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# TECHNICAL SKILLS OF MANAGEMENT STAFF IN HIGH-TECH ENTERPRISES

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## Introduction

This study aims at presenting the self-evaluation of technical skills demonstrated in case of management staff employed in the high-tech sector. It is assumed that the group of skills is of crucial significance in the high-tech sector, as it is characterized by a high level of scientific absorption and intensity of expenses on B+R operation. What is more, significant qualities of this sector comprise of [Matusiak, 2008, p. 379]: a high level of innovation, quick aging of the developed products and technologies, high level of scientific and technical personnel, significant capital and a high level of technical equipment rotation towards more modern and innovative devices, high investment risk and a fast process of “devaluation” of investments, intensive strategic cooperation with other high-tech enterprises and research-development centres in domestic and international field, implication of a technological thought in a form of nu-

merous patents and licenses, as well as competing firms supporting one another in international trade.

The high-tech sector determines the growing need for highly qualified personnel [Zakrzewska-Bielawska, 2011, p. 5], especially the management staff. Therefore, it seems significant to deal with the problem of managing enterprises that operate within the sector of high technologies, in order to enable their growth and development. In literature of the subject, authors often use the term competences, which are a much more complex construct than skills. The variations in meaning of the term competence encountered in literature of the subject hamper presentation of a universal definition. There are two main groups of competences differentiated in literature of the subject, namely: the first one refers to competences of persons – determined as soft competences, and the second one includes competences regarding



job – called hard competences [Armstrong, 2005]. On the basis of the subject literature analysis it is assumed that a competent person knows how to behave to achieve the set goal (knowledge), is able to take proper actions (skills) and is willing to behave in a given way. One of the crucial tasks regarding competences are skills of the management staff. Technical skills seem to be crucial here, as they condition the decisions that aim at development of modern production in enterprises through transfer of technologies. An argument that is in favour of the managerial skills analysis is the fact that those are a key component of management staff, and they form a basis for description of competence requirements [Czapla, 2011, p. 126].

### ***Essence of technical management skills***

The skills have become an object of special attention in contemporary management. It arises from the necessity to adjust to economic phenomena that take place in Poland and around the world. We witness the age of knowledge and information, which is especially significant in the high-tech sector. According to P.F. Drucker, technical skills can be developed during the whole period of professional career, especially when we do not want to become “the manager of one function” [Barnard, 1997, p. 246]. Among this group of skills we may list e.g. acquaintance in organization of one’s own work, fluency in marketing thinking, professionalism in managing costs, finances, etc., i.e. the ability to use tools, methods and technology.

Managerial actions demand both specialist knowledge and that from general managerial field. The first is necessary to lead processes with regard to organizational and technical aspects competently, while the latter is needed to influence the subordinates with competence. Specialist knowledge is more significant for specialization of managerial actions, when it is technology of production what decides about the results of the subordinate team, and when routine works dominate over those conceptual.

The basis of success of very company is efficient management of the owned resources, which lays foundations for the enterprise’s competence. Businesses that operate within the high-tech sector provide their employees with high requirements, which usually are highly specialized. However, technical abilities need to be supported and fulfilled with social and conceptual ones.

Managerial skills are hard to define and enumerate. Most often, they are determined as an ability, i.e. fluency, dexterity or talent, thanks to which someone may take a given action in a given time, without additional training [Reber, 2000, p. 879]. Skills of the managerial staff surely constitute a basis for competences, understood as a source of knowledge (formal qualifications) and practical skill acquired within the course of many years of work on a given position (professional experience), as well as formal authorization for a given

action [Roszyk-Kowalska, Stańda, 2012, p. 257]. A skill is a practical ability to conduct certain physical and mental actions [Spencer, Spencer, 1993, p. 11].

It is neither necessary nor practically possible for each manager to hold all skills. Because of that, on the basis of literature, conducted interviews (pilot studies were conducted in thirteen enterprises, randomly selected on the basis of PCA7 list (Polish Classification of Activity) in Wielkopolskie voivodeship), and through the method of competent arbitrators (the group of arbitrators was composed of five persons that represent social sciences) a list of managerial skills was developed. Those skills were afterwards ordered in a group of technical abilities. this area of skills incorporated: the ability to properly form tasks for a work post, to manage finances, to manage the one’s own work time, to use management instruments (methods, techniques, tools), to organize one’s own work, to determine the ways for realization of tasks, operate with technologies, to act operationally, to hold the knowledge in a specialized field, to know the methods and techniques of motivation. Regardless to the controversies referring to all classifications of managerial skills, the efficiency and effectiveness of the manager is influenced by the ability to use technical skills. There is only one condition: one need to possess those skills, i.e. to have certain knowledge and keep on developing it, to identify with experience from various situations and conditions in managing resources in an organization, and to be characterized with thinking that aims at efficiency and effectiveness [Smoleński, 1999, p. 271].

### ***Research methodology***

The study aimed at self-identification and self-evaluation by management staff, of technical skills that are characteristics for this group in companies that produce radio, TV and communication devices, encompassed in a group of high technology according to the PCA7 classification (27.11.Z; 26.11.Z; 27.90.Z; 26.30.Z; 26.11.Z; 26.30.Z; 26.40.Z), operating their businesses within Wielkopolskie voivodeship. An argument that was in favour of setting this goal was to take an attempt to provide the managers with information on which technical skills they should acquire to support their enterprises during the process of high-tech sector improvement. Because of that, a practical aim of the study is to set forward guidelines within the scope of mastering technical skills of managerial staff in the high-tech sector, with special focus on those enterprises that produce radio, TV and communication devices, incorporated in the group of high technology according to the PCA7 classification.

Theoretical deliberations of the subject literature conducted by the author allowed to form a hypothesis, which comes down to a conclusion that in enterprises that operate in the high-tech sector it is inevitable to present particular technical managerial skills on a good level (it might seem that the best level would be the

highest one, but it needs to be born in mind that over-competence causes employees to become professionally burnt out [Czytelnia/Matryca oceny kompetencji].

The following scale of grades from 2 to 5 was accepted in the research: 2 – unsatisfactory, 3 – satisfactory, 4 – good and 5 – very good, with reference to skills acquisition. Acceptance of this scale is favoured by the fact that most of the managerial staff members associates the above mentioned marks (a system of marks in education), as those were the basis for valuing their knowledge level at the time when they were pupils and students (the average age of the researched managerial staff was 37).

On the basis of literature, conducted interviews and through the method of competent arbitrators, there was a questionnaire developed. It included a list of technical managerial skills that support actions taken by the managerial staff in the high-tech sector. On this basis, empirical research was conducted. The questionnaire was sent to all enterprises that produce radio, TV and communication equipment, encompassed in the group of high-tech according to the PCA7 classification, operating their businesses within Wielkopolskie voivodeship (217 subjects, data received from the Statistical Office in Poznań, status for 31<sup>st</sup> October 2013). The research was conducted with a diagnostic procedure. It was applied in order to find out the current state of affairs [Czermański, Czerska, Nogalski, Rutka, Apanowicz, 2001]. The basis of determination of the sample size was the number of returned surveys. It turned out that actions taken by the managerial staff (filling and sending the surveys back) allowed to examine 103 companies, which made up 47% of the whole population. The number of surveys that were filled correctly and completely was 379. On their basis, the author conducted analysis of technical skills of managerial staff in high-tech enterprises.

## Technical skills of management staff in high-tech enterprises

Among management skills, the management staff of enterprises, encompassed in the sector of high technologies within the area of Wielkopolska, emphasized the highest significance in case of skills in organizing one's own work and in forming tasks for work positions (4,32), skills to use knowledge from a specialized field, skills for determining the ways of tasks realization, skills in managing work time, skills of managing finances, skills of operational actions, skills of using management instruments (methods, techniques, tools), than the skills of operating with technologies and being familiar with methods and techniques of motivation – evaluated by the staff as the skill that is acquired at the lowest level (Figure 1).

## Synthesis of research findings

The conducted studies allow to determine certain correlations, which are characteristics of managerial staff of the researched enterprises.

Analysis of empirical studies results allowed to assume that among technical abilities the one that is evaluated as less significant is the knowledge of methods and techniques of motivation, as this is the one, which obtained less than 4,0 points (Figure 2). This means that a dominating part of the surveyed management staff feels some lacks in this area. It may be cause by politics of enterprises that refers to methods and techniques of motivations, which should be emphasized in high-tech sector companies.

However, acquisition of the skill in organization of one's own work, especially by young persons (up to 40 years of age, and with work experience up to 20 years) demonstrates that there should be an attempt taken in fulfilling the above mentioned skill, particularly among staff that presents secondary education. High evaluation

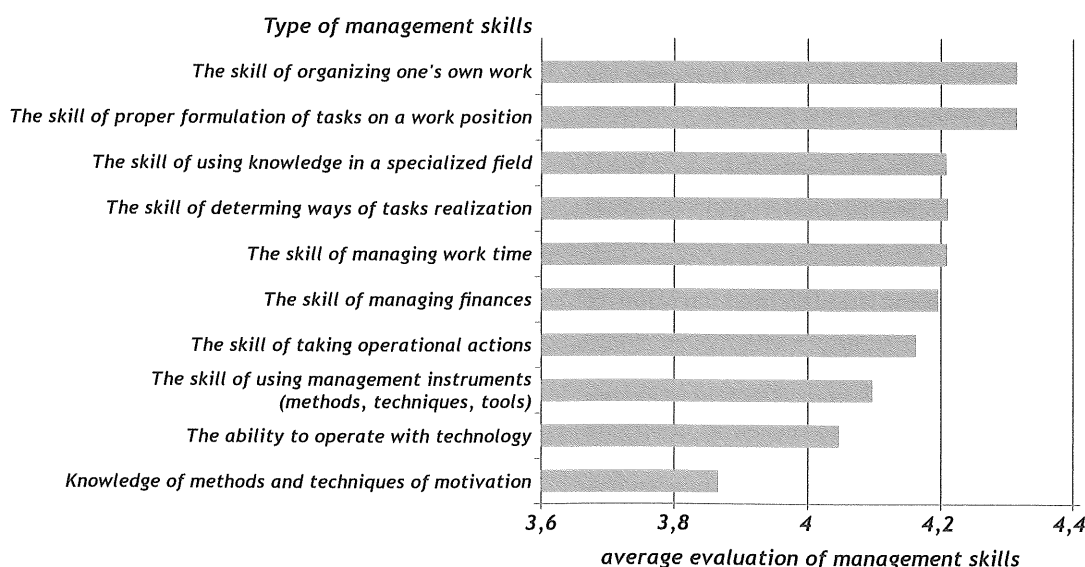


Figure 1. Average evaluation of technical management skills of management staff in high-tech enterprises operating within the area of Wielkopolska

Source: own study

Work position/number of respondents	Evaluation of knowledge in methods and techniques of motivation.			
	2	3	4	5
President / 3 (percentage of respondents)	0,00%	33,33%	33,33%	33,33%
Vice president / 1 (percentage of respondents)	0,00%	0,00%	100,00%	0,00%
Chief accountant / 19 (percentage of respondents)	0,00%	15,79%	84,21%	0,00%
Director / 4 (percentage of respondents)	0,00%	0,00%	75,00%	25,00%
Deputy Director / 22 (percentage of respondents)	0,00%	0,00%	90,91%	9,09%
Manager / 282 (percentage of respondents)	1,42%	17,73%	69,86%	10,99%
Deputy Manager / 24 (percentage of respondents)	0,00%	4,55%	68,18%	27,27%
Others / 24 (percentage of respondents)	0,00%	29,17%	62,50%	8,33%

Figure 2. Knowledge in methods and techniques of motivation regarding the occupied work position  
Source: own study

Work position / number of respondents	Evaluation of the skill in organization of one's own work		
	3	4	5
President / 3 (percentage of respondents)	0,00%	100,00%	0,00%
Vice President / 1 (number of respondents)	0,00%	0,00%	100,00%
Chief Accountant / 20 (percentage of respondents)	0,00%	75,00%	25,00%
Director / 4 (percentage of respondents)	25,00%	75,00%	0,00%
Deputy Director / 22 (percentage of respondents)	9,09%	63,64%	27,27%
Manager / 22 (percentage of respondents)	4,18%	56,45%	39,37%
Deputy Manager / 283 (percentage of respondents)	0,00%	54,55%	45,4 %
Others / 24 (percentage of respondents)	16,67%	62,50%	20,83%

Figure 3. The skill of organizing one's own work according to the occupied work position  
Source: own study

of organization of one's own work (Figure 3) points to the willingness and ability of improving the mentioned skill.

Although, significant acquisition of skills on a good level surely supports this process. While analyzing the managerial skill in high-tech enterprises it is easy to notice that number of those skills is high. Therefore, in deciding on a proper "catalogue" of those abilities that should be required, the empirical approach must remain as dominating, and not the "rich imagination" of various specialists in management, outstripping in enumeration of managerial features and creation of a perfect manager methodology. In numerous studies there are highly sizeable lists of personality features of a manager [Cameron, Whetten, 1983, p. 21], but special attention should be paid to those that are useful in practice. Therefore, we need to formulate some key skills, which managers should acquire and apply well in their practical actions. Through presenting the above mentioned evaluations of skills to the management staff, those with lowest marks should be improved and those with highest need to be cared for. Thanks to that, the management staff will know how to win and

maintain the employees of knowledge, which are highly significant in case of high technology enterprises.

## Conclusion

The research described above indicated relations between the variables which shaped the its subject range. It comprises of technical skills of management staff in enterprises that operate high technology sector. The results lead to validity of management skills analysis in the group of technical abilities. There is a noticeable gap in skills, which is highly valuable as some of them should be improved and mastered, especially those including methods and techniques of motivation. Possessing all the qualities on a high level could result in a professional burnout. For this reason, it is suggested that only those qualities should be mastered which are the most significant and related with technical skills, essential for high technology sector. In literature, two main rules of management skills development are distinguished [Pełka, 1996]. The first one states that all managers in a company should master their skills. This process must be dynamic and of high quality. It cannot

only mean a statistical rotation of employees. Shaping a future management staff stands for the development of the whole present management potential. Even the most extended programs of management skills development will not guarantee success if the company focuses on weaknesses, avoids strengths and neglects integrity and personality while employing people on managing positions.

The second principle suggests that development of skills should be strategic. This strategy will be achievable if the following figures are taken into consideration:

- conditions of skills development must include the process of company policy formulation, defining its strategic goals, informing managers on skills improvement programs;
- statements referring to the significance of management skills development should include:
  - company globalization setting high requirements for management staff in the area of foreign languages, ability of quick adjustment to geographical changes, changes of mentality and mobility,
  - recruitment of young management staff which may be risky and generate high expenses,
  - information transfer which has growing influence on company success but unfortunately managers do not often receive up-to-date and the best information possible,
  - the time spent on product and service innovation is shortening all over the world,
  - lack of restrictive measures towards management staff which do not often react on environment changes and technical innovations,
  - people whose individual or group work determines the company success,
  - direction of management skills development through;
- gaining "generalist" skills – it refers to specialists who must learn to work comprehensively;
- filling technical gaps;
- gaining skills in the area of management and management information systems;
- training management staff on workshops.

Applying the development rules presented above brings the following benefits:

- management skills development programs facilitate and fasten the company adjustment to changeable conditions, new strategies and goals,
- enable active shaping of future,
- boost management staff's self-esteem,
- create conditions for professional and personal development,
- enable discovering talents and using subordinate's skills,
- ensure that notable managers stay in companies longer.

The process of skills improvement should take place on different levels and workshops should reach further than narrow, limited and short-term schooling programs [Chojnacki, Banasiewicz, 2006]. While analyzing

application advantages of management skills development, it must be emphasized that a skill is something that can be taught and which increases its own value within the course of education. Mechanisms of skills development are prepared to contribute noticeably in processes of skills improvement, which is highly significant for all modern organizations. Management staff's work in organizations must be seen through goals that are achieved thanks to skills which had been improved.

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## **Umiejętności techniczne kadry kierowniczej przedsiębiorstw high-tech**

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### **Streszczenie**

W artykule dokonano prezentacji wyników badań ankietowych przeprowadzonych wśród kadry kierowniczej przedsiębiorstw sektora wysokich technologii na terenie województwa wielkopolskiego. Badania ankietowe przeprowadzono przy wykorzystaniu autorskiego kwestionariusza. Celem badania była ocena przez kadrę kierowniczą umiejętności technicznych, którymi legitymuje się kadra kierownicza przedsiębiorstw sektora wysokich technologii. Badania miały charak-

ter pilotażowy jako wstęp do badań właściwych, które zamierza się przeprowadzić na terenie całego naszego kraju. W wyniku przeprowadzonych badań ustalono, że najwyższą przeciętną ocenę otrzymały umiejętności organizowania pracy własnej oraz umiejętności odpowiedniego formułowania zadań na stanowiska pracy (4,32), natomiast najniżej kadra ma opanowane umiejętności dotyczące znajomości metod i technik motywowania.

### **Słowa kluczowe**

umiejętności techniczne kadry kierowniczej, przedsiębiorstwa wysokich technologii

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