

FORMALISING THE FORMATION OF A PROJECT TEAM, TAKING INTO ACCOUNT THE ROLES ITS MEMBERS CAN PERFORM

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There is quite an extensive literature devoted to formalising the formation of project teams [1,2]. At the same time, much attention is paid to approaches to team formation taking into account the knowledge, skills, and experience of candidates. However, it should be remembered that the personal qualities of applicants play a vital role in the team's work. Thus, the leadership style of a project manager can stimulate some participants and sharply repel others; it can give rise to the emergence of groupings that act according to the type 'against whom we are friends'. Bright personalities with high qualifications may be very unfriendly in the team, demand more attention and want to have a very high salary, which will put a heavy burden on the project. A good professional may be an individual player uncomfortable in a team. The list of problems that arise in a team due to the behavioural qualities of its members can go on and on. The question arises. How can the behavioural attributes of applicants be taken into account when formalising team formation? The aim of the paper is to create an approach to formalise the formation of a project team, taking into account the roles that candidates can perform.

There is an extensive literature on models of team effectiveness. Major contributions in this area have been made by Tuckman, B., Beckhard, R., Lombardo, M. M., Eichinger, R. W., LaFasto, F. M. J., Larson, C. E., Hackman, J. R., Salas, E., Dickinson, T. L., Converse, S. A., Tannenbaum, S. I., Patrick L., Robbins S. P., Judge T. A., Katzenbach, J. R., Smith, D. K., Tamiru N. Belbin, R. M., who managed to identify 9 roles that project team members should fulfil, stands out among the famous works. Each team member can fulfil not necessarily one role, but several roles at once. Each role in the team is described by the author, and their strengths and weaknesses are given. The identified roles include Resource Investigator, Teamworker and Coordinator (the Social roles); Plant, Monitor Evaluator and Specialist (the Thinking roles), and Shaper, Implementer and Completer Finisher (the Action or Task roles). The author has developed a questionnaire to assess a candidate's readiness to fulfil a particular role. The questionnaire consists of 8 sections. Each section contains 10 answers. The questionnaire taker should distribute 10 points between the possible answers that characterise him/her best. In some cases, all 10 points can be assigned around one answer. The scores about one role are totalled.

The highest total score a candidate scores indicates how well he or she can perform the role for which he or she is most prepared. Belbin, R. M. has developed a table showing the sum of the scores for each of the roles by which it can be ascertained how much a person's abilities are more pronounced than the 'standard'.

This table shows the ranges of scores for each role: low, medium, high, very high. In addition to self-assessment, Belbin R. M. suggested that an individual be assessed by a minimum of four individuals who have worked with the person for at least 3 months. As a result, at <https://www.belbin.com>, everyone can obtain percentile scores for each team role based on self-assessment and Observers' cumulative perceptions.

To formalise the formation of project teams based on the assessment of the knowledge, skills, and experience of candidates, as well as their readiness to perform certain roles in the team, it is proposed to use the representation of estimates in the form of trapezoidal fuzzy intervals. This representation in comparison with triangular fuzzy numbers allows representing more than one assessment at a time. For example, a Self-Perception score of 72 and combined perception of your Observers score of 81 can be represented by a trapezoidal fuzzy closed interval (segment), which can be interpreted with the following expression: 'the competence score of the j -th candidate on the k -th indicator is approximately in the segment $[72,81]$ '.

It is proposed to find the competence assessments of candidates that satisfy the requirements as the intersection of the belonging functions of fuzzy competence requirements and fuzzy competence assessments. The threshold for the values of the intersection of the belonging functions of fuzzy competence requirements and fuzzy competence assessments is set when reaching which the competencies of a candidate can be considered as satisfying the requirements. It is proposed to form a project team by maximising the sum of dominant competencies, a weighted sum of competencies and minimising the cost of the team taking into account the constraints on the labour intensity of work, on the fulfilment of competence requirements and the cost of teamwork. We applied the generalised function method to solve the multi-criteria problem.

References: 1. Kononenko, I., & Sushko, H. (2021). Mathematical model of software development project team composition optimization with fuzzy initial data. *Radioelectronic and Computer Systems*, 3, 149-159. <https://doi.org/10.32620/reks.2021.3.12>. 2. Kononenko, I., Sushko, H., Babayev, I., & Abdullayev, R. (2024). Solving the problem of ranking applicants for a project team with fuzzy assessment of competencies and requirements. *Radioelectronic and Computer Systems*, 2024(2), 230-243. doi:<https://doi.org/10.32620/reks.2024.2.18>