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Economic processes management at microlevel

COMPETENCE MODELS IN THE INFORMATION TECHNOLOGIES SECTOR

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In the course of the past decade the role of the IT- specialist has experienced a significant evolution – from automated data processing to the development and control of information systems and the provision of technical, business and consultant's services. This way there occurs an issue of a particular significance - the search for a solution of the problem of the management of the IT-professionals' competencies, their description, establishment of competence models, incl. at the level of command, standards, manners and methods for the assessment and development of the competencies required for the performance of the various activities within the organizations in the sector of information technologies (the IT- sector). Within this context the objective of this study is to propose possible competence models, established depending on the characteristics and specificities of the activities and positions in the organizations of the IT- sector. Summarized conclusions and recommendations are provided.
Keywords: competencies; competence model; position; IT-sector.

Introduction. The changes in technologies and economic conditions have brought new requirements to the functions, tasks and skills of the specialists in information and communication technologies. In the course of the past decade the role of the IT-specialist has experienced a significant evolution – from automated data processing to the development and control of information systems and the provision of technical, business and consultant's services. The enterprises operating in the situation of an innovative economy experience a pressing need for professionals in the field of information systems, capable not only to design and develop them, but

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also to manage them according to the needs and requirements of the business. The issue of the establishment of an optimally functioning system of human resources in the IT- sector has gained quite a great scientific and applied significance, in particular under the present conditions of rapid development of IT and sharpening competition. A possible approach to defining the human resources policy is the one that puts the aggregate of the employees' competencies reflecting to the most the requirements of the enterprise's business strategy into the centre of the human resources management.

Analysis of recent researches and publications. The revolutionary transition from the industrial to the information age has also brought changes in the managers' understanding of human resources management in the organizations and in the managerial approach to achieving efficiency. To that regard R. Kaplan and D. Norton consider that "such a new approach requires a general re-qualification of the workers so that their minds and creative abilities are mobilized for the purpose of achieving the organization's tasks". They use the term of "strategic readiness" studying it as a level of development of the competencies for the implementation of in-organization processes of critical significance [5, pp. 169]. S. Horton states the position shared also by M. Vachkova [1, pp. 2], that the management of competencies is quickly turning into a key strategy in human resources.

The development of a competency-orientated system for the management of the IT-employees includes a series of actions, the first of which is the development of competency profiles for the sector, enterprise or particular position. The competence model creates a framework and structures the processes of management of performance through a system of introduction, measurement and development of competencies, bringing to the improvement of the organizational results and achievement of the organizational goals set. It consists of competency profiles organized in a general matrix in a manner matching them to the organization's needs. The competencies and competency profiles are two of the major components of the competence model [10, pp. 30].

The category of „competence" was introduced into scientific literature in 1960's and 1970's. It occurred as a result from the formation of a new economy, new approaches to the study of the opportunities for human resources' development and the needs for man's professional adaptivity to the ever changing conditions. In the contemporary theory and practice there is no commonly accepted definition or a comprehensive and systematically presented classification of competencies. R. White [26, pp. 297] uses the term of "competence" for the first time as an "efficient interaction of human with the surrounding environment ". L. Peter [25, pp. 8] defines competence as an ability and skill to perform a particular function. According to McClelland [22, pp. 19] competencies are major personal characteristics, which are decisive factors for the excellent performance in specific work situations. Competencies can be defined as an aggregate of knowledge, skills, habits and

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professionally-significant personal qualities needed for the successful performance of work in compliance with the requirements of the job and the strategic goals of the organization. They make it possible to determine the employee's readiness for efficient performance in particular situations. Two major relations of competencies have to be taken into account: the relation to the process and the relation to the contents [1, pp. 2]. Boyatzis [15, pp. 47] defines competence as: "A capacity possessed by an individual that results in behavior meeting the requirements of the organizational environment and on its part brings to the desired outcomes from work" [[15, pp. 51] and establishes two types of competencies – personal and social; professional. Spencer and Spencer [21, pp. 32] distinguish basic (threshold) competencies and distinctive competencies. The results from the research held by Spencer and Spencer show that the use of a competence approach in the system of staff management results in an increase of sales by an average of 49 % and in a decrease in the fluctuation of employees by 48 % [21, pp. 13-15].

J. Raven [24, pp. 168] classifies competencies by 37 categories. On their part W. Byham and R. Moyer [16, pp. 43] divide competencies into organizational, role-based and personal. The National Council for Vocational Qualification [23] of Great Britain has developed a unified system of vocational qualifications containing five main levels of professional competence. NVQ is based on the national professional standards describing the required competencies and the level of their proficiency for taking particular positions within a particular job [3, pp. 432]. Rankin [3, pp. 432] describes competencies as "a set of skills and behaviors organizations expect to be applied by their employees in the process of their work". G. Prahalad and C. Hamel [18] develope the concept of key competencies. M. Armstrong [14, pp. 202-216] divides competences into behavioural and technical. Leader's competences have been added by Filipova to the said categories [9, pp. 130]. According to D. Shopov competency is the worker's or employee's ability and skills enabling them to be proficient in the performance of their job tasks and obligations assigned to them [12, pp. 225]. A valuable contribution in the studies of the competence approach to management has been brought by T. Tomov who definea competencies as a successful combination, aggregate of knowledge, skills, attitudes and behaviours of employees for the achievement of results (desired levels of performance) in a particular professional role and within a particular organization [8]. Competence is behavior which if met work brings to a successful achievement of particular results [10, pp. 30]. A strong push to the development of competence approach in Europe was given by the Lisbon strategy, the conceptions of "Economics of knowledge", "Learning organization" and the positions gained in management by the international standards, like ISO 9000/2000/1400, ISO 26000 for corporate social responsibility, "Investors in People" [7]. The EC accentuates on the improvement of the so-called "key competences" [6].

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The competencies required in building modern corporate structures could be divided in three levels:

• strategic (key) competencies, reflecting the resources of abilities of the entire work environment bringing to the achievement and maintenance of competitive advantages [19; 20];

• group competencies reflecting the abilities of the groups or project teams to act jointly in accordance with the requirements of the particular situation [19; 20];

• individual competencies reflecting the individual abilities to meet the requirements of the job [15; 21];

Based on the review of the literature sources the main characteristics of the competencies can be summarized, as follows:

• the major purpose In applying the competencies is to determine the reasons for the successful work activity;

• the competencies have a universal character, they are reproducible and can be developed;

• the competencies are always addressed to a particular subject that can be: an employee, an organization-structural unit or a team of employees, the organization as a whole;

• the competencies are always specific, they are used to assess the current activities and to forecast the success of the future ones, to determine the direction and the contents of further training of human resources and of the establishment of the organizational standards;

• the competencies should correspond to the goals set;

• the competencies are related to particular business processes and professional functions and a balance is needed between the common competences having a broad scope of application, and the special competences related to solving particular problems.

According to T. Tomov [8], for the efficient management of the potential of the organization and for the purpose of providing an efficient deployment of the competence approach the specialists in human resources management should build up integrated systems of competencies complementary to one another, called "competence models". These are frameworks (matrices) of competencies describing the behavior required for the achievement of the best results at a particular position, level, or specific function. The competence model is an aggregate of multiple abilities, which together determine the successful performance in a particular work environment. The model describes not what the employees must do, but how they must do it. It describes in details the standards of employees' behavior for the achievement of the organizational goals. It can be used for ensuring co-ordination and compliance of almost all the processes related to the management of human resources within the organization. Thus the competency profile can be considered a major

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multi-functional and flexible tool in staff management. Tomov derives the basic principles ensuring the usefulness of the competence models for the company [8]:

• the competence models should cover not more than 6-12 competencies;

• the competencies should show (demonstrate) actual, practically implementable behaviors in compliance with the corporate specificity and culture. They should be unambiguous, understandable, known and accepted as a standard of good performance, and should also be certifiable;

• the behaviors characterizing the competency should be liable to observation, measurement and assessment;

• the competencies should be related to the organizational perspective, to the priorities and vision of the organization's future;

• the competencies should be included in all the managerial acts and policies.

In general it could be assumed that the competence model establishes a framework and structures the process of management of performance through a system for introduction, measurement and development of competencies bringing to the improvement of the organizational results and to the achievement of the organizational goals set. The main components of the competence models are shown in Table 1:

Table 1. **Components of a competence model**

Basic components	Contents
Competencies	Name – definition – model behaviours
Competency profiles	A set of competencies describing the requirements for the necessary performance at a given position
Expected level of command of competencies	Description of the expected level of command of the given competency
A scale for the assessment of the competencies	Description of the individual grades forr the assessment of the actual level of command of the competency

Source: G. Hubanova, N. Koynova, V. Georgiev [11]

The policies and initiatives of the EU [13] with regard to the electronic skills gave a push to the development of a European Framework of Electronic Competencies (e-CF). It presents a common language for describing 40 important competencies and five levels of vocational training, incl. skills and requirements to training IT-specialists, with the purpose to address the requirements of the business and other organizations of the public and private sector [2, pp. 15].

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Table 2. **European e-Competence Framework (e-CF)**

Main areas	Competencies	Proficiency level				
		e-1	e-2	e-3	e-4	e-5
PLANNING	Information structures and business strategy alignment				X	X
	Service level management			X	X	
	Business planning			X	X	X
	Product/service planning		X	X	X	
	Architecture design			X	X	
	Application design	X	X			
	Technology trend monitoring				X	
	Sustainable development			X		
	Innovating				X	X
BUILDING	Application development	X	X			
	Component integration		X	X		
	Testing	X	X	X		
	Solution deployment	X	X	X		
	Documentation production	X	X			
	Systems engineering			X	X	
RUNNING	User support	X	X	X		
	Change support		X	X		
	Service delivery	X	X			
	Problem management		X	X	X	
ENABLING	Information security strategy development				X	X
	ICT quality strategy development				X	X
	Education and training provision		X	X		
	Purchasing		X	X	X	
	Sales proposal development		X	X		
	Supply channel management			X	X	
	Sales management			X	X	X
	Contract management		X	X	X	
	Staff development		X	X	X	
	Information and knowledge management			X	X	X
	Needs identification			X	X	X
	e-Marketing		X	X		
MANAGING	Forecast development			X	X	
	Portfolio and project management		X	X	X	
	Risk management		X	X	X	
	Relationship management			X	X	
	Process improvement			X	X	
	ICT quality management		X	X	X	
	Business change management			X	X	X
	Information security management		X	X	X	
	Information structure governance				X	X

Source: http://www.ecompetences.eu/e-cf-overview/ [29]

This framework aims at the provision of a clear and steady orientation to the companies, educational institutions and other organizations taking decision with regard to the employment, professional development, training, drafting curricula and

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other policies in building competence models for the management of human resources in the sector of digital technologies. The philosophy and principles followed in building this competence framework are, as follows:

• E-CF is designed as a tool to provide opportunities for users, not to restrict them;

• expresses digital competences using the following definition: „Competence is a demonstrated ability to apply knowledge, skills and attitudes for achieving observable results". This is a concept related to work activities and incorporating complex human behaviors expressed as internal attitudes;

• competence is a durable concept although technology, jobs, market and IT environment change all the time. In order to remain durable it has to be reviewed every three years;

• a competence can be a component of a job, but it cannot be used as a substitute for similarly named job titles. Competences can be aggregated, as required, to represent the essential content of a job. On the other hand, one single competence may be assigned to a number of different job roles;

• competence is not to be confused with process or technology concepts;

• E-CF does not attempt to cover every possible competence deployed by the IT managers and specialists. Some competences are found in other professions but are very important in the context of digital technologies;

• E-CF is constantly and closely related to the European qualification framework;

• the maintenance and updating of the electronic competence framework is not imperative;

• E-CF is free for the users. It s developed under the umbrella of the European Committee for Standardization and is designed for use by any organization engaged in ICT Human Resource competence development [17].

A research of Computerworld US, held in 2014 through questioning 221 specialists, determined nine skills beyond the technical ones, as the most appreciated in the IT-jobs. These are:

• interaction with users;

• analytical thinking;

• co-operation within a team;

• project management;

• innovation; people management;

• marketing skills;

• using social media in work, and leadership [27].

Or, in a summary, the new competitive advantages of the organization are the quality of staff, like creative activity, constant readiness for innovations, sense of

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responsibility, ability for team work and co-operation. This enhances the significance of the social and psychological competence as important qualifying requirements to the managers and specialists in IT. The application of the competence model into the policies and practices for finding, recruiting, introducing into the job and keeping the necessary professionals contributes to the development of the organization's competitive advantages and to the achievement of its strategic goals [4] and leads to the need to manage competencies within the organization. The management of competencies is to be studied as a purposeful activity of the managers at all the management levels, which covers the development of conceptions, strategies, staff policies, principles and methods of management based on a punctual evaluation of the compliance of the employees' professional competencies with the organization's strategic objectives. The purpose of the competence management is to motivate the person to work implementing to the fullest and adequately one's individual professional capacity within the organization.

Previously unsettled problem constituent. At the current stage the contents, specificities, types of jobs are still not sufficiently studied and developed in theoretical, methodological and practical terms, the same being valid also for the transformation and issues of work of the specialists employed in the field of information technologies. There is still insufficient identification of the specific requirements to the functions of the specialists in the sector of information and communication technologies, as well as of the tools for their management. This way there occurs an issue of a particular significance - the search for a solution of the problem of the management of the IT-professionals' competencies, their description, establishment of competence models, incl. at the level of command, standards, manners and methods for the assessment and development of the competencies required for the performance of the various activities within the organizations in the sector of information technologies (the IT-sector). Nowadays, the business entities of the IT-sector still do not have the required experience for the development and implementation of such competence models, which may become a part of the in-company standards of human resources management.

Main purpose of the article. Within this sense the objective of the study is to propose possible competence models, established depending on the characteristics and specificities of the activities and positions in the organizations of the IT-sector. Theoretical and applied formulations are used from literary sources, publications of branch organizations, information from organizations performing activities in the area of IT, as well as expert help from prominent specialists of the sector.

Basic material with substantiation of the result of the research. The specific peculiarities and characteristics of human resources management in the IT-sector have a significant importance in the design of the competence models - Table 3.

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Table 3. **Peculiarities of human resources management in the IT-sector**

Elements of HRM policy	Brief characterization
Contents of work functions	- continuous occurrence of new job positions; - expansion of the concept of "IT specialist"; - need for integration of economic and technical functions; - need for establishment of job positions for the business-orientated specialists; - inclusion of managerial tasks in the functions of the IT specialists;
Role within the organization	- IT-personnel turning from service into a key staff resource; - transition of the IT managers from the medium to the higher managerial unit in the organizational hierarchy with widening the scope of responsibility;
Responsibilities	- working to the direction of achievement of the organization strategic goals; - performing the ongoing processes and solving the operational tasks; - ensuring the efficient communication and interaction between managers, employees and customers of the organization; - managing the databases; - providing the information security; - supporting the information resources of the organization.
Professional and personal requirements to the employees	- mainly university – technical or economic - education; - 25-45 years of age; - prevalence of male employees.
Professional competences	- self-training and self-development skills; - managerial skills; - efficient communication skills; - team-work skills; - command of business skills.
Personal characteristics	- ability to perform various functions and assignments; - analytical engineering thinking.
Professional skills	- existing conditions for fast career development of the staff; - need for continuous improvement of qualifications through self-educating; - experience serves as a main guarantee of qualification, depending on the employers; - it is compulsory to establish an in-company system of employees' training and development; - need for re-qualification aiming at the expansion of the functional abilities of the IT specialists.
Recruitment and selection	- pressing chronic deficit of highly-qualified IT specialist on the labour market; - growing use of the services of freelance specialists; - growing practice of employee outsourcing; - Internet becomes the mainly used channel of staff recruitment; - young specialists are attracted since the beginner stage of their education at university.
Motivation	- low level of employees' commitment with the employing companies predetermining the high fluidity of manpower; - predominant significance of material stimuli for the employees; - priority of the needs for recognition and esteem, as well as the opportunity for professional development in the IT staff's motivation structure.

Source: developed by the authors

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The issue of the formation of an optimally functioning system of human resources in the IT sector is of a great scientific-applicable significance, in particular in the current situation of a financial-economic crisis and fierce competitive struggle. A possible approach to defining the human resources policy is that placing in the center of the HRM the aggregate of employees' competences reflecting to the fullest the requirements of the business strategy to the enterprise.

The development of a competence-orientated system for the management of the IT-employees, is comprised of the following main activities:

• development of competence models for the sector, for a particular enterprise, for a particular job;

• defining the levels of development of competencies and establishing standards;

• assessment of the employees' IT-competencies;

• planning the development of the IT-staff's competencies;

• determining the needs for a staff possessing the required competencies;

• raising the level of the employees' competencies through training and extra qualifications;

• building a system for employees' motivation aimed at the enhancement of the level of their competencies.

At the development of a competence model, applicable in the IT-sector, the required competencies could be divided into three categories:

1. Technical competencies, which cover:

• knowledge of the existing computer systems and technologies;

• design and development of applied systems and software;

• implementation of procedures, means and methods;

• system integration;

• design and support of the technical devices;

2. Business and managerial competencies, and in particular:

• knowing the practices and approaches in the field of business;

• knowing the organizational structures of business and the problems of corporate policy and culture;

• entrepreneurial behavior;

• abilities to analyze the market;

• project management;

• managing the change in the field of business;

• planning, prioritizing and administrative work;

• awareness;

• focus onto the customer.

3. Behavioral and social competencies:

• leader's qualities and skills for gaining trust;

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- creative and innovative thinking;
- focus onto the results;
- strategic thinking;
- tutorship, delegation and development of personnel;
- building team-spirit relations;
- influence and persuasion;
- skills to conduct negotiations;
- resolving conflicts;
- adaptivity.

All these competencies are a part of an integrated system, a matrix determining the standards of competence within the sector. They serve for the development of the different competency profiles some of them presenting basic, and others – specific competencies for the various jobs. As in all other sectors, in information technologies, too, there are key jobs established as the positions having the greatest importance for the achievement of the enterprises' strategies. Within the Project "Development and Implementation of an Information System for Assessment of Workforce Competencies at Sector and Regional level" (CAIS), implemented by the Bulgarian Industrial Association (BIA) in partnership with the Confederation of the Independent Trade Unions is Bulgaria and "Podkrepa" Confederation of Labour, with the financial support of the European Social Fund of the EU, [28], for the sector of information technologies there are key positions determined with the basic, specific and managerial competencies referring to them, as systematized in Table 4.

Table 4. **Key positions for the IT-sector**

Job	National Occupational Code	Basic competencies	Specific competencies	Managerial competencies
1	2	3	4	5
Business analyst, information technologies	25116002	Flexibility and adaptivity; Building interrelations; Communicating; Undertaking responsibility; Presenting; Purposefulness and managing impulsiveness.	Analysis of requirements; Analysis of the enterprise's needs; Ensuring the compliance with the strategy; Solution assessment and validation; Business analyses planning and monitoring.	Inter-functional cooperation; Planning; Understanding of business environment.

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Table 4.

1	2	3	4	5
Designer, software	25126002	Listening with understanding and empathy; Building interrelations; Enterprise Communicating; Undertaking responsibility; Presenting.	Ensuring the compliance with the strategy; Applying, understanding and using architectural principles; Design and development; Change management;	Decision making; Inter-functional cooperation; Strategic thinking.
Executive officer	11207002	Building interrelations; Innovative thinking; Communicating.	Strategic management; Management of business change; Risk management.	Negotiating; Motivating the collaborators; Sustaining the ethics in the organization; Entrepreneurial spirit; Understanding of business environment; Strategic thinking.
Marketing manager	12216004	Assertiveness; Building interrelations; Innovative thinking;	Identifying the needs; Forecasting the development; Understanding of the company's products and services; Managing contacts and communications; Management of marketing.	Negotiating; Orientation to business results; Supporting efficient interrelations.
Customer support	25226001	Analytical thinking; Listening with understanding and empathy; Caring of the customer; Flexibility and adaptivity; Building interrelations; Communicating; Working under pressure; Solving problems; Formulating questions;	Performing support of users; Managing the levels of servicing; Problem management	-
Programmer, software applications	25146001	Enterprise; Assertiveness; Innovative thinking; Communication; Ongoing learning and development; Perseverance and ability to stay focused; Applying experience and knowledge to new situations; Solving problems.	Providing system integration; Design and development; Testing; Managing problems	-
System administrator	25226001	Listening with understanding and empathy; Caring of the customer; Flexibility and adaptivity; Communicating; Work under pressure; Solving problems; Formulating questions.	Providing system integration; Performing user support; Testing; Managing problems; Change management	-

Source: authors' systematization based on the competence assessment information system [4],

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There are a definition, levels of manifestation for the various positions and behavioral indicators written for each competence. These indicators are models of behavior derived from practice via which the level of command of competencies is measured. Such competence models, as well as the key positions are only of a recommended character. However, the important thing is that when competency models and profiles are developed for the particular organizations it is to be taken into account that they would be successful only if in compliance with the formulated strategic economic, production and technological goals of the companies in the IT-sector.

The key competencies determining the employee's efficiency are not only professional but personal characteristics, too, related to motivation, convictions and mental and physiological characteristics. The competence framework should be used within the context of the strategy of the IT-enterprise and of those requirements it sets for the staff's knowledge and habits. Its implementation is to be made a principle of management of the personnel's competences in the organization.

Table 5 provides a list of the important competencies and the required level of command as a prerequisite for the successful career of the specialists in the area of information technologies.

Table 5. **Common organizational catalogue of competencies for the successful career of the specialists in the IT-sector**

Competencies	Level of command
1	2
Technical competencies:	
- knowledge of existing computer systems and technologies	4
- design and development of applied systems and software	3
- system integration	4
- implementation of procedures, means and methods	3
- design and maintenance of engineering devices	4
Business and managerial competencies	
- knowledge of the practices and approaches in the area of business	2
- entrepreneurial behaviour	3
- abilities for analysis and synthesis	4
- organizing and planning	4
- knowledge of the organizational strategies, business structures, issues of corporate policy and culture	3
- Leadership	4
- Problem solution	3
- Decision making	3
- Focus onto the customer	4

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Table 5.

1	2
Behavioural and social competencies	
- critical thinking	3
- team spirit	4
- interpersonal skills	3
- communication skills	4
- ability to manage information	3
- ability to work in a multicultural environment	2
- ethics	3
- ability to use thinking outside the box	4
- adaptivity/flexibility	3
- creativity	4
- knowledge of other cultures and customs	2
- independence and self-organization	3
- enterprise	3
- caring of quality	4
- self-development and self-training	4

Source: developed by the authors

The competencies are described and presented using a standardized way, their main elements being:

- name;
- definition;
- behavioral indicators (model behaviors).

Table 6 provides an example of the descriptions of some key competencies for the IT-sector.

Table 6. **Definition and behavioural indicators of key competencies for the sector of information technologies**

Name	Definition	Behavioural indicators
1	2	3
Knowledge of existing computer systems and technologies	Knows the essence, designation, manner of use and benefits of modern information technologies.	- actively explores information of the existing and new technologies, their features and benefits they provide for the customers; - studies in details the main sources from which information can be learnt of the new products and benefits they bring to users; - studies the customers' needs in order to be able to offer the most suitable technological solutions; - manages to apply in practice one's knowledge of the existing systems and technologies; - follows all the time the changes and novelties in the area of hi-tech.

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Table 6.

1	2	3
Focus onto the customer	Thoroughly studies the customer's needs in order to provide the best solutions for their satisfaction.	- builds lasting relations with one's colleagues; - knows the individual needs of the regular customers; - offers solutions to meet the customer's requirements as close as possible; - manages in translating the technical terms into a language understandable by every customer; - keeps all the time contact with the customer, using the feedback for the improvement of the services; - manages to find the point where the customer's interests meet the interests of the company.
Building team relations (teamwork spirit)	Builds and maintains good and efficient relationships with the other members of the team as needed for the achievement of the goals set.	- manages to keep good relations with the people in the team regardless of their differences; - demonstrates readiness to share one's knowledge with every member of the team; - If needed, renders cooperation to all the members of the team; - undertakes responsibility for the performance of the common tasks assigned; - shows good intention and cooperates with all the members of the team; - accepts the common goals as one's personal ones; - accepts with respect the opinion of every member of the team even if differing from one's own.
Creative and innovative thinking	Has ingenious ideas and solutions in situations of high degree of uncertainty.	- generates multiple rational ideas of practical nature; - tries various methods for solving the problems or issues that may occur; - gives ideas for the improvement of processes at work; - always looks for a better way; - does not give way to stereotypes; - successfully applies the new technologies for the improvement of existing processes; - actively searches for information to cope with the challenges of work.
Focus onto results	Works for the achievement of lasting, sustainable and effective results, demonstrating perseverance and patience to attain them.	- knows what outcome of work is to be achieved; - accurately plans and organizes one's time to achieve the results within the term set; - sets oneself difficult and challenging tasks; - overcomes the obstacles occurring on the way of achievement of the result pursued; - makes a plan and builds alternative paths for the achievement of the result pursued; - critically and objectively measures the results obtained using all efforts to improve them at the next stage of work; - feels self-satisfaction with the achievement of excellent results.
Adaptivity	Succeeds in adjusting oneself to the changing environment by matching one's behaviour to the particular situation.	- finds correct solutions under changing conditions; - patiently and carefully analyzes the circumstances before undertaking certain actions; - shows readiness for change in one's work environment and conditions; - applies one's knowledge and skills appropriately given the situation; - has an adequate behaviour taking into consideration the situations that may occur; - quickly learns knowledge and skills required upon a change of the requirements for the job or upon changing the job position.
Self-training, awareness and self-development	Ongoing readiness and willingness to acquire further knowledge and skills in order to improve the results from one's work and to achieve professional development.	- critically assesses one's own knowledge and skills; - constant strive for development; - appropriate choice of the sources of information; - carefully and analytically reviews the information received; - feels self need for the enhancement of one's knowledge and skills, no need to be forced to study and learn; - has the attitude of "there always is some better solution"; - believes that one's current knowledge and skills are not sufficient and should be furthered all the time.

Source: developed by the authors

Conclusions and directions of feather researches. The names, definitions and behavioural indicators of the competencies presented hereinabove do not aim at

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creating a pattern or a matrix through which the companies of the IT-sector are to build their competence models. It is the principle of compliance of the model with the chosen business strategy that is to be always followed in order to bring to the enhancement of the organization's uniqueness and to the improvement of the competiveness of the company. The behavioural indicators reflect the corporate culture, on the one hand, but on the other, they build it as they constitute a standard to be followed by all the employees of a company.

Management is to build up, integrate and re-configure the chosen model with a view to the quickly changing outer environment and organizational status. Therefore the following are to be assessed and taken into account:

- if the character of the new or changed skills is short- or long-term;
- the extent of change of skills and abilities;
- expected peaks and drops in workload and in the required combination of skills determined at planning the management of the service and the improvement of the product or service.

The list given hereinabove presents a common framework of competencies required from the employees in the Information technologies sector in general. May be on the labour market there are some specialists possessing all these skills, but, however, their number is not sufficient to meet the current huge demand by the part of the business.

The selection of a suitable model with the set of competencies covered by it is an important stage in the process of building a competency-orientated system of HR management. Basic selection criteria could be the size of the organization and the goal of the introduction of such a model. More than 90 % of the IT-enterprises in Bulgaria are small and given equal other conditions it is recommendable for them to introduce a common competence model valid for all the positions and employees. From the list of the most important competencies presented hereinabove it becomes obvious that their number exceeds the recommended number to be used in a model (8 to 12 competencies).

According to the opinion of the author of this work the employees in the organizations of the IT-sector could be categorized in three main groups of key positions. The first group includes all the engineering-technical jobs, like, for example, a software programmer (developer), quality engineer, system administrator, PC technician, code quality specialist, etc. The competency profile of this category of employees should cover mainly technical competencies with the highest level of proficiency. They could be: knowledge of the existing computer systems and technologies; design and development of applied systems and software; design and maintenance of engineering devices; implementation of procedures, means and methods; system integration; testing; performing user support, and others. It is recommended to restrict this group of employees' direct contact with the user of the

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product or service for two main reasons: the first one concerns the fact that the technical staff often does not possess the required level of social competencies to be applied in the process of direct interaction with the customer. During the past several years many companies have organized trainings for the development of "soft" skills of their engineering-technical staff, but the practice proves that the effect is often unsatisfactory and there is a waste of training resource that with a greater success could be directed to the improvement of the technical competencies. The second reason is related to the fact that these specialists form the group of the scarcest workforce in the branch, consuming the biggest employer's costs for salaries and wages. This necessitates the creation of an organization of labour that enables the use of their specialized skills to the fullest in order to achieve the maximum effect.

The second group of jobs is the one with administrative-managerial and sales-consulting functions performed by the line of direct interaction with organizations from the outside, suppliers and customers. These are, for example, sales (purchase) manager; marketing manager; product manager; project manager; sales assistant in the sales of computer facilities and software and others. The competencies to be included in their job profiles should be mainly of the categories of business, managerial and social competencies on the account of the technical knowledge and skills. Some of the most appropriate competencies for such positions are: entrepreneurial behavior; organization and planning; knowledge of the practices and approaches in the field of business; leadership; decision-making; focus onto the customer; interpersonal skills; communicative skills, adaptivity, etc. This, however, does not exclude the need for good knowledge of the existing computer technologies and information solutions.

The third group is formed by the employees placed in the middle – between the front- and back-office of the company. Such jobs are: business analyst; technical organizer; business-consultant of information technologies; organizer of service and maintenance, and others. They could be called "hybrid" specialists and should possess both technical and social competencies at sufficiently high levels. This is to be taken into consideration by the managers when designing the organizational structure and positions in the company. In our opining their role shall become even more important in the future development of the IT-sector. Therefore, the secondary vocational schools and the universities should increase the numbers of admission and should include new specialties by which professionals in the said jobs are to be trained. The curricula should be brought into compliance with the current and future requirements with regard to acquiring a larger scope of technical, social and managerial competencies. To that end engineering, economic, managerial and social subjects are to be combined appropriately and studied to the same level. Such exemplary "hybrid" specialties could be: Business Informatics, Management in IT,

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Digital Marketing, Computer science and business analysis, SEO optimization, PR in digital environment, etc.

The nature of the sector of information technologies, as well as the state and trends of the labour market are prerequisites for revising the existing HR management systems. All the managers and experts in the branch share the same opinion – the major problem currently is the lack of sufficiently prepared manpower to meet their requirements. Such a deficit of a major resource for the organizations brings to further challenges for which adequate solutions are to be found. The competence models could be used in various functional areas of the personnel management system within the context of counteraction to the consequences of the crisis on the labour market. It is an opinion of the author that the competence models find their largest application in the activities of recruitment and selection of staff, training, design of the positions within the enterprise's organizational structure, assessment of employees, organization of work and working hours and motivation. The use of competence models in the formation of remunerations and in the area of employment relations is of the lowest efficiency.

In our opinion, with a view to the achievement of a greater effect from the application of competence models in the separate elements of the HR management system in the sector of information technologies, it is necessary to take into consideration some significant characteristics. From the very process of planning and determining the enterprise's needs for human resources, apart from the quantity of employees, the most important competencies to be possessed by them are to be defined, too. The number of the required competencies should not be too big, as it would bring to difficulties in finding applicants meeting such requirements. For companies with a number of staff less than 50 people it is recommended to develop a common model applied to all the positions. The demand for specialists with a broadly-profiled preparation currently exceeds the supply, which limits the applicability of more complex competence models. An opportunity can be created through making changes in the organizational structure of the business by designing positions of simpler requirements regarding competencies. A possible risk could be brought by the occurrence of need for employing extra staff and increase of the total costs of salaries and wages.

The competence models can help the managers and HR specialists in the IT sector improve the quality and potential of their employees, increase the efficiency of use of human resources and in consequence contribute to the improvement of competitiveness of the organizations in a situation of a hyper-dynamic outer environment.

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References

1. Vachkova, E. Obuchenie po UChR, bazirano na kompetenciite. International University, Sofia. (In Bulgarian)

2. Denchev, S., Kovacheva, E., Nikolov, R. Informacionen menidzhmynt. Izd. „Za bukvite – O pismeneh", UniBIT, 2014. (In Bulgarian)

3. Dessler G. Upravlenie personalom. BINOM, 2009. (In Russian)

4. Informacionna sistema za ocenka na kompetenciite. (In Bulgarian)

5. Kaplan, R., D. Nortyn. Balansirana sistema ot pokazateli za efektivnost. Klasika i stil, 2005, Sofiia. (In Bulgarian)

6. Kliuchovi kompetentnosti. EK. (In Bulgarian)

7. Tomov, T. Investitori v hora. (In Bulgarian)

8. Tomov, T. Razrabotvane na kompetentnostni modeli, ili kakvo povedenie e neobhodimo za uspeshno trudovo predstaviane. (In Bulgarian)

9. Filipova, M. Liderstvo i liderski kompetencii v turizma, UI „N. Rilski", Blagoevgrad, 2015. (In Bulgarian)

10. Hristova, T. Upravlenie na choveshkite resursi. Elektronen uchebnik, Varna, 2007. (In Bulgarian)

11. Hubanova, G., Kojnova, N., Georgiev, V. Metodicheski ukazaniia za proektirane, aprobaciia, testvane i verificirane na sektorni i firmeni kompetentnostni modeli i karti za ocenka na kompetenciite na rabotnata sila. Sofia, 2011. (In Bulgarian)

12. Shopov D. i kolektiv. Terminologichen rechnik po upravlenie na choveshkite resursi. UI „Stopanstvo", Sofiia, 2004. (In Bulgarian)

13. A common European Framework for ICT Professionals in all industry sectors. European e-Competence Framework 3.0. (2014). Available at: http://www.ecompetences.eu/wp-content/uploads/2014/02/European-e-Competence-Framework-3.0_cen_cwa_16234-1_2014.pdf

14. Armstrong, M. A Handbook of Human Resource Management Practice. Kogan Page, London, 2006.

15. Boyatzis, R. E. The competent manager. A model for effective performance. New York, John Wiley & Sons. 1982.

16. Byham, W., Moyer, R. Using Competencies to Build a Successful Organization. PA: Development Dimensions International, Pittsburgh, 1998

17. European e-Competence Framework. The what, how and why guide to the e-CF. Available at: http://www.ecompetences.eu

18. Hamel, G., Prahalad, C. The Core Competence of the Corporation. Available at: https://hbr.org/1990/05/the-core-competence-of-the-corporation/ar/1

19. Hamel, G., Heene, A. Competence Based Competition. John Wiley & Sons, New York, 1994.

20. Javidan, M. Core competence: What Does it Means in Practice. Long Range Planning, Vol. 31, No. 1, pp. 60 to 71, 1998 © 1998 Elsevier Science Ltd. Available at: https://s3.amazonaws.com/academia.edu.documents/51360511/s0024-6301_2897_2900091-520170115-19001-zpk9x8.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1518083676&Signature=cQokn8LXWixLIFX6P6kl2lwY178%3D&response-content-disposition=inline%3B%20filename%3DCore_competence_what_does_it_mean_in_pra.pdf

21. Lyle M. Spencer Jr., Signe M. Spencer. Competence at Work: Models for Superior Performance Hardcover. Wiley, 1993.

22. McClelland, D. Testing for Competence Rather Than for "Intelligence". Harvard University, 1973.

23. National Council for Vocational Qualifications - NCVQ, 1986.

24. Raven, J. Competence in modern society. RFP, New York, 1984

25. Peter, L., Hull, R. The Peter Principle: Why Things Always Go Wrong. William Morrow and Company, New York, 1969.

26. White, R. Motivation reconsidered: The concept of competence. Psychological Review, 1959.

27. Available at: http://www.computerworld.com/

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28. Available at: http://mycompetence.bg/position (In Bulgarian)
29. Available at: http://www.ecompetences.eu/e-cf-overview/

МОДЕЛИ КОМПЕТЕНЦИЙ В СЕКТОРЕ ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ

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За последнее десятилетие роль ИТ-специалиста значительно расширилась от автоматической обработки данных до создания и управления информационными системами и предоставления технических, деловых и консалтинговых услуг. Особенно актуальным становится поиск решения проблемы управления компетенциями ИТ-специалистов, их описание, формирование моделей компетенций, включительно уровень компетентности, стандарты, способы и методы оценки и развития компетенций, необходимых для осуществления различных видов деятельности в сфере информационных технологий (ИТ-сектор). В этом контексте цель исследования – предложить возможные модели компетенций, сформированные в соответствии с характеристикой и особенностями деятельности и позиций в организациях ИТ-сектора. В статье предложенны общие выводы и рекомендации.

Ключевые слова: *компетенции, модель компетенций, должность, ИТ-сектор*