic budgets	3.80	1.08	0.28	4
Identification of demand for resources	3.43	1.16	0.34	4
Greater involvement of employees in budgeting	3.31	0.95	0.29	4
Better acceptance of budgets	3.29	1.33	0.40	4

[a] The respondents were asked to assign a rating on a five-grade scale: 1 – no benefit, 2 – little benefit, 3 – moderate benefit, 4 – considerable benefit, 5 – great benefit.

It should be stressed that the great majority of the 17 companies which have implemented activity-based budgeting apply it only in certain areas of activity, while in other areas they use traditional budgeting – this is the case with 15 (88.2%) of the companies which declared the use of ABB. Only 2 of them (11.8%) gave up traditional budgeting after ABB implementation.

There are a number of ABB applications that companies can benefit from, for instance: (1) availability of historical data on the levels of resource drivers or activities will support making rational decisions on the level of resources necessary e.g. for future expansion of the company, (2) activity-based variance analysis can be useful in monitoring the causes of variances, (3) provision of information on utilisation of production capacity through comparison of the actual level with available capacity potential (Yoshikava *et al.*, 1992; Kaplan, 1994a).

Research conducted by Innes *et al.* (2000) found that about 60% of the largest British companies using ABC had implemented ABB as well. The following benefits deriving from ABB have been identified: better identification of centres' demand for resources, preparation of more realistic budgets, greater involvement of employees in budgets preparation, improved systems of performance measurement, improved connection between costs and responsibility, better acceptance of budgets, enhanced quality of variance analysis.

Information from activity-based costing systems is used in relations with customers in a variety of ways (see table 4.26).

Table 4.26. Application of ABC information in customer relations

Specification	Mean[a]	Standard deviation	Variability coefficient	Dominant value
Improves customer service cost control	3.35	1.35	0.40	4
Provides information for price policy formulation	3.23	1.21	0.37	4
Provides information for marketing strategy development	3.08	1.20	0.39	3
Provides information for customer policy formulation	3.04	1.22	0.40	4
Provides a basis for negotiations with customers	2.73	1.25	0.46	4
Provides a basis for giving up customers	2.60	1.29	0.50	4

[a] The respondents were asked to assign a rating on a five-grade scale: 1 – no benefit, 2 – little benefit, 3 – moderate benefit, 4 – considerable benefit, 5 – great benefit.

Analysis of data in table 4.26 shows that as regards customer relations, ABC information is used to a moderate extent in all the areas specified. It is interesting to note that the majority of the respondents stated that ABC information is used in customer relations to a considerable extent (predominant rating – 4); only for development of marketing strategy the rating was 3. Research on the diffusion of activity-based costing proved that ABC implementation improves customer profitability analysis (e.g. in research by Clarke *et al*. (1999), improvement of customer profitability analysis was recorded in 25% of companies using ABC).

The enterprises which have implemented activity-based costing also use other advanced management methods (see table 4.27). Some of the sample companies made use of advanced management methods in addition to ABC – some used many such methods while others only a few. It was found that:

1) one company used eight methods, one company – six and one company – five,
2) six companies used three methods;
3) seven companies used two methods and seven used one method;
4) ten companies did not use any advanced management methods other than ABC.

In the last question of the survey, respondents were asked to express their opinion on expected modifications of ABC system in their companies. 8 (25.8%) companies did not plan to introduce any modifications to the existing activity-based costing as the system was appropriate for their needs. 7 (22.6%) companies do not intend to modify the functioning system within the next year, although they think that the system should be modified but there is no change-oriented atmosphere, no sufficient financial resources, no time or there are other priorities.

Table 4.27. Application of advanced management methods in the companies surveyed

Specification	n	%
Just in time	3	9.1
Business process reengineering	7	21.2
Continuous improvement	9	27.3
Benchmarking	12	36.4
Target costing	5	15.2
Life cycle costing	4	12.1
Balanced scorecard	10	30.3
Economic value added	6	18.2
Other	2	6.1

More than a half of companies (51.6%) was planning to modify the functioning activity-based costing within the next year, the modifications included:

- "extension of range, improvement of automatic data entering into EXCEL spreadsheet" (chemical industry company);
- "changes will include introduction of cost division into fixed and variable, and taking into account the costs of unused capacity" (food industry manufacturing company);
- "soon, the ABC system will undergo some major changes, however it depends on management's attitude and head office requirements" (company manufacturing household goods);
- "system's adaptation to cost calculation of new services will cause changes" (consulting company);
- "modifications related to adaptation to changes in the organizational structure" (insurance company);
- "those will be annual or even more frequent changes, connected with product development, company's strategy, structure reorganization – possible acquisitions, technical services outsourcing etc." (telecommunications company).

4.5. Summary and conclusions

The author's own questionnaire research into the diffusion of activity-based costing in Polish companies (495 companies, questionnaire A) and research on functioning of those systems within enterprises which use them (33 companies, questionnaire B) enabled formulation of the following detailed conclusions, which support the main thesis and verify hypotheses:

1. The research (questionnaire A) proved that Polish companies mainly use traditional cost accounting systems; modern systems (e.g. activity-based costing or target costing) are implemented sporadically and their diffusion is considerably

lesser in comparison to Western countries. Majority of the companies surveyed, 392 companies (79.2%), use actual costing (full costing or variable costing), 135 companies (27.3%) use standard costing (full or variable) and 60 companies (12.1%) use multi-step and multi-dimensional costing. The use of modern methods of costing is not frequent – activity-based costing is used by 46 companies (9.3%) and target costing is used by merely 9 companies (1.8%). In several cases respondents declared using other cost accounting systems, and a few companies admitted to using a combined system, which comprised of features characteristic of different cost accounting systems.

2. The respondents were asked to indicate which of the factors listed in the questionnaire research (questionnaire A) had influenced the decision to implement ABC in their enterprises and to what extent. After calculating the average rating done by the respondents, it turned out that the reasons for ABC implementation of important and very important significance mainly included: other reasons (e.g. necessity to value non-standard products, the need to obtain accurate information for managing activities or to adopt a system used by the competitors) (4.80), the need for cost reduction and performance improvement (4.03), changed management information needs (3.91) and the need for improvement of management control (3.62). The factors believed to have contributed to ABC adoption to a slightly lesser degree included dissatisfaction with the current cost accounting system (3.25), increased competition (3.19), headquarters' demand (3.12), and seeking to gain new markets (2.78) – the respondents rated he importance of these factors as moderate. The least importance was attached to change of strategy (2.48), availability of financial resources (2.47), change in organisational structure (2.47), availability of human resources (2.35), new technologies implementation (2.30), change of management (2.14) and favourable atmosphere among employees (1.91).

3. With respect to companies which consider implementation of activity-based costing, the questionnaire research (questionnaire A) enabled identification of three 'significant' problems expected in the implementation process: other (e.g. changes in legal and corporate regulations, fear of novelty) (4), insufficient knowledge of ABC among employees (3.97), and high labour input in ABC implementation and operation (3.66). Potential problems regarded by the respondents as 'moderately' important included: difficulty with ABC model designing (3.45), high cost of ABC implementation and operation (3.13), lack of sufficient IT resources (2.88), and other priorities (2.51). Lack of management support for ABC implementation is believed by the respondents to be the least important problem (2.11) – the problem was rated as 'slight'. Contrary to the above problems expected by companies considering implementation of ABC, the analysis of real problems which appeared during implementation in companies using activity-based costing provided interesting results. The companies researched (questionnaire B) rated high labour input in implementation and

maintenance as a considerable problem (3.55). None of the problems listed in the survey questionnaire was assessed as 'very significant'. However, respondents named four problems as 'moderately important': insufficient knowledge of ABC among employees (3.42), difficulties with model designing (e.g. choice of activities, drivers etc.) (3.25), other problems (e.g. resistance to change or mutual antagonism) (3), and lack of sufficient IT resources (2.68). Problems evaluated as 'insignificant' included: high costs of ABC implementation and maintenance (2.33), lack of management (board, headquarters etc.) support (1.81), and other priorities (e.g. adoption of ISO, TQM or ERP etc.) (1.80). It needs to be stressed that the actual problems encountered during activity-based costing implementation were lesser (lower ratings) than the problems expected by companies considering implementation.

4. The questionnaire research (questionnaire A) revealed the reasons for non-consideration or rejection of activity-based costing. Problems rated by respondents as 'significant' included: insufficient knowledge of ABC among employees (4.05), high labour input in ABC implementation and operation (3.99), high cost of ABC implementation and operation (3.82), difficulty with model construction (3.64). Among problems of high importance, respondents named other problems e.g. lack of guidelines from headquarters abroad, the need to measure profitability at the level of headquarters' (located abroad), too small scope of activity, fast and not completely predictable growth of the company, inadequate financial resources, lack of awareness of the need for proper cost calculation, negative attitude of the accounting department (4.31). The factors which influenced to a lesser degree rejection or non-consideration of ABC implementation included: lack of adequate IT resources (3.29), lack of management support (3.17) and other priorities (2.87) – respondents rated these problems as 'moderate'. Low levels of indirect costs (2.49) and satisfaction with the current costing system (2.46) were considered to be the least important problems.

5. The questionnaire research (questionnaire A) did not prove the positive relationship between activity-based costing implementation and level of competition in the company's main area of activity. However, it is possible to assume that:

a) the larger the company, the more likely that it uses ABC or considers its implementation;

b) the higher the share of indirect costs within the company's cost structure, the more likely that the company uses activity-based costing or considers its implementation;

c) activity-based costing is used or considered by a considerably higher percentage of companies with a larger share of foreign capital than by companies with domestic capital only.

6. ABC embraces five basic elements i.e. resources, resource cost drivers, activities, activity cost drivers and cost objects. The model is simplified,

however it portrays well the ABC structure within the company surveyed and its complexity degree. With regard to number of elements identified, the systems of activity-based costing functioning in the companies researched (questionnaire B) vary considerably. In some small companies, activity-based costing system was not well developed and it contained only a few resources, resource cost drivers, activities, activity cost drivers and cost objects (out of companies analyzed, 9 declared that they used ABC in its limited scope). In four large companies, within the ABC system, between 100 and 500 activities have been identified, but only in one of the companies 100 different activity cost drivers have been distinguished. The questionnaire research enables to conclude that in most of the companies surveyed, ABC system has the following number of elements: 6–100 resources (76.1% of companies), 1–20 resource cost drivers (81% of companies), 6–100 activities (72.4% of companies), 6–100 activity cost drivers (73.1% of companies) and from 21 to more than 500 cost objects (82.7% of companies). Cost calculations for different types of objects (products, customers, distribution channels, projects etc.) constitute a considerable part of activity-based costing. The highest proportion of the companies (72.2%) prepare cost calculations for products and group of products, 39.4% of companies prepare cost calculations for customers, and 48.5% of firms prepares it for groups of customers. Information from ABC systems also provides basis for cost calculation for sales regions, distribution channels or projects (45.5% of companies). It should be emphasized that the number of profitability analyzes prepared by means of activity-based costing coincides with the number of cost calculations i.e. generally, profitability analyzes were prepared for those cost objects for which cost calculations were done. The complexity of activity-based costing depends on the number of identified elements (resources, resource cost drivers, activities, activity cost drivers and objects) but also on the certain features of the activities: (a) out of the companies surveyed, 14 (42.4%) divided activities into support, primary and general, (b) 13 companies (39.4%) isolated activities on the level of unit of product, batch of products, type of products and the entire company, (c) 7 companies (21.2%) divided activities into strategic and operational, (d) only 6 companies (18.2%) declared that they differentiate activities into value adding and no-value adding activities for customers. Among 33 companies researched, 27 (81.8%) enterprises divided indirect costs into fixed and variable. Less than half of the companies (41.9%, 13 companies) isolates costs of unused capacity.

7. In companies, where activity-based costing functions (questionnaire B), information generated by the system is used differently by individual departments and enables making various decisions, in particular:

a) information from activity-based costing systems in the companies researched is used 'very frequently' by such departments as the purchase department or engineering department (4.50), 'frequent' use was reported to be made by management accountants (4.28) and top management (3.71), 'occasional' use was made by: marketing and sales department (3.41), operational departments (3.10) and 'sporadic' use was ascribed to accountants (2.63);

b) information from the system was used by the companies surveyed in making numerous decisions, the information was ranked as 'significant' in such areas as: cost reduction (4.16), price decisions (3.81), budgeting (3.75), performance measurement and improvement (3.65), sales plan optimalization (3.56) and customer profitability analysis (3.52). The information from ABC was regarded as 'fairly significant' for cost modelling (3.41) and product design (2.88), and it was rated 'not very significant' for inventories valuation for financial reporting (2.40);

c) ABC information is more frequently used for making decisions about expansion of expenditure and to a lesser extent about reduction of expenditure or about making new investments. Information provided by ABC systems is rarely used for making decisions about liquidation;

d) on the basis of present research, it is possible to claim that information from ABC systems is 'frequently' used for measurement and evaluation of activities and processes (3.59) and the whole company performance measurement and evaluation (3.50), and 'sometimes' it is used for responsibility centres performance measurement and evaluation (3.15) as well as management and employee performance measurement and evaluation (2.93);

e) information from ABC in the companies studied is used to 'moderate' extent in customer relations, in particular it: improves customer service cost control (3.35), provides information for price policy formulation (3.23), provides information for marketing strategy development (3.08), provides information for customer policy formulation (3.04), provides a basis for negotiations with customers (2.73) and provides a basis for giving up customers (2.60).

8. Companies, in which activity-based costing has been adopted, additionally use other modern methods of management i.e. mainly benchmarking (36.4%), balanced scorecard (30.3%) and continuous improvement (27.3%). To some lesser extent, companies applied such methods as business process reengineering (21.2%), economic value added (18.2%), target costing (15.2%). Methods which have been rarely used included: life cycle costing (12.1%) and just in time (9.1%). Two companies (6.1%) declared use of some other modern methods – researched companies used six sigma method (car parts manufacturer), lean management (car parts manufacturer) and strategic analysis (household goods manufacturer). Some of the surveyed companies, apart from ABC, used numerous modern methods of management, and others used fewer of them, 10 companies did not use any other method apart from activity-based costing.

CHAPTER 5

FUNCTIONING OF ACTIVITY-BASED COSTING IN POLAND IN THE LIGHT OF CASE STUDIES AND ACTION RESEARCH

5.1. Introduction

Research in the form of case studies and action research (innovation action research) were advocated by Kaplan already in the 1980s. They were intended to better understand and analyze management accounting practice and to provide a basis for developing new concepts and methods to be subsequently used in practice (e.g. activity-based costing systems) (Kaplan, 1984, 1986). Despite certain limitations of case studies (Hopper *et al.*, 2001; Zimmermann, 2001; Scapens, 2004), this method is increasingly adopted for the purpose of a detailed analysis of ABC systems in practice, and for identification and understanding of related processes and problems.

The case study method and action research method are increasingly used in research on ABC implementation in Polish companies. The first case studies were carried out in 2000 (Wnuk, 2000; Kujawski, Ossowski, 2000), and action research – in 2001 (Świderska, Pielaszek, 2001). Later the number of such research projects grew, especially from 2004, when there was a steady increase in the number of companies using, implementing or considering implementation of ABC. The subject matter of this research varied widely – generally speaking, it was mainly concerned with ABC systems implementation and utilisation of information generated by these systems. The main topics of research in the form of case studies and action research are presented in table 5.1.

Table 5.1. Topics of research in the form of case study and action research

Topic	Research
Circumstances of ABC implementation	Kujawski, Ossowski (2000); Świderska, Pielaszek (2001)
Structure of ABC information model	Świderska *et al.* (2002); Czakon (2004); Wnuk-Pel (2006b)
Use of information generated by ABC system	Świderska, Pielaszek (2002); Szyszłowski (2006, 2007); Wnuk-Pel (2008)
Influence of ABC assumptions on the quality of information in ABC model	Wnuk (2000)

So far there have not been however any research in Poland explaining factors influencing ABC adoption and changes which are taking place in companies after activity-based costing implementation. Additionally there is a clearly expressed need for replication, extension and refinement of studies on ABC implementation process which were done so far in more developed countries. In the light of presented facts, it is important to fill in the identified research gap i.e. to analyze process of activity-based costing implementation in Polish companies. Taking the above into consideration the purpose of the chapter is to analyze factors influencing ABC implementation and explain methodological and institutional changes in the company that result from ABC implementation. The chapter is organized as follows. First the research methodology is shortly presented followed by analysis of ABC implementation and operation in four companies. Then factors influencing ABC implementation and changes in management accounting systems following implementation are discussed. The chapter ends with a short conclusions.

5.2. Research methodology

In the last two decades management accounting literature has witnessed a growing interest in the research of management accounting innovations (Lapsley, Wright, 2004; Alcouffe *et al.*, 2008). In management accounting literature innovations could be observed by the emergence of contemporary management accounting techniques. The distinction between contemporary and traditional techniques is that the latter are focused on strategy and based both on financial and non-financial information (Chenhall, Langfield-Smith, 1998). Chenhall (2008, p. 519) defines management accounting innovations as strategic management accounting to "connect the strategies to value chain and link activities across the organization that relates to cost objects". Among management accounting techniques that have the characteristics of innovations are: benchmarking,

activity-based costing, activity-based management, target costing, business process reengineering, theory of constraints, balanced scorecard, total quality management and value-chain management (Chenhall, 2008). It could be argued that one of the most important innovations in the area of management accounting in the 20th century is activity-based costing along with variance analysis, return on investment, and the balanced scorecard (Gosselin, 2007).

Although ABC has been known for about two decades, its low diffusion level makes it possible to still treat it as an innovation (in fact ABC is perceived as an innovation by majority of practitioners and academics). The research on activity-based costing and activity-based management falls into four categories: (a) descriptive studies identifying the extent of ABC adoption, (b) studies identifying the benefits of ABC and its influence on managers' and employees' satisfaction, (c) research on the factors influencing adoption of ABC, and (d) studies on the factors affecting successful implementation of ABC. Given the above, it is evident that the literature on management accounting has shown a growing interest into the study of management accounting innovations, and especially ABC. Ever since the concepts of activity-based costing and activity-based management were popularised some twenty years ago, they have been attracting much attention from companies all over the world. Many of them have implemented, with varying degrees of success, these relatively new cost management models. Activity-based costing has been found to have a number of limitations – installing an ABC system is considered to be technically complex and requiring skilled personnel and a considerable amount of time and money. Innes and Mitchell (Innes *et al.*, 2000) have found that the high labour input required in ABC implementation and operation is not only a major issue taken into account before the decision to adopt/reject the system, but also one of the five key problems reported by companies which are using ABC (the other problems being: difficulty in collecting data on cost drivers, processes going beyond organizational boundaries, other priorities, and time load of the accounting personnel). Numerous researches into ABC systems application across the world has shown that information generated by these systems is used in making a wide range of decisions, in such areas as pricing, activities budgeting, products and services development, customer profitability analysis or cost modelling (e.g. sensitivity analysis). Studies investigating the extent of ABC adoption in different countries (Ask, Ax, 1992; Lukka, Granlund, 1996; Cinquini *et al.*, 1999; Innes *et al.*, 2000; Bescos *et al.*, 2001; Pierce, 2004) have revealed that the proportion of companies that have adopted ABC differs largely, which partly reflects differences in the level of management accounting development in particular countries, the type and character of sample companies (large/small, manufacturing/non-manufacturing, financial institutions etc.) and the period covered by surveys (earlier surveys generally found significantly lower proportions of ABC adopters).

Transformations taking place in the field of management accounting contributed to intensification of research and made it possible to formulate theories which explained the process of innovation implementation. According to contingency theories the design and functioning of organizations are affected by technological and environmental factors (Covaleski *et al.*, 1996). Contingency theory literature suggests that organizational structure is a response to a set of contingencies. As an important part of a company's organizational structure accounting system will depend upon the circumstances in which the company operates (Otley, 1980). Literature on the subject (Otley, 1995; Covaleski *et al.*, 1996; Mitchell, 2002) show that the main contingencies affecting organizational structure and in particular management accounting systems are: size, environmental uncertainty, production technology, corporate strategy and market environment.

The two theories which are most commonly used in research on innovations belong to the group of contingency theories i.e. management accounting change theories and accounting innovation diffusion theories[1]. The theories can be divided into three key streams (Grott, Lukka, 2000):

- rational choice theories – according to rational choice theories, change in management accounting (implementation of innovation) is a rational change which means that it is improvement of methods/procedures which functioned in the company before. Hopwood's model of change (1987), which falls into rational choice theory, assumes that changes in the market environment of a company lead to changes in the company's operation, this further leads to organizational changes and changes in information system, and subsequently this leads to changes in accounting system and that, in turn, causes improvement in decision-making;
- evolutionary theories – the theories assume that companies implement such innovations which help them to survive. According to those theories, if a company can rationally evaluate usefulness of innovation, then the firm makes independent decision about implementation (or about quitting the implementation), however, if the rational evaluation of usefulness of innovation is impossible, then the company imitates others (e.g. leading companies in a given sector), i.e. it implements innovations which are implemented by other companies from the same business line, and abandons those innovations which are rejected (DiMaggio, Powell, 1983);
- chaos and transformation theories – the basic assumption of chaos and transformation theory (Cohen *et al.*, 1972) is the fact that due to complexity of company structures, managers are not able to make decisions about innovation implementation in a fully rational manner (their decisions are based on incomplete information).

[1] Management accounting change theories focus on the way a change in management accounting occurs and on its essence, whereas accounting innovation diffusion theories concentrate on explanation of ways of management accounting innovations diffusion.

Grott and Lukka (2000) developed a model of change in management accounting which is based on rational choice theories, evolutionary theories and chaos and transformation theories. The model, which is an extended version of Hopwood's model (1987), introduces the concept of factors influencing the change: motivators, catalysts, facilitators and obstructors. According to Grott and Lukka's model, motivators (e.g. production technology, product cost structure and level of competition in the market) influence the change process in a general manner. Catalysts are factors whose occurrence corresponds closely with the timing of change and they are directly associated with the change (e.g. launch of competing products, poor financial performance). Facilitators (e.g. availability of IT resources and accounting staff, authority of accountants) are factors although not sufficient but necessary for a change to occur. Management accounting change takes place through the interaction of motivators, catalysts and facilitators which act positively promoting the process of change. The model by Grott and Lukka identified one type of factors (obstructors) which disturb the process of change (e.g. resistance towards change, great amount of labour). The model devised by Grott and Lukka states that changes in management accounting include both change of scientific paradigm and change of management accounting system in practice of a given company. Grott and Lukka's model defining a process of management accounting change could serve as a framework which can be applied to analyze changes in costing system and in particular activity-based costing implementation.

Fads and fashions theory by Abrahamson (1991) is a concept which links all groups of innovation theories. Fads and fashions theory claims that innovation in management accounting should be looked at in two dimensions i.e. power of imitation processes (decisive or indecisive) and power of groups involved in diffusion of innovation (companies which might potentially implement the innovation or organizations which are not interested in implementation of innovation but rather in its promotion). Combination of those two dimensions (i.e. power of imitation processes and power of groups involved in diffusion of innovation) enables distinction of four patterns of innovation diffusion: rational choice, imposed choice, trend and fashion.

Using the above theories of change in management accounting, a model which explains the process of activity-based costing implementation has been formulated. The model is generally based on contingency theory and uses in particular assumptions of such models and theories as: Hopwood's models of change in management accounting (1983, 1987), Grott and Lukka's (2000) theory of change in management accounting and Abrahamson's model of fashions and trends (Abrahamson, 1991; Abrahamson, Rosenkopf, 1993)[2]. The model formulated for the purpose of this study is a cause-and-effect model (figure 5.1);

[2] Theories of management accounting used for explanation of globalization influence on performance measurement were used for the first time in Poland by Michalak (2006).

the model distinguishes three types of positive factors which influence the process of implementation (motivators, catalysts, facilitators) and one type of negative factors (obstructors). Implementation of activity-based costing in a company results in methodological and institutional/organizational changes.

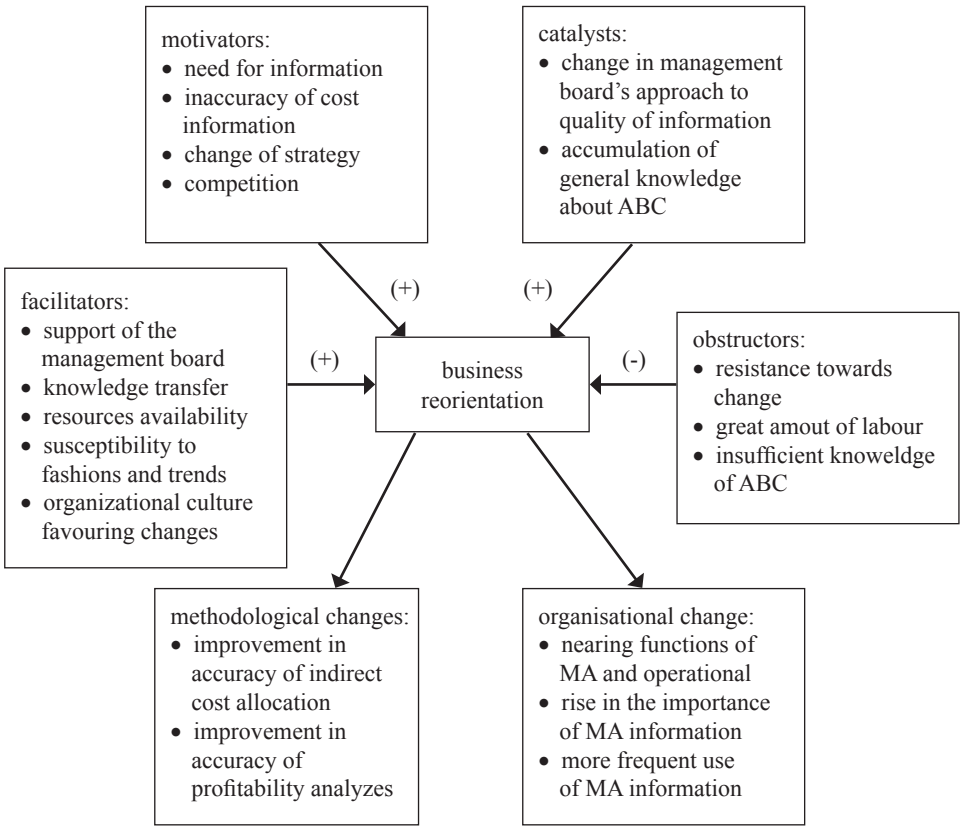

Figure 5.1. Model explaining process of activity-based costing implementation

Based on the literature about theory of changes and diffusion of innovation in management accounting (Hopwood, 1983, 1987; Groot, Lukka, 2000; Abrahamson, 1991; Abrahamson, Rosenkopf, 1993), the following hypothesis have been formulated to test the model explaining process of activity-based costing implementation:

• hypothesis 1 – ABC implementation process is influenced positively by three groups of factors: motivators, catalysts and facilitators; the factors affect the implementation collectively, promoting the process of change:

hypothesis 1.1 – the key causative factors which have constant and long-term influence on innovation implementation are: the need for information articulated

by managers, inaccuracy of data from the previous cost accounting system, change of strategy, and rise of competition;

hypothesis 1.2 – among the catalysts which directly influenced the implementation of innovation the following shall be mentioned: the management board acknowledgement that activity-based costing can provide better information for the process of management and knowledge accumulation about ABC especially in financial sections of the company;

hypothesis 1.3 – the key facilitators which influenced implementation (without them implementation would be impossible) were: management board's support, transfer of knowledge to other than financial sections, accessibility of resources, susceptibility to trends and fashions and changes-oriented organizational structure;

- hypothesis 2 – the factors which obstruct the process of ABC implementation are: resistance towards change, great amount of labour and insufficient knowledge on ABC;
- hypothesis 3 – ABC implementation triggers off numerous methodological changes, mainly improvement in accuracy of indirect costs allocation and improvement in accuracy of profitability analyzes;
- hypothesis 4 – implementation of activity-based costing system contributes to organizational changes in the company i.e. nearing functions of management accounting and operational functions, the rise in the importance of management accounting information, as well as its more frequent use, especially in the decision-making process.

Once hypotheses were formulated, the choice of companies was made, and the choice was deliberate – the selected companies replaced their existing cost accounting system with ABC and therefore analysis of its implementation and implementation results was possible. Out of the companies which were asked to complete questionnaire B (chapter 4) i.e. companies which had already implemented activity-based costing, four enterprises have been selected, which: (a) consented to participate in the research, (b) were different in terms of size, (c) were different in terms of area of operation. Due to trade secret, names of the companies were not disclosed, the companies were referred to as: ALFA SA (medium-sized manufacturing company), BETA SA (large telecommunications company), GAMMA SA (large insurance company), OMEGA SA (medium-sized manufacturing and trading company). Some less significant features of the enterprises have been changed, and others were presented in a general manner, so that identification of the analyzed companies was impossible. Deliberate distortion of identification data was designed so as not to influence the results of ABC implementation and its use in the companies researched.

During preparations and research in the form of case studies (both questionnaires and interviews as well as action research), activities, which were

to guarantee structural reliability, internal and external reliability as well as validity of the research have been undertaken. All of the above activities implied in the case studies (conducted by means of questionnaires, interviews and action research) aimed to improve the quality of present research.

Case studies were initiated by questionnaires A and B – information from the questionnaires was a starting point for further analysis of a given company. Information obtained by means of questionnaires was subsequently made more detailed in the course of interviews; the information was also extended with problems which could not be surveyed in the questionnaire itself (e.g. methodological and institutional changes that occurred after implementation of the new management accounting concept – activity-based costing). In all the companies, interviews were conducted with workers employed in operational and financial departments (management accounting/controlling department, finance, accounting, budgeting and analysis etc.); most of the time was given, in particular, to people responsible for functioning of the activity-based costing system.

Data analysis and evaluation (in-house documentation of the analyzed companies, activity-based costing documentation and notes made during interviews) constituted the last stage of empirical research conducted in the form of case studies (including action research). Amassed documentation was verified in terms of cross-compliance; among others it was verified whether a given issue is confirmed by many sources (e.g. activity-based costing documentation and interviews).

5.3. Case studies of activity-based costing implementation

5.3.1. Activity-based costing implementation in production company ALFA SA

ALFA SA was established over twenty years ago in central Poland. It was originally a trading company which supplied intestines, seasonings and other additives to meat processing plants. Gradually the scope of goods offered by ALFA SA widened, the number of clients increased and the company began developing dynamically. Several years ago, a decision was made to expand the business and the company started to manufacture flexible netting used in the meat industry. At that time, the company's strategy was to give up purchasing ready-made products and gradually replace them with their own goods. ALFA SA continued development of their products, carried on implementing new technologies, began building up a network of sales branches in entire Poland and expanded its sales abroad.

ALFA SA employed more than 100 people, the business in which it operated characterized of average competitiveness. The company's capital was entirely Polish and its sales was mainly domestic (approx. 70%). The company had a functional structure with basic functions, among them logistics, production,

sales and finance (in this structure, the Controller was subordinate to the Chief Accountant). Prior to ABC implementation, ALFA SA used the traditional full absorption costing. It has been decided by the Board to implement it and, from then on, it was used in the company despite any external influences. In the company's cost structure, one could distinguish the following: (a) direct materials (60%), (b) direct labour cost (15%), (c) indirect costs (25%).

Before the implementation of activity-based costing in ALFA SA, the Controller branded the decision making process as "management by trial and error". The lack of information (about the costs and profitability) and relying extensively on the intuitive decision making was the most characteristic of the company. Since the financial situation of ALFA SA was satisfactory, no one has realized the need to improve the product costing system. The approach changed after the company underwent an internal course on cost accounting and management accounting. During the course, the CEO (Chief Executive Officer) of the company realized that "product costing in his company leaves much to be desired, and that this area has been neglected, yet the company could benefit from implementing improvements". Subsequently, the CEO of ALFA SA selected a group of several employees who could potentially deal with the problem, and afterwards he appointed one the Controller to lead the group. The Controller, in order to complement and broaden his knowledge on cost and management accounting, was delegated to attend post-graduate studies in management accounting and controlling.

The implementation of activity-based costing in ALFA SA was influenced by numerous factors. Changing management's information needs, cost reduction, improving business results and improving control were considered crucial. Yet, the implementation of ABC was mainly caused by dissatisfaction with the existing cost accounting system and the need to alter company's organizational structure as well as firm's strategy. The change in the top management and implementation of new technologies moderately influenced the introduction of ABC. The rise of competitiveness, the aim to enter new markets, favourable atmosphere or access to relevant financial and human resources were of little significance.

Originally, in ALFA's SA cost accounting system only breakdown of costs by type functioned, which was mainly used for financial reporting. During the implementation of activity-based costing, new dimensions in the company's chart of accounts have been created: (a) cost centres (divisions, departments, regions etc.), (b) activities (groups of related actions taken in the relevant cost centres, i.e. activities such as warping, weaving, braiding, weft winding, packaging have been isolated in the production department).

Activity-based costing model in ALFA SA is functioning in EXCEL spreadsheet and the Cost Calculation module, supported by information received from other modules. In the activity-based costing system in ALFA SA all the resources may be assessed in standard cost as well as in historical cost and it is

possible to draw up the cost variance analysis for each product (thus the activity-based costing is interconnected with elements of the standard costing).

Activity-based costing implementation in ALFA SA was considered by the workers to be a 'moderate success'. During the implementation process several minor and major problems occurred. The most serious ones were the enormous amount of labour required to implement and maintain ABC (major problem) and other priorities (significant problem). Other common problems were listed such as high costs of ABC implementation and maintenance, insufficient knowledge of ABC among employees and difficulties with the model itself (selection of activities, drivers etc.). In the implementation process and the following system maintenance, there were in fact no problems with the management's support nor with the IT resources (slight problem).

ALFA's SA activity-based costing system did not accurately follow the Kaplan and Cooper's cost accounting notion which focuses on tracing all direct costs on the basis of source information to products, and tracing all indirect costs firstly to resources and then allocating them to activities and lastly allocating costs of activities to products. ALFA's SA model is close to the above, yet with a few exceptions:

- costs of machine and production unit repairs with all other machines' costs are not collected on the resources of 'machine X' or 'machine Y' but they are directly allocated to activities, for example 'packaging';
- direct employees' remuneration costs are not traced in the cost accounting system to products, but they are allocated, on the basis of source information (timesheets), to activities performed by the employees for particular groups of products;
- costs of raw materials are not directly traced to products but first they go to activities, in which they are used, however, there is no indication what product they are used for. Subsequently, the raw material costs accumulated on a particular activity are accounted, proportionally to established standards, for goods produced in a given activity;
- there are activity costs only on the level of a unit product activity (there are no activities on the level of product groups or a type of products). The lack of activities on the level of product groups or type of products, as the CFO in ALFA SA put it, "is the only thing in the ABC system, which has not been taken into consideration yet";
- indirect costs are only accounted for products and their groups (the clients profitability is calculated as a variation between the client's revenue and cost of products sold to a particular customer – no activity costs are directly accounted for clients).

One should mention, that in the researched company, nobody used a term of a 'cost driver', instead they talked about an 'allocation base'. However, the allocation base used in ALFA SA was equivalent to a cost driver from the ABC

model. The company did not seek to implement the exact activity-based costing system with all its terminology and concepts presented in the academic literature, but they sought to improve considerably the quality of product costing. The CFO defined it as follows, "it was not about dividing by number or value of products sold or produced".

The generation and implementation of the activity-based costing in ALFA SA enabled creating better information regarding costs and profitability for the inner customers in order to make accurate decisions for the production, sales and controlling results of these decisions. The implemented activity-based costing enabled drawing up of profitability analysis of products, groups of products, customers and groups of customers and selection of sales areas in the enterprise. All the information was used in ALFA SA to explain the process of generating costs and allowed the cause-and-effect analysis, using benchmarking and outsourcing, undertaking activities aiming at cost reduction and providing accurate information regarding costs and profitability of products, customers etc.

As far as usage of the information received from the activity-based costing in ALFA SA is concerned, it should be emphasized that:

- the main users of the activity-based costing system in ALFA SA were the junior and senior managers of the company, i.e. Junior Managers of Production (four persons) and Senior Managers (Senior Production Manager and Senior Sales Manager). The President of the company did not use the information received from the activity-based costing. He was interested in more general information, namely costs and profitability of the whole company and production departments as well as controlling of the income and the expenses and the ownership transformations within the group of managed companies;
- the information from the ABC were mainly used for decisions regarding prices, the optimization of the sales plan and performance measurement and improvement (the information from ABC was significant for making these decisions). The information from activity-based costing was relatively important in such areas as: cost reduction, product design, customer profitability analysis, cost tailoring and inventory valuation for financial reporting;
- the information received from the activity-based costing was primarily used for taking decisions on the groups of products and products. These decisions concerned withdrawing unprofitable products and groups of products, limiting expenses for unprofitable products and groups of products, facilitating sales of profitable products and groups of products and investing in new, potentially profitable products and groups of products;
- the information from ABC was also 'frequently' used for measurement and evaluation of particular activities and processes and 'frequently' for performance measurement and evaluation of particular managers and employees, particular responsibility centres and the whole company.

All the people engaged in implementing of the ABC in ALFA SA manifested a positive approach towards the system. All the efforts put in the implementation of the activity-based costing became a new challenge for the people involved, diverted from the daily routines, were a chance for displaying one's own skills in front of the superiors and enabled to strengthen one's position in the company. All group emphasized that the managers, as the main recipients of the information from the ABC (especially those working in production units), presented a positive approach towards the implementation of the activity-based costing. They were, along with the management accounting specialists, the main beneficiaries of the implementation of the activity-based costing (the production managers eagerly used the ABC model as their bonuses greatly depended upon the results worked out by their departments and these results were measured in the ABC system).

It should be mentioned however, that the development and the maintenance of the ABC systems can be jeopardized and the most important problems include:

- leaving the company by the key person responsible for the ABC project, i.e. the Controller (it is not certain if other employees shall be capable of taking the substantive supervision over the functioning of the ABC system, updating the system and involving other areas such as budgeting);
- implementing activity-based costing with the use of EXCEL spreadsheet (apart from numerous advantages like small cost, widespread use, the spreadsheet has its limitations – highly individualized problem-solving system or low susceptibility for unauthorized modifications. In brief, the model prepared by one user can be used with great difficulty by some other user, who may not be knowledgeable enough and may "spoil" the model in the process);
- the loss of interest in the ABC system by the President.

In the light of the above mentioned problems, the statement that development of the management methods in the company may describe a circle and change "from the management by trial and error into the management based on the reliable information and then from the management based on the reliable information back to the management by trial and error" made by the former Controller in ALFA SA may seem prophetic.

5.3.2. Activity-based costing implementation in telecommunications company BETA SA

BETA SA is a big telecommunications company, sales of BETA SA is totally (100%) domestic. The structure of the company comprises of: Sales and Marketing Section, Technical Section, IT Section, Legal Section and the Section of Finance and Administration. In the cost structure of the company the following costs can be enumerated: direct remuneration costs – approximately 3%, other direct costs

(mainly the operator interconnection costs) – 37%, indirect costs – approximately 60%. The basic processes outlined in BETA SA comprise of: products development, products management, marketing, products sales, operator interconnections cost clearing, billing, debt collecting, customer service, telecommunication network creation, access network development, telecommunication network maintenance, financial management, strategic management, buying, company assets management, IT systems maintenance, human resources.

The changes in the cost accounting system in BETA SA which eventually resulted in activity-based costing creation (occurring within several years), date back to the late 1990s. At that time the attempts to create an interconnection costs allocation model were undertaken. In the subsequent years a sales costs allocation model was formed – regarding primarily commissions and remaining personal costs of the sales section employees. Subsequently, the costs division into the telecommunication network elements were worked out (the telecommunication network elements are not only the costs of depreciation but also personal costs and costs of external services). No reliable information regarding costs of products and customers was contained in the previous cost accounting system. According to the words of the Controlling Department Manager, "on the basis of the information from this system nobody would risk a statement that the profitability of products or customers calculated with this system would mean anything".

The activity-based costing implementation in BETA SA occurred seven years ago and the decision to implement it was a direct initiative of the Management Board. According to the opinions of the Controlling Department and the managers of the operation sections two factors influenced the ABC implementation in BETA SA: the change of the managers' information needs and determination of costs reduction and performance improvement (according to the Controlling Department there are three more, equally important factors for the implementation: facilitating of the control process, the change of strategy and new technologies implementation). In the analysis of the factors influencing activity-based costing implementation it is emphasized that the Controlling Department enumerates other factors significant for the process of implementation, such as: parent company requirements and the ABC implementation in competing companies, while the managers of operation sections do not acknowledge these factors (ABC implementation in competing companies) or they belittle their importance (parent company requirements).

The activity-based costing implementation in BETA SA took almost a year. The subsequent steps of implementation were as follows: (a) implementation planning and implementation duties distribution, (b) defining bills of resources, activities and objects for ABC, (c) defining drivers of resources and activities for ABC, (d) creation of activity-based costing model, (e) test of activity-based costing model.

The activity-based costing system in BETA SA specifies: approximately three hundred resources, a dozen or so resource drivers, a hundred and a several dozen activities, several dozen activity drivers and several thousands of cost objects (products, customers etc.). The costs in the activity-based costing were divided into fixed and variable costs. Also the costs of unused capacity were outlined but only on the level of resources connected with the network infrastructure. The activities on the level of a product unit, product batch, product type and the company as a whole were also specified.

Including the costs of the technical infrastructure of the telecommunication company in the ABC model required specifying of several basic elements in the model, in BETA SA they were:

- resources (remuneration, telephones, cars, offices, computer network, type approval costs, interconnection costs etc.);
- supplementary activities, basic and general – hosting systems development, CRM system development, wholesale customers clearing, debts collecting, financial assets management, operational reporting etc.;
- the elements of the telecommunication network – several dozen groups of fixed assets into which the whole telecommunication network was divided (e.g. light pipes, radio lines, the Internet services servers, network safety systems, subscriber's devices etc.);
- technical layers of network (technical products[3]) – several dozen groups consisting of the elements of telecommunication network used by specific technology (transmitting and commuting) to provide voice services and data transmission services (i.e. access layer, layer of data transmission services, hosting services layer etc.);
- cost objects: (a) motion fractures (local connections, interurban connections, international connections etc.), (b) products (analogue line, wholesale voice termination, hosting services, collocation services etc.), (c) company (all the costs not connected to any other cost object – incurred in connection with the general company management or resulting from law regulations).

In the basic activity-based costing model described by Kaplan and Cooper there are resources, activities and cost objects – these elements are also a part of the ABC system in BETA SA. In this system, however, two more elements function, i.e. telecommunication network elements and technical network layer (technical products) – the description of these objects was necessary for appropriate reflection of the processes occurring in activity-based costing system in BETA SA. Thanks to the allocation of a considerable part of costs of telecommunication network elements, these costs can be relocated to the technical network layers and then the costs of technical network layers can be relocated to cost objects (motion

[3] Technical products mean the elements of indirect costs allocation connected with the telecommunication network. Later these costs are allocated to motion fractures and products. Technical products can be described as platforms and transmission and access network layers.

fractions and products) – relocating of these costs directly to products and motion fractions with the omission of the previous allocation of telecommunication network elements and technical network layers would be impossible.

The activity-based costing in BETA SA is carried out to estimate budget data to compare with real data. This model (with budget data) basically does not make activity cost allocation of the company on particular objects of calculation – however such allocation is possible if, apart from the model itself, the way of carrying it out is assumed. In the ABC model in the company the allocation of the costs of unused capacity (these costs were estimated on the level of network resources) can be perceived in two different ways. It is possible to calculate all model with costs of unused capacity (then these costs are not demonstrated separately but they will charge products or customers) or without costs of unused capacity (in that case this costs do not charge product costs or customers) – depending on actual needs BETA SA uses both methods.

The activity-based costing implementation was unambiguously acknowledged as a success by the Controlling Department Manager (the person responsible for the substance of the implementation). The management of operation sections (business) perceived the implementation as a moderate success. During the process several less or more important problems were detected (see table 5.2).

Table 5.2. Problems in ABC implementation and maintenance in BETA SA

Problem	According to Controlling Department	According to operation sections
Extremely significant	a lot of work included in ABC implementation and maintenance	a lot of work included in ABC implementation and maintenance other priorities (i.e. ISO implementation, TQM, ERP etc.) problems with the model (i.e. choice of activities, drivers etc.)
Significant	insufficient knowledge of ABC among employees considerable costs of the ABC system implementation and maintenance problems with model construction lack of sufficient financial resources	insufficient knowledge of ABC among employees
Average	–	lack of support on the management side (the Management Board, the parent company etc.) considerable costs of the ABC implementation and maintenance
No problem	–	lack of sufficient IT resources

The ABC system implementation in BETA SA enabled the creation of reliable information about costs and results received mainly from products and product groups (reliable information regarding the costs in these aspects was not accessible in the previous cost accounting system in the company). This information is used in BETA SA to: explain the process of cost generating, enable cause and effect analysis, use benchmarking and outsourcing, undertake cost-reducing activities and provide reliable information regarding costs and profitability for different cost objects in the company. The following analysis are managed and carried out in BETA SA: (a) the profitability of customer segment and product, (b) the profitability of product and customer segment, (c) the profitability of customer segment, product and types of connections, (d) the profitability of segment and type of installation.

As for the information generated by activity-based costing in BETA SA it is worth emphasizing that:

- very often the information from ABC is used by marketing and sales specialists, operational sections and management accounting specialists. It is also frequently used by technical management, sporadically by senior management, and accountants do not use it at all;
- the information generated by the activity-based costing is extremely important in the following areas: cost-reduction, customer profitability analysis and measurement and improvement of achievements. The information is also significant in price decision-making and cost-modelling. Less frequently the information provided by activity-based costing is used in sales planning and product design (information is quite important). This information is not used for the purpose of financial reporting and budgeting;
- the information generated by the activity-based costing in BETA SA is used to make decisions regarding increasing costs for products, investments in new products and product groups reducing costs for customers and customer groups. The activity-based costing system is not used to make decisions regarding the region sales, distribution channels, organizational units of the company and the projects because suitable information for this purpose is not generated in the current ABC in BETA SA;
- as for the relations with the customers the activity-based costing in BETA SA influences the control of customer service costs (to a great extent), gives directions for working out of marketing strategy (to a great extent), is a base for the resignation from the customers (to some extent), provide information for forming the price policy (not frequently). The information from the ABC is not used either for forming customer policy or for renegotiating of cooperation conditions with the customers.

After several years of functioning of the ABC model in the company, a few quite significant changes in the financial section of the company occurred – there

were different causes for the resignation from the post of almost all employees in Controlling Department, including the Manager. The persons who were employed for their posts came from other companies and did not have sufficient knowledge regarding either the telecommunications company or functioning of activity-based costing (particularly its specific character in telecommunications company). The consequences of these were the changes in ABC model which made the whole model simpler and led to resignation from allocation on the basis of employees' work card of the supporting sections personal costs (the costs of these sections increased the general costs of the company which were not allocated to the final objects).

5.3.3. Activity-based costing implementation in insurance company GAMMA SA

GAMMA SA was one of the leaders on the Polish insurance market, it employed several thousands of workers and it specialized in providing mass products to numerous clients (cost strategy); the area it operated in was characterized by high competitiveness. Sales of GAMMA SA was entirely (100%) domestic. Operation of GAMMA SA embraced three basic areas: technical operation (operational), investment operation and reinsurance operation. Technical operation (operational) meant sales of insurance, among them such activities as direct sale of insurance but also activities indirectly related to insurance sales (active reinsurance).

Full absorption costing was the cost accounting system functioning in GAMMA SA before ABC implementation – it was decided by the Board to implement it and it was used despite any external influences (actuaries had a significant influence on its shape). The system was mainly entirely used for the means of external reporting, it was simplified and it was not used in terms of support of business decisions in the company (according to one of the employees of Management Accounting Department "it was hard to reconcile requirements of external reporting with requirements of management accounting"). Another employee of Management Accounting Department claimed that in terms of business decisions support, the current cost accounting "was in some situations too detailed, and in some instances too general", whereas information about costs and profitability of insurance products "was so distorted that no one wanted to trust it".

Activity-based costing operating in GAMMA SA had been implemented more than a year before carrying out this research and the decision about the implementation came directly from the Board of the capital group, to which the company belonged. Interviewed employees of GAMMA SA noticed that the implementation of activity-based costing was influenced by various factors. The

ABC implementation was triggered by demands of the head office, dissatisfaction with the current cost accounting system, the necessity to alter management's information needs and cost reduction with improvement of business results. The implementation was moderately influenced by the growing competitiveness, change of strategy and the drive to improve control. The activity-based costing implementation in GAMMA SA was little influenced by such factors as: change of organizational structure, change in top management, implementation of new technologies, aiming to enter new sales markets, favourable attitude of workers towards changes or availability of financial and human resources.

The implementation of activity-based costing in GAMMA SA lasted for two years (although it was initially planned to take 18 months), stages of work on ABC implementation were as follows: (a) development of the concept of activity-based costing, (b) study of data availability needed for ABC, (c) creation of activity-based costing system, (d) generation of data needed for ABC, (e) tests of activity-based costing system.

Implementation of activity-based costing in GAMMA SA was an extremely complex process – in order to create the system the right way, the cooperation between financial departments and operational ones was necessary. To make the cooperation more formal, Steering Committee was founded; it consisted of representatives of business units, financial units, IT, actuaries and representatives of consulting company, which aided the process of implementation. In terms of contents, the shape of activity-based costing in GAMMA SA was substantially influenced by the Management Accounting Department (representatives of this department spent the biggest amount of time on tasks which involved implementation of ABC). After implementation of ABC, the Steering Committee was dissolved, however it transformed into a regular committee which supervised the functioning of the system (maintenance and modifications of the system).

In the activity-based costing system in GAMMA SA several dozen of resources, several resource drivers, a few hundred of activities and a few dozen of activity drivers, and more than five hundred cost objects (products, clients etc.) have been isolated. In the activity-based costing system of the company costs of unused capacity have been defined, yet no fixed or variable costs nor activity hierarchy (activities on the level of unit of product, batch of products, type of products and the whole company) have been isolated. Within the system a wide range of profitability analyzes, in various cross-sections and of different minuteness, are carried out – more than five hundred analyzes are made for products, whereas between a few and a few dozen of analyzes are prepared for such objects as groups of products, clients, groups of clients, sales regions, internal organizational units, distribution channels or projects.

In the activity-based costing in GAMMA SA costs of individual activities may be, when needed, allocated to different cost objects i.e. costs of one activity

can be, in terms of product profitability analysis, accounted by one driver for products, whereas in case of customer profitability analysis can be accounted by a different driver for customers. Portion of general activities in GAMMA SA is not allocated to costs objects by individual drivers but proportionally to income.

Having implemented activity-based costing, GAMMA SA did not quit the previously used cost accounting system – ABC was used for internal purposes whereas the previous cost accounting provided a basis for external reporting. The activity-based costing implementation was considered by the Head of Management Accounting Department (the one who was responsible for the implementation in terms of merits) as a complete success. However, during the implementation process numerous problems of different significance were noticed, among them high labour input in ABC implementation and operation was considered as significant. Amid problems of moderate scale one could enumerate high costs of ABC implementation and operation, insufficient knowledge of ABC among workers, difficulties in system construction and lack of adequate data analysis resources. Other priorities than ABC implementation were a slight problem. However, there was no problem with the top management's support of the activity-based costing implementation project.

Implementation of activity-based costing system in GAMMA SA enabled to generate reliable information about costs and results in the field of products and groups of products (competent information about costs in those dimensions was not available in the previous cost accounting system functioning in the company). The information was used in GAMMA SA to explain the process of cost formation, it enabled the cause-and-effect analysis, it enabled benchmarking and outsourcing, as well as undertaking steps to lower costs; it also provided competent data about costs and profitability for various cost objects in the company. With reference to information generated by the activity-based costing system in GAMMA SA, it should be emphasized that:

- the ABC information was really frequently used by the management accounting specialists as well as experts from operational departments. It was quite often used by marketing and sales specialists and the top management, whereas accountants made use of it sporadically;
- among the areas, in which information generated from activity-based costing was crucial, there were product design, customer profitability analysis as well as measurement and improvement of performance. ABC information was important in initiatives related to cost reduction and quite significant in pricing decisions, sales plan optimalization and cost modelling. Its significance was little for budgeting (ABB) and it was completely irrelevant in case of financial reporting;
- information generated from activity-based costing in GAMMA SA was used to make decisions about restriction or increase of inputs. Those decisions related to restriction/increase of product input, restriction of input in case of groups

of clients, increase of input in terms of sales regions and distribution channels, restriction of input in case of organizational units (e.g. departments);

- when relation with clients is considered, activity-based costing in GAMMA SA provided information needed to shape customer policy (major extent), influenced costs control involved in customer service (significant extent), helped to make decisions about quitting a client (significant extent), provided advice necessary for preparation of a marketing strategy (moderate extent), provided a basis for renegotiation of terms and conditions of cooperation with customers (moderate extent) and it also provided information which was useful in the process of shaping of pricing policy (minor extent).

5.3.4. Activity-based costing implementation in manufacturing and trading company OMEGA SA – action research

OMEGA SA was a manufacturing and trading company which mainly purchased nuts, dried fruits and vegetables, portioned and packed them and subsequently sold under its own brand name or other private labels inside, as well as outside the country. Company's head office and logistics centre were in the central part of the country and its production plant in the eastern part. When the study was carried out, the company employed a few hundred people and it specialized in providing mass products to numerous customers (cost strategy), whereas the business line it operated in characterized of average competition. The sales of OMEGA SA were nearly entirely domestic, the export sales constituted only 4% of the whole sales. In the cost structure in OMEGA SA direct costs took up to approximately 74% of total costs. Indirect costs came second, and their share in the total costs of the company equalled to 22%. Direct compensation and other indirect costs constituted approximately 2% each of the company's costs.

Prior to activity-based costing implementation in OMEGA SA, full absorption costing functioned in the company. The system enabled real estimation of financial results for the company as a whole, however: (a) it did not generate fully accurate information about costs and income of products and groups of products sold, (b) it prevented profitability evaluation of isolated types of operation, organizational units, customers and groups of customers, (c) it did not provide reliable information about costs of processes taking place in the company e.g. logistics processes, production processes, infrastructure maintenance processes etc.

The decision about the implementation of activity-based costing in OMEGA SA came from the Board (the role of the Board Member responsible for finance was crucial in the decision-making process). The decision about implementation of ABC system was mainly influenced by the change in the management's information needs, the willingness to reduce costs and improve results as well as the willingness to improve control.

The analysis of OMEGA SA lasted for about a month and it was carried out by five consultants from an external company (around 30 working days) and twenty people from the Board and top management (around 15 working days). The first stage of work on the ABC model in OMEGA SA comprised of analysis of the processes, especially the process of inside logistics, production, marketing and sales, external logistics, maintenance of organization, product development, quality and support process. At the same time, the analysis of procedures of the previous cost accounting system used in OMEGA SA was carried out. In particular, attention was paid to the system of collecting and processing information in the IT systems (inter alia in the integrated IT system of the company and in the system of budgeting, which functioned in EXCEL spreadsheet) in terms of the usefulness of information generated by the systems in the light of the planned activity-based costing and profitability management.

This stage of the analysis closed with the assessment of correctness of information about costs in the area of the following structures: by type, organizational unit and cost object (products and their groups, customers and groups of customers, distribution channels, sales regions) from the company strategy point of view. The assessment helped to formulate a proposal of changes in the area of costs accounting, so that the system met the information needs of the Board and the top management of the company. The proposal presented by the consultants underwent an analysis and the compromise reached between the consultants and the management of OMEGA SA became a starting point for preparation of the activity-based costing draft in the following stage. For the purpose of the project and effectiveness of the ABC implementation process, the top management (around 25 people) took part in a two-day training session on ABC/M.

In the construction of the ABC system, which lasted for about 2 months, three outside consultants (approx. 30 working days) and fifteen people from the Board and top management of OMEGA SA (approx. 20 working days) took part. The modelling of activity-based costing was divided into following stages: (a) cost objects identification, (b) resource identification, (c) activity identification, (d) resource cost drivers identification, (e) activity cost drivers identification, (f) defining changes within the integrated IT system.

The activity-based costing system which functions in OMEGA SA is a system where one can distinguish: a few dozen of resources, a dozen or so resource cost drivers, a few dozen of activities, between ten and twenty activity cost drivers, more than thousand of cost objects (products, groups of products, brands, recipients, distribution channels, groups of distribution channels, sales representatives, regions etc.).

Creation of the profitability management system on a basis of ABC lasted for about 2 months. Three consultants from an external company (approx. 20 working days) and five people from the Board and the top management of OMEGA SA

(approx. 10 working days) participated in the project. At this stage, it was possible to construct tabular profitability reports, which constituted an elementary method of internal reporting. The reports were issued monthly (or more frequently if needed) and they were prepared in two versions i.e. on a monthly basis, for a particular month, and on a year-to-date basis – from the beginning of the calendar year to the end of a given month (the data was accumulated from the start of the year). The reports mirrored the operation of OMEGA SA and provided information about costs, revenues and gross margin in different sections, which was especially useful when making decisions was concerned. Distribution of data in the report allowed to asses profitability of particular: (a) products, groups of products, brands, (b) recipients, payers, distribution channels, groups of distribution channels, (c) sales representatives, sales regions, countries.

The purpose of those profitability reports was to provide economic information (planned and actual) to the management of OMEGA SA (the Management Board, Trading Department, International Sales Department, Financial Department, Production and Logistics Department). The profitability reports, which were issued within the framework of management accounting system, constituted a source of information necessary to carry out: analyzes of profitability in various sections (planned and actual), analyzes of break-even point, analyzes of sensitivity of financial result, scenario analyzes (what happens if) for OMEGA SA as a company but also for its fractions (e.g. regions, groups of products etc.).

The information generated by the activity-based costing system in OMEGA SA was important for the managers in terms of valuation of products, making pricing decisions and product and customer profitability analyzes (in particular, the profitability analyzes prepared on a basis of activity-based costing were used to make decisions about the increase of expenses on products, groups of products, customers, groups of customers, sales regions, distribution channels and organizational units). The information from the ABC system in OMEGA SA was frequently used to measure and evaluate the performance of individual managers and employees, individual responsibility centres, activities and processes.

The activity-based costing was additionally used in terms of relations with customers. It basically provided information which was useful in case of shaping customer policy, it supplied information needed to shape the pricing policy, it had influence on the control of costs of customer service, it guided the marketing strategy, it provided a basis for quitting a customer and it also provided a basis for renegotiation of terms and conditions of customer cooperation.

After implementation of the activity-based costing system in OMEGA SA, one employee was involved in the maintenance of the system, however it was just one among his other regular responsibilities. The company did not quit the previous cost accounting system, which functioned prior to the implementation, and used it for financial reporting, whereas the ABC system was used for management. The

implementation of activity-based costing in the company was perceived by their employees as a moderate success.

Insufficiency of resources (both people and money) is the main reason behind the fact that so few small and medium-sized companies make the decision about the implementation of ABC. As far as financial resources are concerned, they were not a problem in case of OMEGA SA. Both remuneration for the consulting company and other costs were insignificant for the company. In terms of human resources, the problem occurred (but it was not impossible to overcome):

- the data needed for valuation and calculation of some activities was not collected at all – it happened with reference to some activities in the sales process (some sales representatives did not fill out the specially designed activity sheets which made precise cost calculation of those activities on cost objects impossible). The main reason underlying the problem was the fact the manager, who was in charge of sales representatives, changed his job at the beginning of the implementation process;
- the ABC analytics, which were implemented in the financial and accounting system of the company in the first version of the ABC, caused prolongation of journal entries of accounting documents (the company attempted to modify the method of data gathering, so that it was less time-consuming for the employees, however, bearing in mind the fact, that all the important data for the ABC system must be available at hand);
- some of the information generated by the ABC system was not sufficiently used. For example, the management of the company was focused on the information about the profitability of a products, groups of products, brands, customers, distribution channels etc., however they did not pay much attention to the operational and financial information about activities or resources.

All of the above problems occurred during the process of implementation of activity-based costing in the analyzed company. The problems, however, did not eclipse the success of implementation. It means that the process of implementation of activity-based costing is difficult and it is not easy to foresee all the problems which might arise during the implementation and, subsequently, during the usage of the implemented system. When this case study was prepared, the activity-based costing system in OMEGA SA was undergoing redefinition in terms of yearly experience and in terms of the necessity to adjust it to the current conditions of the company's operation. The Management Board was convinced that the modified version of the system would appear to be a better tool used for supporting the process of company management. Better than the first version of the ABC system.

5.4. Factors influencing activity-based costing implementation and changes in management accounting systems following the implementation

It should be emphasized that in the case of all companies analyzed (ALFA SA, BETA SA, GAMMA SA and OMEGA SA) the key motivator of the implementation of the new cost accounting system in the company was the managers' dissatisfaction with the information provided by the previous cost accounting system, which was explicitly expressed by the President of ALFA SA addressing the Controller: "do something with the calculation model as the present one is not good".

Three types of positive factors and one type of a negative factor influenced the process of the implementation of the innovations within the area of management accounting (in this case on the implementation process of activity-based costing). They are as follows:

- motivators (having a continuous, long-term influence on the implementation of the innovations);
- catalysts (having a direct influence on the implementation of the innovations);
- facilitators (factors without which the implementation of the innovations would be impossible);
- obstructers (factors having a negative influence on the implementation of the innovations).

These factors had a joint influence on the process of activity-based costing implementation, thus promoting the process of innovations (the number of positive factors outweighs the number of negative factors). The list of key factors influencing activity-based costing implementation in ALFA SA are presented in table 5.3. Two aspects of changes in management accounting in the analyzed companies could be observed after the activity-based costing had been implemented, namely: methodological changes and institutional changes. The above changes are presented in table 5.4.

In conclusion it should be stated that in all the companies surveyed by means of case studies a similar pattern was detected. In the companies, both managers as well as management accounting specialists were ready to question the existing costing system and to plan and implement a new, better system. Managers questioned the quality of information provided by the current cost accounting system, and management accounting specialists reacted to that need by implementing activity-based costing. Management accounting specialists were on the one hand aware of the changes taking place on the market and inside their own company, and on the other hand, they were also aware of the new cost accounting and cost management methods. As a result, they adapted the latest tool of cost accounting to solve problems within their company.

Table 5.3. Factors influencing the ABC implementation in analyzed companies

Type of factors	ALFA SA	BETA SA	GAMMA SA	OMEGA SA
Motivators	• the increase of competitiveness and market strategy • production strategy (the increase of diversity and complexity of products – the customers began to demand unconventional products, in short batches) • the need for information reported by the managers • inaccuracy of data received from the present cost accounting	• extremely high level of competition • strategy (increase of differentiation and complexity of products) • the need for information reported by operational sections managers (technical sections, sales sections, supporting sections) • lack or inaccuracy of the important information in the previous cost accounting system	• the need for information reported by operational sections manager (dealing with acquisition, liquidation and administration) • lack of the important information useful in the process of management in the previous cost accounting system • high level of competition in business and increase of differentiation and complexity of products	• the need for information reported by the Board and managers of sales, production and logistics departments • lack or inaccuracy of the important information in the previous cost accounting system
Catalysts	• in-service training in the area of cost accounting • post-graduate studies undertaken by the Controller	• the management board's acknowledgement of the activity-based costing as the system which the telecommunication company "should have because other companies already have this system" (Financial Director)	• the management board's acknowledgement of the activity-based costing as the system which could provide for the first time information useful for managers	• the CFO's acknowledgement of the activity-based costing as the system which may significantly improve the quality of information about costs and profitability

Table 5.3 (cont.)

Type of factor	ALFA SA	BETA SA	GAMMA SA	OMEGA SA
Facilitators	• the management board support (the presidents' 'blessing' and giving a 'free hand') • knowledge transfer into the company (in-service training) • Controller's level of knowledge in the area of new cost accounting systems • susceptibility to fashions and trends • sufficient resources • medium-sized company, medium level of complexity of processes, 'everybody does everything', it is difficult to find persons potentially involved in the controlling implementation who would be proficient in the narrow part of the activity solely • good general condition of the company, the usage of the productive capacity up to 100%	• the management board's support (all key persons who were important for ABC implementation in the organization knew that the implementation must be successful) • changes-oriented organizational culture in operational sections (mainly in technical sections, sales and supporting sections) • knowledge transfer regarding ABC to the company (in-house trainings carried out by the consultants, the participation of selected persons from financial section in the open trainings) • technical knowledge transfer – in-house trainings regarding the processes implemented in BETA SA carried out by the technical sections for the Controlling Department employees) • susceptibility to fashions and trends (the conviction that the company such as BETA SA simply must have the system like ABC) • sufficient resources (human, technical and financial)	• the management board's support (making managers aware of benefits ensuing from ABC implementation and making them involved in the process of implementation) • changes-oriented organizational culture in operational sections (managers got involved in the process of implementation of the new cost accounting system because they believed it would provide information which could be used in the decision-making process) • knowledge transfer regarding ABC to the company e.g. in-house trainings carried out by the consultants • susceptibility to fashions and trends (many companies from the financial sector use activity-based costing) • sufficient resources (human, technical and financial) • huge dedication of Management Accounting Department (as the Head put it – "fierceness during implementation")	• strong management board's support (all the people involved in the implementation process were convinced that, as the Controller put it, "the Board is behind the implementation of activity-based costing all the way") • knowledge transfer regarding ABC to the company - in-house training carried out by the consultants, participation of the board's CFO in an open management accounting training, which mainly dealt with the issue of activity-based costing • susceptibility to fashions and trends (the conviction of the CFO that "it is simply becoming for the company to have such a system like ABC") • sufficient resources (human, technical and financial)

Table 5.3 (cont.)

Type of factor	ALFA SA	BETA SA	GAMMA SA	OMEGA SA
Obstructors	• corporate culture objecting any changes (according to the employees of the company: "nobody has the time to get involved in tasks needed to have been done yesterday", "the company has no time and money for facilitating the process of time and money management", "the initial state – management by trial and error, it is good but no one knows why") • insufficient level of knowledge of the senior management of the company	• very complicated and differentiated company's activity – it is difficult to find a person who knows all its aspects • insufficient knowledge of technical processes of financial section employees • organizational culture not favouring changes in other not operational sections (mainly administrative sections, IT supporting sections, legal sections etc.) • insufficient level of knowledge of medium and senior management of the company (regarding both cost accounting knowledge and the knowledge of the complexity of processes occurring in the company)	• very complicated and differentiated company's activity and its size – the company operates in several regions all over the country, it has hundreds of organizational units and employs a few thousand of people (there are 14 million of cost objects functioning in the ABC system) • insufficient knowledge of processes taking place in a big insurance company among financial section employees (some employees of Management Accounting Department worked there for a short time) • insufficient level of knowledge of activity-based costing among employees from financial and operational sections • lack of understanding of the importance of activity-based costing by the IT Department	• organizational culture not favouring changes (apart from ABC, the company did not use any of the modern methods of management and management accounting) • changes in the integrated IT system used for management of the company (it led to revisions of procedures connected with data collection and transfer to the ABC system) • high labour-consumption of recording of documents in terms of activity-based costing system in its first version • departure of the manager who was in charge of sales representatives

Table 5.4. The changes in management accounting in analyzed companies after ABC implementation

Company	Area of changes	Before ABC implementation	After ABC implementation
ALFA SA	methodological changes	• decision-making through "management by trial and error" • low accuracy of direct cost tracing to products • full absorption costing with indirect cost settling "using the method direct costs + X" • costs established only for a groups of products • profitability analysis of the whole company and very inaccurate analysis of products profitability • no planning of the production capacity in order to determine its influence on the unit price (costs of unused resources not specified)	• decision-making based on numerical data from ABC system • high accuracy of direct cost tracing to products • activity-based costing with indirect cost allocation according to various costs drivers • costs established for products as variable cost according to activities and resources plus fixed cost according to activities and resources • profitability analysis of the whole company, products, groups of customers and customers etc., established based on activity-based costing • costs of products calculated for normal production capacity (costs of unused resources allocated to profit and loss account)
	institutional changes	• Controller supervised by Chief Accountant • management accounting function distant from production and sales function • low approach to information delivery needed for decision-making • no specified responsibility centres • information from the management accounting rarely used by the managers of production, sales and other positions in the company	• Controller not supervised by Chief Accountant, directly supervised by President • management accounting function close to production and sales function • higher approach to information delivery needed for decision-making • specified centres responsible for costs and profits • information from the management accounting frequently used by the managers of production, sales and other positions in the company
BETA SA	methodological changes	• intuitional decision-making ("if the competing company does this so we must do it as well" – the Manager of the Controlling Department)	• taking numeral data from ABC in decision-making into consideration (data from ABC were not the only data considered in decision-making, neither were they the most important source of information – still they were used)

Table 5.4 (cont.)

Company	Area of changes	Before ABC implementation	After ABC implementation
BETA SA	methodological changes	• very low accuracy of calculating direct costs of products (mainly IC costs)	• very high accuracy of calculating direct costs of products (as a result of ABC implementation the accuracy of measures increased significantly therefore the costs of IC could be allocated on products)
		• profitability analysis on the level of the whole company and very inaccurate, in fact useless, profitability analysis of products	• reliable profitability analysis on the level of the whole company, groups of products, products, groups of customers and customers, etc. based on activity-based costing
		• lack of specified of unused capacity costs (costs of products were charged with the costs of unused capacity)	• the possibility of cost calculating without costs of unused capacity (these costs did not charge the products but they were allocated directly to the company as a whole)
	institutional changes	• lack of significant specification of persons responsible for the cost accounting system in the Controlling Department structure	• specified post of the person in the Controlling Department whose main task was to manage the ABC system; two other persons were responsible for managing of the ABC but it was only one of their regular duties; additionally, during the yearly modification of the system, if required, other employees of the Controlling Department participated in the works
		• low importance of the Controlling Department	• increase of the importance of Controlling Department in the opinion of operational sections
		• the function of the management accounting remote from operational functions (technical sections, sales and supporting sections)	• the function of the management accounting close to operational functions (technical sections, sales and supporting sections)
		• low attitude to information delivery for decisions	• greater attitude to information delivery for decisions
		• the information from the management accounting were not used to activities evaluation	• the information from the management accounting were used for activities evaluation for the whole company and their basic function sections

Table 5.4 (cont.)

Company	Area of changes	Before ABC implementation	After ABC implementation
BETA SA	institutional changes	• the information from the management accounting were basically useless for the decision making of the managers of the operational sections	• the information from the management accounting are more frequently used for the decision making by the managers of the operational sections
GAMMA SA	methodological changes	• making decisions without taking into account information about costs and profitability • very low accuracy of calculating costs of products and lack of calculation of costs for other objects • profitability analysis on the level of the whole company and very inaccurate (in fact useless) profitability analysis of products • traditional budgeting functioned • lack of reporting system	• taking into consideration the numeral data from ABC in decision-making • very high accuracy of calculating costs of regions, distribution channels, groups of customers, customers, lines of business, business segments, products • profitability analysis on the level of the whole company, regions, distribution channels, groups of customers, customers, lines of business, business segments, products etc. on the basis of activity-based costing • traditional budgeting still functions however the implemented ABC, according to the Head of Management Accounting Department, "will support budgeting" • creation of reporting system on the basis of activity-based costing
	institutional changes	• the function of the management accounting remote from operational functions • low attitude to information delivery for decisions • the information from management accounting was not used by the operational managers at all • lack of significant specification of people responsible for providing information about costs, income and results in the Management Accounting Department structure for the needs of operational departments	• the function of the management accounting close to operational functions (acquisition, liquidation, administration) • greater attitude to information delivery for decisions • the information from management accounting is more frequently used by the operational managers • specified post of the person in the Management Accounting Department whose main task was to manage the ABC system; two other persons were responsible for managing of the ABC but it was only one of their regular duties

Table 5.4 (cont.)

Company	Area of changes	Before ABC implementation	After ABC implementation
OMEGA SA	methodological changes	• making pricing decisions without any relation to the information provided by the cost accounting system • low accuracy of calculating indirect costs • costs precisely calculated only on the level of the whole company • profitability analysis on the level of the whole company and very inaccurate, in fact useless, profitability analysis of products, customers and other cost objects • information from the cost accounting system was not used to make customer-related decisions	• taking numeral data from ABC into consideration in pricing decision-making • high accuracy of calculating indirect costs on different cost objects • real costs precisely calculated on the level of products, customers, distribution channel, regions etc. • reliable profitability analyzes on the level of the whole company, sales regions, distribution channels, groups of customers, customers, brands, groups of products, products etc. prepared on the basis of activity-based costing • high significance of ABC information in case of making: pricing decisions, decisions which shape customer policy, decisions about the marketing strategy, decisions about renegotiation of terms and conditions of customer cooperation and decisions about quitting customers
	institutional changes	• the function of the management accounting remote from operational functions (production section, sales section, logistics section etc.) • low attitude to information delivery for decisions • the information from the management accounting was not used to evaluate performance • the information from the management accounting was basically useless in terms of the decision-making of the managers of the organizational sections	• the function of the management accounting close to operational functions (production section, sales section, logistics section etc.) • greater attitude to information delivery for decisions about pricing, discounts etc. • the information from the management accounting is used to evaluate performance of individual managers and employees, responsibility centres and activities and processes • the information from the management accounting is more frequently used for the decision-making by the Board and the managers of the operational sections (it is also used by the management accounting specialists)

5.5. Summary and conclusions

For the purpose of explanation of activity-based costing implementation process a model based on contingency theory, Hopwood's management accounting change model and a model by Grott and Lukka (2000) as well as Abrahamson's (1991) fads and fashions theory has been used. The model distinguishes three types of positive factors which influence the process of innovation implementation (motivators, catalysts and facilitators) and one type of negative factors (obstructors); two types of changes resulting from the process of implementation have been distinguished i.e. methodological changes and institutional/organizational changes. On the basis of the research carried out in four companies the following conclusions on the hypothesis tested, shall be drawn:

1. The research enabled distinction of three types of factors positively influencing activity-based costing implementation and one type of negative factors. The factors affect the process of implementation collectively, promoting the process of changes (positive factors dominate negative factors in that respect). The research identified the following positive factors:

a) the most important motivators, which have a continuous and long-term influence on implementation of the innovation, were: management's need for information (4 companies), inaccuracy of data from the current costing system (4 companies), increase of differentiation of products and customers' demand (3 companies) and increase of competitiveness (3 companies);

b) among catalysts, which directly influence implementation of the innovation, the following were distinguished: the management board's acknowledgement of the activity-based costing as the system which could provide significant information useful for management (2 companies), the management board's acknowledgement of the activity-based costing as the system which 'is becoming' to have (1 company), in-service training in the area of cost accounting and post-graduate studies undertaken by the Controller (1 company);

c) four facilitators were identified in each company (without them, the process of implementation would be impossible): the management board support, knowledge transfer, availability of sufficient resources and susceptibility to fashions and trends. Additionally, in two companies, there was another facilitator i.e. change-oriented organizational culture.

2. The key factors, which negatively influenced the process of implementation of management accounting innovation in the researched companies included: organizational culture not favoring changes (2 companies) and insufficient knowledge of medium and senior management of the company (3 companies). In two, out of four analyzed companies, there were also other obstructers impeding

the process of implementation i.e. very complicated and differentiated company's activity and insufficient knowledge of technical processes among financial section employees. Sporadically (one case only), other negative factors were identified, including: lack of understanding of the importance of activity-based costing by the IT Department, change of the IT system and high labour input into activity-based costing procedures.

3. Changes triggered off by the implementation of activity-based costing in the analyzed companies were evident in two areas – methodological and institutional/organizational. The research revealed that in all the four companies, the following methodological changes took place: improvement of accuracy of cost calculation (direct and indirect), improvement of cost of products calculation, improvement of accuracy and wider use of profitability analyzes, as well as use of ABC information for making decisions. What is more, in two companies, the implementation of activity-based costing enabled isolation of costs of unused capacity, and in one of the companies it improved the system of budgeting and reporting.

4. Case studies also revealed institutional/organizational changes, which resulted from activity-based costing implementation. The basic institutional changes in all the four companies included: nearing of management accounting function to other operational functions, greater attitude to information delivery for decisions and more frequent use of management accounting information by managers. In two companies, implementation of activity-based costing triggered off creation of a specified post for the person in the Controlling Department whose main task was to manage the ABC system, and additionally, in the third company, the Controller was no longer supervised by the Chief Accountant but directly by the President. In one case, a significant increase in the importance of management accounting in the company was identified.

On the basis of the conducted research, it may be claimed that the model taken into consideration at the beginning was verified in a positive manner; this could mean that the model may be used (with caution) in terms of explanation of the change process and innovation diffusion in management accounting and activity-based costing in particular.

CHAPTER 6

SATISFACTION AND BENEFITS OF ACTIVITY-BASED COSTING IMPLEMENTATION IN POLISH COMPANIES

6.1. Introduction

At the turn of the 20th and 21st century, a substantial percentage of companies in different countries undertook the laborious task of activity-based costing implementation; the companies experienced numerous problems in the process of implementation and in some cases the implementation success was questionable. One of the first works, which aimed to identify factors influencing the success of ABC implementation, was the research by Shields (1995). The research was carried out on the group of 143 companies using activity-based costing and it proved that the degree of satisfaction of ABC was greatly varied (activity-based costing implementation was seen as a moderate success and companies using ABC evaluated the implementation as financially profitable). The study proved that success of ABC implementation depends on behavioural and organizational factors, among them: board support, relation to competitive strategy, relation to systems of performance appraisal and reward and the fact of having enough resources for implementation. Shields (1995) concluded that success of ABC implementation does not significantly depend on such technical variables as: type of software, consultants' participation in the process of implementation or implementation as a part of ERP or other system.

Swenson (1995) completed his study in the same year as Shields (1995). The research aimed to analyze financial and operational managers' satisfaction ensuing from activity-based costing functioning in their companies (the research was carried out on a group of 25 companies). In general, the study showed that the level of ABC satisfaction was higher than the satisfaction of traditional system.

However the author stressed that one should interpret the results cautiously since respondents came from a group of people which, in the analyzed companies, were responsible for activity-based costing implementation process. Measurement of success of ABC implementation was improved in the research by Foster and Swenson (1997), who suggested four measures of success i.e. the use of ABC information in the decision making process, making decisions and taking actions based on ABC information, perceived financial consequences of ABC implementation and success evaluation of ABC implementation by managers[1].

In another research on the factors determining the success of activity-based costing implementation, McGowan and Klammer (1997) analyzed relation between the factors which determined ABC implementation and employees' satisfaction of the system. The main result of the study stated that the degree of satisfaction of ABC system was dependent on most of the factors, which had been earlier identified in the research by Shields (1995) i.e. board support, the degree of involvement in the implementation process, relation to the system of performance appraisal and training. The research (McGowan, Klammer, 1997) proved that employees generally found the implementation of activity-based costing as a positive phenomenon, however the level of satisfaction was higher with people who daily oversaw the functioning of ABC system (preparers) than those who only used ABC information (users). Involvement of employees in the process of ABC implementation and assessment of information quality generated by the activity-based costing were positively correlated to ABC implementation success.

Research conducted by Anderson and Young (1999) concentrated on the analysis of relations between the employees' satisfaction of activity-based costing and the factors determining the implementation. The study based on an example of two companies helped to form a statement that the general evaluation of activity-based costing is mainly dependent on the quality of traditional costing system and the precision of ABC information generally depends on the perceived by respondents' necessity of changes and involvement of adequate resources in the design process, whereas the use of information generated by ABC system was mainly dependent on board support, accessibility of adequate resources, respondent's involvement into the project and organization of implementation. The fundamental variables used in the key studies of activity-based costing satisfaction and ABC implementation success are presented in table 6.1.

[1] Foster and Swenson's study (1997) aimed to analyze the factors which influence the success of implementation of activity-based management accounting methods. The research was based on a sample of 166 ABC implementations in 132 companies. It agreed with earlier studies that the two key factors which determine implementation success are board support and relation to the system of performance appraisal. The analysis showed that there was a positive relation between the success of ABC implementation and the length of time it was used and the number of various applications of the system.

Table 6.1. Variables used to analyze satisfaction and ABC implementation success

Research	Method	Variables used
Anderson (1995)	case study of one company	success as transition to another phase of implementation
Shields (1995)	survey of 143 companies which use ABC	perceived implementation success financial effects of implementation
Swenson (1995)	telephone interviews with 50 people from 25 companies	satisfaction of previous product costing satisfaction of ABC product costing
Innes, Mitchell (1995)	survey of 21 manufacturing and non-manufacturing companies	success as transition to another phase of implementation
Gosselin (1997)	survey of 161 business units in manufacturing companies	success as transition to another phase of implementation
McGowan, Klammer (1997)	study of 53 employees from 4 companies	perceived ABC implementation success
Foster, Swenson (1997)	survey of 166 ABC users from 132 companies, 15 companies visited	use of ABC information in decision making and taking actions based on ABC information perceived financial effects of ABC implementation ABC implementation success seen by managers composite measure
McGowan (1998)	survey of 4 companies (67 respondents, both preparers and users)	user attitude technical characteristics of information perceived usefulness in improving job performance organizational process impact
Anderson, Young (1999)	survey and case studies of 21 ABC projects in 2 companies	perceived ABC value perceived ABC accuracy perceived usage of ABC information
Swenson, Barney (2001)	survey of 15 best practice ABC companies	quantifiable financial improvements perceptions of success of key managers
Kennedy, Affleck-Graves (2001)	survey of UK firms	increase in firm value
Fortin *et al.* (2007)	survey of 15 government organizations (25 respondents)	ABC uses and frequency of use changes made financial improvements managers' and personnel's evaluation of ABC success composite measure
Byrne *et al.* (2009)	survey of 7 companies (65 respondents, both preparers and users)	user attitude technical characteristics of information perceived usefulness in improving job performance organizational process impact

To sum up the analysis of research into evaluation of activity-based costing implementation success, it should be stressed that it was mainly based on the opinions of management and employees (generally managers and employees were asked for a subjective assessment of success in the five-point Likert scale). As a result, evaluation of ABC implementation success in the analyzed research may be difficult to assess in terms of subjectivity. Measurement of success ensuing from activity-based costing implementation is not simple, although in the following researches (Shields, 1995; Anderson, Young, 1999) better measures were used.

Literature on activity-based costing contains a long list of potential benefits companies may derive from ABC implementation. Despite the fact that many publications bring up examples of potential benefits of ABC implementation, one may notice an insufficient number of studies on the actual benefits of companies, in which activity-based costing has been implemented. The research into the benefits of ABC implementation primarily used one general measure of success i.e. 'respondent's satisfaction' (Swenson, 1995; Shields, 1995; McGowan, Klammer, 1997)[2]. Only few research provided more detailed proofs of perceived benefits of ABC implementation[3]. McGowan (1998), for example, researched benefits of ABC implementation in four dimensions: (a) general satisfaction of ABC, (b) quality of ABC information, (c) perceived usefulness of ABC, (d) influence of ABC on the organization (the same approach was replicated by Byrne *et al.* (2009)).

Questions about the benefits of activity-based costing are interesting not only for academics. The answers may be even more interesting for practitioners, who decide or will decide on ABC implementation – it is important for them to verify the real usefulness of ABC in a company; it will help them to make a decision which is not only based on 'the possible benefits' but on the opinions of people whose companies have already implemented and use ABC. The results of the research may provide the people who prepare and those who use the ABC information with data about the potential influence of implementation on their work; the results also emphasize the need to consider behavioural issues, which may contribute to the improvement of implementation effectiveness and maximizing of benefits of ABC system. In the light of presented facts, it is important to fill in the identified

[2] It should be stressed that although such measures of ABC success as *increase in firm value* or *financial effects of implementation* are theoretically appealing, they are very difficult to control – it is extremely difficult to prove that there is a direct link between implementation of ABC and *increase in firm value* or *financial effects of implementation*. Consequently the most often used measure of ABC success is perceived satisfaction, it could be argued that satisfaction with ABC could be a proxy for system success (McGowan, Klammer, 1997; McGowan, 1998) – measure of overall user attitude toward ABC is appropriate surrogate for accessing success of the system.

[3] Literature on management information systems shows that evaluation based on the criterion of usefulness for users is the most important criterion used in assessment of information system effectiveness (Lucas, 1975).

research gap i.e. to analyze satisfaction and to identify benefits of activity-based costing implementation in Polish companies.

The research in this chapter (questionnaire C) aims to analyze satisfaction and benefits of ABC implementation in companies operating in Poland, in particular it aims to analyze attitudes of preparers and users of ABC information, quality of ABC information, its usefulness and its influence on the company[4]. In order to realize the aim of this research, it has been divided into two parts. The first part characterizes the research methodology i.e. it presents tested sample, analyzed variables and research hypotheses. The second part presents research results i.e. analysis of results of carried out works and conclusions. The chapter ends with summary, limitations of this research and directions of further studies.

6.2. Research method

In order to examine the benefits of activity-based costing implementation in companies operating in Poland, it was necessary to identify companies which have already implemented ABC system. To determine the biggest possible population of companies using ABC, the author made use of all information sources known to him i.e. (a) results of his previous surveys (questionnaires A and B), (b) projects and cases of implementation of cost accounting (including ABC) carried out by the author under his consulting activity, (c) all known publications, which described companies using ABC, (d) conference publications and didactic aids which enlisted companies using ABC, (e) information from IT and consulting companies, which implemented ABC systems.

Generally, 71 companies, which used activity-based costing, have been identified (46 companies have been identified on the basis of author's own survey research (questionnaires A and B) and 25 have come from other sources). The author contacted the companies in person or on the telephone and sent them detailed questionnaires via e-mail. The companies have sent back 28 completed surveys (from the statistical point of view the sample was small). The author made sure that the people who completed the surveys had practical knowledge of ABC – they were responsible in their companies for construction and modification of activity-based costing or used ABC information. In 5 out of 7 companies ABC system was mature (fully implemented) and in 2 companies the implementation process was advanced in about 60%. There were more companies in the sample tested (7) and they came from broader cross-section of industries then in McGowan (1998) study (still Byrne *et al.* (2009) study included even more (30) companies from more (8) industry sections).

[4] Research carried out in this paper are modelled on McGowan's research (1998), particularly, a questionnaire developed for the purpose of the latter, has been used (McGowan research was replicated in 2009 by Byrne *et al.* on the sample of Australian companies).

Respondents came from seven companies, among them a mid-size manufacturing and trading company (5 questionnaires), a large manufacturing company (8 questionnaires), a very large company from financial sector (2 questionnaires), a big manufacturing and trading company (4 questionnaires), a large service company (5 questionnaires), a very large company from telecommunications sector (2 questionnaires) and a big manufacturing company (2 questionnaires). Respondents, in each of the companies, have been categorized into two groups – people preparing the ABC information (the group was defined as 'preparers' – 12 people) and those who made use of the information (the group was defined as 'users' – 16 people). As respondents were asked to compare two costing systems, to participate in the study they had to have experience with both a traditional (old) costing system and ABC (new) system. The average work experience of respondents varied from 2.5 years to 18.5 years with mean being at the level of 8.5 years. Most of the respondents were relatively young (24 out of 28 respondents under 45 years).

Research into benefits of ABC implementation in companies operating in Poland were preceded by intensive literature studies. The studies embraced literature on activity-based costing and activity-based management, in particular research into measurement of ABC implementation successes and benefits of it. To analyze the benefits of ABC implementation in Polish companies, four basic groups of variables have been used (to ease between country comparisons, the items were the same as those used by McGowan (1998) and Byrne *et al.* (2009)):

1. General satisfaction of ABC implementation – generally, implementation is perceived as a success if the implemented system is accepted and used (Lucas, 1975; Robey, 1979) or if the user's satisfaction improves (Bailey, Pearson, 1983; Ives *et al*., 1983; Doll, Torkzadeh, 1988). The first of the enlisted measurements i.e. acceptation and use of the system cannot be used in this research, since the study was carried out in companies which implemented and use ABC (in this context, in all of the tested companies ABC is 'accepted and used'). In this case, as a measurement of success, general attitude towards the functioning of activity-based costing can be implemented. So far, the research clearly proved that activity-based costing is generally well-received. Both managers (Bailey, 1991; Innes, Mitchell, 1991; Nicholls, 1992; Swenson, 1995) and employees of companies using ABC (Foster, Gupta, 1990; McGowan, Klammer, 1997) expressed positive opinions about implementation and found this system better than the previous one.

2. Quality of ABC information – virtually all Polish and foreign practical publications from the last twenty years stress the fact that traditional cost accounting does not provide sufficient information needed to manage the company in the competitive, global and rapidly changing environment. New methods e.g. ABC were an answer to companies' new needs in the new conditions of operation. Most of the researchers confirm that activity-based costing provides better information compared

to the previously used traditional costing system (Raffish, Turney, 1991; Brimson, 1991). Those common appreciative opinions about the quality of ABC information mingle with critical viewpoints[5]. Does activity-based costing really provide information of better quality in comparison to the traditional cost accounting systems? The literature enumerates many characteristic features of information, important from the users' point of view (Delone, McClean, 1997). The difference in satisfaction of ABC implementation perceived by managers and employees may be dependent not only on the fact that the old cost accounting system was replaced by a new one, but on the quality of information the new system provides compared to the previous one. Qualitative characteristics of information, which influence the satisfaction of the system used, are mentioned in the literature: for example (a) general high quality of information (Lucas, 1975), (b) accessibility of information (Kraemer *at el.*, 1993), (c) accuracy and adequacy of information (Fuerst, Cheney, 1982).

3. Usefulness of ABC information – one answer to a question about the reasons underlying the satisfaction of activity-based costing, may be that it depends on its usefulness at work. In numerous publications, one may find an opinion that activity-based costing leads to better knowledge of causes of costs or that ABC may respond to managers and employees' needs in a more flexible manner compared to the traditional systems (Turney, 1992; Brimson, 1991; Pemberton *et al.*, 1996; Geishecker, 1996). Hamilton and Chervany (1981) notice that generally usefulness of the information system may be different depending on the manger and employee position in a company[6]. Having in mind ABC, it may indicate that, depending on the fact whether the person prepares or uses ABC information, the usefulness of activity-based costing may be perceived differently.

4. ABC influence on company – influence of any implemented innovation on a company is critical at assessment of success and effectiveness of implementation of a given innovation. Every implemented innovation should be well-received by the managers and employees but it simultaneously should match the organization (it should be compatible with the organization). In this context, it is worth to examine the analyzed implementations of activity-based costing. ABC perceives organization not through the prism of divisions and departments but through the prism of processes and activities – it helps to overcome functional barriers existing in the company. Bhimani and Pigot (1992) claim, on the basis of carried out studies, that ABC implementation success is closely related to such variables as: decision making, interpersonal relations, communication and involvement in the realization of aims of the company.

[5] For example Piper and Walley (1990) question fundamental ABC principles, including the one that activities generate costs. They also claim that the internal logic of activity-based costing is wrong.

[6] Hamilton and Chervany's (1981) research proved that implemented system improved the quality of decisions but lengthened the time needed to make them.

5. Characteristics of preparers and users of ABC information – studies on the satisfaction of ABC clearly prove that activity-based costing is evaluated in a positive manner (Bailey, 1991; Innes, Mitchell, 1991; Nicholls, 1992; Swenson, 1995; Foster, Gupta, 1990; McGowan, Klammer, 1997). Are satisfaction of implemented activity-based costing and its positive evaluation common? Is it influenced by such variables as: (a) respondent's education and experience (Lucas, 1975), (b) respondent's age (Fuerst, Cheney, 1982), (c) respondent's personality and character traits (DeSanctis, 1984) or (d) respondent's position in the company (Zmud, Cox, 1979; McKeen *et al.*, 1994; Anderson, 1995)? Implementation of the new cost accounting system may influence, in a large degree the change of roles in the company, it may alternate the level of freedom of individual people or departments, it may influence the procedures of decision making. The impact of those changes on individual people may influence their perception of ABC. It is possible that managers and employees see activity-based costing in a different way, depending whether they prepare the information for ABC or whether they are users of the information. This research concentrates on the two groups – preparers and users of ABC information (McKeen *et al.*, 1994; Leonard-Barton, 1988):

a) users of ABC information – individuals (employees and managers) for whom activity-based costing has been created and who use ABC information at work (e.g. in the process of decision making). From their point of view, the system is evaluated in a positive manner if it provides information useful in their work;

b) preparers of ABC information – individuals such as analysts, accountants, programmers, management accounting and controlling specialists, who are responsible for development, modifications and maintenance of ABC. From their point of view, the system is evaluated in a positive manner if tasks (aims) set up for the system are realized and the system functions well.

To summarize, individuals who prepare the information will pay more attention to the quality of the information, whereas individuals who make use of the information will pay more attention to the information's usefulness in their everyday work[7].

All major worldwide research on activity-based costing prove that both managers and employees share a positive attitude towards ABC implementation. With reference to the characteristics of managers' and employees' attitude in Polish companies, the following hypothesis has been suggested: hypothesis 1 – managers and employees are positively oriented towards ABC implementation.

One of the main reasons which underlies the laborious task of ABC implementation is the pursuit of improvement of the information obtained from

[7] It should be noted that people responsible for development, modifications and maintenance of ABC may identify with the system and are more prone to determine the implementation as a success (Anderson, 1995). On the other hand, those people may see some limitations of the system in a given company; it may ensue from the fact that they are involved in the implementation process and have knowledge of ABC, therefore they are aware of the possible shortcomings of activity-based costing in a particular company (e.g. they know which assumptions of the model are likely to fail).

the activity-based costing in comparison with the traditional cost accounting system. With respect to the characteristics of information from activity-based costing, the following hypothesis has been formulated: hypothesis 2 – managers and employees rank the information from ABC higher than from the traditional cost accounting system. In order to verify the hypothesis, it has been decided to specifically verify whether managers and employees perceive the information from ABC as: (a) more accurate, (b) more accessible, (c) more reliable, (d) timely to obtain and (e) more understandable in comparison with the traditional cost accounting system.

Benefit assessment ensuing from the ABC implementation may be viewed through the usefulness of activity-based costing in everyday work of a given person. With reference to the usefulness of information generated from activity-based costing, following hypothesis has been suggested: hypothesis 3 – managers and employees evaluate positively the usefulness of the ABC information. To verify the hypothesis, it has been decided to specifically verify whether managers and employees see the ABC implementation as a process which: (a) has improved the quality of their work, (b) has improved the control over their work, (c) has enabled accomplishing tasks more quickly, (d) has supported the critical aspects of their job, (e) has improved job productivity, (f) has enabled improvement of job performance, (g) has enabled them to perform a bigger number of tasks, (h) has increased effectiveness of their job, (i) has facilitated easier accomplishment of work-related tasks and (j) has generally been useful at work.

Every new initiative in a company, especially as significant as implementation of a new cost accounting system, influences the organization's functioning. With reference to the influence of activity-based costing on a company, the following hypothesis has been formulated: hypothesis 4 – managers and employees are convinced that ABC implementation influenced their company in a positive way. In order to verify the hypothesis, it has been decided to specifically verify whether managers and employees see the ABC implementation as a process which influenced: (a) the improvement of quality of decisions, (b) the waste reduction (c) the rise of innovativeness, (d) the improvement of relationships across functions, (e) the improvement of communications across functions and (f) the increase of focus on the goals of the entity.

Individual innovations implemented in a company may be evaluated differently, depending on the point of view of the person who is evaluating – generally the evaluations of people involved in the implementation and responsible for the preparation of information (preparers) may be different from those who make use of that information (users). With reference to the standpoints on ABC of preparers and users, the following hypothesis has been suggested: hypothesis 5 – opinions of preparers and users of ABC information on implementation benefits will differ considerably.

6.3. Analysis of the research results

To carry out the examination of perceived benefits of ABC implementation, descriptive analysis and test of significance for mean values and variations have been used (to see if the observed relations are statistically significant). To allow comparisons with both United States (McGowan, 1998) and Australian (Byrne *et al*., 2009) studies the parametric statistical methods were used. Below one can find detailed results of the research which enable verification of all formulated hypotheses i.e. general satisfaction ensuing from the ABC implementation, quality of information from ABC in comparison with the traditional cost accounting system, usefulness of information from ABC, the influence of ABC on the company and differences in ABC assessment made by preparers and users of the ABC information.

6.3.1. General satisfaction ensuing from ABC implementation

The results presented in table 6.2 support hypothesis 1. The value of satisfaction assessment ensuing from the activity-based costing implementation is significantly (statistical significance 0.01, t = –16.20) smaller than the test value of 3 (3 – average satisfaction of ABC implementation). The results are statistically significant and point out that on average respondents are definitely positive towards ABC implementation (mean = 1.43).

The results of this research, with respect to hypothesis 1, confirm the results of McGowan (1998) and Byrne *et al.* (2009), who, in the researched sample, also got confirmation of the respondents' generally positive attitude towards the ABC implementation. However, the average satisfaction in this research was assessed at a higher level (1.43) than in the studies by McGowan (1.98) and Byrne *et al.* (1.83).

Table 6.2. General satisfaction ensuing from ABC implementation

Dependent variable[a]	Mean	Standard deviation	t-value	McGowan (1998) mean	Byrne *et al.* (2009) mean
General satisfaction of ABC implementation	1.43	0.50	–16.20[b]	1.98	1.83

[a] In this question a scale from 1-very high evaluation to 5-very low evaluation has been used.
[b] Significant at level 0.01.

6.3.2. Quality of ABC information with respect to traditional system

In order to verify the hypothesis about better quality of information from ABC in comparison to traditional cost accounting system, tests enabling comparison of two means in case of related pairs of samples have been carried out. The respondents were asked to evaluate the traditional cost accounting system and the newly implemented ABC system in terms of five features i.e. accuracy, accessibility, reliability, timeliness and understandability of information provided by both systems. The results presented in table 6.3 support hypothesis 2. The respondents assess accuracy (statistical significance 0.01, t = –8.42), accessibility (statistical significance 0.01, t = –5.89), reliability (statistical significance 0.01, t = –3.18), timeliness (statistical significance 0.01, t = –4.30) and understandability (statistical significance 0.01, t = –5.65) of the information from the newly implemented ABC system significantly higher than the information generated from the traditional cost accounting system.

Table 6.3. Quality of ABC information with respect to traditional system

Dependent variable[a]	Traditional system		ABC		t-value	McGowan (1998) ABC mean	Byrne *et al.* (2009) ABC mean
	mean	standard deviation	mean	standard deviation			
Accuracy	3.29	1.05	1.43	0.63	–8.42[b]	2.27	2.20
Accessibility	3.36	0.99	1.64	0.73	–5.89[b]	3.57	2.38
Reliability	2.86	1.48	1.86	0.76	–3.18[b]	2.49	2.35
Timeliness	3.36	1.25	1.71	0.81	–4.30[b]	2.58	2.45
Understandability	2.93	1.05	1.64	0.62	–5.65[b]	2.47	2.31

[a] In this question a scale from 1-very high evaluation to 5-very low evaluation has been used.
[b] Significant at level 0.01.

The research results of information quality from the new activity-based costing, with respect to the information from the traditional cost accounting system (table 6.3), are confirmed by McGowan's (1998) and Byrne *et al.* (2009) studies; however: (a) in this research the information quality from the new ABC, in relation to the traditional cost accounting system, was ranked much higher (all averages below 2) than in the McGowan's (1998) and Byrne *et al.* (2009) studies (where none of the averages was lower than 2), (b) in McGowan's research (1998) the accessibility of information from the current system and ABC was evaluated by respondents at a similar level (3.50 and 3.57 respectively), yet the difference was not statistically significant.

The results obtained in this research are mirrored in the work of Swenson *et al.* (1996), who examined the level of satisfaction of managers from 25 companies

(where activity-based costing was used) ensuing from implementation of product valuation methods. The average satisfaction level was much higher in case of ABC than in case of traditional cost accounting system (managers' satisfaction with ABC in companies which implemented ABC in Swenson, Flescher (1996) study, was similar to the satisfaction of managers in Howell's *et al.* research (1987)). Similar results were also reported in the study of Swenson and Barney (2001), who examined 15 best ABC practice companies. The overall attitude towards ABC was in this study quite favourable, especially when compared with traditional costing system[8]. One respondent in this research noted that "ABC/M is and has been our only cost management tool. Compared to what we had before, it's excellent". Swenson and Barney (2001) noted, however, that for many companies the positive perceptions were based not on actual but projected benefits.

6.3.3. Usefulness of ABC information

In order to evaluate usefulness of activity-based costing, ten variables have been used (while variable ten tested the overall perception of ABC usefulness and variable six the job performance, the rest of the variables related generally to the usefulness of ABC information in respondents' work). The results presented in table 6.4 support hypothesis 3. Respondents confirm positive and statistically significant influence of ABC (much lower mean than the average value of 3) on their work, especially its influence on improvement in the quality of their work (mean 1.57 and t = –8.88 at statistical significance 0.01), its influence on control over work-related procedures (mean 1.50 and t = –10.46 at statistical significance 0.01), the ability to accomplish tasks quickly (mean 2.21 and t = –4.27 at statistical significance 0.01), aiding of critical aspects of their job (mean 1.43 and t = –11.01 at statistical significance 0.01), its influence on the improvement of their job productivity (mean 1.86 and t = –7 at statistical significance 0.01), the ability to improve their job performance (mean 1.64 and t = –8.54 at statistical significance 0.01), accomplishing more work than under the old system (mean 2.07 and t = –4.93 at statistical significance 0.01), improvement of their job effectiveness (mean 1.93 and t = –6.85 at statistical significance 0.01), easier accomplishment of work-related tasks (average 1.64 and t = –9.65 at statistical significance 0.01). Respondents point out that ABC is generally useful in their work – they rank its influence on their work usefulness as definitely positive and the influence is statistically significant (mean 1.43 and t = –11.01 at statistical significance 0.01).

[8] Swenson and Barney (2001) reported that ABC/M was perceived as 'good' or 'excellent' in respect of information reliability (by 88% of respondents), timeliness of information (by 64% of respondents) and information accessibility (by 47% of respondents).

Table 6.4. Usefulness of ABC information

Dependent variable[a]	Mean	Standard deviation	t-value	McGowan (1998) mean	Byrne *et al.* (2009) mean
Improvements in the quality of work	1.57	0.84	–8.88[b]	2.30	2.42
Greater control over work-related procedures	1.50	0.75	–10.46[b]	2.49	2.23
Accomplishing tasks more quickly	2.21	0.96	–4.27[b]	2.56	2.74
Support for the critical aspects of job	1.43	0.74	–11.01[b]	2.33	2.14
Increased job productivity	1.86	0.85	–7.00[b]	2.30	2.46
Increased job performance	1.64	0.83	–8.54[b]	2.13	2.40
Accomplishing more work than under the old system	2.07	0.98	–4.93[b]	2.62	2.80
Enhanced effectiveness on the job	1.93	0.81	–6.85[b]	2.28	2.31
Makes it easier to accomplish work-related tasks	1.64	0.73	–9.65[b]	2.77	2.48
Overall, I find ABCM useful in my job	1.43	0.74	–11.01[b]	2.03	2.09

[a] In this question a scale from 1-definitely yes to 5-definitely not has been used.
[b] Significant at level 0.01.

The results of research which examined usefulness of information generated from the newly implemented activity-based costing are confirmed by the results of McGowan's (1998) and Byrne *et al.* (2009) studies, however: (a) this research found the usefulness of ABC information higher (eight means below 2) than the McGowan's (1998) and Byrne *et al.* (2009) studies (none of the means was lower than 2), (b) in this research respondents assessed that the implementation of ABC makes it easier to accomplish work-related tasks in a considerably positive and statistically significant manner, whereas respondents in the McGowan's study (1998) did not see such relationship.

6.3.4. Influence of ABC on company

The results presented in table 6.5 partly support hypothesis 4. Respondents confirm that ABC implementation had a considerably positive and statistically significant impact (much lower than the average value of 3) on the increase of quality of decisions (mean 1.48 and t = –13.61 at statistical significance 0.01) as well as on the increase of overall focus on the goals of the entity (mean 1.50

and t = –15.31 at statistical significance 0.01). According to respondents, ABC implementation had a slightly positive (slightly lower than the average value of 3) yet statistically significant influence on the boost of innovativeness (mean 2.14 and t = –5.89 at statistical significance 0.01) and improvement of communications across functions (mean 2.50 and t = –3.10 at statistical significance 0.01). The research proves that ABC implementation had no statistically significant influence on the improvement of relations across functions (insignificant and unimportant positive impact) or on the waste reductions (insignificant and unimportant negative impact).

Table 6.5. Influence of ABC on company

Dependent variable[a]	Mean	Standard deviation	t-value	McGowan (1998) mean	Byrne *et al.* (2009) mean
Quality of decisions	1.48	0.58	–13.61[b]	2.32	2.05
Waste reductions	3.29	1.18	1.26	2.01	2.26
Innovation	2.14	0.76	–5.89[b]	2.10	2.51
Relationships across functions	2.86	0.76	–0.98	2.29	2.40
Communications across functions	2.50	0.84	–3.10[b]	2.21	2.39
Overall focus on the goals of the entity	1.50	0.51	–15.31[b]	2.23	2.92

[a] In this question a scale from 1-definitely yes to 5-definitely not has been used.
[b] Significant at level 0.01.

The results of this research on the influence of a newly implemented ABC on a company (table 6.5) are partly confirmed by McGowan's (1998) and Byrne *et al.* (2009) studies. However, their studies claimed that the influence of ABC implementation on a company was insubstantial yet statistically significant in case of all dependent variables. The research carried out in Poland claims that ABC implementation had: (a) a substantially positive and statistically significant influence on the quality improvement of decisions and the increase of concentration on company's aims, (b) a slightly positive and statistically significant impact on the boost of innovativeness and improvement of communication across functions, and (c) a statistically insignificant and unsubstantial influence on the improvement of relations across functions (positive influence) and waste reductions (negative influence).

The results are confirmed by the Swenson and Flescher research (1996). Authors of the study noticed that the general satisfaction assessment ensuing from ABC implementation (which was very positive in their study) was a rather subjective measure of benefits derived from the process of ABC implementation. They also claimed that ABC information may be of little importance if it is not

used in the decision-making process. After close examination of ABC information use, they stated that 92% of companies used it to improve the processes, 72% to set product prices and to make decisions about products, 48% used it in the process of product design and 24% in making decisions about components[9]. Respondents emphasized the necessity to integrate ABC with all other areas of company's functioning and they stressed the fact that the systems were not implemented in isolation. In all companies, with no exceptions, representatives of different departments took part in the process of implementation, and ABC systems were designed with an application of a new philosophy – people who made use of ABC information were seen as ABC system *clients* whereas accounting departments attempted to satisfy the needs of internal *clients*, just in the same way as the companies tried to satisfy the needs of their external clients.

6.3.5. Differences in ABC evaluation by preparers and users

The results presented in table 6.6 mostly do not support hypothesis 5. In particular:

1) general satisfaction of ABC implementation does not significantly differ between preparers and users of ABC information (in the study by McGowan (1998), satisfaction of people preparing the information was statistically more significant than the people who used it);

2) evaluation of accuracy, reliability and understandability of information does not differ between preparers and users of ABC information, however accessibility (F = 5.44 at statistical significance 0.01) and timeliness of ABC information (F = 3.68 at statistical significance 0.01) was evaluated higher by preparers than users (in McGowan's research (1998) there were no statistically significant discrepancies);

3) evaluation of the influence of ABC implementation on the aiding of critical aspects of respondents' work (F = 3.21 at statistical significance 0.1) and its general usefulness in their work (F = 5.04 at statistical significance 0.1) is ranked substantially higher by preparers than users; the evaluation of remaining variables which influence the quality of information does not differ significantly between the preparers and users of ABC information (in McGowan's study (1998) statistically significant differences were noticed in the perception of improvement of work quality, improvement of work control and boost of work effectiveness);\

4) evaluation of the influence of ABC implementation on the improvement of decision quality (F = 2.61 at statistical significance 0.1) is ranked substantially higher

[9] The results of current research were also supported by findings of Swenson and Barney (2001), who observed that 97% of respondents from 15 best ABC practice companies assessed ABC/M information as 'good' or 'excellent' in decision support and 73% as 'good' or 'excellent' from the point of view of cross-functional needs.

by preparers than users; the evaluation of remaining variables does not differ significantly between the two groups (in McGowan's study (1998) there were no statistically significant discrepancies).

Table 6.6. Differences in ABC evaluation by preparers and users

Dependent variable	Mean (preparers)	Mean (users)	F-value
A. Satisfaction			
General satisfaction of ABC implementation	1.50	1.38	1.12
B. Information quality			
Accessibility	2.00	1.75	1.37
Accuracy	1.33	2.00	5.44[a]
Reliability	1.83	0.38	1.50
Timeliness	1.17	2.00	3.68[a]
Understandability	2.17	0.63	2.47
C. Information usefulness			
Improvements in the quality of my work	1.50	1.63	1.20
Greater control over work-related procedures	1.50	1.50	1.23
Accomplishing tasks more quickly	2.50	2.00	1.28
Support for the critical aspects of my job	1.33	1.50	3.21[b]
Increased job productivity	1.67	2.00	1.29
Increased job performance	1.50	1.75	1.12
Accomplishing more work than under the old system	1.83	2.25	2.39
Enhanced effectiveness on the job	2.00	1.88	2.46
Makes it easier to accomplish work-related tasks	1.33	1.88	2.61
Overall, I find ABCM useful in my job	1.17	1.63	5.04[b]
D. Influence on company			
Quality of decisions	1.50	1.38	2.61[b]
Waste reductions	2.67	3.75	1.27
Innovation	2.00	2.25	1.60
Relationships across functions	2.67	3.00	1.17
Communications across functions	2.50	2.50	1.22
Overall focus on the goals of the entity	1.92	1.13	1.36

[a] Significant at 0.01.

[b] Significant at 0.1.

In the research by Swenson and Flescher (1996) one may find different results of satisfaction evaluation ensuing from ABC implementation perceived by preparers and users of the information. In that research, satisfaction of preparers (3.30) was statistically more significant than the users (2.73) (where 1 meant 'lack of satisfaction', 2 'the need of improvement', 3 'satisfaction' and 4 'great satisfaction'). The change of cost accounting system is a complex and

expensive process. It should take place to improve the satisfaction of information users. Swenson's *et al.* (1996) respondents stressed the fact that they would have implemented ABC "even if they had to spend their own money on it". After ABC implementation, the people who used the information were substantially more satisfied with the information provided by management accounting specialists.

6.4. Summary and conclusions

Due to the fact that most of activity-based costing implementations in developing countries, including Poland, took place in the first decade of the 21st century, the majority of empirical research on ABC diffusion in those countries appeared in recent years. Research issue related to measurement of ABC implementation successes in developing countries is current, both for theoreticians, enabling them comparison to the practices implemented in more developed countries, and for practitioners who seek to determine the degree of satisfaction and benefits connected with ABC implementation. Carried out survey research on satisfaction and benefits of activity-based costing implementation in Polish companies perceived by preparers and users of ABC information, enabled to form the following, detailed conclusions and enabled to verify formulated at the beginning of the chapter hypotheses:

1. In accordance with previous studies on the way activity-based costing is perceived (Foster, Gupta, 1990; Bailey, 1991; Innes, Mitchell, 1991; Nicholls, 1992; Swenson, 1995; McGowan, Klammer, 1997; McGowan, 1998; Byrne *et al.*, 2009), this research shows that respondents display strongly positive attitude towards ABC implementation and the results are statistically significant. In general, activity-based costing is regarded to be better than previously implemented systems, however the average satisfaction of ABC implementation in this study was higher (mean of 1.43) than in the research by McGowan (1.98) and Byrne *et al.* (1.83).

2. Conducted research proves that the quality of ABC information is better than of the traditional cost accounting system. All studied qualitative characteristics of information i.e. accuracy, accessibility, reliability, timeliness and understandability were evaluated notably higher and the results were statistically significant (overall mean evaluation of those characteristics in the traditional cost accounting system was 'neutral' –3.16, and in the case of ABC it was 'good' to 'very good' –1.66). The results are compliant with both literature (e.g. Rafish, Turney, 1991; Brimson, 1991) and the results of earlier studies e.g. by McGowan (1998) and Byrne *et al.* (2009). However, in this research the quality of ABC information in comparison to the traditional cost accounting system was evaluated considerably higher than in the McGowan's and Byrne *et al.* research (accessibility of ABC information

and information from the traditional cost accounting was evaluated likewise in the McGowan's research).

3. Many publications (Turney, 1992; Brimson, 1991; Pemberton *et al.*, 1996; Geishecker, 1996) claim that ABC is useful in the work of both managers and employees – this claim is confirmed by the research results. It means that respondents agree with the statement that ABC has a considerably positive and statistically significant influence on their work, in particular: it improves work quality, improves control over work-related procedures, helps to accomplish more tasks, aids critical aspects of their work, improves productivity, helps to improve job performance, helps to accomplish more work than before, boosts effectiveness of their work and makes it easier to accomplish work-related tasks. Respondents point out that ABC is extremely useful in their job (average of 1.43). The results are confirmed by McGowan's (1998) and Byrne *et al.* (2009) researches. The elementary difference between the studies is the fact that usefulness of ABC information was ranked higher (eight out of ten means were below 2) in this research than in the research by McGowan and Byrne *et al.* (none of the means was below 2).

4. Respondents positively evaluate influence of ABC implementation on the improvement of quality of decisions and the increase of concentration on company's aims (considerably positive impact) and on the boost of innovativeness and improvement of communications across functions (minor positive impact). The results, however, do not confirm the influence of activity-based costing implementation on improvement of relations across functions or on waste reduction. The results are partly confirmed by the results of McGowan's (1998) and Byrne *et al.* (2009) studies. However, in McGowan's and Byrne *et al.* research, the influence of ABC implementation on the company was minor but statistically significant for all dependent variables (in this research on four out of six variables).

5. In accordance with literature (Zmud, Cox, 1979; McKeen *et al.*, 1994; Anderson, 1995) evaluation of implemented innovation may be influenced by respondent's role in the organization. As the research shows general satisfaction of activity-based costing implementation does not significantly differ between preparers and users of ABC information (in McGowan's research (1998), satisfaction of preparers was considerably higher than users). Yet, the research helped to notice that preparers evaluate ABC implementation better in terms of accessibility and timeliness, aiding critical aspects of their work and general ABC usefulness at work than the users. Inverse pattern (better evaluation among users than preparers) was registered in case of influence of ABC implementation on the improvement of quality of decisions.

Conclusions of this research (questionnaire C) bear both theoretical and practical significance. From the practical point of view, companies considering implementation of ABC in the future should be aware of the problems with

implementation and benefits it may bring for the organization. Managers thinking of ABC implementation must be aware of the fact that activity-based costing may provide information of better quality, in terms of all features characterizing the quality of information, than the traditional cost accounting system. They may additionally use the knowledge of usefulness of ABC information in preparers and users job as well as the knowledge of ABC implementation influence on the company (the characteristics of ABC do suggest consideration by companies operating in global, competitive and changing environment). This finding of the research carried is an important contribution to the literature on ABC because it suggests that the slow diffusion and low adoption rates is not the effect of a perceived lack of satisfaction with ABC (the research done in developing country, Poland, confirms the findings in the United States and Australia). This knowledge may facilitate better decision making in case of implementations of ABC systems, and when the decision has been made, it may increase the likelihood of a successful implementation process.

From the theoretical point of view, conducted research may facilitate defining of a general tendency: modifications of cost accounting systems in companies in developing countries (e.g. Poland) and implementation of modern management accounting methods e.g. ABC, although delayed in comparison to the more economically developed countries, head in a similar direction as the practice of management accounting in the world, and newly implemented innovative cost accounting systems, such as ABC, are evaluated positively. Carried out research stresses also a necessity to systematically analyze what better cost accounting system means, how satisfaction from new cost accounting system should be measured and what problems are specific for these measurements. This study also addresses a need to articulate the success measure for innovative management accounting techniques to achieve comparability between different studies and therefore help the theory advancement.

Previous research on implementations of various projects into the practice of numerous companies in the world allow to state that there is a relation between evaluation of implementation success and factors characteristic of specific organization. The factors are e.g. size of the company, type of business, organizational structure and environment the organization operates in (McKeen *et al*., 1994). The increase of satisfaction of information provided by ABC and the traditional cost accounting depends on the quality of the former system (e.g. it is hard to, on the basis of the conducted research, state how 'good' is the implemented ABC system since it is not known how 'good' was the previous system – only the difference in quality of information provided by both systems was examined). The factors, in quite a clear way, influence the fact that all generalizations, made on the basis of this research, must be careful. Evaluation of satisfaction of implemented system (e.g. ABC) is influenced by specific factors, characteristic of a particular

company. Analysis of the factors is interesting and worth taking into account in the future, however it falls out of the framework of this research.

The results of this study may also be influenced by characteristics of respondents i.e. their education and experience (Lucas, 1975), age (Fuerst, Cheney, 1982), personality (DeSanctis, 1984) or position in the company (Anderson 1995). Out of enlisted characteristics, only one was taken into consideration in this research – respondents' answers were analyzed on the basis of the fact whether respondents prepared or used ABC information.

Means of measurement of the elementary variable, which characterizes satisfaction of ABC implementation, is another limitation of this research. Since it was a subjective opinion formed by the respondents, the results mirror their viewpoint and not necessarily the real success of implementation[10]. Even if the results are not fully objective in terms of implementation success, they may be interesting and significant because generally positive attitude towards the implemented activity-based costing reflects, to some extent, the benefits of implementation for the company (satisfaction may be an important implementation success indicator, since it leads to more frequent use of ABC information for example in decision making).

Measurement of satisfaction and benefits of ABC implementation is a part of a more general tendency, which measures success of implementation of all innovative methods of management accounting. Many authors of publications, both for students and practitioners, promote 'new' tools of management accounting, emphasizing their benefits, yet they base their opinion on anecdotes or unsystematic and fragmentary analysis of case studies from practice (knowledge of ABC functioning in developing countries is mostly normative and does not include information about the real degree of satisfaction and benefits of ABC implementation). According to the author, this research on the degree of satisfaction and perceived benefits ensuing from ABC implementation, may lead to better and fuller recognition of attitudes presented by preparers and users of ABC information, and, at the same time, better and fuller recognition of the degree of satisfaction and benefits of ABC implementation, perceived by the persons. Additionally, this research may facilitate analysis of attitudes towards ABC implementations by companies operating in developing countries and companies from developed countries. Large extent of conformity of this research's results with the results of studies carried out in more developed countries, means that practice of management accounting in developing countries, although delayed, develops in a similar way, and in the same direction as the practice of more developed countries.

[10] Applied means of the study claim that all respondents want to share their opinion on the degree of satisfaction ensuing from ABC, however this may not be true. Respondents' answers may be influenced by the extent of satisfaction and their general attitude towards ABC (e.g. respondents who are highly satisfied with ABC implementation may tend to participate in the research more often).

CONCLUSIONS

In the first years of the 21st century, a growing number of Polish companies was implementing modern systems of cost accounting. In general, the practice of management accounting in Poland heads in the same direction as the practice of management accounting in the world. An increasing number of Polish companies uses methods, which are used by companies in more developed countries – one of them is activity-based costing. Its first wider use in Polish companies was identified at the beginning of the 21st century when more and more manufacturing and non-manufacturing companies implemented or were implementing activity-based costing. Due to growing interest in the method and its more frequent use among practitioners, the research objective has been formulated; it aimed to analyze the development and diffusion of activity-based costing, and, additionally, to study and evaluate the use and extent of activity-based costing in Polish companies.

Presented research support the main thesis, which claimed that the diffusion of activity-based costing in Polish companies, although delayed in comparison to the practice of more developed countries, is conditioned by the same factors and heads in the same direction as in other countries.

Conducted questionnaire research (495 companies in questionnaire A, 33 companies in questionnaire B and 28 companies in questionnaire C) and research in the form of case studies (4 companies) cannot constitute a complete source of knowledge about the diffusion, structure and use, as well as evaluation of ABC implementation in Polish companies. With respect to the questionnaire research, there are two reasons for that. Firstly, the sample is not representative, thus it cannot be seen as the basis for evaluation of activity-based costing functioning in all the companies operating in Poland. Secondly, limitations of the questionnaire research itself must be taken into consideration; it is impossible to conduct a detailed and accurate analysis of the structure and use of ABC systems by means of this method. Case studies (including action research) applied to carry out a more detailed analysis of activity-based costing systems used in Polish companies also characterize of some limitations, among them a small sample. The

limitations of the methods used have been reduced to some extent by triangulation of research methods and by comparison of the study to other research carried out by different authors, and subject literature.

Conclusions of present research bear theoretical and practical significance. From the theoretical point of view, the research complies with the general tendency that activity-based costing modifications in Polish companies and implementation of modern methods of management accounting, such as ABC, head in the similar direction as in other countries in the world. From the practical point of view, companies considering implementation of ABC in the future should be aware of the factors influencing ABC implementation, as well as problems which might occur during implementation. Managers, who are considering implementation, must be aware of the minuteness level, ways of activity-based costing modelling and methods of information use. They also may benefit from gaining knowledge about the factors which positively and negatively influence activity-based costing implementation, as well as about methodological and institutional/organizational changes ensuing from implementation of such costing system. The knowledge may facilitate decisions about implementation of ABC systems, and once the decision is made, it is more likely that implementation is successful. The present research may also provide numerous recommendations for companies which use activity-based costing, as well as for those which are considering ABC implementation in the future:

1. Implementation of activity-based costing should be considered particularly by large companies with a varied scope of activity, in which indirect costs have a large share in total costs and their products are exposed to high level of price competitiveness.

2. Activity-based costing may be used as a supplement to the traditional cost accounting system. Systems of activity-based costing do not have to embrace all indirect costs, they may exclusively focus on indirect costs of the primary activity e.g. distribution or marketing activities.

3. Companies which are considering implementation of activity-based costing should know that ABC systems do not have to be extended (especially in the early stage of its use). Cost calculations and profitability analyzes do not have to be prepared on current or monthly basis but for example on quarterly or semiannual basis, and that considerably reduces costs of collecting information and system's maintenance.

4. Complexity of ABC/ABM model depends on the purpose it is used for. If the system is implemented to facilitate economic processes then the model should be more detailed. If the system is implemented for the purpose of product or customer profitability analysis then the number of elements within the model can be reduced. A more complex and larger model is not always a better one. Optimal size and level of complexity depend on the purpose of implementation and company's own conditioning.

5. In order to overcome problems occurring in the implementation of activity-based costing, the company should: (a) make sure that the implementation process has management's support, (b) provide sufficient resources for implementation and maintenance of the system, (c) spread the knowledge about activity-based costing among management, (d) clearly communicate aims of implementation, (e) involve managers from all areas of the company into implementation, (f) appropriately outline the range and plan implementation well, (g) not design models that are too complex, (h) integrate the system of activity-based costing with the existing IT infrastructure, (i) provide real results as quickly as possible.

6. In companies which use activity-based costing, the information generated by the system should be used for: (a) operational cost management through effective evaluation and control of company's activity in cross-section of activities and processes performed in the company, (b) product management through monitoring of product profitability, pricing policy as well as promotion and marketing strategy based on reliable information about costs of products, (c) customer management through analysis of profitability and customer and groups of customers service costs and through appropriate customization of products on offer and ways of certain groups of customers servicing, (d) strategic cost management through defining the value of activities and optimalization of resource use.

7. Implemented system of activity-based costing should be used for performance evaluation and evaluation of the entire company, as well as individual responsibility centres, processes and activities, managers and employees. Linking activity-based costing to performance evaluation fosters use of information from that system by managers from all levels of management.

8. Companies using activity-based costing should remember about its modifications, which will customize the system to the changing conditions the firms are operating in. The systems should be gradually improved so that they meet the needs of the company's management.

9. The system of activity-based costing can be integrated with other modern methods of management e.g. target costing, balanced scorecard or economic value added.

10. Implementation of activity-based costing does not directly improve competitiveness of the company or its financial results. This is only possible when information generated by the system is used by managers in taking appropriate operational and strategic decisions.

11. Activity-based costing should not be implemented by all companies. It seems that smaller companies, in which the share of indirect costs is slight, products are highly profitable and not differentiated, and availability of resources, especially human resources is constrained, should wait with implementation of activity-based costing.

On the basis of present study, the following conclusions for further research can be formulated:

1. The conducted questionnaire research may be continued. A lot of Polish companies are considering implementation of ABC, a lot of international companies, which use ABC may soon invest in Poland – both factors may increase the percentage of companies using ABC. Conducting presented questionnaire research again, in its initial form, in a few-years time might seem interesting. It would improve representativeness of the sample, and on the other hand it would show how the practice of activity-based costing implementation and functioning, and the use of ABC information changes in time.

2. In order to analyze the construction of ABC systems and the use of ABC information in more detail, case studies method (especially action research) should be extended. This method would enable a detailed analysis of how the systems were implemented, how they function and how they are used (within an individual company or companies), and how they are modified and how different people from the company evaluate ABC functioning (in particular the analysis of opinions of preparers and users). Analysis of ABC implementations in the form of case studies, despite its limitations, would enable better investigation into the above problems.

3. As it was mentioned before, a large number of companies is considering ABC implementation in the near future. Some of them will decide to undergo the difficult process of implementation and some of them will reject implementation. The companies, which quit ABC implementation after analyzing its pros and cons, will constitute an interesting group. The group may be analyzed and may provide reasons for rejection of ABC implementation, direction of change in the costing system of those companies, and analysis of results ensuing from non-implementation of significant modifications in the costing system of those companies. In terms of further research, comparison of companies which, after analysis, implemented ABC to companies which rejected ABC seems interesting.

4. Further research which would analyze and evaluate satisfaction and benefits of activity-based costing implementation in Polish companies, in particular: financial benefits related to the process of implementation, satisfaction with cost of products, customers etc. calculation, use of information for decision-making and general evaluation of activity-based costing implementation might seem intriguing.

5. At the beginning of the 20th century, a new generations of ABC emerged; it aimed to solve the fundamental problems connected to the process of implementation and use of activity-based costing – time-driven activity-based costing and resource consumption accounting. It would be interesting to investigate if, and how these methods are going to be used in Polish companies in the future.

6. Research on changes in cost accounting systems in Polish companies should be further developed in order to analyze in more detail particular phenomena. Other research areas for further investigation are e.g. target costing, balanced scorecard, theory of constraints or value chain costing. These research areas may be, and should be, analyzed with the use of all the available like sarveys, case studies and action research.

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