

Article

A Schematic Model for Implementing Industries High Risk Projects through the Agent of Human Capital

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Abstract: Given the global drive for more sustainable industrial practices, the goal of this paper is to develop and test an algorithm to diagnose the readiness of industrial enterprises to implement team management in innovation projects. Our model was tested at a large industrial enterprise in the food industry. To study the peculiar features of the perception of a company image by different functional groups of participants (within the framework of the proposed structural model of the image), we used the in-depth interview method. The study involved a total of 60 people making up three groups of company employees (managers, brand sellers, workers). The data were complemented by a documentary analysis. Because of the chosen research approach, the research results may lack generalizability, thus researchers are encouraged to test the proposed propositions further. The results reveal significant discrepancies in the company image formed among different groups of current and potential employees. An analysis showed that the enterprise under study is not ready for the implementation of team management, and additional training is required. The proposed approach will allow us to identify the factors that somewhat (inwardly) impede the implementation of investments at the enterprise and restrain its sustainable innovation and development. The scientific and business significance of the developed correctional and diagnostic model lies in its ability to assess the level of consistency in the perception of the goals and development prospects of the company. As such, the potential participants in project teams are identified, and, through the implementation of corrective measures, we create a basis for the formation of effective teams.

Keywords: sustainable industry; team management; innovation project; project risk; human capital



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1. Introduction

The current stage of development of economics is rightly called the “economics of knowledge”. Personnel or “human capital” is the leading resource determining the level of competitiveness and efficiency of enterprises. It is implied that the staff, as a form of capital, have important professional qualities that can create added value for the organization. However, this type of capital requires the efficient management and competent use of the knowledge and skills of staff to create more economic benefits.

The most high-risk type of enterprise activity is investment. Modern researchers believe that the key factor to the success or failure of any investment project is the human factor [1,2]. Through the fault of staff, cost-effective projects are often not fully implemented or not implemented at all, due to inadequate staff qualifications, the psychological unpreparedness of individual employees to take risks and work in conditions of tight deadlines, low staff motivation, and difficulties with working in a group. Our position is that the most effective form of organization for the investment process is working in a team, in which, due to the synergy effect, higher levels of realizability of investment projects are achieved.

Project managers have long known that the effectiveness of a project team has a strong impact on the performance of the project as a whole [3,4]. However, project management specialists more often derive knowledge from management and economics, missing out on a great deal of experience in team management accumulated in organizational

psychology [2,5]. Thus, teams are a multidisciplinary object of study. The data accumulated within the framework of different scientific schools often duplicate each other, or even conflict entirely. To develop an efficient management model for an investment project team, it is necessary to eliminate these contradictions, identify the essence of team management, give a clear definition of “team”, and identify the factors necessary for the implementation of team management in businesses. There is practically no applied research on the implementation of team management in enterprises of various profiles in project management.

We are most interested in studying the influence of the human factor on the investment activity of industrial enterprises. This is primarily due to regional specifics (the leading role of industry in the development of the region), as well as the very essence of industrial enterprises (simultaneous implementation of a large number of projects, varying risk levels of projects, high levels of differentiation of personnel in terms of qualifications and experience, etc.).

Thus, the goal of this paper is to summarize the team management knowledge accumulated in different scientific schools, to determine the essence of “team”, to identify the stages of introducing team management in industrial enterprises, and to develop and test an algorithm to diagnose the readiness of industrial enterprises to implement team management. The scientific novelty of the proposed tool lies in using a three-level structure of the company’s image within the diagnostics framework of the consistency of perception of the company’s goals and development prospects by potential participants in high-risk projects. Authors suggest recognizing such consistency of perception as a critical condition for the formation of effective teams.

The paper consists of eight parts. The first two parts describe the significance of research and the essence of team management in industrial enterprises. The literature overview provides the main approaches to interpreting team efficiency and its formation conditions. Particular attention is paid to literature sources describing the features of building command intelligence. Then, the authors propose a diagnostic model to assess the level of psychological readiness of a company to create efficiently functioning teams, and describe the study and methods. A practical example of the model’s application is described and analyzed with different investigated components, which leads to a set of recommendations. Finally, the conclusion shows the significance of the research results, their limitations, and further potential research directions.

2. The Essence of Team Management in Sustainable Industrial Enterprises

The implementation of team management in an investment project in an industrial enterprise must consider the specifics of investment activities in enterprises of this category, and the specifics of the team management itself.

Our analysis revealed three key factors reflecting the specifics of the investment activities of industrial enterprises, which should be considered when building a model of team management. The authors defined these key factors via interviews with the heads of the industrial companies, corroborated by a literature overview, as carefully outlined.

The factor of “substantial length of time from initial investment to financial results” necessitates the formation of teams in the initial stages of the investment project, while taking the planned result into account [6–8].

The factor “high probability of losses from investments” necessitates the assignment of high-risk projects to teams with minimal risk (minimal deviation of its effectiveness) [1,9,10].

The factor of “simultaneous implementation of a large number of investment projects” in situations in which the enterprise has limited resources necessitates competent team project planning, which will make it possible to distribute limited resources in such a way that projects are implemented with maximum efficiency [7,8,11].

The team management of the investment activity of an industrial enterprise must take into account the above factors, but to a greater degree, it must take into account the specifics of team management itself. Additionally, team management is an object of study in many sciences (management, organizational psychology, sociology, etc.). A large amount

of often contradictory data has been accumulated in various fields, which significantly complicates the task of identifying team management principles. It should be noted that ideas of a team-based approach to management developed simultaneously in different schools and different countries, but the most interesting and relevant ideas (in terms of the team management of investment projects considered in this study) originate from the R. Likert school [12,13]. Therefore, we will consider this branch of evolutionary development in this article.

Most researchers define a team as a “group” (generic concept), endowing it with specific features (aspectual differences) [14–22]. We consider this approach to be quite appropriate and convenient from a practical point of view. Here, we analyze the outlined features of the team and determine the most significant, without which the team cannot be separated from the categories of this type.

Features of Teams

It is these “specific” features of teams that should define the principles of team management. As outlined below, the features of teams are clearly defined and put into perspective.

Presence of common goals [14–17,21–24]. The team members must have the same vision, accept it, and have the opportunity and desire to achieve it. It is impossible to achieve a synergy effect if this condition is not met.

Mutual responsibility [12–14,21–23,25]. The idea of “mutual responsibility”, proposed in the 1950–1960s by R. Likert, gives the team distinctive features. After all, a group can be a “team” only if each participant works not for his own benefit, but for a common collective result.

Complementarity [6,21,22,25], **interchangeability of skills** [17], **multi-functionality of participants** [6,18]. In our opinion, the skills of team members should partially overlap and mutually complement each other, but should not completely duplicate one another.

Autonomy, self-control, minimal need for a manager [18,19,23,26]. The idea of “distributed management and leadership” distinguishes teams from other groups; “the minimal need for a manager”, related to the participants taking responsibility for the results of their collective work, is the consequence. The presence of a strong external leader may encourage group members to shift some of the responsibility onto them, writing off failures as the fault of incompetent leadership.

High performance [25]. Indeed, a team differs from a usual group by their high performance, but this is the result of the influence of other characteristics (presence, understanding, and adoption of a common goal, the mutual responsibility of the participants, distributed control, etc.).

High qualification [27]. We cannot fully agree with this, since the employees’ qualifications must correspond with the goal of the team’s activities. Qualification level is not decisive in achieving “simple” goals.

Full commitment of the participants [27,28]. In this case, we are referring to loyalty and the maximum interest of participants in achieving their goals. In a team, this is achieved through the distribution of leadership and responsibility, as well as through the principles of material and non-material incentives relative to the collective results and the individual contributions of the participant.

Continuous interaction and cohesion [28,29]. From our point of view, the unique aspect of the team is not the “constant interaction” of the participants in itself, but the possibility of this. That is, team members should feel that in the case of difficulties, they can turn to any of the other members of the team for help, whether they are nearby or thousands of kilometers away.

Thus, at an industrial enterprise, the management of an investment project team (IPT) should be based on the peculiarities of team management itself, and also take into account the specifics of the investment activities of the industrial enterprise (Figure 1).

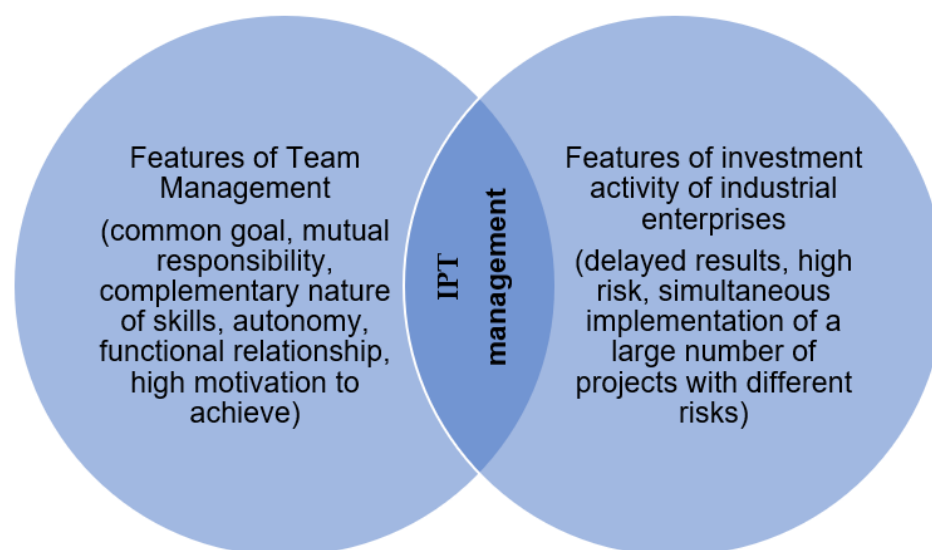


Figure 1. Management of the investment project team (IPT).

We define the concept of investment project teams based on the above principles: an investment project team is an autonomous group of employees, formed in accordance with the objectives and risks of an investment project, the participants in which are functionally interconnected, possess complementary skills, have a common vision of a common goal, strive to achieve it as much as possible, and bear collective responsibility for the project's results.

3. Related Literature

Today, researchers pay a lot of attention to the problems of teams. The authors' positions differ significantly concerning the most relevant and promising areas of scientific research. Some authors consider the team as directly connected with the changing environment, and try to establish patterns of influence of certain factors on the course of team processes [30–32]. Other authors believe that the key problem lies in the forced use of parallel development, i.e., in “parallelizing” tasks to accelerate projects' implementation (most important in innovative projects). This always leads to additional errors [33–37]. The third group of authors [38–46] asks the question, “Why are some teams stable in a dynamically changing environment? Why do they solve tasks efficiently and on time, while others are destroyed, make mistakes, and delay deadlines? What is the reason for this, and how do we form an effective team?” This third group of researchers investigates the field of command intelligence. According to the authors [47,48], the team, as a single organism, has separate thought processes that form “team intelligence”. In the team's intelligence peculiarities, the authors see the reason for its effectiveness or inefficiency. One way or another, all modern teams try to comprehend the essence of the team's efficiency, and the key factors in its achievement.

The authors tend to understand team intelligence as the ability of team members to learn, teach, communicate, reason, and think together, implementing the committed goals regardless of their position in any hierarchy. This comprises three levels (cognitive, affective (emotional), and behavioral). This structure was taken as the basis to develop a model of the company image in the minds of potential team members.

Modern scientists interpret the concept of “team effectiveness” as the ability of a team to perform the tasks assigned to it [49], or to achieve group goals while achieving individual goals [50]; the level of team development at which the participants' contributions exceed the leader's contribution [51]; a condition in which the team is devoid of dysfunctions [52], and the result of exposure to several factors [53]. Thus, there is no single view of either the generic category of “team effectiveness”, its content, or the mechanisms of achievement. There is no unified, generally accepted approach to achieving “effectiveness” by a team

and creating conditions for its development. This need exists among modern enterprises. They need effective mechanisms for the allocation of human resources and the creation of effective teams. Researchers consider the inclusion of “team intelligence” to be a condition for a team to achieve efficiency; collective thinking separates effective teams from ineffective ones [54,55]. The higher the complexity and innovativeness of the project, the higher the team’s need for adaptation and coherence of thinking [56], since such projects require a high level of concentration [47].

The complexity and specificity of each project, combined with a high level of interdependence of participants and implicit causal relationships of emerging events, make it challenging to use adaptation methods at each stage of the project [31,57]. Therefore, for high-risk projects, a preliminary adaptation of employees is required, which will allow for building a single vector of perception and coordinating team thinking. This approach differs from the generally accepted ones, in which managerial actions are carried out after the implementation of the risk assessment [58]. This is always very costly for the business [59], so companies should focus their primary attention on general adaptation processes associated with strengthening trust, and achieving a single vector of perception and a single social identity [60,61]. These factors make it possible to effectively deal with the uncertainty inherent in innovative projects [61–63]. On an emotional level, commitment, expressed in loyalty to the company, and social identity, reflecting the level of team involvement, can also facilitate or limit collective reflection through reinforcement with positive or negative emotions [61,64]. Thus, team thinking is influenced by a whole complex of factors that must be considered systematically. However, the authors often consider their influence in isolation, which is not entirely correct, since a change in one component entails a shift in the entire system. The systematic approach to the analysis of the coherence of the factors of the formation of command intelligence distinguishes the diagnostic model proposed by the authors.

4. Description of the Proposed Team Formation Model

We propose to use the principles of three model groups: traditional (allowing us to take into account individual and group competencies), weighted position models (for highlighting the contribution of each participant and effectively distributing the bonus fund), and index (allowing us to generalize data about teams, compare their effectiveness, choose teams with specific indicators, and effectively distribute limited human resources). The methodology is described in more detail in a separate article [65].

According to the above definition in Section 2, the team formation model should include two levels:

- (1) the formation of a group of functionally interconnected employees with complementary skills according to the objectives and risk level of the project (based on individual performance indicators);
- (2) the formation of a single “vision of the result” among the team members, achieving a certain level of coordination between personal motivation and the motivation of the team, and the formation of collective responsibility for the results of work.

Level 2 is the most laborious and costly. As a rule, large industrial enterprises simultaneously implement a large number of investment projects with various levels of risk. Conducting separate motivational events for each team will cost the company dearly, and the return on such events may be insignificant in the long term. Therefore, in order to reduce the financial burden on the enterprise, the authors propose the introduction of team management into the investment process in several stages, carrying out the preparatory (diagnostic) stage at the very beginning of the investment process.

Thus, our proposed model of team formation is based on current trends in the theory of team management, and involves:

- managing team characteristics based on individual and collective indicators according to the project characteristics and company objectives (in relation to maximizing the average investment performance indicator) [50,66–68];

- calculating complex indicators of team performance and risk [7];
- optimizing the time spent by managers on forming the team through the development of an integrated IT product [1,7,69,70];
- implementing a diagnostic (psychological) stage, which will identify “problem areas” and align the employees’ individual and team goals with the goals of the organization.

It seems to be most beneficial to consider the features of implementing innovative projects when the team is being completed. We propose ranking projects according to their potential impact. We may estimate the impact due to economic efficiency, risk and social significance. Then, we compare the project with the team (taking into account team efficiency and risk). Specifically, high-risk projects should be undertaken by an effective team with a relatively low risk.

Let us consider in more detail the content of the model stages.

Preparatory stage—includes two steps:

- diagnosing the enterprise’s readiness for implementing team management;
- eliminating problem areas.

The formation of employee profiles in the analytical database:

- employee performance analysis;
- risk analysis for each employee.

Team formation (with a given efficiency and risk) according to the risk of the project. In the third stage, the optimization problem is solved. An optimal ratio between the project and the team characteristics is established. Note that during the implementation, The project transitions from one phase to another, and this may change the functional composition of the team, considering the scope and specifics of the tasks to be solved. This means the optimization model should be used again to renew the team composition.

At the preparatory stage, it is necessary to determine the level of motivation of employees, their commitment to the goals of the company and individual projects, their readiness to work in a team, etc. This stage is the most difficult, as it affects the psychological aspects of the employees, their inner world. This should be done very carefully in order to get proper results, on the one hand, and not to harm the employee on the other.

The implementation of only stages 2 and 3 (without the stage of diagnosing and eliminating problem areas) can lead to failures. A team with “optimal” indicators may not work together in a project due to social and psychological mechanisms. For projects of low and medium risk, this is not so significant; however, projects of heightened and high risk require close attention. In these projects, even a small deviation of efficiency can lead to significant losses of income. Therefore, for projects in the heightened and high-risk categories, the implementation of a preparatory management stage is necessary, making it possible to level out the emerging risk of team heterogeneity. To do this, it is necessary to collect feedback from potential participants in terms of their perception of the company’s image, its goals, and their position in the company and in the team, and to assess the willingness to bear collective responsibility. If there are significant discrepancies between a team candidate’s image of the company and the candidate’s image of themselves within the company, it is necessary to make appropriate adjustments in order to minimize the potential risk.

The phenomenon to be studied is the image of the company in the perception of the employee. In general psychology, the concept of “image” is interpreted as a subjective picture of the world or its fragments and the subjective representation of objects of the external world, resulting both from sensually perceived signs (affective component) and hypothetical constructs (cognitive component). It includes the subject themselves, other people (other objects), the spatial environment, and the temporal sequence of events. As the basis for the execution of practical actions to master the outside world, the image is also determined by the nature of these actions, during which the original image is modified, thus helping to satisfy practical needs (behavioral component) [71–73].

Thus, within the framework of the psychological approach, the boundaries of the notion of “company image” are narrowed down to understanding it as a kind of cognitive–emotional construct in an individual’s mind, prompting them to engage in certain activities (working in a company, participating in a project, achieving project goals). The concept of “company image” includes three components (or levels):

- (1) the cognitive structures level (objective and subjective knowledge about the company, the team, yourself);
- (2) the affective construction level (emotional attitude and emotional evaluation of the company);
- (3) the behavioral activity level (continued work in the company, participation in projects, working towards a result).

All three levels are integrated by social identity, as a result of the identification process and as a manifestation of employee identification with the company as a whole. The more strongly the employee identifies themselves with the rest of the company’s staff (at all three levels of the image), the more active they will be in striving to achieve the company’s goals, because these aspirations coincide with their common goals. Thus, social identity is the strongest marker of the strength of a given image [74,75].

Summarizing the above theoretical concepts of the three-component structure of the company’s image in the minds of employees, the place of emotional adherence in the structure of this image, and the role of identification in the process of its formation, we obtain a model that characterizes the structure of the phenomenon (Figure 2).

Cognitive component	Objective knowledge	Representation (subjective knowledge)	Social identity
Affective component	Emotional attitude	Emotional evaluation	
Behavioral component	Work in a company	Participation in projects	

Figure 2. Structural model of the company image.

This model makes it possible to study the structure of the company image in the minds of potential project participants, identify problem areas, and make the necessary adjustments to harmonize the image. A common vision of the goals and directions of the development of the company is a prerequisite for the introduction of team management.

5. Description of the Study

The proposed model was tested at a large enterprise in the food industry.

The **purpose** of the empirical portion of this work was to conduct a comparative analysis of the characteristics of the perception of a company’s image in different functional groups of current and potential employees, based on the proposed model for studying the image. To achieve this purpose, it was necessary to solve the following **tasks**:

- Identify differences in the perception of the company by different functional groups of current employees (office workers, production workers, and specialists of the sales department);
- Identify differences in the perception of company image by different functional groups of potential employees (workers and specialists of the sales department);
- To identify differences in the perception of the company image between the groups of current and potential employees within one functional group (between current and potential workers, as well as between current and potential sales staff).

The subject of the study is the perception of the company image by different functional groups of current and potential employees (potential internal and external participants of the investment project team). The company is located in a large industrial city and is part of the food industry.

The object of the study consists of (1) current employees (potential internal participants of the projects; office workers, production workers and specialists of the sales department of the management and executive level) and (2) potential employees (potential external participants in the projects; individuals applying for employment as production workers and specialists of the sales department).

5.1. Selection Description

The selection (Table 1) included five groups of respondents (three groups of current employees (potential internal participants of projects) and two groups of potential employees (potential external participants of projects)).

Table 1. Composition of the selection.

Categories of Participants	Group No.	Composition	Number of People	Gender		Age
				F	M	
Potential internal project participants	1.1.	Workers	20	20	-	20–55
	1.2.	Specialists in the sales and personnel departments	20	14	6	23–45
	1.3.	Administration (accounting, HR department, senior managers)	20	14	6	30–55
Potential external project participants	2.1.	Workers	20	12	8	24–45
	2.2.	Specialists in the sales and HR departments	20	9	11	20–38

5.2. Data Collection Methods

We used the interview method to study the characteristics of the perception of the company image by different functional groups of participants (within the framework of the cognitive and affective component of the *structural model of the image*) [76]. An in-depth interview scheme was developed to collect information, consisting of four blocks.

We used the conversation method to study the features of the perception of the company image within the cognitive component of its structural model (in the first block of the interview). The questions of the first block of the interview were mainly aimed at identifying the structural cognitive elements of the company image in the minds of potential project participants (internal and external). The data obtained have been processed through content analysis [77]. The remaining interview blocks were designed to study the aspects of the perception of the company image within the framework of the affective component of the structural model.

The second block of the interview was aimed at identifying the emotional attitudes of employees towards the company. For this we used such projective techniques as free (question 4, block 1) and directed associations (the whole second block). Respondents were asked to describe the company as an animal, a car, a character (from a film, animation, fairy tale, etc.). Question 5 (projective) of the first block of interviews aimed to identify the participants' emotional attachment and satisfaction.

We also used a modified version of the semantic differential established by C. Osgood to study the respondents' emotional evaluation of the company's image [78,79] (block 3 of the interview). Based on a preliminary survey, 17 bipolar scales were selected. Five major factors were identified through correlation analysis of the scales (at a significance level of 0.001). Moreover, the factors were the same for potential internal and external participants; differences were only observed in the values of the correlation relationship between the individual scales. All scales were grouped according to the key factors, in accordance with which the data were further processed.

The fourth block of the interview was designed to study the features of company employees' identification with its typical representatives. For this, a personal semantic differential was developed, which was developed at the St. Petersburg Bekhterev Psychoneurological Research Institute [80]. The differential consists of 21 bipolar scales corresponding to the factors of activity, evaluation, and power. Respondents were asked to rate "themselves" and "a typical employee of the company". Thus, the selected blocks of interviews corresponded to tasks set during the study.

We used the following data collection methods in our study:

1. conversation method;
2. projective techniques (free and directed associations);
3. modified semantic differential of C. Osgood;
4. personal semantic differential, developed at the St. Petersburg Bekhterev Psychoneurological Research Institute.

5.3. Mathematical Data Processing Methods

We used descriptive statistics methods (calculation of average values) in the analysis of the research results. The non-parametric Mann–Whitney U-test was used to study the significance of differences in the assessment of the company image by different functional groups of current and potential employees, as well as to study the significance of differences in indicators of the participants' identification with a typical company representative. The Pearson correlation coefficient was used to identify the correlation factors of the developed semantic differential.

6. Description of the Research Results

In this approach, three levels of consistency in the perception of the company image of selected groups of respondents were identified. Note that all top- and middle-level managers were surveyed as ordinary participants in order to apply both approaches to the team formation in the future (selecting a team for a leader and, vice versa, a leader for a team). However, the current composition of top management significantly affects the company's image formation by employees.

- Level 1. (Gray)—No significant differences in the perception of company image.
- Level 2. (Orange)—Significant differences in the perception of the company image identified through qualitative research methods.
- Level 3. (Blue)—Moderate differences in the perception of the company image identified through quantitative methods.
- Level 4. (Red)—Statistically significant differences in the perception of the company image identified through quantitative research methods.

The analysis of the obtained data allowed us to construct a matrix of problem zones (presented in Figure 3).

Cognitive component													Identification with a typical employee	
	1	2	3	4	5	Objective knowledge		1	2	3	4	5		Subjective knowledge
1		-	-	-	-		1		+	+	-	+		
2			-	-	-		2			+	+	-		
3				-	-		3				+	+		
4					-		4					+		
5							5							
Affective component														
	1	2	3	4	5	Attitude		1	2	3	4	5		Evaluation
1		-	+	+	+		1		++	+++	-	+++		
2			+	+	+		2			+++	-	++		
3				-	-		3				++	-		
4					-		4					++		
5							5							
Behavioral component														
	1	2	3	4	5	Intention to continue working at the company	Intention to participate in projects							
1		+	+	-	-									
2			+	-	-									
3				-	-									
4					-									
5														

Figure 3. Matrix of problem areas (1—managers, 2—workers, 3—HR and sales, 4—potential workers, 5—potential HR and sales). Gray (−)—no significant differences. Orange (+)—significant differences identified through qualitative methods. Blue (++)—significant differences identified through quantitative methods (moderately expressed). Red (+++)—significant differences identified through quantitative methods (strongly pronounced).

This matrix makes it possible to visually assess the company's readiness for implementing team management, identifying weaknesses, and developing measures to eliminate them.

6.1. Analysis of Differences within the Cognitive Component

The cognitive level consists of two areas: objective and subjective knowledge. Significant differences have been identified in the field of objective ideas about the company. Respondents knew the history of the company, the structure of the leadership, and its position in the market. Their views corresponded with reality.

In terms of subjective representations, we noted that each group focused on different features. Representations are refracted and modified depending on the respondent's level of experience and professional field of activity (Table 2).

Table 2. Analysis of differences within the cognitive component (subjective perceptions).

No.	Group	Image Content
1	Managers	Focus on the strengths of the organization, emphasize its importance.
2	Workers	Focus is shifted towards personal restrictions and infringements on the part of the company's management; there is a clear opposition to the management.
3	HR and sales	Concentrate their attention on the shortcomings of the enterprise, indicate the main sources, but emphasize the organization's great potential and its ability to overcome the difficulties it faces.

Table 2. Cont.

No.	Group	Image Content
4	Potential workers	Focus on the internal features of the enterprise, its internal organization, and technology; ignore the features of the market.
5	Potential HR and sales	Focus on brand, advertising, PR; note the insufficient work done by the company in this area, some stagnation in the company's work, in rare cases negative customer attitudes towards the company, and high prices.

The table shows that each group perceives the company through the prism of their own experience. The image of the company is incomplete in the minds of each individual group and requires adjustment.

6.2. Analysis of Differences within the Affective Component

The affective component of the proposed model overlaps in meaning with the modern concept of loyalty and its structure [81]. Loyalty is characterized by a positive attitude, pronounced affection, satisfaction, and the ability to provide an emotional assessment of the object of affection. However, the key factor of loyalty (employee loyalty to the company, in this research) is social identification, i.e., identifying oneself with an object, perceiving oneself as being in close connection with it. We believe that the key disagreements in the different company images for the functional groups may lie precisely in the area of identifying “oneself with a typical employee of the company”. The results of the research on **attitudes towards the company** are presented in Table 3.

Table 3. Analysis of differences within the affective component (emotional attitude).

No.	Group	Attitude Nature	Factors
1	Managers	Positive	Perceive the company as “their offspring”.
2	Workers	Negative	Related in great part to poor working conditions and low pay.
3	HR and sales	Ambiguous with a negative bias	It was revealed that the emotional attitude of the employees of this group is determined by estimates “from the external environment” of the organization. They lack their “own” estimates, reflecting instead the attitude of the buyer.
4	Potential workers	Positive	Based upon production performance (high speed, manufacturability); note the planned nature of all work, shrewdness. Speak (in a positive way) of working on the brand, changing the company image, and bright colors.
5	Potential HR and sales	Ambiguous with a positive bias	The company is represented as a powerful but simple “Soviet” factory, with difficulty accepting changes or innovation, which focuses on the masses in its production and large output (with average and sometimes low product quality).

The greatest difference in the emotional attitude towards the company was noted between the workers and the administration. This “opposition” may impede the introduction of team management into the enterprise, and therefore requires adjustment. The second element of the affective component of the model is **emotional evaluation**. The company was evaluated by five factors: strength, activity, status, competence, and organization (Table 4).

Table 4. Key factors and their company image characteristics.

Factor	Image Characteristics
STRENGTH	Strong, powerful, stable
ACTIVITY	Active, working, developing, leading
ORGANIZATION	Organized, clear, responsible, with tradition
COMPETENCE	Competent, modern, attractive
STATUS	Status, prestigious, reliable

Significant differences were revealed (significance level $p < 0.05$) in the emotional evaluations of the company's image by current employees. The differences are presented in Figure 4.

**Figure 4.** Emotional evaluation of the company by current employees (composite profile).

Figure 4 shows that the differences between the groups are natural. There is a tendency towards lower ratings for all factors from office workers to sales staff, and from the latter to production workers. Thus, office workers perceive the company most positively, and production workers the least. A statistical analysis of the reliability of differences in the company's assessment by individual groups of employees is necessary for a more detailed consideration of the identified features of perception. The non-parametric Mann–Whitney U-test was used to calculate the significance of differences. The results of the analysis are shown in Table 5.

Table 5. Reliability of differences in the evaluation of the company image by factors.

Factor	Groups	Level of Reliability of Differences	Rating of Significance of Differences
STRENGTH	3 and 2	0.04532 *	12
	2 and 1	0.00280 *	9
	1 and 3	0.00002 **	1
ACTIVITY	3 and 2	0.51621	-
	2 and 1	0.00021 **	4
	1 and 3	0.00005 **	2
ORGANIZATION	3 and 2	0.01607 *	11
	2 and 1	0.00334 *	10
	1 and 3	0.00014 **	3

Table 5. Cont.

Factor	Groups	Level of Reliability of Differences	Rating of Significance of Differences
COMPETENCE	3 and 2	0.76605	-
	2 and 1	0.00048 **	6
	1 and 3	0.001064 *	7
STATUS	3 and 2	0.18955	-
	2 and 1	0.00268 *	8
	1 and 3	0.00036 **	5

Legend: *—significance of differences at reliability level $p < 0.05$; **—significance of differences at reliability level $p < 0.001$; 1—managers; 2—workers; 3—HR and sales.

When analyzing the results of **current employees**, three levels of emotional evaluation were identified: a high score of the company was given by office employees, medium by sales department specialists, and low by production workers. No differences in the emotional evaluation of the company between production workers and sales staff were identified.

Emotional evaluations of the company's image between groups of **potential employees** revealed significant differences ($p < 0.05$) in the "strength" and "organization" factors. It was revealed that potential sales department specialists, similar to real sales managers, tend to assign companies higher ratings for all factors than groups of workers (Figure 5).

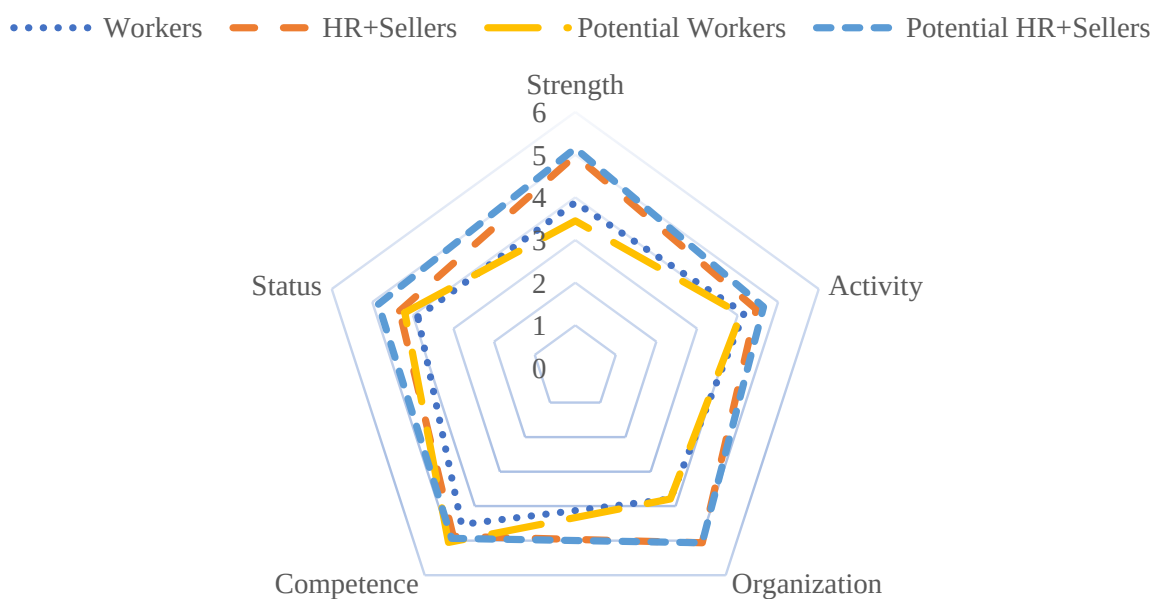


Figure 5. Emotional evaluation of the company by current and potential employees (composite profile).

No significant differences in the emotional assessment of the company's image were revealed between the groups of current and potential employees of the same specialization. However, significant differences were revealed in the assessment of the company's image by current and potential employees of different specializations ($p < 0.05$) in the "strength" and "organization" factors (Table 6).

Table 6. Reliability of differences in the evaluation of the company image by the groups of real and potential employees.

Factor	Groups	Level of Reliability of Differences	Rating of Significance of Differences
STRENGTH	4 and 5	0.00533 *	1
	2 and 4	0.46518	-
	3 and 5	0.64562	-
	2 and 5	0.01436 *	3
	3 and 4	0.00979 *	2
ACTIVITY	4 and 5	0.41708	-
	2 and 4	0.807656	-
	3 and 5	0.64562	-
	2 and 5	0.343765	-
	3 and 4	0.47348	-
ORGANIZATION	4 and 5	0.01607 *	4
	2 and 4	1.00000	-
	3 and 5	1.00000	-
	2 and 5	0.01607 *	4
	3 and 4	0.01607 *	4
COMPETENCE	4 and 5	0.35070	-
	2 and 4	0.218406	-
	3 and 5	0.89241	-
	2 and 5	0.588507	-
	3 and 4	0.18058	-
STATUS	4 and 5	0.10459	-
	2 and 4	0.36484	-
	3 and 5	0.15167	-
	2 and 5	0.06586	-
	3 and 4	0.84982	-

Legend: 2—workers; 3—HR and sales; 4—potential workers; 5—potential HR and sales; *—significance of differences at reliability level $p < 0.05$.

The study showed that specialization, orientation in activities, level of education, and environment can have a lasting effect on the attitude towards the company, and on the respondents' emotional evaluation of the company. However, emotional evaluation and attitude towards the company are formed throughout the period of employment and are the resulting indicators of a more complex internal psychological process.

We believe that the key mismatch in the company images present in different functional groups may lie in the field of identification “with a typical employee of the company”. It is this mechanism that forms the respondents' attitude towards the company, and is an important motivating factor.

6.3. Analysis of Differences within the Behavioral Component

We previously noted that the model of the company's image consists of three components (levels) through which identification runs. An employee holds a certain set of information about the company, evaluates themselves and the company based on the identification mechanism, relates themselves to the employees of the company, and then forms their emotional attitude towards the company, which leads them to engage in certain actions. Actions for the company form the “behavioral level” of the model. In this study, in the framework of the behavioral component, only the **desire of employees to continue working in the company** was considered. However, in the course of the survey, it turned out that some of the employees who intend on continuing to work at the company are not interested in participating in the implementation of the company's projects. Thus, we

propose the evaluation of two parameters in future studies: the desire to continue working in the company and the desire to participate in projects.

In order to avoid the distortion of ratings of the “desire to continue working in the company” indicator, we used projective questions (question 5 of the first block of the interview). The employees did not answer directly whether they intended to continue working in the company. Rather, they indicated this indirectly by answering the question “Would you recommend work at this company to a friend?” Table 7 reflects the results obtained.

Table 7. Analysis of differences within the behavioral component. Percentage of employees in the group.

Parameter	Workers	HR and Sales	Managers
It is worth working in the company	10	35	45
It is definitely not worth working at the company	75	40	10
It is difficult, but possible to work in the company	15	25	45
Evaluation factors			
Salary is significantly lower than the market average	50	10	-
Non-compliance of incentives with labor costs (the work is too difficult)	75	55	40
Other businesses are more automated and it is easier to work there	30	-	10
Unsatisfactory working conditions Depreciation of industrial premises and equipment	65	50	-
It is fun to work here	-	15	-
Gain good experience, immerse oneself in culture and good traditions	-	25	20

The table shows that there are significant differences in the intentions of different groups of employees in relation to continuing work in the company. The largest percentage of employees satisfied with their work was the top managers group. Almost half of them consider the work prestigious and preferred, although they note the low level of wages and the burden of work.

Thus, through qualitative methods, we revealed significant differences within the framework of the behavioral component. Moreover, quantitative indicators reflecting staff turnover at the company confirm the results obtained: the average staff turnover rate over the previous 5 years for top managers was 0.05, for sales managers it was 0.18, and for workers 0.32. The coefficient was calculated as the ratio of the number of employees who resigned at their own will or were let go for violation of labor discipline to the average number of employees. Thus, the analysis of the perception of the company within the behavioral component revealed significant differences between the groups, which should also be taken into account when introducing team management to companies.

6.4. Analysis of Differences in Current Employees' Identification with a “Typical Representative”

In our view, it is the mechanism of identification with a typical company representative that forms the employees' general attitude towards the company, and is an important motivating factor for continuing to work in the company and participating in projects for company development. It is very difficult to assess an employee's identification with a typical representative. First, it is difficult to distinguish the three levels of perception (cognitive, affective, and behavioral) in identification, and secondly, there is a high probability of the distortion of data through direct assessment. Therefore, in this study, we decided not to single out the levels of perception, but rather to use projective questions (question 5 of the first interview block) to avoid the distortion of marks.

In this paper, the difference in assessments of “self” by the employee and assessments of a typical employee of the company was used as an identification indicator. Thus, a certain “involvement” of the employee in the company's team was revealed. The personal semantic differential was used as a diagnostic method [82,83]. The semantic differential

consisted of 21 bipolar scales which correspond to the factors of activity, evaluation, and strength. The employees of the organization were asked to evaluate a “typical employee of the company” and “themselves as an employee of the company”.

Thus, for each employee of the company, the distance between the estimates of self and the typical employee was calculated. This indicator served as a marker of employee identification with the team. The greater the difference between the evaluation of oneself and a typical employee, the lower the level of employee’s “involvement” in the team. Individual data were grouped by factors (assessment, strength, activity) and divided into groups (office workers, production workers, sales department specialists); the results are presented in Table 8.

Table 8. Average values of the personal differential by factors.

Factors	Evaluation of Self			Evaluation of a Typical Employee			Identification Rate (Difference between Assessing Oneself and a Typical Employee)		
	1	2	3	1	2	3	1	2	3
Evaluation	6.25	6.44	6.07	6.16	6.06	5.09	0.09	0.38	0.98
Strength	5.80	4.90	5.51	5.44	4.60	4.34	0.36	0.3	1.17
Activity	5.36	5.73	5.17	5.36	5.60	4.57	0	0.13	0.6
Average	5.8	5.69	5.58	5.65	5.42	4.67	0.15	0.27	0.91

Legend: 1—managers; 2—workers; 3—HR and sales.

We used statistical data processing to diagnose differences in the perception of the company by different groups of employees. The use of the Mann–Whitney U-test revealed significant differences (reliability level $p < 0.05$) in the identification indicators (distance between self and typical employee scores) between the office workers and sales staff groups by assessment and activity factors (Table 9).

Table 9. Reliability of differences in average self-evaluations and those of a typical company. Represented by Mann–Whitney U-criterion (in groups of current employees).

Factor	Rating of Significance of Differences		
	1 and 2	2 and 3	1 and 3
Evaluation	0.43278	0.07871	0.01383 *
Strength	0.89241	0.21339	0.16773
Activity	0.60729	0.18058	0.10751
Average evaluation	0.77639	0.06198	0.002074 **

Legend: *—significance of differences at reliability level $p < 0.05$; **—significance of differences at reliability level $p < 0.01$; 1—managers; 2—workers; 3—HR and sales.

According to the results of the study, all groups of employees tend to overestimate themselves. The greatest distance between the evaluation of self and that of a typical employee can be observed in the sales managers groups, and the smallest in the managers group (Table 9).

The noted difficulties in identifying “with the team” among sales managers may be due to the competitive nature of the work (fighting for clients) and the constant ability to compare the company’s results with the results of other companies in the industry (interaction with the external environment). Identification with the team can also be influenced by the form of pay (office employees have a stable salary; the sales department receives a commission from transactions completed). It is curious that sales managers give themselves lower marks on average than the other employee groups, and a typical company representative is assigned even lower marks.

In interviews with the sales staff, the respondents noted more than once the “lack of a unified team” and the “absence of common goals and moods of the team”. Due to the

specifics of their activities (organizing sales, interacting with the external environment), representatives of this department spend less time together than office workers, and practically do not cross paths with the latter. On the contrary, office employees are more inclined to work in a team, collectively; they spend a lot of time together. A significant proportion of the office workers are middle-aged people (40–50 years old) who have many common interests and problems (children, family) and a long experience of collective activities, and are more adapted to each other.

6.5. Analysis of Differences in the Identification of Self and a Typical Representative of the Company by Potential Employees

To analyze differences in the identification of self with a typical representative of the company among potential employees, the *personal semantic differential* was also used as a diagnostic method, and potential employees of the organization were asked to evaluate the “typical employee of the company” and “themselves as a potential employee of the company”.

Individual data were grouped by factors (evaluation, strength, activity) and divided into groups; the results are presented in Table 10.

Table 10. Average values of the personal semantic differential by factors.

Factors	Self-Evaluation					Evaluation of a Typical Employee					Identification Rate (Difference between Assessing Oneself and a Typical Employee)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Evaluation	6.25	6.44	6.07	6.14	5.64	6.16	6.06	5.09	5.75	4.96	0.09	0.38	0.98	0.39	0.68
Strength	5.80	4.90	5.51	5.5	5.14	5.44	4.60	4.34	4.93	4.75	0.36	0.3	1.17	0.57	0.39
Activity	5.36	5.73	5.17	5.07	5.11	5.36	5.60	4.57	5.25	4.11	0	0.13	0.6	−0.18	1
Average	5.8	5.69	5.58	5.57	5.3	5.65	5.42	4.67	5.31	4.61	0.15	0.27	0.91	0.26	0.69

Legend: 1—managers; 2—workers; 3—HR and sales; 4—potential workers; 5—potential HR and Sales.

Through statistical processing using the Mann–Whitney U-test, we found significant differences (reliability level $p < 0.05$) in the identification indicators (distance between evaluations of self and of a typical employee) between the group of potential workers and the group of potential sales department specialists by the “Activity” factor (Table 11).

Table 11. Reliability of differences in identification with the company team. By Mann–Whitney U-criterion between groups 4 and 5 (potential employees).

Factors	Rating of Significance of Differences
Evaluation	0.11355
Strength	0.37204
Activity	0.00007 **
Average evaluation	0.00836 *

Legend: *—significance of differences at reliability level $p < 0.05$ **—significance of differences at reliability level $p < 0.001$.

It can be seen that the groups of potential employees of the company identify themselves with the team to varying degrees. The greatest differences can be observed in the “activity” factor and in the “average rating”. Table 10 shows that potential sales professionals consider themselves to be much more active than current employees of the company; however, they assess themselves worse than other groups, on average. They repeatedly noted the inconsistency of the company’s behavior with the current market requirements. Representatives of this group of respondents believe that they will be able to make a greater contribution to the development of the enterprise than current employees of the sales department. In the potential workers group, this fact is not observed; their own activity and the activity of current employees are estimated approximately equally.

According to the indicators of the overall assessment, it is clear that potential employees of both groups evaluate their own qualities higher than the qualities of current employees, and the greatest discrepancy is again in the evaluations of potential sales department specialists.

Potential employees (moreover, sales managers to a greater degree) see imperfections in the company both in the internal and external environment, see potential for development, and appear ready to make their own efforts to achieve this (higher indicators in the “activity” factor).

6.6. Analysis of Differences between Groups of Current and Potential Employees in the Indicator “Identification with a Typical Representative of the Company”

We completed statistical data processing using the Mann–Whitney U-test in accordance with the objectives of our research (to diagnose differences in the perception of the company by different groups of employees). The results of the application of the criterion are given in Table 12.

Table 12. Reliability of differences in identification with the company’s staff according to the Mann–Whitney U-criterion (parallel and cross-comparison) among current and potential employees.

Factors	Rating of Significance of Differences between Groups			
	2 and 4	3 and 5	2 and 5	3 and 4
Evaluation	0.50751	0.66516	0.03047 *	0.28531
Strength	0.27329	0.19415	0.74548	0.48187
Activity	0.60729	0.04388 *	0.00293 *	0.03605 *
Average evaluation	0.64562	0.58851	0.00306 *	0.15955

Legend: *—significance of differences at reliability level $p < 0.05$; 2—workers; 3—HR and sales; 4—potential workers; 5—potential sales specialists.

As a result of the study, it was revealed that there are significant differences between current and potential sales managers in their identification with a typical representative of the company, according to the “activity” factor. Potential sales managers consider themselves more active than current employees of the company. In the interview, they repeatedly pointed out errors in the company’s marketing policy, outdated work patterns, red tape, and rigidity.

The cross-comparison of the estimates revealed significant differences between current workers and potential sales managers in the “activity” and “assessment” factors, as well as between current sales managers and potential workers in the “activity” factor. Table 12 shows that significant differences are caused by significant discrepancies in the estimates of “self” and the team by sales managers (both current and potential). This group of employees is more inclined to overestimate their activity and importance, realizing that if there are no sales, there is no company. In addition, this group of employees is compensated through piecework wages. They receive commissions from their own sales, so they tend to lead an active, purposeful, somewhat selfish way of life, and they appreciate their abilities. Workers, on the contrary, tend to be included in the team as much as possible and are willing to turn a blind eye to the low level of wages, because they feel a sense of social security and importance. Therefore, the differences between the estimates of this group of respondents themselves and the team are not so significant.

The application of our model has made it possible to confirm our hypothesis about the heterogeneity of the company’s image among different groups of potential participants in an investment project team. We were also able to diagnose “problem zones” within the framework of the structural elements of the model. If the company plans to introduce the team method of investment management, the identified “problem areas” should be worked out in detail, and significant conflicts should be eliminated. Otherwise, it will not be possible to enact a high-risk project with an efficient team with minimal risk.

7. Recommendations

In the course of the study, we have compiled a matrix of problem zones (presented in Figure 3). The severity of differences in the matrix is indicated by color. We propose assigning a particular score to each color (Table 13).

Table 13. Scoring criteria.

Color	Data Acquisition Method	Severity of Differences	Recommended Score
Gray (–)	Any	No differences	0
Orange (+)	Qualitative	Moderately or strongly expressed	1
Blue (++)	Quantitative	Moderately expressed	1
Red (+++)	Quantitative	Strongly expressed	2

After processing the matrix data, we rated the problem zones. Each zone of the matrix was assigned a score depending on the color. The results are summarized in Table 14.

Table 14. Ranking of the problem zones (1—managers, 2—workers, 3—HR and sellers, 4—potential workers, 5—potential sellers).

Groups	Structural Elements of the Model						Total	Rank
	Cognitive Level		Affective Level		Behavioral Level	Identification		
	Objective Knowledge	Subjective Knowledge	Attitude	Evaluation	Intention to Continue Work			
1–3	0	1	1	2	1	2	7	1
2–3	0	1	1	2	1	0	6	2
1–5	0	1	1	2	0	0	4	3
2–5	0	0	1	1	0	2	4	3
1–2	0	1	0	1	1	0	3	4
3–4	0	1	0	1	0	1	3	4
4–5	0	1	0	1	0	1	3	4
2–4	0	1	1	0	0	0	2	5
3–5	0	1	0	0	0	1	2	5
1–4	0	0	1	0	0	0	1	6

As Table 14 shows, the company itself (rank 1 and 2) turned out to be the location of the main problem areas. That is, the processes occurring between employees prevent the company from fully developing. Close attention must be paid to the sales managers group, whose vision of the company is significantly different from the vision expressed by workers and top management. It is necessary to work systematically, working through the individual structural elements of the image. The most significant differences are at the affective level of the model and in identification, so it is necessary to begin with them. However, it should be understood that an image is a complex system, wherein a change in one component entails a change in the whole system. Therefore, we recommend adjusting the image to begin with more neutral cognitive components, gradually changing the employees' perception of the company. The same can be said about identification, since as a result of this process, the employee evaluates themselves and, comparing themselves with other employees, forms their attitude towards the company. In turn, the employee builds their behavior within the company on the foundation of their assessment of and formed attitude towards the company.

After the implementation of corrective measures, it is necessary to conduct additional diagnoses. If the results of the diagnostics do not reveal significant discrepancies between the groups in terms of the perception of the company's image, then it will be possible

to move from the diagnostic stage to the implementation of the team management of investment processes in the enterprise.

8. Conclusions

In the era of knowledge economy and sustainable development, human and social capital have become key resources. In the face of growing competition, it is human capital that allows an enterprise to achieve higher rates of investment activity. The most effective form of organization of investment activity is teamwork (synergy effect). The economic results of the project and the associated financial losses depend on the team's performance.

We propose the introduction of team management into investment processes in several stages. The preparatory stage includes two steps: diagnosis of the enterprise's readiness for the implementation of team management, and the elimination of problem areas. In the second stage, employee profiles are formed and stored in a database (analysis of employee performance and risk analysis for each employee). In the third stage, teams are formed with a set level of efficiency and risk (in accordance with the risk of the project).

For high-risk projects, the first stage is both the most important and most expensive. In these projects, even a small deviation in efficiency can lead to a significant loss of income. Therefore, for the category of projects with heightened and high risk, it is necessary to complete the preparatory (diagnostic) step, which will make it possible to level out the emerging risk of team heterogeneity.

We propose a method of diagnostics based on our structural model of company image. The model has three levels: the cognitive constructions level (objective and subjective knowledge about the company, the team, and oneself); the affective constructions level (emotional attitude and emotional evaluation of the company); and the behavioral activity level (continued work in the company, participation in projects). All three levels of social identity are integrated as a result of the identification process and as a kind of employee identification with the company as a whole.

The result of the diagnostic stage is a matrix of problem areas, developed in accordance with the structural model. A common vision of the goals and areas of development of the company is a necessary condition for the introduction of team management in an industrial enterprise.

Policy Implication

Implementing our model may generally impact the company's human resources policy because the diagnostic results will help with learning the deficits and creating the adaptation program for currently working teams. A more significant impact may arise if the company uses this model to test people before hiring, because it may generate a tremendous financial effect due to hiring more consistent employees, which will require fewer resources for adaptation.

The application of the model made it possible to confirm our hypothesis about the heterogeneity of the company's image among different groups of potential participants in the investment project team. We were also able to diagnose "problem zones" within the framework of the structural elements of the model. If the company plans to introduce the team method of investment management, the identified "problem areas" should be worked out in detail, and significant conflicts should be eliminated. Otherwise, it will not be possible to support a high-risk project with an efficient team with minimal risk.

The researchers consider the isolated impact of staff psychological processes on team effectiveness. The loyalty to the company and social identity relate to individual inclusion in the team and collective understanding through positive or negative emotional reinforcement. However, the launch of command intelligence is required due to the systemic influence of several factors described by the theory of psychological attitude. The model of the company's image was proposed by the authors with a three-component structure on the psychological attitude basis. It allows for diagnosing and eliminating non-obvious mismatches in the company's image that prevent the launch of team intelligence and reduce

the potential performance. The proposed model is new from a scientific point of view, and opens up new areas for research.

Future research directions could be constructed, with the following aims:

1. Expanding the behavioral component of the model with the “desire to participate in project activities” element and find relevant research methods;
2. Identifying the connection between the model components;
3. Searching for the optimal ratios between model elements for different types of projects;
4. Searching for the most appropriate and low-cost methods to study the model components;
5. Expanding the affective component with the “loyalty to the company” element, which may qualitatively improve the results;
6. Researching and estimating a company’s image impact on high-quality human capital formation.

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