



# Managing the Team by Individualization. How Can Artificial Intelligence Help to Manage a Team Effectively and Increase Its Efficiency?

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**Abstract.** This article aims to present how manage the team using Individualised Management to support efficient achievement of specific business objectives. An individualised approach to employees and the whole concept of Individualised Management works for individual employees, hence the approach has been expanded to incorporate entire teams. An IT tool i.e., an application that uses AI has been developed to enable individualised management and support managers in analysing the internal needs of employees and teams, and in using this knowledge to effectively manage their teams. Knowledge from various fields was used to develop the tool: Artificial Intelligence (AI) as well as psychology of management and needs.

The tool presented here provides managers with recommendations on how to manage teams, thus supporting organisations in fast and effective achievement of business objectives through an individualised approach and utilising state-of-the-art information technology. The IT solution operates on the basis of proprietary algorithms and models developed during research.

**Keywords:** Team management · Setting goals for the team · Effective team · Needs assessment · Individualised management · Artificial

## 1 Introduction

The goal of the research was to figure out how could be possible manage the team using Individualised Management to support efficient achievement of specific business objectives. It was assumed that the above research objective could only be achieved by answering the following research question: why do some teams work effectively and achieve the set objectives, while some do not? Too often team management overlooks the role of individual employees and the conceptualisation of the team as a multi-level structure consisting of individuals (multilevel entities) [1]. More and more research are focusing on group processes, looking at them not only from the level of the whole team, but paying more attention to individual employees [2, 3]. In our article we intend to present

a method for managing teams which focuses on individual resources of employees, profiling their needs and applying individualised management using Artificial Intelligence. The diagnostic app we are developing is a response to the needs of many companies and the problems addressed in research on the impact of individual differences on team effectiveness and the decline in commitment.

## 2 Individual Differences vs Team Efficiency and Commitment

Research into the development of interpersonal relations, which includes among other studies of the individual fit between the worker and the team [4] and impact of personality on interactions with fellow team members, suggests that individual character traits have a significant impact on relations and effectiveness of the team [5]. Bell and Outland (2017) [6] demonstrated in their study that individual character traits are an important factor affecting team cohesion.

In teams composed of different professionals, there are three levels of factors that support or inhibit group processes: organisational, group and individual. The way individual members understand cooperation and the way they communicate with fellow team members influences the quality and effectiveness of relations [7]. The lack of consensus in how different aspects of group work are interpreted has a significant impact on the understanding of group roles, decisions on compromises in communication and thus on group dynamics and the learning process.

Differences in perception of group work have an adverse effect on efficiency. A shared vision, good communication and understanding of group roles all result in improved efficiency [7]. Research also suggests a significant role of different perceptions of group work and the matching of values of individual employees. On the one hand, different values differentiate employees into, for example, those who prefer hierarchy or open communication. On the other, depending on the perception of group work, it is important for employees to share a common vision, as a team [8].

Studies of Tasa, Taggar, and Seijts [9] demonstrated that individual task-related expertise and the feeling of efficacy are key predictors of group behaviour at the individual level. Research also points to other individual characteristics, such as empathy, self-confidence, affect management, identification with the company or expression of emotions [10]. Particularly in areas that require specialised knowledge (e.g., product development, software and hardware design; [11, 12]), the requirements related to interactions with other team members or effective information sharing are high [13], since mastering them is crucial to ensuring team effectiveness [3]. In order to develop an efficient team working model it is essential to focus on the behaviour of not just the group as a whole, but also individuals in the context of group work, to identify predictors of individual behaviour and their impact on the dynamics of group processes [14].

Many managers and team members share the same views on problems in the company or their daily working experience [15] One of the more visible challenges to teamwork is the lack of commitment of individual members [16]. Research shows that individual members of the group differ in their levels of commitment even at the level of specific group tasks [17]. Another difficulty with teamwork is the dominance of overly aggressive individuals [18], who can have a negative influence on less assertive persons. Considering

the importance of an individualised approach and seeing the team through the lens of the individual, we have decided to develop an application which would, while referring to numerous studies of group processes, focus not only on the team as a group but on individual persons and their individual needs.

### 3 Diversity Management. Opportunities and Threats

Diversity in teams is an increasingly popular topic in the field of organisational culture. Individual resources of the employee contribute various experiences, skills and problem-solving capacity to the team. In the age of globalisation having culturally diverse teams is becoming increasingly common, however diversity should also be understood more locally – as individual differences between team members. An individual skill set significantly influences the team’s ability to innovate. At the same time, a high level of diversity may result in communication problems and conflicts caused by differences of opinion, ultimately resulting in lower motivation to get involved in teamwork [19].

Many studies have shown a link between cohesion and positive group performance [20]. Team cohesion is identified as a priority value for effectiveness. It is defined as perception of group experiences shared by the team members [21]. There are two aspects of cohesion: social and task-related [22]. While social cohesion represents the interpersonal nature of the construct, task cohesion represents activities focused on the task [23].

Diversity in the team may lead to conflicts, which in turn result in reduced effectiveness of the whole group [24]. On the other hand, research points to positive impact of task-related diversity on the achievement of group goals [25]. The analysis of 41 teams, performed at the University of Haifa, made it possible to establish which personality traits a group should have in order to be innovative. The data shows that the team should include people who are flexible, easy to work with and highly self-confident [26].

The interviews with team leaders in international projects mentioned the lack of knowledge of the employee [27], insufficient communication skills and lack of face-to-face contact [28] as some of the most important reasons for unsatisfactory cooperation and conflicts. Vakola and Wilson [27] warn against underestimating the importance of the human factor and the way employees communicate for team effectiveness. Important elements of satisfying cooperation included communicating change and keeping employees informed, a pleasant working environment, a positive atmosphere as well as highlighting positive results and rewarding employees for a job well done [27]. Moreover, accepting the employee’s weaknesses and matching their tasks to their strengths also played a key role in an effective and fruitful collaboration. The conflicts emerging in the team were attributed to personality differences. Group members who, according to the employees, had a negative impact on group cooperation were described as “over-extroverts”, “difficult people” “aggressive people who are always right”, and “introverts who never share their knowledge” [29].

In summarising the above research, the significance of an individualised approach for effectiveness and commitment in the team should not be overlooked. On the other hand, it is easy to notice the inconsistent results related to managing diversity in the team. Social psychology research shows that we like people who are similar to ourselves [30]. However, the diversity of individuals in a team positively influences the creativity and variety of proposed solutions to problems.

The application we developed enables the user to analyse the needs of individual team members, identifying an ideal set of characteristics to ensure a positive influence on work effectiveness and the achievement of goals. What is more, the app also supports the manager, providing them with the necessary set of recommendations to manage the diverse needs of individual team members.

## 4 Research Method

Social research is based on defining and finding a method of measurement for the phenomenon being measured. The psychometric tools available on the market are often expensive to use and difficult to interpret. Moreover, the use of tools in social sciences has recently raised many questions among researchers. There is a lack of transparent and reliable methodologies that would make it possible to collect the right content, interpret it quickly and draw conclusions [31]. Barry and colleagues [32] showed in their research that 40–93% of measurement methods used in studies published in scientific journals lacked confirmation of the accuracy of the tool.

The selection of psychometric tools is one of the most important steps in the measurement of variables. The social sciences offer at least 280 scales to measure depression [33], 65 different scales to measure emotions, 19 of which are dedicated to the measurement of anger [34]. The app used in our study exploits the potential of Artificial Intelligence and machine learning. Artificial Intelligence provides many innovative techniques in various areas of business and science. Intelligent agents [35] are used to assist in the search for information and manage systems in organisations. Expert systems used in companies take over tedious and repetitive tasks such as protocol analysis, simulations or document sorting [36].

The starting point for our tool (AIA), which aims to manage employees in an individualised way to ensure quick and effective achievement of business objectives, is the analysis of the individual needs of the employee. On the basis of the research into needs analysis, the number of needs was limited to 32.

Every human being has all the needs mentioned above, but with different saturation. In order to determine the level of saturation on a scale of 0 to 100 percent, you first need to fill in the questionnaire in the AIA application. Once the value of the need is defined, the system develops recommendations for the manager. The application suggests which actions should be taken towards the employee to boost their effectiveness. The role of the supervisor is limited to following the suggestions from the system and providing feedback on whether a given recommendation was useful or not. Through this system of active cooperation between the manager and the application, the AIA app continues to learn about every person, and its suggestions become more and more relevant. The development of this system has only now become possible with the use of Artificial Intelligence and deep learning. Until now, the manager had to not only watch the employee to be able to analyse their individual needs but also to draw conclusions on how to manage the specific employee and the entire team. The development of an individualised management strategy was not only tiring and time-consuming but also fraught with many potential errors.

The AIA app used in this study is easy to interpret and delivers a high level of relevance and reliability. A set of questions and needs was defined during system design.

The number of needs was then reduced to 32 during the development, validation and tests. The mobile app performs an online survey, and a profile is developed individually for the tested person with the use of Artificial Intelligence. The fact that AI is used ensures that the profile is calculated from the responses taking all parameters embedded in the app into account. AI looks for correlations in the calculations obtained. The application improves the model as new surveys are delivered along with new data, including user confirmations/denials at later stages.

The figure below shows the process of deploying the application to a company. The organisation identifies all existing teams. The system analyses the individual needs of all employees, and then aggregates them. The identified teams are analysed for strengths and weaknesses and potential conflicts. The system develops team matrixes based on the individual needs of employees along with recommendations for the manager formulated in such a way so as to reach as many individual team members as possible. The recommendations include: guidelines for setting goals for the team, how to communicate, how to build a positive work environment and how to effectively motivate the team. In addition, every team member (employee of the organisation) receives guidance on communication within the team.

In situations where the team is ineffective, a “rotation” is suggested; the system currently only examines needs related to personality, it does not consider competence. In the future we plan to develop the system further by adding competence, in order to strengthen the results of the team survey and expand the value of the IT system.

A sales team can serve as an example of individualised analysis of team members. The research compiled suggests that the most effective sales staff have a set of three needs:

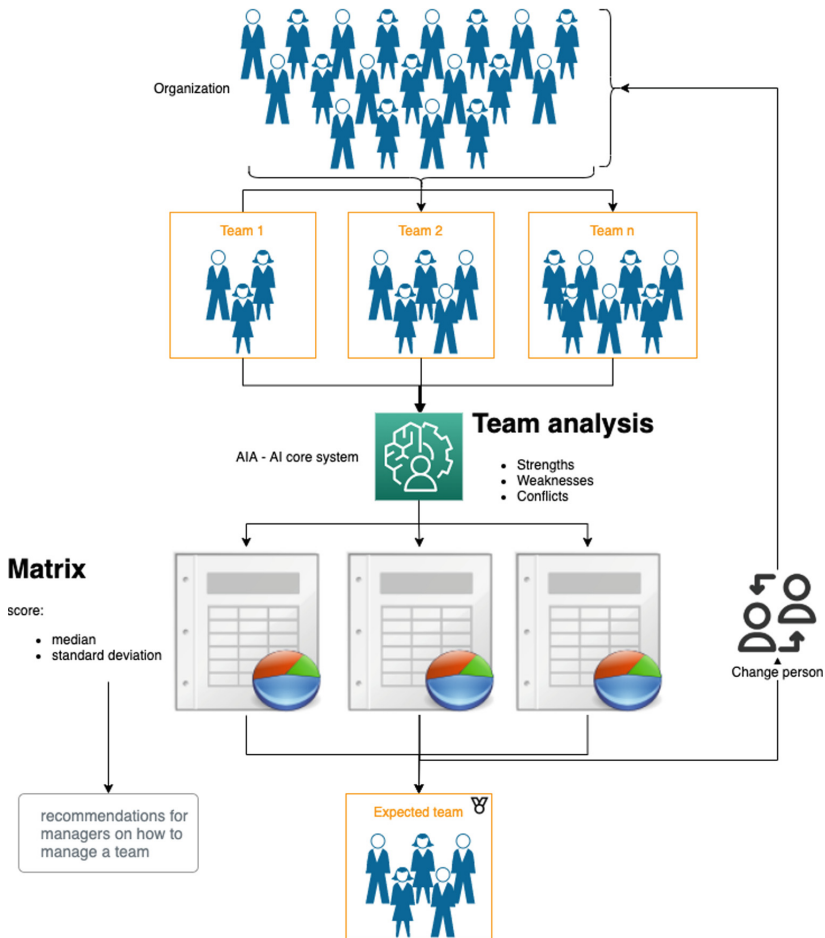
- High need of social contacts,
- High need of status,
- Low need of acceptance.

In order to check whether the team under examination has the necessary set of characteristics to sell effectively, you need to analyse the needs of the team’s members and check the strength of these needs e.g. for social contacts the median should be above 50 percent. At the same time, the standard deviation of the needs mentioned above should be as low as possible, while other needs should remain diverse (Fig. 1).

## 5 Conclusion

Effective teams are characterised by the fact that they consist of people with diverse personality types. At the same time, the more diverse the team, the more difficult it is to manage. While individual employees are relatively easy to manage, managing entire teams represents a challenge, as you are dealing with very different people, with varied value systems and different needs. The market lacks tools to support the manager in team management, tools capable of providing clear, precise and reliable support.

The app, developed on the basis of empirical research, analyses the individual needs of team members and presents them in aggregate form on the matrix of team needs. The



**Fig. 1.** Description of the AIA system based on artificial intelligence Source: Own work.

software uses neural networks. Collected samples were used during the deep learning process to develop the correct model. The software works on a case-by-case basis. The app analyses the team’s results to determine those individual needs of team members, which are consistently shared by all of them. The results are analysed further and ultimately the manager is presented with a system of recommendations and guidelines on how to manage the entire team, set goals and motivate it in a way that is consistent with the needs of team members. The software learns about the team and supplies optimum suggestions based on the user’s assessment of its recommendations.

Apart from the most consistent needs of the teams, the system also analyses those that differentiate the teams the most, as they are a likely reason of conflicts. Awareness of these areas coupled with the right suggestions for the manager, also developed by the app, are an indispensable element of the tool that has been created to support the manager in their daily work with people.

The paper describes a new approach to team management through individualisation, at the same time addressing the needs identified in research on group processes and team effectiveness. Using Artificial Intelligence as well as expertise and experience in studying motivation, we offer support in managing and analysing internal needs of employees and teams, and in using this knowledge in effective team management. By analysing needs at individual level, companies will not only be able to achieve their business goals more effectively but also to create specialised and highly motivated employee teams. The key advantage of the proposed solution is not only the fact that it automates the process of needs analysis but also that it offers support to managers with specific recommendations. The needs assessment allows you to check the potential of the team, identify its strengths and weaknesses and analyse potential conflicts. Through a multiple needs analysis and by including and removing individual team members it is possible to create a homogenous team with skills and needs matched to a specific task.

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