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SOCIAL-PSYCHOLOGICAL ASPECTS OF THE COMPETENCE OF IT SPECIALISTS IN THE CONTEXT OF PROFESSIONAL INTERACTION

Abstract. This article presents the results of the analysis of recent publications on the peculiarities of professional activities and the requirements for professional competences and skills of companies' employees in the field of information technology. Based on the analysis of the practical activities of modern IT specialists and research findings, a complex of knowledge and skills that an information technology expert should possess for successful professional activities has been defined. These professional competencies include proficiency in information modeling methods, the ability to implement information models by means of information and communication technologies, the capability to employ modern methods for developing and researching algorithms for problem-solving in modeling objects and processes, and implementing these algorithms using contemporary programming languages and many others.

At the same time, significant emphasis is placed on the growing trend of cooperation among companies within the modern IT sector, with a greater focus on interpersonal communication. It is also noted that team collaboration is widespread
in IT companies, the effectiveness of which largely depends on the efficiency of interactions between its members.

The conducted analysis has affirmed that building effective interpersonal relationships within an organization, both horizontally and vertically (among employees, different departments, project managers, and company leadership), as well as establishing a productive external communication system (with clients, partners, etc.), is no less important than creating a high-quality and competitive technological product. Consequently, this requires the development of not only "hard skills" – professional competences and technical skills but also a sufficient level of "soft skills" – personal social competences that influence teamwork, cooperation, and self-organization.

It has been proved that in the social-psychological context, a modern IT professional is an individual who is prepared to work effectively within a team, capable of establishing constructive interactions both with colleagues at various levels of collaboration and service consumers. This has provided a basis for justifying the necessity of developing social-psychological competences – acquiring and improving skills of working with people, the ability to build effective interpersonal interactions, conflict resolution competency, and the capacity to address conflicts constructively, which may arise in professional activities.

**Keywords:** IT professionals, professional competences, professional interpersonal interaction, teamwork, social-psychological competences, conflict resolution competence.

**Problem Statement:** Transformational social processes and social changes resulting from the war launched by Russia against Ukraine affect both society as a whole and the professional sphere in which individuals pursue their careers. The professional activities of contemporary individuals working in organizations in these circumstances are characterized by instability, unpredictability, and increased psychological stress, which affect their professional and social interactions, as well as their well-being.

This problem is particularly relevant for professionals in the field of information technology, whose work entails specific challenges, including significant psychological cognitive strain, intellectual concentration, overtime work, sedentary job, and more. Additionally, this profession places demands not only on the individual's technical skills but also on their personal competences, communicative abilities, and organizational aptitude. Consequently, there is a need to study an individual in the context of functioning within organizations in the information technology sector and explore their personal competences through the prism of professional interaction.

**Analysis of Recent Research and Publications.** In contemporary psychological research, there is a growing interest in the field of information
technology (IT), with a focus on issues related to the training of IT specialists and the essential professional qualities required for them in accordance with modern professional demands (O. Hurska [1]; P. Malezhyk [2]; M. Smulson [3]; O. Trofymenko [4], and others). Researchers such as D. Rovenska, O. Latysheva, and I. Smyrnova [5]; J. Saldaña-Ramos, A. Sanz-Esteban, J. Garcia, and A. Amescua [6], as well as H. Gil de Zuniga, N. Jung, and S. Valenzuela [7] and others have explored the competences necessary for IT professionals to work in a global software development team. Studies conducted by Yu. Bozhko [8], N.-M. Yaghoubi, H. Salarzehi, and J. Moloudi [9] have examined the psychological factors that contribute to professional growth and employee loyalty within IT companies (A. Y. Zhang., A. S. Tsui et al. [10]). The research of O. Maletska [11], N. Panasenko, and V. Homonyuk [12], M. Sydorova, O. Baybuz, O. Lapets, and others [13], and L. Villanueva, D. Intriago, and colleagues [14] has focused on personal characteristics that promote professional development. Emotional burnout and the ability to manage one's emotions among Ukrainian IT professionals have been examined by M. Stasyuk [15] and O. Schnaider [16].

The purpose of the article is to determine the essential personal social-psychological competences for professionals in the IT sector, based on the analysis of the peculiarities of their professional activities and to emphasize the importance of their development in the context of professional interaction.

Presenting main material. When discussing the specific nature of professional activities in the field of information technology (IT), it is worth noting that today, the range of different directions within IT professionals' work is quite extensive. This includes programmers, specialists in information systems and system administration, database administrators, system analysts, IT managers, information resource experts, sales managers for solutions and complex technical systems and others. These various directions demand specific professional knowledge, skills, and competences that ensure success in the IT sector.

The professional activities of IT professionals, as indicated by researchers, are closely tied to “…defining functional tasks for the creation and operation of computer information systems; developing mathematical, visual, and logical models of functional tasks; creating technology for system componentization and providing autonomy to individual components; service-oriented integration models for components within a unified information network; planning and designing user interfaces; and providing information systems with self-reconfiguration mechanisms. And this is far from a complete list of objects of professional activity of IT specialists” (Malezhyk, 2020) [2, p.80].

The demands placed on these professionals with regard to their professional competence are reflected in a unique “standard of professional competence for IT professionals,” which is defined based on the analysis of the practical activities of contemporary IT experts in the field.
This standard is presented as a complex of knowledge and skills that an information technology specialist must possess for successful professional activity: 1) specialized competences that enable professionals to creatively use computer programs, various software packages, utilities, and gadgets to solve arising problems; 2) knowledge of a wide range of programming languages and the ability to consciously use them during collaborative organizational activities to address specific tasks; 3) the ability to enter a specialized mode of information activity, involving focusing consciousness on symbolic information and transforming acquired information into organizationally significant knowledge; 4) the ability to integrate into a single organizational field the information produced within computer networks with information circulating through other channels within the organizational structure (Hurska, 2017) [1, pp.48-49].

However, at the dawn of information technology development in the 1970s and 1980s, researchers noted that in addition to specific professional competences such as the ability to understand, determine the architecture of, and modify a program, the ability to envision the perspective of a program being developed at the moment, the capability to apply and combine well-known programming techniques and standard algorithms, etc., psychological characteristics and personality traits are important for success in the field of IT (Dijkstra, 1976; Shneiderman, 1980) [17, 18].

This refers to the ability to analyze one's own mistakes, the skill of working with users and understanding their needs, and the capability to work effectively within a team (Dijkstra, 1976) [17]. Emphasis was placed on qualities such as persistence, which denotes the possession of necessary initiative; extraversion, beneficial for friendly interpersonal interactions in collaborative teamwork and user engagement; internal locus of control, reflecting the desire to assert control over circumstances; high motivation, tolerance for ambiguity, modesty, and stress resilience, all contributing to effective performance in stressful situations (Shneiderman, 1980) [18].

Inherent determinants of successful performance in the work of specialists in this field, as noted by researchers, include flexibility and strategic thinking; quick thinking; decision-making skills under time constraints; creative thinking abilities; attention to detail, demonstrated by the ability to avoid errors; high work capacity and diligence; and the ability to create a conducive workspace that enhances work productivity (Smulson, 2001) [3, p.131].

Today, the development of the information technology industry is gaining rapid momentum leading to increased demand in the global labor market for IT professionals who must meet modern requirements.

The analysis of the problem of training IT specialists has provided researchers with grounds to define the concept of "professionalism" for a specialist in the field of IT as an “integral personal characteristic of a person who has mastered the norms of professional activity and communication perfectly to achieve professional
excellence in the field of information technology; adheres to professional ethics; continuously develops themselves through their profession and takes into account new social demands..., arouses social interest in the results of their professional activities, contributing to the prestige of their profession in society” (Hurska, 2017) [1, p.48].

Also, researchers emphasize the readiness of IT professionals for their professional activities, highlighting three main components of readiness: theoretical, which includes an appropriate amount of basic knowledge in fundamental, core technical, and professionally oriented special disciplines; practical, involving the presence of developed technical skills and abilities; and personal readiness, which is a combination of professional and value-based qualities aimed at effective professional activity (Malezhyk, 2020) [2, p.86].

Regarding the list of essential knowledge, skills, and abilities that IT professionals should possess, these are outlined in the Computing Curricula: Computer Science and the standards of higher education in Ukraine at the first (bachelor's) and second (master's) levels of education, in the subject specialization 014.09 Secondary Education (Computer Science), and, accordingly, in the educational and professional programs of various institutions of higher education where such specialists are trained (Zaporizhia National University, Volyn National University named after Lesya Ukrainka, and others). These competencies include the ability to apply knowledge of scientific facts, concepts, theories, principles, and methods of modern informatics in the practice of teaching informatics; proficiency in information modeling methods; the ability to implement information models using information and communication technologies; and the capability to use modern methods for developing and researching algorithms for problem-solving in object and process modeling, as well as implementing these algorithms using contemporary programming languages and others.

Along with these special professional competencies, the list of general competencies refers to the ability for interpersonal and partner interaction and teamwork in the field of professional activity, communication with representatives of groups of different levels (professional and social).

When it comes to a modern IT specialist, they significantly differ from those who worked 20-30 years ago. Contemporary research notes that IT specialists are more frequently required to adapt to various changes, working in project-based organizations, which demand advanced learning capabilities throughout their professional careers (Panasenko, 2014) [12]. The professional communication of IT professionals, depending on the type and specialization of the organization, can involve software product support and promotion, project or managerial activities, teamwork (Maletska, 2018) [11], and models of competence for working in global software development teams are being developed (Saldaña-Ramos et al, 2014) [6] and other aspects.
Emphasis is placed on the fact that IT professionals must possess a set of essential abilities based on a combination of various psychological characteristics, among which, in particular, “...the ability to convey their thoughts in a language understandable to average non-specialist colleagues (who are not IT professionals) when explaining the rules of working with computer/software hardware and operating systems. This ability is based on a combination of a high level of social intelligence and basic communication skills. Furthermore, they should have the ability to emotionally respond in a balanced manner to possible mistakes made by colleagues and immediate supervisors during their work with office computer programs and networks. They should be able to explain everything they need to know in order to avoid similar mistakes in the future in an accessible and polite manner. This ability is based on a combination of a high level of emotional self-control and relevant communication skills” (Hurska, 2017) [1, p.49].

In organizations within the field of information technology communication occurs at all levels of professional (with colleagues, subordinates, and managers) as well as non-professional interaction (with clients and service consumers) and can take various forms and formats. In the IT field, teamwork is widespread, and its effectiveness largely depends on the efficiency of interaction among its members.

Researchers note that contemporary programming is a collective process, where an individual programmer's usefulness is closely tied to the team's overall usefulness. Programming is a creative and complex activity, thus requiring coordinated efforts and a shared understanding of the common goal (Beecham et al., 2008) [19]. It is asserted that effective communication, a positive psychological climate, and an experienced manager in the team are among the decisive factors influencing the team's success (Bozhko, 2013) [8].

It should be noted that the ability to collaborate and work as a team plays a crucial role in achieving success for any company. Bit.ai, a next-generation collaboration platform that helps teams exchange knowledge by connecting various types of digital content, provides statistics on collaboration that demonstrate the power of teamwork. Specifically, it emphasizes that when employees work towards a common goal, they can complement each other's strengths and weaknesses, ultimately enabling them to solve any tasks (21 Collaboration Statistics..., 2022) [20].

Undoubtedly, collaboration contributes to stimulating creativity, increasing productivity, fostering a sense of community and belonging, improving problem-solving, and generating innovative ideas and innovations. According to a report published by McKinsey, intellectual workers spend an average of 14% of their working week on internal communication and collaboration. The research also showed that improving internal collaboration through social tools can increase interaction productivity by as much as 20-25%. It is also noted that the potential value of social technologies lies in enhancing collaboration and communication within and between companies (McKinsey Global Institute..., 2012) [21].
Therefore, a modern specialist in the field of IT in the socio-psychological context is a person who is ready to work effectively in a team, capable of establishing constructive communication and cooperation both with colleagues at different levels of cooperation, and with service consumers.

Such skills of team members in the IT field, according to researchers, are aimed at improving both their personal level of operational performance in the context of "performance management skills" and the effectiveness of implementing project ideas and tasks as a whole. They emphasize that to create favorable conditions for the successful execution and completion of a project, as well as for the successful generation of innovative ideas and their implementation in project teams, creative groups, or any other creative teams, it is crucial to understand the roles that various members of the creative team or project team can play at different stages of its implementation. It is also essential to understand how these roles can influence group dynamics and the overall efficiency of the team's work (Rovenska et al., 2023) [5].

Accordingly, when selecting IT professionals for teams, it is important to consider not only their "hard skills," such as technical competences (e.g., proficiency in JavaScript or Python), but also their level of "soft skills," which are personal and social competences that influence teamwork and self-organization. These soft skills can include communication skills, collaboration ability, psychological flexibility, stress resistance, resilience, emotional intelligence, conflict competence, and more.

Google specialists found out that more developed soft skills are directly related to the productivity of IT teams. Candidates with strong soft skills are more preferred for employment because the work process often involves interaction with colleagues, management, or clients, regardless of whether they are web designers, project managers, or DevOps engineers. The results of a study on the skills required for IT professionals in India also underscore the importance of these skills, including adaptability, flexibility, loyalty, creativity, proactiveness, creative thinking, persuasiveness, gratitude, and interpersonal communication skills (Misra R. K., Khurana K., 2018) [22].

Research conducted by Ukrainian scientists, based on an analysis of publications from IT companies, also presents a list of the most important soft skills for software developers, taking into account the specificity of communication skills in the respective field, which a software developer needs to develop in order to successfully address professional tasks in a team, increase productivity and job satisfaction. These skills include communication, teamwork, time management, error acknowledgment, empathy, emotional intelligence, patience, adaptability, creativity, leadership, problem-solving, and people skills (Trofymenko et al., 2023) [4].

According to Deloitte Access Economics, by 2030, two-thirds of all jobs will be professions that require a high level of soft skills from employees. Consequently, it is essential to identify the soft skills that need to be developed to remain competitive in the IT job market.
In the report on the future of jobs, titled "The Future of Jobs Report 2020," based on forecasts from executives of over 300 global companies and data from LinkedIn, FutureFit.AI, and the ADP Research Institute, ten key skills were identified that will be in demand in the coming years (The Future of Jobs Report, 2020) [23].

Therefore, the current focus of existing retraining and upgrading programs includes the following skills: technology use, monitoring and control; technological design and programming; analytical thinking and innovation; leadership and social impact; critical thinking and analysis; a comprehensive approach to problem-solving; active learning and learning strategies; resilience, stress resistance and flexibility; argumentation and problem-solving skills, idea generation; creativity, originality, and initiative (Ne lyshe kodynh..., 2022) [24].

Among them, only the first two skills are related to hard skills (with technology), while the other eight are soft skills related to problem-solving, self-management, and working with people.

When it comes to analytical thinking and innovation as the ability to process data, it helps to correctly understand, evaluate, systematize, and structure information, find correlations, and draw conclusions. Important soft skills for an IT product developer include the ability to tackle complex tasks and the capacity to handle unexpected situations – the ability to approach problem-solving comprehensively. As demonstrated by the experience gained during the pandemic and the full-scale invasion of Russia into Ukraine, this skill should be acquired and improved daily. Because today, there is often a change in requirements that requires evaluating the work done, analyzing what needs to be replaced or created from scratch. Therefore, the ability not to panic, focus efforts on setting new tasks, and so on, is crucial.

The ability to think critically enables individuals to handle unexpected problems, assess situations rationally, and effectively communicate arguments. Due to the rapid advancement of technology, certain skills become obsolete, new professions and tools emerge, which require lifelong learning, the ability to keep one's knowledge up to date, and the implementation of a strategic and proactive approach to learning. Additionally, during the project development process, significant changes may be introduced, and it is essential to react quickly and creatively to such changes. This requires the development of creativity and initiative, which are undoubtedly among the most crucial soft skills for future programmers.

It is worth noting that professionals in the IT industry often encounter various stressful factors. They frequently work under resource constraints, face client demands that may seem impossible, and sometimes deal with colleagues from other departments who may not fully understand their requirements. In such situations, it is essential to maintain composure, flexibility, avoid taking things personally, and not react aggressively. This requires the development of resilience and the ability to
resist stress. Resilience is understood as a dynamic process of individual and collective responses to adverse circumstances, economic crises, tragic events, war conflicts, and the ability to recover from their impact. We believe that groups and teams with inherent psychological resilience are capable of proactively responding to new, challenging, and stressful situations and challenges. In this context, efforts should be made to activate and enhance employees' ability to resist such situations, master them, and recover from their impact, as well as to identify and apply the necessary resources and supportive factors.

It is also important to develop leadership qualities to inspire team members, maintain friendly relationships, promote a positive organizational culture, provide feedback, and strengthen the sense of belonging, which is an indicator of team and organizational engagement. This sense of belonging arises through interaction and is a fundamental social need and motivator that encourages individuals to engage in social interactions. As researchers point out, the higher the sense of belonging, the higher the level of engagement among each member of the group or community (Gil de Zuñiga, Jung, & Valenzuela, 2012) [7].

Therefore, it is important to focus efforts on developing a sense of belonging among employees and team members. This will contribute to an awareness of one's significance and connection with supra-individual processes, strengthen the ability to contribute to a common result and the feeling of being an important part of the team.

In the context of our research problem, it is also worth referring to the analysis of soft skills by LinkedIn ex-CEO Jeff Weiner. He pointed out that modern IT organizations rely increasingly on collaboration between companies and place greater emphasis on interpersonal communication (The CEO…, 2018) [25].

In modern companies, IT professionals often have to communicate extensively with colleagues, managers, and clients. However, quite often, especially when they need to have a conversation with someone outside the IT environment, developers may find it challenging to build a dialogue and convey their thoughts.

As researchers point out, communication in this field requires open-mindedness and a willingness to listen. The best solution may be to synthesize proposals from several people, and for this, it is important to be able to listen, convey your ideas, and negotiate effectively (Trofymenko et al., 2023) [4].

There is also an emphasis on the ability to provide and receive feedback, which facilitates team learning and development, and further fosters quality communication within the team. It is noted that feedback can be given and received in various aspects of business communication: communicative (perception of message content), perceptual (perception of emotional states), and interactive (acceptance and correction of interaction); and for each of them, besides general principles, there are specific techniques and competencies (Sydorova et al., 2021) [13].

Therefore, in the context of the interaction process, perception of messages and the psychological atmosphere within the team will depend on developed
communication skills, including emotional competence, the ability to verbalize one's emotional state, and the regulation of emotional tension within the team, and other aspects.

Communication skills, says Jeff Weiner, are critical, especially in jobs like sales development and project management. However, relying on the results of recent research addressing the skills gap in the IT industry in the United States, he noted that communication skills were where the gaps were most pronounced, particularly in the development of interpersonal skills (The CEO..., 2018) [25]. As Cheryl Cran noted in her keynote address “the future of work demands us to change” at the Information and Communications Technology Council, “...seeing collaboration as a prerequisite for understanding, we must be flexible when it comes to behavior and capabilities, and understand that the future of work depends on collaboration and teamwork” (Snider, 2019) [26, p.8]. This, of course, requires acquiring and improving the skills of working with people.

The results of research on whether the application of interpersonal communication skills ensures the effectiveness of companies (using Ecuadorian companies as an example) demonstrate that the practice of interpersonal skills contributes to the efficiency and performance of companies. It allows managers to interact effectively with their employees in a way that motivates them to commit to achieving organizational goals (Villanueva et al., 2022) [14].

The issue of developing such skills was also highlighted in the Hart Research Associates report of 2013. According to the results presented in the report, employers believe that the greatest emphasis should be placed on the development of critical thinking and analytical reasoning (82% of employers); the ability to innovate and be creative (71%), and communication skills (both oral and written) (80%), and others (IT TAKES MORE THAN A MAJOR..., 2013) [27, p.8].

Such an analysis confirms that, indeed, for the successful operation of any IT company, it is important to create a high-quality and competitive technological product. At the same time, an equally important aspect of the company's activities is the building of effective interpersonal relationships within the organization, both horizontally and vertically (among employees, different departments, project managers, and company leadership), as well as a productive external communication system (with clients, partners, etc.).

It is also important to note that the professional activity of modern individuals in Ukraine, in the conditions of war, is characterized by increased psychological tension, instability, unpredictability, especially in the field of information technology. In these conditions, the functioning of organizations becomes more complicated, and the impact of various factors on professional interaction and the occurrence of conflicts within the organization increases. Thus, the results of the study of the main manifestations of stress in the personnel of organizations, problems in communicating with people, and performing professional activities in
the context of war in Ukraine have shown that one of the significant problems in relationships with people during the war is related to the ability to carry out professional activities (ensure its effective organization and productivity). This includes conflicts with subjects of professional interaction in organizations where the respondents work (Karamushka, 2022) [28].

Thus, regardless of the technical direction of the work, IT professionals are required to be able to build effective interpersonal interaction, as well as the ability to constructively resolve conflicts that may arise in professional activities.

In this context, the concept of conflict competence has drawn the attention of modern researchers as an integral part of general communicative competence and its development. This competence includes awareness of the range of possible strategies for conflict behavior and the ability to adequately implement these strategies in a specific life situation.

It is considered an important attribute of personal and professional growth for individuals, and possessing conflict competence enables the ability to resolve conflicts constructively (with minimal losses), interact with opponents, and achieve set goals (Vlasenko, 2021) [29]. The insufficient level of conflict competence of an organization's employees may manifest as a tendency to fear conflicts rather than view them as a common phenomenon; they may seek to avoid conflicts, have a limited understanding of the essence of conflicts and behavioral strategies within them, and lack the inclination to invest effort in a deeper analysis of their relationships with others, and so on. Therefore, to mitigate the negative consequences of conflicts and fully utilize their positive potential for organizational development, efforts should be directed towards developing employees' conflict competence and enhancing their ability to build effective interpersonal and partnership relationships.

Conclusions. Therefore, as indicated by the analysis conducted, regardless of the technical focus of their work, IT professionals must prioritize the development of effective interpersonal relationships both within the organization and in ensuring a productive external communication system, which requires the development of IT employees' skills in working with people and the ability to build effective interpersonal interaction.

We consider it important to enhance the sense of belonging among information technology professionals as an indicator of organizational activity. This entails the ability to resist challenges for the effective fulfillment of professional duties, which is linked to the awareness of one's own capabilities and resources. It involves establishing horizontal and vertical relationships within the organization and building an effective communication system with the external world. This also includes the ability to constructively resolve conflicts. Achieving this requires the development of personal social competencies that influence teamwork and self-organization – such as sociability, collaboration, emotional stability, psychological
resilience, emotional intelligence, conflict competence, and more. Additionally, it involves social-psychological support for effective conflict management within organizations operating in the field of information technology, which will be a perspective for our future research.

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