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IMPROVING THE QUALITY OF WORK OF CONSTRUCTION PROJECT TEAMS TAKING INTO ACCOUNT SOCIO-PSYCHOLOGICAL ASPECTS

Abstract: Today, the construction industry in many countries is experiencing a complex impact of global trends (large and multicultural workforce, digitalisation, economic and geopolitical instability, etc). The aim of the study is to determine the influence of socio-psychological specifics of interaction between construction project team members, their cultural and subcultural differences on work quality today and in the future. A thorough analysis of literary sources was carried out. We used diagnostic tools and models of team role composition (by M. Belbin), organisational culture (by C. Quinn and R. Cameron), intergroup adaptation (A. Bulgakov) through the study of its emotional component. The strengths of project teams in construction and the reserves for improving the quality of their work are established, their subcultural and role characteristics are presented. The obtained results have practical significance for managing multicultural teams of construction projects and improving the quality of their work in the future (forecasts by K. Schwab, Global Trends-2040).

Keywords: construction teams, productivity, future scenarios, multiculturalism in the construction industry, subcultures, role composition of the team.

1. Introduction

The global integration of economies and societies has been gathering pace over the last decades. It is an inevitable and complex process and is hotly debated (UN, 2023). Globalisation is accompanied by uncertainty, instability. This not only causes frustration and anxiety, but can also undermine the ability to act collectively (The 2021/2022 Human Development Report, 2022). For large production areas, where the quality of outcomes is determined by the quality of social contacts established in the workforce, ignoring this trend is unacceptable, both at organisational, sectoral and national levels.

The next wave of mass migration sweeping the planet changes the circumstances of life and work of the people on the move, the indigenous inhabitants of the territories where the migrants enter and leave. The receiving party undertakes obligations to accommodate, employ migrants, acculturate them, and establish ties with the host community. At the same time, the problem of relations between the ethnic majority and representatives of national minorities in multicultural regions has not lost its relevance. An example of such a problem is the problem of communication:

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representatives of one language group are employed by communities and continue to communicate in their native language, refusing to master the language of the host country to the proper extent, which creates the effect of a "linguistic ghetto" (Mubeena Zehar Banu & Ramakrishnan, 2023). It is important for people from different cultures to be able to speak the same language in order to establish and maintain quality professional communication. The Tower of Babel is a metaphor for this: an ambitious project that could not be realised without communication in the same language.

Multiculturalism as diversity includes not only national differences. Already at the turn of the 18th and 19th centuries, local cultures were treated as subcultures. In the era of development of mass communications, including through the Internet, many criteria for subcultural differences have been identified and researched: gender, age, profession, lifestyle, etc. Any difference from mass culture can become a sign of subculture. Subcultural heterogeneity not only motivates in professional interaction, interests, but also can cause opposition. Subcultures are interested in contrast against the background of traditional values of the main culture and other subcultures, in preserving their identity, which can lead to aggression, conflicts, extremism. In this case it is already a counterculture. The very presence of counterculture in an organisation is divisive, so its emergence should be prevented.

Manufacturing quality in an era of global change is being transformed by the widespread adoption of Fourth Industrial Revolution technologies (Schwab, 2017, Schwab & Davis, 2018). The twelve futuristic technologies described by Schwab, K. seemed fantastic in 2018, but have now become reality in many ways. The effects of such changes have not yet been fully realised, but already make us think about the risks associated with them: the unpredictability of informatisation and digitalisation, automation and robotisation,

and the use of artificial intelligence. Humans are disorientated about the uptake of new technologies and their relevance due to competition from automated systems (Schwab & Davis, 2018). The human contribution to production, striving for autonomy, optimised by smart systems, is losing its importance. Releasing people from the labour process is romanticised by the impending era of prosperity and the prospect of creativity, income security programmes, public service jobs, and new forms of tax incentives are being developed.

However, the practice of guaranteed income in its experimental part has shown that the quality of life has not improved. This is especially true for men. In the USA, Canada, and Finland, pilot projects with forms of income support have been discontinued in various years from the 1960s to the present. It turned out that laid-off workers, deprived of structured employment, are socially isolated, in a progressive depressed state (Bernick, 2017).

Depression, anxiety, fear and other emotions serve as markers of a person's overall psycho-emotional state, which is the foundation for constructive engagement in social contexts and health in general. The UN pays special attention to mental health. After all, unsettledness reduces mental wellbeing and psychological resilience, the ability of people to transform resources into achievements, to fulfil their potential (The 2021/2022 Human Development Report, 2022). Insecurity at the individual level is reflected in the quality of the labour force. Therefore, the negative context is transformed into conditions for development, change, learning. Uncertainty creates the need to cope with this difficult life situation and to fit into a new frame of reference. This task is solved at the individual level, but for large complex organisations the creation of conditions for successful adaptation of personnel to changing realities is a task of organisational management scale.

The fifth industrial revolution, as the next technological step in the development of humanity, is already positioned through the lens of a positive future, as the unity of humans and robotic systems, where the robot no longer acts as a competitor, but as a collaborator and colleague (Nahavandi, 2019).

The analysis of the Global trends-2040 report, according to organisational principles, is structured in three sections (Global trends-2040, 2021). The first section is a study of structural forces in four main areas: demography, environment, economy, and technology. These areas were selected because of their universality in scope, the availability of existing data and evidence, and because they are fundamental to shaping future dynamics. The second section: exploring the interaction and intersection of these structural forces at different levels (individual, social, state, international). Here the degree of uncertainty is higher due to the unpredictability of human reactions, which affects all levels. Section Three: identifying key uncertainties and using them to forecast development scenarios to 2040. This analysis has points of overlap with Schwab's projections. Five world development scenarios have been proposed. The scenarios "Revival of Democracy", "Drifting World", "Competitive Coexistence (US and China)" emphasise international challenges and US-China rivalry. The radical scenarios "Separate Silos" and "Tragedy and Mobilisation" (Global trends-2040, 2021) warn of possible serious global ruptures. In general, the forecasts are rather pessimistic; the worst scenario is associated with the risks of the end of humanity's existence.

The following conclusions of the report, which are important for this paper, are worth noting. First, urbanisation will continue. Historically, it has been a key driver of economic development. Urban sprawl stimulates the development of the construction industry and helps to provide jobs for both local residents and newcomers from other regions. This is given close

attention in this paper. Secondly, the demographic factor. Life expectancy in European countries will increase, the number of elderly citizens in these countries will increase (25 per cent of the total population by 2040 compared to 15 per cent in 2010), the economy will suffer due to a shortage of able-bodied people, while population growth in a number of African countries will be up to 2/3 of the world population growth by 2040, and by 2050 the population of sub-Saharan Africa will double compared to 2021 (Global trends-2040, 2021). Third, migration processes. This follows from the previous conclusion. Sub-Saharan Africa's problems will be due to increasing urbanisation due to population growth, subsequent inability to provide infrastructure and education and health needs. Migration processes from such countries to "ageing" countries (mainly EU countries) will increase, even with a preference for technological innovation and automation, which may somewhat limit the demand for highly skilled labour (Global trends-2040, 2021). Fourth, the nature of conflict at all levels will change. The rapidly evolving technologies of the Fourth Industrial Revolution will provide opportunities in the form of coercive tools not only to states but also to terrorist organisations around the world. In addition, the level of distrust of citizens of different countries towards governments is increasing due to the latter's inability to meet people's needs and/or expectations, which may trigger outbreaks of discontent and conflicts (Global trends-2040, 2021).

The current trends described above, which will intensify in the future, can be traced all over the world, especially in the numerous industries. In the real sectors of the economy, construction is an example of such a sector. Construction has been going on in almost every corner of the planet for centuries. Even global economic crises, catastrophic circumstances of different nature are not paralysing for the construction industry. Affected territories need to be

restored and rebuilt. In this regard, the construction sector often acts as a driver of the economy of entire countries. After the pause caused by Covid, construction industries are actively recovering, especially in the Asian region (Vietnam, Indonesia, Malaysia, Philippines). Short-term problems will be offset by growth over the next 15 years (2022 to 2037), according to April Skinner (2023).

Now, with all the economic and geopolitical challenges, the global construction market is growing: 14503.87 million USD in 2022, 15461, 84 million USD in 2023. It is expected to grow to $19519.26 million by 2027 at a compound annual growth rate of 0.6%. The construction markets of Brazil, China, India, Indonesia, India, Saudi Arabia are actively growing. Such data is provided in the Global Construction Market Report 2023 (2023), which includes 48 countries from seven regions (Asia-Pacific, Africa, Middle East, Eastern and Western Europe, North and South America).

Such a large-scale geographical coverage combined with mass migration trends serves as a justification for the relevance of the topic under development and the universality of further application of its results for the development of programmes to improve the quality of work of multicultural teams in construction projects.

A construction project team is understood in the context of this paper as a group of (usually temporary) professionals of different specialities, united by goals and objectives related to the construction product. In addition to project teams, construction teams (construction teams working on a construction site) are widely used in the construction industry.

Due to its large number and labour-intensive nature, the construction sector is rarely monocultural in composition. Construction is popular among migrants, including illegal migrants. They accept jobs that locals are unwilling or unable to do. Illegal employment violates migrants' rights and makes them vulnerable. Policies vary greatly from country to country regarding the recruitment of labour in construction. For example, in Australia, the labour force is mostly local, highly skilled, well paid. But the construction segment in Malaysia mostly employs migrants from neighbouring countries who work illegally with low wages. This has a negative impact on the quality of construction production in terms of the choice of construction technologies and the efficiency of economic solutions (Chan, 2011). At the same time, it is important to emphasise that construction teams consisting only of locals have the characteristics of multiculturalism too.

The current situation complicates the task of studying the quality of construction workers' work in many ways, turning the research field into an unregulated informal sector and preventing the mass collection of reliable data. This concerns both the technical side of the process and issues related to the human factor and the specifics of human communities, their socio-psychological component.

The social psychological side illuminates the mechanisms of concrete interaction between society and the individual in response to the expanding demands of practice and production. Social psychology emerged and developed in parallel with industrial revolutions, when the next changes dictated specific tasks to this scientific branch. In any type of society and at all times social communication, leadership, cohesion are relevant. At the same time, new conditions are reflected in the content of various forms of interaction and attitudes that arise in relation to certain social phenomena. The new social reality generates the need for new emphases of social psychological research: psychological adaptation of individuals and groups, self-identification and identity in the digital environment, optimisation of team interaction, including those working remotely, and many others. It is impossible to imagine the professional construction environment without social interaction, but

its study is associated with a number of difficulties.

Any production is aimed at the final product. Financial and time costs must be justified. At the same time, research takes time. It is not possible to conduct research directly during the work process, it distracts the labour force from professional tasks and disrupts established activities. Outside of working hours, working with questionnaires and methods violates the right of staff to rest. Information and communication tools have not yet solved this problem either. The alternative, which allows to conduct qualitative research, has become an educational platform, where employees and managers of construction companies and organisations are trained.

Nurhidayah Azmy (2012) conducted a dissertation study of construction teams in the USA. He was addressing the lack of diagnostic techniques that are appropriate (and possible) to use in the construction industry. Global experience provides the opportunity to apply a variety of techniques in other professional groups, but in construction it is not easy to do so yet (Azmy, 2012).

The study of multicultural teams has been conducted not for the first year, since 2018 a new stage was started related to the introduction of BIM-technologies in construction, when the emotional component of intergroup adaptation in multicultural construction organisations began to be studied (Magera, 2018a, 2018b, 2019).

Many years of managerial experience (Verstina & Slepkova, 2019), fifteen years of experience in the development and implementation of the MBA Programme in construction allows us to draw on it in this paper (Verstina & Evseev, 2019).

According to Mubeena Zehar Banu and Ramakrishnan (2023) prior studies on construction teams are divided into group-categories such as: "socio-cultural impact", "health and safety issues", "impact on industry and project performance" and "training, skill development and career plans". Adopting this logic for construction project teams too, in the context of this paper its following main elements are highlighted:

- The conditions of the modern world in which construction project teams work and which determine people's emotions.
- The quality of work of construction project teams in modern conditions, where quality is defined through productivity indicators in relation to the resources spent.
- Socio-psychological characteristics of multicultural teams of construction projects, taking into account the human factor in construction production, including psychological well-being and health.
- Prospects for improving the quality of construction project teams in the future.

In view of the above, the purpose of this paper is to determine the impact on the quality of work of construction project teams of the socio-psychological specifics of interactions of their members, cultural and subcultural differences.

It is assumed that taking into account the universal socio-psychological specifics of interaction between members of construction project teams can improve the quality of their work. The results will help to create reserves invariant in relation to the types of construction organisations, their country and cultural affiliation.

The novelty of this work is confirmed by a thorough analysis of scientific publications and is associated with an expanded approach to understanding multicultural teams in modern conditions with a perspective for the future, in which are represented not only representatives of different ethnic groups, but also representatives of various subcultures, the originality of which manifestations invade the process of professional interaction and can affect the

quality of construction production. The approach is supplemented by the peculiarities of the introduction of BIM-technologies in construction and the inclusion of an emotional component. Previously, such an integrative approach was not used, traditionally multiculturalism and multicultural teams were interpreted as diverse only on ethnic grounds, and the relevance of the topic of emotions in the construction industry is increasing.

For managers and HR professionals in multicultural construction organisations in different countries, the results of the study are of practical importance in the light of the described trends and the identified socio-psychological aspects. The introduction of BIM technology is accompanied by the need for organisational change. The first months are associated with learning the new technology and losses. Profitability is restored within 1-1.5 years. It is important that professional communication in a single digital space is carried out with the least losses and distortions, and the work was coherent. The development of recommendations based on the results of this work will make it possible to select a promising team at the stage of team formation, maintain its effectiveness in the process of work, optimise the interaction between teams, and reduce transitional losses.

The socio-psychological research space is subject to the factor of situationality and unpredictability, and is defined by different level groups of selected factors: from global to individual (Table 1).

Table 1. Groups of factors taken into account in the study

Groups of factors	Factors
Global	Integration Migration Demography Technologies of the Fourth Industrial Revolution Uncertainty and instability
Organisational	Consolidation International alliances Informatisation and digitalisation Multiculturalism
Teams	Multiculturalism Role composition Team interaction
Individuals	Emotional component of intergroup adaptation

2. Organisational, group and individual aspects of the quality of work of multicultural construction project teams

The effectiveness of construction project teams, peculiarities of intra- and intergroup interaction are studied in different countries. Conflicts and team management styles are not considered here separately, but they are an integral socio-psychological component of multicultural teams in construction.

Works from countries that contrast in terms of culture are of interest. For example, Malaysia, Sweden. Within Malaysia, conflicts in multicultural construction teams have been investigated (Tabassi et al., 2019). The authors of the study have been investigating the impact of conflict on the performance of multicultural construction teams for several years, and also correlate conflict management style with team performance. Multicultural construction teams in Malaysia are represented by cultures from Malaysia, China, and India.

The authors indicate that team performance is enhanced when the style of conflict behaviour is avoidant or collaborative (Tabassi et al., 2019). Swedish researchers touched on the topic of rigid management in the process of construction project implementation by teams, they doubted the validity of applying this type of management in Sweden. However, it was confirmed that deadlines and quality requirements justify a rigid management style with the necessary motivation (Larsson et al., 2018).

Multicultural teams of construction projects in this paper are represented by subcultures of professions, generations and organisational cultures. The complex composition obliges to have a serious bank of management tools to improve the quality of work and conflict management. In addition, the quality of work is related to the role composition of teams, intra- and inter-group adaptation of teams in the organisation. The emotional component represents individual capabilities initially at the individual level. Emotions signal their own current state of a team member, inform other team members about their state, and serve as a marker of the success of the adaptation process. The adaptation mechanisms are not discussed separately in this paper, but it is worth mentioning that human adaptation is bidirectional: a person adapts to the environment and simultaneously adapts the environment to him/herself. Therefore, individual emotions, their manifestations and consequences are not localised within the psyche of one team member, employee of the organisation. They create a general background of interaction and work, supporting or weakening its qualitative productivity.

2.1. Subcultures of occupations in multicultural construction project teams

The quality of work is expressed in professionalism. Professional tasks are not solved in the same way by representatives of different subcultures, interpersonal communication tasks are understood differently. Lack of attention to different subcultures hinders effective work and achievement of organisational goals. For example, the subculture of one structural unit may dominate over the subculture of another or over the culture of the organisation as a whole. In this way, a unified professional organism loses a common system of values and perception of common management goals.

The number of multicultural organisations is growing not only due to migration flows. Against the backdrop of informatisation and digitalisation, the diversity of workforce and construction project teams is also increasing.

In construction, this is related to the introduction of BIM technologies. The industry's transition to digitalisation creates a common space for simultaneous interaction between teams and representatives of various professional groups. Access to a visual model facilitates work, reduces the time spent working on a project and tracking its implementation. Autodesk software developers note a huge difference in working with BIM technologies compared to previous 2D technologies (2023).

The socio-psychological side of the issue, in terms of subcultural differences, shows that representatives of different professional groups in construction (engineers, IT specialists, architects, designers, economists, transport workers, labourers...) - representatives of separate subcultures. Before the introduction of BIM-technologies or information modelling technologies, they worked in a linear way, almost without contact with each other. In the course of preparation and realisation of the project, everyone was involved at his own stage and left when his part of the work was completed. BIM functions at all stages of preparation, existence and utilisation of a construction project. All professional groups are involved at once, changes, especially errors in the model or collisions, are visible at once. Professional support is ensured by

quality communication. Representatives of different professions are different people who use their own professional language. It is difficult for them to agree on common professional tasks, and this must be learnt through the development of a common language, training of communication skills, and the development of social and emotional competence.

The quality of specialists is formulated by employers. The content we analysed on employment portals in different countries (Getwork, HeadHunter, Indeed, LinkedIn, SuperJob) allowed us to draw up a portrait of representatives of different subcultures in construction. For example, three generalised characteristics are given: a civil engineer/engineer-designer, an IT specialist, and an architect/designer. Each typical representative of the professional subculture is described on the basis of a set of complex requirements of employers to professionals and through a psychological portrait compiled on the basis of such requirements, accumulated observations, available research results (Magera, 2018a). For engineers and designers in construction, professional activity imposes numerous and rather rigid requirements, which affects the personal characteristics of professionals (Table 2).

Architect/designer is a creative profession, which mainly distinguishes them from other professional subcultures. They are closer to art, aesthetics, artistic images (Table 3).

Table 2. The subculture of the civil engineer

A variant of the complex requirements of employers	Psychological portrait of a professional
Analysis of potential construction sites for the implementation of works (visit to inspect surface and underground sites), calculation of profitability of the site, placement, organisation and control... Stress resistance, communication skills, discipline…	purposefulness, practicality, psychic stability. The need for contacts is related to forming and maintaining long-term relationships with a small group of people, your team. They are not demonstrative, prefer a low-key style of expression

Table 3. Architect/designer subculture

A variant of the complex requirements of employers	Psychological portrait of a professional
development and adjustment of design project, work on the concept, project, working documentation, visits to the object, including country houses, measurements of the object, knowledge of profile programmes (AutoCad, PhotoShop, etc.), ability to create stylish collages, moodboards in Photoshop, Indesign, stress resistance, ability to work in a team...	emotional sensitivity, freethinking, sentimentality, tolerance for uncertainty, alternative, passion work, motivated by the new product. They find ways to demonstrate their creative potential in external attributes, manners, style: colourful accessories, a slight carelessness in the design of the appearance, often sociability with expressive inclusions

Information technology specialists are in demand in all areas of the economy and production due to the introduction of technologies of the Fourth Industrial Revolution. Construction is no exception, as automation, digitalisation and robotisation have fully embraced this sector or are striving to do so. IT professionals are the most introverted individuals of the three represented. This helps when immersed in individual work when developing a code, a computer programme. There are many legends and stereotypes about the representatives of this profession, which affects the image of the profession. But in case of career growth in the management vector (for example, the position of IT project manager in the field of network infrastructure construction) the qualities of leadership, coordination with contractors,

suppliers and internal team(s), providing administration and construction management, cooperation with the project team of facilities, as well as providing a single point of contact with the client's IT-team and the global team for the protection

of facilities are actualised. This dramatically changes the psychological profile of the IT professional, as it adds purely managerial competencies. IT specialists, however, communicate with the outside world, more often remotely (Table 4).

Table 4. The subculture of the IT professional in the construction industry

A variant of the complex requirements of employers	Psychological portrait of a professional
maintenance (administration) of server systems, knowledge of the principles of local networks, remote access and network equipment, knowledge of programming languages, software development, IT support, neatness, working remotely and in a team...	are withdrawn, ready for long periods of independent work on the computer, meticulous and demanding maximum attention, not compatible with office conversations. They are not inclined to socialise, each working individually on their own tasks, prefer a circle of like-minded people, more often than not on the internet. on the Internet, they are recognised by their rich computer jargon, live communications are not developed. A typical IT specialist looks casual, doesn't pay attention self-decoration and presentation

For professionals, ordinary employees of multicultural construction organisations, socio-psychological skills are of course necessary. But for managers they are vital.

The monitoring of employers' requirements to representatives of various professional subcultures in construction continues. It is of scientific interest for us to analyse the change of such requirements against the background of the changing world. We plan to analyse the dynamics of such changes in the future, taking into account the progression on the time scale. It is important for us that excellent communication and teamwork skills are required in almost all construction-related professions.

2.2. Intergenerational subcultures in multicultural construction project teams

Scientific interest in the topic of generations in the literature of European authors emerged in the second half of the 19th century, which was caused by the comprehension of such a philosophical

category as time. There has always been a worldly interest in the relations between representatives of different age groups.

The multitude of interpretations that were used in the process of studying the term "generation" persists today. The division into the generation of parents and the generation of children is an approach corresponding to the biological, genetic, demographic understanding. Here the division has a stable character, does not depend on the state of society.

Other classifications of generations are built on the principle of cycles. The most widespread is the classification based on the theory of generations. This theory emerged on the basis of the works of three authors, which were published almost simultaneously. They are writer Douglas Copeland, historian William Strauss and economist Neil Howe (Coupland, 1991, Howe & Strauss, 1991, 1997). A generation is defined by them as "the totality of all people born in a time interval" of about 20 years, or one phase of life: childhood, youth,

middle age and old age. One cycle or "long human life" or "natural age" lasts 80-90 years and consists of four periods of 20-22 years each: awakening, rise, decline, crisis (Coupland, 1991, Howe & Strauss, 1991, 1997).

The authors refer readers to the ancient Greek historian Polybius, having previously referred to the law of biological existence - cyclic repetition, including sociodynamic processes, where each culture goes through a certain life cycle, moving in a circle of development to the initial state of chaos (Howe & Strauss, 1991, 1997). In addition to Polybius, who spoke of six main successive political regimes (monarchy, tyranny, aristocracy, oligarchy, democracy, ochlocracy) (McGing, 2010), cyclicity was laid down in the works of J. Vico (cycle in history) (Pons, 2015), O. Spengler (completeness of cycles of cultural development from "childhood" ("spring") to "old age" ("winter") (Spengler, 2020). I. Adizes' model, in which the stages of an organisation's existence are represented by analogy with the developing human organism, takes its place in the list of models of organisation development (Adizes, 2023).

The dominant generation (periods of awakening and crisis) with its inherent independent behaviour and inherent leading role in the formation of the epoch interacts with the recessive generation (periods of decline and rise), which is distinguished by its dependent role in the formation of the epoch (Howe & Strauss, 1991, 1997).

The boundaries of generations are extremely blurred. Copyrights for names, classifications, characteristics of generations are established approximately. Analysis of publications and sources on this topic allows only tentatively adhere to the chronological limits with the obligatory prefix "conditionally". Of the generations identified from the first decades of the last century to the present day and described in the sources, six generations are presented in this paper. In order to maintain the consistency of the material, it is necessary to compactly designate the generations, their periods of birth and subcultural characteristics expediently selected for this paper (Table 5).

Table 5. Intergenerational subcultures

Title	Years of birth	Characteristics
The silent (quiet) generation	1920-1940	Patience, law-abidingness, diligence, hard work
Baby boomers	1940-1960	Proactivity, teamwork, purposefulness
Generation X	1960-1980	Self-reliance, pragmatism, adaptability
Generation Y (online, NEXT, millennials)	1980-2000	Fickleness, independence, emotionality
Generation Z (centenarians)	2000-2015	Hyperactivity, spontaneity, anxiety
Generation Alpha	2015-2020	Multifunctionality, manufacturability, superficiality

2.3. Organisational culture in multicultural construction project teams

Organisational or corporate culture is made up of values and behaviours that are accepted by the majority of the organisation's members. Turning to the classifications and developments of predecessors, it is worth considering that the measurements of organisational culture have errors, the results of the functioning of organisations are largely determined by its

changeable originality, and the types of organisational cultures exist in a mixed form, but one or two are dominant (Pochebut & Chiker, 2020, p.237). The touches to the psychological portrait of employees of construction organisations, made according to the criterion of dominant organisational culture, provide initial grounds for the study of the composition of construction teams in correlation with the peculiarities of their purposeful labour interaction. We focused on such bases of typologies of organisational cultures that are related to or concern performance as an indicator of the quality of teamwork, social interaction and emotionality.

Among the many classifications of organisational cultures recognised in the scientific literature, the first one was proposed by T. Parsons in 1937 (Parsons, 1937). The most interesting in the context of this study and the authors' research interests are two of the five social reference variables describing value orientations in different cultures. They represent the features of human relationships and the behaviour that determines them. They affect the irrational, emotional side of human psychological nature (dichotomy affectivity - affective neutrality) and the criteria for evaluating the activity of an individual (dichotomy quality - result). All five variables serve as a benchmark to overcome uncertainty, which is highly relevant in the current environment and presumably in the future. Affectivity implies a focus on satisfying one's own needs, affective neutrality reveals a desire to earn the approval of others; outcome promotes an attitude towards the object as a set of successful activities, as opposed to quality in the sense of conformity and agreeableness (Parsons, 1937). Parsons proposed a classification based on social reference variables and including four types of organisational cultures.

Four types of organisational cultures were also proposed by C. Handy. Developing Roger Harrison's ideas about organisations, he oriented his typology towards power,

role, task and personality (Handy C., 2001). F. Trompenaars, based on T. Parsons' criteria, classified the cultures of organisations on the basis of national cultural features of behaviour according to seven criteria, among which there are emotional (criterion "emotionality - emotional neutrality") and performance-based (criterion "achievement - ascription (affiliation)) components (Pochebut & Chiker, 2020, p. 231): "Family" cultures (paternalistic model as, for example, in Greece, Spain, Singapore, Japan), "Eiffel Tower" (classical mechanism of bureaucratic system with its inherent attitude to people as "human resources"), "Controlled Rocket" (favourable professional conditions for temporary quality work (as in project teams), for example, in the countries of North-West Europe, USA, Canada), "Incubator" (opportunity for self-expression, self-improvement, creativity) (Pochebut & Chiker, 2020, p.233).

One of the most popular is the classification of C. Cameron and R. Quinn, whose authors offered not only types and their characteristics, but also specific recommendations for changing organisational culture. According to Cameron and Quinn, the market culture, which came in the late 1960s to replace the hierarchical culture established by W. Weber, under the slogan "all or nothing" is set up for tough competition, leadership in the market, striving for superiority (Cameron & Quinn, 2011, pp. 71-73).

Due to the multicultural composition of the construction industry, the typology of G. Hofstede is of interest, which is the result of intercultural research (the most empirically confirmed model among the presented ones), which identifies such causes of behavioural differences in organisations as national culture and socio-demographic characteristics (Pochebut & Chiker, 2020, pp. 236-237). Thus, representatives of individualistic cultures (mainly European, Western culture) are characterised by emotional independence, in contrast to

representatives of collectivistic cultures (more often these are Eastern and Asian countries), where the degree of cooperation, integration, awareness of "we" is high, as well as the degree of emotional dependence on other people, the group. Hofstede also described mixed cultures (for example, countries of Latin America, Southern Europe). In addition to emotional dependence - independence, Hofstede described such syndromes characterising specialists, managers and organisations as power distance, avoidance - acceptance of uncertainty (an important component in an unstable and unpredictable world), masculinity - femininity (the ratio of characteristics associated with male and female roles), strategic thinking (long-term (initially - "Confucian dynamism") - short-term orientation to the future) (Pochebut & Chiker, 2020, p.240).

2.4. Role composition of multicultural construction project teams

M. Belbin's model of team roles consists of eight (sometimes nine) roles. A team role is understood as the most effective role for team interaction and realisation of team goals. A team role is different from a functional role, the content of which is determined by job functions. Each team role has strengths and weaknesses and implies opportunities and limitations for teamwork in different circumstances. Belbin M. states high team effectiveness when all roles are present in its composition. Roles are categorised according to the type of focus: on thoughts, on actions and on people. The roles are described by the type of orientation to thoughts, the roles of evaluator and thinker. By the type of orientation to actions, the roles of the doer, the doer and the shaper. By type of orientation towards people - collectivist, chairman and scout (Belbin, 2020).

The team role of chairman or coordinator corresponds to a manager capable of being realised as a confidently supportive member of a cohesive team. The shaper is individualistic, emotional, enterprising, energetic, impulsive and impatient, vindictive, sometimes irritable and easily despondent. The thinker is the intellectual and creative basis in the team. He is an introvert who generates ideas, puts forward options for solving a problem situation, but rarely successfully communicates, the more so he is weak in managerial activity. The evaluator is judicious, impartial, independent, measured. Acts as a source of counterargumentation, for example, for proposals coming from a thinker. Executors are characterised by discipline, practically guaranteeing their efficiency, reliability, and ability to work. They are stable, methodical, controllable, sincere, honest, and have a strong character.

Scouts are stable, dominant, extroverts. They gather ideas, information, innovations outside the team, transform them to fit the tasks at hand and broadcast them in the internal environment of the team. A collectivist maintains a comfortable psychological climate in the team. It is a peacemaker on a team scale, characterised by gentleness, delicacy, sensitivity to other people's experiences, ability to neutralise sharp contradictions and pre-conflict situations.

The Closer ensures the achievement of quality team results and takes responsibility for it, but at the same time reacts weakly to changes in the environment, does not catch the signals of such changes, is unable to abandon goals that are no longer relevant.

A brief summary of the characteristics, highlighting the strengths to improve the quality of the team and the acceptable weaknesses of each role, is necessary to compact the material (Table 6).

Table 6. Team roles based on Belbin, M.

Team role	a. Characterisation
	b. Strengths (improve the quality of the team's work)
	c. Allowable weaknesses
	d. Emotional side
Thinker (idea generator)	a. Intelligent, imaginative, unconventional b. Proposes original ideas, solves complex issues unconventionally c. Poorly communicates with and manages ordinary team members d. Emotional detachment
Evaluator (observer, critic)	a. Soberly assesses the situation, intelligent b. Ensures the quality of project strategy selection and decision making c. Lacks the ability to inspire the rest of the team d. Lack of or poor expression of positive emotions
Shaper (organiser, navigator)	a. Very strong personality, sociable, dynamic b. Able to work in a high-stress mode, overcoming obstacles to achieve a goal c. Easily provoked, has a fiery temperament d. Aggression at the end of work
Contractor, executor (worker, worker bee, company worker)	a. Conservative, disciplined, reliable b. Ensures that projects are implemented c. Inflexible, slow to respond to new opportunities d. Non-adaptability
Closer (dotting the i's, completer, finisher)	a. Conscious, restless b. Ensures timing, quality, results c. Tends to worry in vain, does not like to delegate authority d. Emotional instability
Chairperson (coordinator)	a. Mature, self-confident, trusting b. Clarifies and prioritises goals, motivates colleagues, promotes others c. Not very intelligent, personality not highly creative d. Manipulation
Collectivist (peacemaker, team worker, soul of the team)	a. Socially orientated, gentle, accommodating, receptive b. Ensures the quality of the psychological climate of the team c. Becomes lost in acute situations d. Excessive loyalty, avoiding conflict resolution
Prospector (resource explorer, supply officer, scout, resource investigator)	a. Extroverted, enthusiastic. Curious, sociable b. Provides quality contact with the outside world c. Loses interest as initial enthusiasm wanes d. Dependent on the presence of intrinsic motivation

2.5. Optimisation of intergroup interaction of multicultural construction project teams

Intergroup interaction is understood as the impact of groups of organisations on each other, resulting in adaptation or maladaptation. Intergroup interaction enhances the effectiveness of the structures of both individual groups and the whole organisation where these groups are included.

Professor Bulgakov A.V. proposed the concept of intergroup adaptation (IGA), the meaning of which is to optimise the interaction of different groups (Bulgakov et al., 2017).

The socio-psychological regularities of IGA include: the presence of a dominant culture; a decrease in the degree of tension in IGA situations in groups with similar subcultures; narrowing of the range of organisational subcultures in groups with low status in the organisation and expansion of the range of organisational subcultures in high-status groups; non-linear influence of the status gap between groups and its size on IGA (Bulgakov et al., 2017). At the same time, the diversity in the subcultures of the organisation's groups is represented by the cultures of "Order", "Result", "Relationship", "Creativity", and the directions of interaction (horizontal for equal-status groups and vertical for groups with different status) are contradictory, characterised by flickering sociodynamics, and change over time.

Intergroup adaptation presupposes the presence of socio-role functions in groups, the realisation of which in different types of interaction is influenced by the specifics of this joint activity and is transformed into a dominant factor. The system of relations or contradictions between professional groups with different levels of professional competence is determined by a combination of objective factors of the current situation, factors of individual or personal order and intergroup factors (Bulgakov et al., 2017). The organisation's IGA and the dynamics of its processes are affected by external factors (Bulgakov et al., 2017). External to the organisation or environmental factors of the IGA concept are systematically combined with organisational, group, situational factors.

The components of IGA are revealed in specific models of IGA of real organisations in the spheres of professional activity. The main psychological content of intergroup interaction is intergroup relations between communities-categories, collectives, teams, between members of communities regardless of their affiliation, between these communities and groups external to the organisation (Bulgakov et al., 2017). For the construction industry, examples of intergroup interaction are the categories of managers and employees, categories of belonging to multi-generational social groups and other subculturally and culturally determined categories. Examples of teams are subdivisions of organisations characterised by a hierarchical structure.

The IGA concept emphasises the notion of an intergroup adaptation situation, which is interpreted as a state of the human-environment system. Such a state is recorded by a person in real time, taking into account subjective personal evaluation. This assessment makes objective environmental components dependent on the focus of attention, perception, experience and personal significance for the participants of the IYA situation. The IYA situation changes in case of occurrence (or expectation) of real or perceived status fluctuations, role behaviour, inconsistencies in the content and/or performance sides of joint activities, threats to the membership of a particular group. The IGA situation is observable in its results, has increased dynamics in comparison with the passing of stages of a traditional adaptation situation, and is expressed stereotypically and rigidly. It is always a difficult situation of social interaction, capable of escalating into a conflict.

Multicultural organisations need to monitor and manage IYA situations, for this purpose IYA technologies have been developed for personnel in organisations. These are technologies of team building, attention to identity in terms of actualisation of its group level, psychoemotional and volitional self-regulation of IGA situation participants (managers and employees of organisations). The socio-psychological vector of IYA technologies is aimed at improving intergroup relations, supervising the development of groups and organisations, applying preventive measures and providing psychological assistance in case of disadaptation. The improvement of intergroup relations includes the formation

and maintenance of intergroup tolerance, conflict and stress resistance, social and psychological climate comfortable for professional interaction (Bulgakov et al., 2017, Magera, 2018a).

2.6. Emotional component

The topic of emotions in science occupies an ambiguous position. On the one hand, they have been written about them for centuries, which indicates the interest in this topic. On the other hand, due to their irrationality, ambivalence, and difficult accessibility in terms of research, emotions remain understudied. The analysis of the world sources of the pre-scientific and scientific period confirms it: dozens of contradictory theories of emotions, approaches, hypotheses. Starting from the Antique period, in the works of Aristotle, Cicero, Plato, etc., attention is paid to emotions. The interest persists in the New Age and during the Age of Enlightenment (Bacon F. Descartes B. Spinoza, Leibniz G.W., Hobbes T., Locke J., J.-J. Rousseau, Herbart I.F., Darwin C., Spencer G., etc.) (Magera, 2018b). In the twentieth century, the most interesting theories of emotions appear, typologies are developed: Lange N.N. and James W., Kennon W., Bard P., Hebb D., Festinger L., Schechter S., Lazarus R., Arnold M., Anokhin P.K., Izard K., Simonov P.V. and many others (Magera, 2018b). At the turn of the twentieth and twenty-first centuries, the topic of emotions becomes even more popular, which is confirmed by the presence of works by such authors as D. Goleman, D. V. Lucin and D. V. Ushakov, Boyatzis R. and McKee E., R. J. Sternberg and others. Especially the topic of emotions has undergone diversification due to the introduction of the concepts of social and emotional intelligence into everyday life and science. (Magera, 2018a).

Some authors welcomed the development of models of social and emotional intelligence (Thorndike, Allport, Payne, Gardner, etc.), while others considered them unpromising (Thurstone, Spearman, Anastasi, Wexler, Cronbach, etc.). But even the opponents of these models could not but recognise that in addition to rational, "intellectual" abilities (counting abilities, thinking, attention, etc.), "non-intellectual" (communication skills, personality factors) are in demand in the human community, especially among managers, which became a kind of "precursors" of social intelligence (Magera, 2018b). In the 20s of the last century Thorndike, E. proposes the term "social intelligence" (the ability to understand different people, to interact wisely), in 1933 Vernon, F. studies the relationship between intelligence and racial differences, heredity and environment, social skills. Guilford, J. and Sullivan, M. develop a battery of standardised tests. The tests (subtests) are aimed at diagnosing such components of social intelligence as understanding and predicting behaviour, recognising intentions, feelings and emotions of people around them by verbal and non-verbal expression. In 1961, Allport G., developing the theory of personality traits, spoke about "social gift", and defined social intelligence as the ability to adapt in the changing world of people (Magera, 2018b). Payne W. in 1985 in his doctoral thesis literally beats the drum, calling to address the topic of emotions and emotional intelligence, calling to take his research as a prototype of a guide to develop emotional intelligence. He suggests three ways: by raising important issues related to emotions; by adopting, using language and structure to explore and discuss the issues that arise; and by developing concepts, methods, and tools for developing emotional intelligence. Payne W. talks about emotional ignorance, emotional toxicity, emotional poison, and social problems caused by suppression of emotions and one's own feelings (Payne, 1985).

Gardner (2011), having studied the existing models of intelligences, abilities, their typologies and classifications, notes in 1981 that these models do not take into account the variety of roles and skills needed in

human culture. In his structure of multiple intelligences, Gardner included eight types of intelligence that have different levels of development in different people. He identified personal (intrapersonal and interpersonal) intelligences as a separate type and studied them in the context of their dependence on different cultures, noting the "striking diversity" while being careful not to pit genetic factors against cultural factors. For example, originality and novelty are valued favourably in Western society, whereas in many other cultures these qualities are undesirable because of a commitment to the permanence of tradition. Gardner gives examples of the functioning of the intellects in conjunction with the emotional sphere in order to adapt to an unfamiliar and frightening situation, describing subsequent courses of action as ways to regain lost equilibrium. He makes reference to the discussions of W. James and Z. Freud in 1909, when two aspects of human nature were articulated: access to awareness of one's feelings (intrapersonal intelligence) and outward orientation to others (interpersonal intelligence) (Gardner, 2011). The first aspect involves the full range of a person's feelings and emotions, quickly understanding them, distinguishing them, and using them as a means of self-understanding and self-control. The second aspect includes the ability to understand the differences between others and their characteristics. Thus, intrapersonal and interpersonal intelligence are distinguished. Intrapersonal is considered as the ability to understand one's own inner experiences, and interpersonal as the ability to notice and distinguish the characteristic features of other people. The models of emotional intelligence used by modern researchers mainly adhere to this structure.

In this paper, emotional intelligence is understood as a hierarchical model of the intrapersonal and interpersonal components presented above. The hierarchical logic is set by the direction "from intrapersonal to interpersonal". This determines the sequence of diagnostics and development of emotional intelligence. The top of the model in its interpersonal part is the constructive management of interaction on the basis of emotional literacy.

In the scientific community, interest in the study of emotional intelligence in construction has emerged relatively recently. Publications have been appearing since 2000. The analysis of publication activity for this period shows uneven growing dynamics (Kukah et al., 2021).

In the human community, especially in multicultural organisations, emotions perform a number of significant functions, among which the signalling function can be of crucial importance. Therefore, the concept of intergroup adaptation pays close attention to the emotional component and its system-forming role (Bulgakov et al., 2017, Magera, 2018b).

3. Materials and methods

The subject of the research is defined as socio-psychological aspects of teamwork quality in multicultural construction organisations.

Due to the need to manoeuvre among the above-mentioned obstacles: illegal employment of migrants (this completely closes access to socio-psychological applied research), continuity of the production process (then we would have to stop construction for the sake of the research, which is a huge economic loss), a barrier to conducting the research arose.

To solve the problem, it was decided to use educational sites as research sites. On the basis of the National Research Moscow State University of Civil Engineering there are training programmes of both technical orientation and programmes aimed at the formation and development of universal (supraprofessional) competences (teamwork, communication skills, leadership, etc.). For example, "Team Building Technologies",

"Leadership and Team Management", "Fundamentals of Social Interaction".

The contingent of students makes it possible to compile a sample that meets the requirements of multiculturalism and professionalism. These are students, master's students, as well as those studying under postgraduate training programmes (MBA, postgraduate studies, advanced training, retraining). The condition for inclusion in the sample is also the current labour experience in construction companies for at least 1 month. The length of experience is determined by the period of adaptation to the team and the organisation as a whole. Professional subcultures are fully represented. Ethnic cultural differences are represented by students from Africa, Afghanistan, Vietnam, Myanmar, China, Russia, Eastern Europe. Subcultures by age criterion for working learners are represented in the range from 23 years to 51 years (generation X, millennials, generation Z).

Initially, in order to ensure the representativeness of the research results and their extrapolation to other construction companies, three samples were formed, combined into a common sampling frame. Sample No. 1: employees and managers of construction companies studying in the above programmes, sample No. 2: staff of multicultural construction organisations recommended for the survey of university students (4 multicultural construction organisations), sample No. 3: staff of multicultural construction organisations implementing BIM technologies (2 organisations, a forming experiment was conducted). The qualitative characteristic of the sample was determined by the types of labour activity in construction as a field of professional activity (the total population includes both employees of design organisations and construction teams). The condition for quota selection of construction units was the preservation of the proportions of managers and specialists in the sample and the presence of experience of joint activities for at least one month, as stated

above, which is the minimum period for the socio-psychological formation of group processes and phenomena.

We adhere to this design of subjects to this day. Numerical composition is changing: by 2018, it was 618 subjects: sample #1 had 412 subjects, sample #2 had 218 subjects, and sample #3 had 48 subjects. The COVID pandemic and post-pandemic periods significantly reduced the sample size. Starting in autumn 2022, the progress of the research resumed in full.

In this paper, it is expedient to present some results from sample No. 1: university-trained employees and managers of design construction companies, a total of 150 people.

Team productivity as an indicator of the quality of its work is determined by us in the course of business team games, in which a real object is designed (stage 1) and built (stage 2). Time and construction material (in classrooms, the construction material is A4 sheets of paper) are limited, and overruns are paid in game conditional monetary units. The quality of the object has its own measurement parameters: stability, size. Resources, quality parameters of the object are included in the formula of the quality of work (efficiency) of the team. After the end of the "construction", presentation of the object and its acceptance by the "commission", the results are calculated. The effective team demonstrates the profit. The task is completed by analysing the work in a discussion format and a reflexive report.

The application of methodological tools is included in the lesson plan. For this work we have chosen the results of measuring: organisational culture by modernised methodology of K. Quinn and R. Cameron; role composition of multicultural teams of construction projects Belbin Team Inventory test; emotional component of MHA through the study of emotional orientation by methodology of B.I. Dodonov.

The methodology for assessing organisational culture by K. Quinn and R.

Cameron (Cameron & Quinn, 2011) in the modernisation of A.V. Bulgakov allows for standardised measurements of organisational culture. Dominant subculture in construction teams/organisations is defined as exceeding the mean (25 points) by 5 points. The modernised questionnaire includes six tasks. Respondents are given an instruction that explains that all the listed factors (answer options: A, B, C, D) are simultaneously present in the organisational culture of each company (division) to some extent, which totals 100%. The respondents' attention is focused on the need to carefully study the questions and their corresponding answer options (A, B, C, D). After that, the scores are assigned to each factor in per cent in the table in the column "Factor share, in %" so that A+B+C+D=100%. The generalised results obtained will optimise the mechanisms for establishing social partnership between team members and employer/management. In the modernised methodology, hierarchical organisational culture corresponds to "Discipline (order)" culture, market culture to "Result" culture, clan culture to "Relationship" culture, adhocratic culture to "Creativity" culture. The methodology is given in an abbreviated form in order to save time.

A diagnostic tool for investigating the role composition of construction project teams is presented by Belbin Team Inventory test. The questionnaire includes seven blocks of eight questions or statements. The respondent evaluates the degree of his/her agreement/disagreement. There are 10 points for each block, which can be assigned to no more than 3 or 4 statements in a block. If you agree with a statement 100%, all 10 points are assigned to it. A minimum of 2 points can be assigned to a single sentence. It must be checked that the sum of all points for each block does not exceed 10 points.

The emotional component of the IGA of teams and organisations is investigated through the assessment of the emotional orientation and saturation of the emotional component of the IGA of employees and leaders of organisations, their social identity and overall emotional potential, as well as through a separate assessment of the emotional potential of company leaders (Bulgakov et al., 2017, Magera, 2018, b). In this study, emotional orientation is presented. Emotional orientation was determined by the methodology of B.I. Dodonov. The methodology links emotions with certain needs (Bulgakov et al., 2017, Magera, 2018b). Each emotion-need contributes to the overall structure of team and organisation performance. The author of the methodology identifies 10 types of such emotions associated with a certain actual need and differing in the ways of expression (Table 7).

Table 7. Emotions-needs

Emotions and their manifestation	The need for...
Altruistic: participation, empathy	...aiding, abetting, patronising, assisting
Communicative: sympathy, respect	...communication, emotional intimacy
Gloric emotions (from Latin gloria - glory): pride, superiority	...self-affirmation, recognition, honour
Praxic: enthusiasm for work, work tone	...activity, success, overcoming difficulties
Pugnetic (from Latin pugna - struggle): excitement, determination	...thrill, risk, overcoming danger
Romantic: expectation of wonder, premonitions of	...the mysterious, the enigmatic, the unknowable
Gnostic (from Greek gnosis - knowledge) (intellectual feelings): surprise, conjecture, insight	...comprehension of the essence of phenomena, systematisation of knowledge
Aesthetic: admiration, fascination	...beauty, grace, elegance, grace
Hedonistic: pleasure, serenity, euphoria	...bodily and mental comfort
Acquisitive (from French acquisition): the joy and satisfaction of accumulating	...acquisition, consumerism, hoarding

The methodology consists of sixty statements - descriptions of various human emotions and emotional states. The instructions invite respondents to familiarise themselves with them and assess the frequency of experiencing such states on a scale from "0" to "2" (often - there are doubts about the answer choice - very rarely or never))

4. Results and Discussion

4.1. Results of the study of organisational culture and discussion of the findings

The results of the Quinn and Cameron test in Bulgakov's adaptation show a dominant organisational culture "Result" in all groups identified by the criterion of subculture of the profession.

The organisational culture of architects and designers in construction is characterised by a pronounced creative component, but the significant indicator of result culture is retained (Fig. 1.).
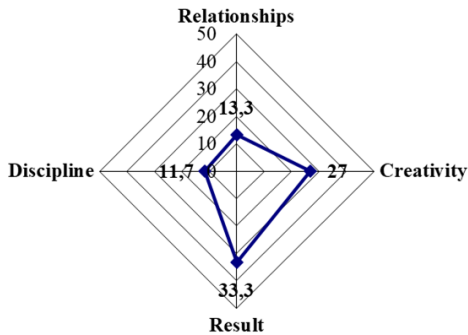
Figure 1. Organisational culture of architects and designers in the construction industry

The organisational culture of engineers and planners has a less pronounced creative component compared to creative architects (Fig. 2.).
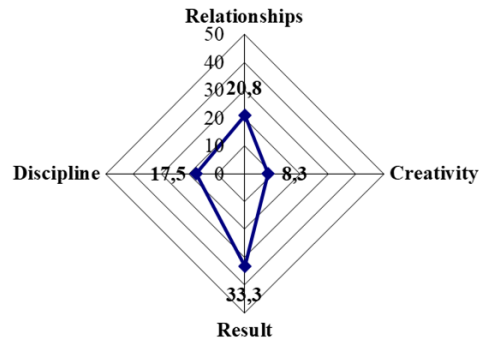
Figure 2. Organisational Culture of Engineers and Designers in Construction

The organisational culture of information technology specialists in construction is less pronounced in all four manifestations, but the result culture is nevertheless manifested (Fig. 3.).
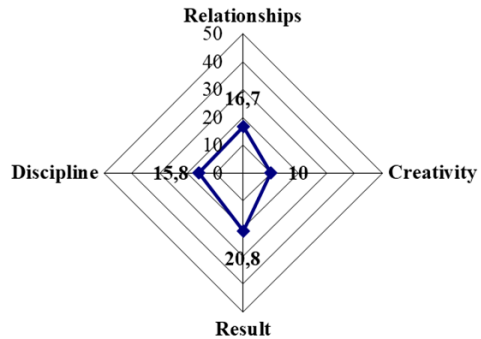
Figure 3. Organisational culture of information technology professionals in the construction industry

Construction workers are real people, the organisational culture of "Results" is the most common in construction organisations (Magera, 2018a). In multicultural construction teams differentiated by the criterion of the subculture of the profession, the organisational culture hardly changes. Result-oriented employees of construction organisations are used to operating in a tough competitive environment under strict guidance, control, supervision. Construction provides safety and comfort of human life, it is a zone of high responsibility regulated by norms, rules. It is the conditions for the

manifestation of such volitional qualities as purposefulness, endurance, perseverance. Control and stability are necessary to achieve results when this organisational culture dominates. With all its heaviness (and as a consequence - inertness), the construction industry cannot but react to the mobile changing world, here the focus on the result serves as a safe corridor for construction companies, does not allow to be distracted by disturbing factors for a long time. On the one hand, mental inflexibility of builders slows down the speed of adequate response to changes, but on the other hand it ensures the safety of people, professional activity and the industry. A serious share of responsibility is on the management of the company/organisation.

The organisational culture of "Result" is characteristic of goal-oriented, task-oriented, competitive employees (Pochebut & Chiker, 2020, p.235).

Interestingly, according to Handy (Handy Ch., 2001, p.12) the culture of result is characterised by flexibility, adaptability; intra-organisational plasticity when necessary, but difficult to control, without a pronounced centre. Ch. Handy warns against hasty adoption of such a culture, "it "survives" only in favourable technological and "climatic" conditions" (Handy, 2001, p. 12).

4.2. Results of the team role composition study and discussion of the findings

The general picture shows a predominance of doers and collectivists among the builders, and the percentage of doorkeepers is also high (Fig. 4, 5).
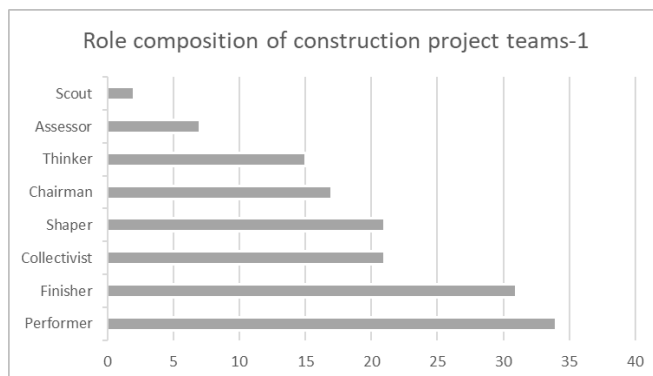

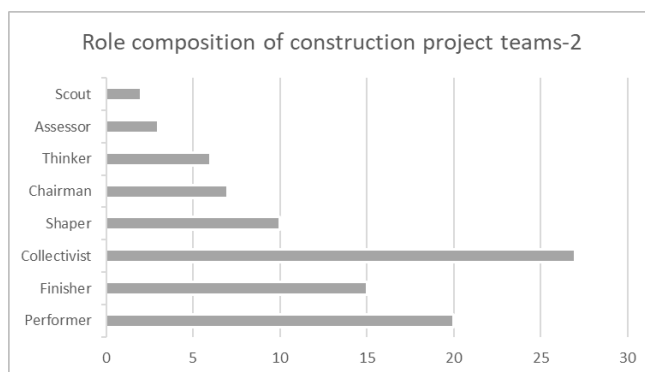**Figure 4.** Role composition of multicultural construction teams (1)

Figure 5. Role composition of multicultural construction teams (2)

Performers (Executors), according to Belbin, are reliable, disciplined, efficient, but inert, difficult to accept innovations. Collectivists are friendly but indecisive and have low stress tolerance. For collectivists, the most comfortable working environment is likely to be an organisational culture of relationships. Closers are neat, attentive, but anxious. Both samples have low presence of estimators and scouts in construction teams. The pros of appraisers are in judgement, strong analytical and strategic thinking, while those of scouts are in sociability, openness, flexibility. These are the qualities that construction teams lack, and efforts should be directed towards their development.

The strength of construction teams, based on the results obtained, is the focus on goal realisation, the desire to overcome emerging difficulties along the way, to meet deadlines, to keep the quality level of professional activity at an appropriate high level, to maintain purposeful activity even in conditions of alarming uncertainty. Tough leadership in this case gives acceleration, directs the potential energy of teams in complex modern conditions, through non-standard managerial decisions maintains the correspondence between specific intra-organisational (team) capabilities and the external world, which was confirmed by the Swedish colleagues we mentioned above (Larsson et al., 2018).

To discuss the results of diagnosing the role composition of teams, the work of Pentland S. (Pentland, 2012) and his colleagues is interesting. They investigated the effectiveness of project teams in the USA from a variety of industries, the total sample size was 2500 people. An innovative method was the use of wearable devices worn by each study participant to capture recorded cues (e.g., body movements: nods, turns, tone of voice, who the participant interacted with and more). Electronic sensors collected data on social behaviour over several weeks. It turned out that through patterns of communication, engagement, energy, and energy within the team were broadcast, channelled, and reinforced, and through establishing and maintaining external relationships, outside the team, another identified powerful factor - exploration (this is a direct function of the team scouting role!). Pentland S. and colleagues emphasise that successful teams are more likely to interact with other teams, crossing the boundaries of their social group, preventing isolation. This diversifies the internal team space, saturates it with new ideas and develops it. The productivity of a successful team increases, which invariably affects economic performance (Pentland, 2012).

4.3. Results of the study of the emotional component of the MHA of multicultural construction teams and discussion of the findings

The emotional component of the MGA of construction teams, represented by emotional orientation through the prevailing emotion-needs, revealed the targets of influence when managing the process of improving the quality of teamwork. It should be noted that the methodology does not give a rigid differentiation of types (the average ranges from 5.1 to 6.2 ranks), but the distribution of ranks over the whole sample makes it possible to assess the overall picture. The results of ranking the prevalence of emotion-needs are visualised in the following order: altruistic (1), pugnichne (2), aesthetic (3), gloric (4), communicative (5), akizitic (6), praxic (7), hedonistic (8), gnostic (9), romantic (10) (Fig. 6).

Figure 6. Emotions-needs of members of multicultural construction teams, in ranks

In the whole sample altruistic, pugnistic, aesthetic orientations of emotions prevail, while romantic, gnostic, hedonistic ones are rejected. It is logical that it is peculiar for people involved in collective activity to provide help and support (altruistic emotion-needs). The choice was most likely influenced by the fact that this is a socially approved quality for them. The construction process involves risks and dangers (pugnistic emotion-needs), while the achieved result causes a harmonious feeling of satisfaction from the work done, comparable to aesthetic experiences (aesthetic emotion-needs).

The emotion-needs rejected by the respondents indicate the prevailing organisational culture of the outcome. Abstract romantic, gnostic, hedonistic emotions-needs are perceived by them as irrelevant and devoid of concreteness. The craving for everything extraordinary and mysterious is quite satisfied or irrelevant. Builders need inclusion in real affairs, real relations, they make real decisions. Work with them in the organisation, units should be concrete and on the substance of the problem.

With all their materialism, builders do not have strongly akizitic emotions-needs, they have not revealed interest in accumulation of acquisitions beyond practical needs.

5. Conclusion

Global trends and related changes at different levels bring both risks and opportunities for all generations of working age. Migration processes blur cultural boundaries, the interdisciplinary nature of construction workers' activities mixes the professional composition of teams and organisations, the introduction of technologies of the Fourth Industrial Revolution prompts the development of adequate adaptability at both individual, team and organisational levels.

Changing the ways of organising joint activities is a necessary condition for effective work of multicultural teams in the conditions of change, including the introduction of information modelling technologies in construction. In order to effectively manage an organisation, a manager must have a clear understanding of organisational subcultural diversity, be able to adequately assess and manage the impact that subcultures can have on achieving organisational goals. At the stage of team building, identifying subcultural differences, leading team roles and diagnosing the emotional component of the IGA will help to create a potentially effective team. Teamwork is characteristic of baby boomers, builders-designers, and engineers. The least ready for teamwork among the represented

subcultures are IT specialists, who are characterised by reduced communication skills (except for the generation over 40 years old). The dominant organisational culture "Result" indicates the need to use clear instructions, rules, tasks. So does the "Performer" team role. In connection with ignoring emotions, attention should be paid to preservation of psycho-emotional health, development of emotional intelligence to prevent deterioration of general health.

In the process of the team's work on the project, it is necessary to constantly monitor intra- and inter-group interaction, including tracking emotional markers. This will allow to take timely preventive measures for difficulties and to develop a spirit of co-operation.

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