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The Impact of an Enterprise's Intellectualization on Its Leadership Potential

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Abstract: The intellectualization of medical companies is gaining special importance in modern conditions of sustainable development, including the minimization of coronavirus consequences. The study aims to form a methodological approach to assess the impact of enterprise intellectualization on the level of leadership potential in the context of stimulating its components. The study demonstrates the effectiveness of a system of factors for achieving leadership based on the intellectualization of Russian clinics, as well as the construction of a synergistic mechanism for combining factors with each other. The scientific contribution of the study is the proposed methodological toolkit for a comprehensive assessment of the impact of a company's intellectualization on its leadership potential. It provides an opportunity to prioritize the management potential of skills, abilities, and capabilities in order to create a competitive advantage of an enterprise, achieve strategic goals, and form leadership positions in the market. Most of the studied companies were characterized by a lack of balance between leadership potential components in the context of intellectualization. Determining the level of leadership potential development based on companies' intellectualization demonstrated that the level of qualifications determines the corresponding capabilities, which stimulate the development of a clinics' personnel. The tested model of assessing the leadership potential of the studied companies' personnel proves that intellectualization of general clinics influences their leadership potential. It also contributes to sustainable development in the context of actualizing their social component (namely, increased efficiency of medical services, their quality, and, accordingly, the level of health care in general).

Keywords: human capital; innovation; intellectual potential; knowledge economy; leadership stimulation; personal intelligence; sustainability

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1. Introduction

Modernizing shifts in the world economy, its focus on innovative ways of development, and, at the same time, its social orientation should become strategic priorities in the context of sustainable development [1]. The success of these tasks directly depends on the formation of new, quality intellectual potential. The formation of intellectual potential is an important task of national economies in the process of achieving their leadership position on the world stage [2]. Active transition to the knowledge economy determines the direction of an enterprise's development, in which the dominant role in the management and production refers to the intelligence of an individual [3]. In modern conditions, an important task for enterprises is the formation of new competitive advantages based on the effective accumulation of intellectual potential and the development of the intellectual

activity of staff [4]. The solution to these problems is not only to achieve the status of an economic and innovative leader in the domestic and global markets but also to improve the efficiency of an enterprise's management. An effective mechanism in ensuring a high level of competitiveness in today's environment is an enterprise's intellectualization, and a prerequisite for its implementation is the use and multiplication of intellectual potential [5,6].

In post-industrial economy knowledge management, intellectualization processes are a significant challenge to the growth of an enterprise's competitiveness. The intellectual potential of an enterprise's personnel is manifested in its professionalism and creativity, as well as production modification in accordance with the requirements of dynamic markets and individualized consumers [6]. The relevant issue remains the study of the system of factors for achieving leadership, as well as the construction of a synergistic mechanism of factors' combination. The presence of factors in itself does not determine the intellectual leadership of a national economy on the world stage, but only creates opportunities for its achievement. It is a country's ability to identify existing capabilities and incorporate them into the intellectual and innovative process that has a significant social and commercial effect [7]. Researchers who have conducted research in this area look at intellectualization in the process of shaping company leadership from the following angles:

(1) First, as the orientation of an enterprise's activities toward the acquisition, creation, and use of knowledge to turn it into new goods, services, or business models [8,9];
(2) Second, as a manageable structure, characterized by the ability of managers to understand and manage key processes, business strategy, and the speed with which the business is able to find, respond to, and fix problems that arise [10];
(3) Third, as a stimulating effect of intellectual capital on the economic object that constantly attracts, produces, and distributes components of intellectual potential, thereby supporting the transfer and dissemination of intellectualization, and the promotion of new and specialized knowledge, goods, and services [11];
(4) Fourth, as the active use of the unique abilities of individuals to create innovative products and information technology, the widespread introduction of intellectual components, the creation and development of new industries and applications of knowledge [12].

The investigated issue attracts scientific interest, but there is a focus on individual characteristics or processes related to intellectualization. Despite the presence of multifaceted and multidirectional modern studies of intellectualization, its impact on a company's leadership potential is insufficiently studied. Therefore, there is an objective need to study the formation of leadership capacity based on intellectualization. Considering the situation with increased needs of the population for quality health care in the context of sustainable development and minimizing COVID-19 consequences, this study aims to fill a gap in science by forming a methodological approach to assess the impact of intellectualization on generalist clinics' leadership capacities in the context of stimulating their components. Clinics' activities in the context of a pandemic take on special significance at the current stage of health care development. A prerequisite for adequate development is the recognition of the fact that health care institutions are producers of a special commodity in the form of medical services. One of the most important managerial tasks in the field of public health is to achieve sustainability targets: improving the quality and accessibility of medical care through the effective use of limited financial, material, labor, and other health resources in a rapidly growing competition in the market of medical services. However, insufficient attention is paid to the processes of medical institutions' intellectualization, which can become a platform for the sustainable development of a country. Therefore, this study aims to investigate the impact of intellectualization on the ability of medical companies to form leadership positions and thereby increase the level of sustainability in the context of health care, providing the population with quality health services.

The study was based on the materials of general clinics in Russia; this country has been implementing health care reform for 10 years. Patients complain about the poor

conditions, queues to see specialists, and shortages of specialists. Medical workers, in turn, are dissatisfied with their salaries and high workloads. Health care reform has led to a massive reduction in the number of medical facilities in the country. Therefore, the intellectualization of clinics can be a driver not only of their leadership potential, but also of the country's sustainable development in the context of improved health care.

This allowed for highlighting the study purpose—to form a methodological approach to assess the impact of an enterprise's intellectualization on its leadership potential in the context of stimulating its components. To achieve this goal, the following research tasks were solved. Firstly, based on expert evaluation, three groups of indicators characterizing the intellectualization of activity were formed, each of which, in turn, contains a different number of attributes. Secondly, the diagnosis of leadership potential elements in the context of intellectualization of the studied companies was carried out. Thirdly, a correlation analysis between intellectualization's integral indicators and the integral indicator of leadership potential was carried out. Fourthly, a model for assessing potential leadership developments based on an enterprise's intellectualization was developed and tested on the studied companies.

2. Literature Review

2.1. Peculiarities of Intellectualization in the Context of Leadership Potential Formation

On the scale of a national economy, intellectualization has a large reserve of economic activity and is a key vector of innovation development of the modern information society. This is the only factor, the development of which is a fairly limitless resource in terms of both qualitative, quantitative, and temporal parameters [13]. At an enterprise level, intellectualization is the basis of modern development, strengthening the competitive advantages, entrepreneurial and managerial skills, and leadership qualities of employees. It sets the pace and character of managerial innovations in an enterprise's management system [14,15]. Intellectual potential, developing based on previous forms, absorbs their basic properties and, at the same time, has its own meaning, which is determined by:

- the presence and progressive development of intellectual property [16];
- formation of a creative thinking type of employees [17];
- the predominant formation of the intellectual center, which gradually covers the entire set of factors of production, distribution, exchange, and consumption [18].

At a time when the imperative of national economic survival and global responsibility for the future is globally recognized, the diversity of society's social structures is increasing, and the objective need to develop multifaceted and flexible thinking is recognized [19]. The key value and the main capital of a modern enterprise becomes a creative employee, capable of seeking and mastering new knowledge and making non-standard decisions. The value of the intellectual potential of an enterprise's personnel is manifested in their professionalism and creativity of thinking, along with the modification of the production structure in accordance with the requirements of dynamic markets and individualized consumers [20,21]. Intellectualization becomes the main condition for scientific and technological progress, as it changes labor into creative activity of personnel [22].

It is possible to distinguish intellectualization features in the context of leadership potential formation. The first direction covers scientific research, where the primary source of intellectualization is a person—an individual who has natural abilities and is able to learn and accumulate knowledge [23]. The intellectual abilities of a person are the most dynamic component of leadership potential, which require constant development, training, and, therefore, they are less stable and more difficult to measure [24]. The second area of research includes definitions that characterize the cumulative acquired opportunities for further use in the operation of an enterprise [25]. The third can include definitions that see intellectualization as the accumulated body of information and knowledge that can be used in the future in leadership capacity formation [26]. The fourth direction characterizes intellectualization as an integral abstract category. Adaptive nature is manifested in the interpretation of intellectualization as the readiness of an enterprise and an individual to

open up to changes in the external environment through the improvement of technology, the exploration of new markets, the development of new products, increasing production and sales, etc. [27].

According to belonging to a certain level, intellectualization can be seen as the basis of forming the intellectual potential of:

- a territorial community (planet, country, nation, region) [28];
- a socioeconomic system (enterprise, corporation) [29];
- an industry (engineering-technological, educational, economic thought, managerial level) [30];
- an individual (human potential) [31].

According to the resource characteristic, intellectualization is the basis of intellectual potential, which is considered as a set of intellectual resources: knowledge, abilities of individuals (groups of people), the educational system, computer support, communications system, databases (libraries and electronic systems), and the system of science [32].

Within the functional characteristic, intellectualization is interpreted through the prism of economic actors' ability to perform certain actions in order to leverage their intellectual resources [33,34]. According to the target characteristic, the definition of intellectualization focuses on the application of intellectual resources to achieve the goals, in particular to create scientific, technological, and managerial innovations, transfer information, etc. [35].

2.2. Factors of Enterprise Intellectualization and Leadership in Today's Environment

It should be taken into account that the drivers of an enterprise's intellectualization are two components. First, an enterprise itself in the form of acquired (cumulative) intellectual achievements (technical, technological, organizational, structural, and product innovation, information and communication technologies, software, managerial experience, etc.) [36]. Second, personal potential, which belongs to the staff (knowledge, skills, competence, and creativity) [37].

Factors of leadership in today's environment should also include the ability of a subject to use their own or attracted resources and their combination to produce modern goods using modern technologies [38]. Innovativeness and entrepreneurial talent are defined as the basis of competitiveness and leadership. The competitiveness tree illustrates the interrelation of factors and prerequisites of competitiveness as the basis of leadership potential [39]. In this case, an important factor contributing to the leadership of companies or countries is the growth of scientific research, especially in the high-tech sector. The materialized result of such activity is most often patents and licenses, which form the intellectual property rights market. In turn, such results of intellectual activity become generators of further development, affecting a country's participation in global processes and its ability to share knowledge [40]. Individual opportunities for the development of intellectualization are quite specific because they are determined by subjective factors and depend on the activity of an individual [41]. However, within a state, such activity can be stimulated by the presence of specific opportunities for personal development. Thus, the formation of individual intellectual potential occurs in the system of family upbringing, education and science, and its implementation—already in the conditions of professional activity. Thus, the development of opportunities and the achievement of intellectual leadership is influenced by a huge number of factors, each of which is not decisive, but the totality of which provides the economy its position in the world economic arena. As can be seen, the greatest influence on the formation of these factors is exerted by a state and its institutions, as well as large corporations as key market players. A state has the greatest influence on resource and environmental factors (creating conditions for the development of the non-profit sector of the economy, infrastructure, education, science, culture, access to them by the population, etc.). Whereas business largely influences the achievement of intellectual activity results (patent activity, the formation of royalty and license fee flows, high-tech production, etc.) and their practical implementation [42].

It is important to emphasize the multifaceted and multidirectional modern research of intellectualization. At the same time, its impact on a company's leadership potential is insufficiently studied. The investigated problems in a number of scientific works indicate the absence of a core concept of leadership potential formation based on intellectualization. While there is considerable scientific attention to the topic under study, the emphasis in the works is on individual attributes or processes that characterize intellectualization. However, given the multifaceted modern scientific research on intellectualization, the impact of its level on a company's leadership potential is not sufficiently studied. In this regard, there is an urgent need to consider the problem of leadership capacity building based on the development of intellectualization processes. Against the background of increased public demand for quality health care in the context of sustainable development and the mitigation of COVID-19 losses, this study attempted to fill the resulting scientific gap. Namely, it developed a methodological approach to assess the impact of intellectualization on enterprises' leadership potentials in the context of stimulating its components on the example of general clinics. To achieve this goal, the following scientific hypotheses were proposed:

Hypothesis 1 (H1). *A company's increased intellectualization effectiveness contributes to an increase in its leadership potential;*

Hypothesis 2 (H2). *Harmonization of intellectualization can stimulate a company's leadership potential.*

3. Materials and Methods

The methodology of this study is based on determining the integral indicators of intellectualization affecting the leadership potential of an enterprise, their correlation analysis, and testing of the proposed model for assessing leadership potential.

When forming the system of indicators, for informativeness and significance of the integral indicator, a large number of diverse input indicators were grouped according to a certain characteristic. This made it possible to identify the main groups of indicators of companies' leadership potential: skills (S), capabilities (C), and abilities (A).

The selection of these groups of indicators is due to the fact that assessing potential is based on the diagnosis of qualification sets (knowledge, skills, experience), opportunities, and abilities of employees. Thus, S group characterizes the following:

- the level of education and qualifications of the staff;
- common understanding of the mission, main goal, objectives, and vision of a business;
- knowledge and understanding of the key success factors and performance indicators;
- understanding the risks and arising problems;
- knowledge and understanding of business development methods and technologies;
- clear understanding of roles and responsibilities of each employee and the entire team [43,44].

The C group, characterizing the opportunities of personnel and a company, contains the following indicators:

- a climate conducive to the learning and intellectualization of a business;
- flexible communication channels;
- opportunities to attract progressive forms and methods of personnel training;
- flexible mechanisms of remuneration, stimulation, and motivation of personnel;
- financial capabilities of personnel;
- material and technical capabilities of personnel development [45,46].

When considering A group, the following indicators of a company's intellectualization are highlighted:

- ability to quickly make and implement various decisions;
- ability for group learning and self-development;
- ability to exchange information;

- ability to adopt and apply best business practices;
- ability to resolve conflicts;
- ability to create, implement, and develop own intellectual assets (patents, copyrights, know-how, etc.);
- ability to navigate in extreme situations, solve problems, etc. [47,48].

Based on a survey of experts, the degree of importance of intellectualization indicators was assessed. Along with indicators of relative importance, it is essential to determine consistency of expert opinion [49]. The consistency of expert opinion on the relative importance of the *j*-th factor was determined by the coefficient of variation for each factor:

$$Vj = \frac{\sigma_j}{Mj} \quad (1)$$

where $\sigma_j = \sqrt{\frac{1}{m_j - 1} \sum_{i=1}^{m_j} (C_{ij} - M_j)^2}$—standard deviation ($m_j$—the number of experts who evaluated the *j*-th factor);

$M_j = \frac{1}{m_j} \sum_{i=1}^{m_j} C_{ij}$—the average statistical value of the estimate of each of the factors.

The degree of consistency of expert opinions on the relative importance of all proposals for evaluating the factors can be checked using the coefficient of concordance, which is defined by the following formula [50]:

$$W = \frac{12 \sum_{k=1}^{n} \left[\sum_{i-1}^{m} c_{ik} - m(n+1)/2 \right]^2}{m^2 (n^3 - n)} \quad (2)$$

where *m*—number of experts, *n*—number of factors, and $\sum_{i-1}^{m} c_{ik}$—the sum of the ranks for each factor.

The concordance coefficient can take values from 0 to 1. It is determined for each question in the context of "relative importance assessment". In the case of complete agreement of the experts' opinions, $k = 1$. If the value of the concordance coefficient is small, it means that there is weak agreement of the experts' opinions. The reason for the low concordance of experts can be either the actual absence of a common opinion among experts, or there are groups of experts with high concordance of opinions, but their general thoughts are opposite.

The significance of the concordance coefficient was assessed using X^2 criterion. The integral indicator of leadership potential (LP) in the context of a company's intellectualization is calculated using a linear weighted convolution, as the average value of integral indicators of each component of potential, taking into account the weight w_i of the corresponding group of indicators in the quantitative assessment of intellectual potential:

$$LP = \sum_{i=1}^{n} w_i \cdot IP_i \quad (3)$$

where IP_1—integral indicator of S group; IP_2—integral indicator of C group; IP_3—integral indicator of A group.

To determine the relative importance of factors, the following value was determined:

$$w_{ij} = \frac{C_{ij}}{\sum_{j=1}^{m} C_{ij}} \quad (4)$$

where C_{ij}—evaluation of the *j*-th factor by the i-th expert; w_{ij}—weight of *j*-th factor according to the *i*-th expert.

The weight of the factors according to all experts was found by the formula:

$$w_j = \frac{\sum_{i=1}^{m} w_{ij}}{\sum_{i=1}^{m} \sum_{j=1}^{n} w_{ij}} \quad (5)$$

The conclusion about an enterprise's intellectualization can be made based on expert evaluations scale. One can use, for example, a universal scale of Harrington, depending on the total integral indicator, based on the assumption about the law of non-uniform distribution of the criterion and the formation of its change ranges [51].

According to the Harrington scale, the criteria for assessing LP in the context of a company's intellectualization can be presented as follows:

(1) if the level is from 0 to 0.20 (crisis), then the pre-crisis level of LP is observed;
(2) if the level is between 0.21 and 0.37 (low), then there is a low LP;
(3) if the level is between 0.38 and 0.63 (sufficient), then a normal LP level is observed;
(4) if the level is between 0.64 and 0.80 (acceptable), then an average (stable) level of LP is observed;
(5) if the level is from 0.81 to 1 (high), then there is a high (innovative) level of LP.

To test the proposed algorithm for assessing leadership potential based on intellectualization of activities, 8 private general clinics in Russia were selected, namely: Aksis, Mediteks, Astra-Med, Spektra, Paratsels, AvisMed, Palitra, and MirA. The main criterion for the selection of these clinics was an annual revenue of USD 2.5 million, according to which the studied companies are leaders in their market.

After a thorough analysis to assess LP, a questionnaire was created to get a deeper understanding of the employees (experts) and determine the key indicators of LP assessment in the context of a company's intellectualization.

In order to implement the procedure of expert evaluation, expert groups were formed at each company. An insufficient sample can lead to unreliable information and unreliable conclusions, and a large sample can lead to irrational expenditure of resources. Therefore, the number of experts was determined by the statistical method. Assuming that the margin of error for the general population of experts is 20%, the normalized deviation for the level of significance is $t_{\propto} = 1.98$ ($\alpha = 0.05$), and considering that the calculation of the required sample size is carried out for an alternative feature and its proportion is unknown, it is taken equal to its maximum value of 0.5. Then, the general formula for determining the sample size n can be represented as: $n = \frac{25 \cdot {t_{\propto}}^2}{\wedge^2}$.

Since $n = \frac{25 \cdot 1.98^2}{0.04} = 24.5$, then it is enough to subject 25 workers to the survey in order to draw statistically reliable conclusions with a 95% confidence level with a marginal error not exceeding 20%.

Expert competence was evaluated based on objective data (educational level, work experience in the industry (not only in the clinic under study), experience in similar examinations, etc.).

The distribution of the expert group by level of education shows that 58% are employees with complete higher education, 42% have the basic level of education, and none have secondary special education. The experience of the experts of more than 10 years—27%, 5–10 years—42.5%, 3–5 years—25%, and less than 3 years—5.5%, but only 23% had experience in the surveys.

To statistically substantiate the competence level of each expert, the sum of points for all the criteria for each expert, the relative value of the level, and the parameter for the membership function were determined. The calculations showed an average or high level of experts, and no experts with a low membership function were identified (Figure 1).

According to the proposed approach, the choice of management strategy for the intellectualization of enterprises is based on calculating the aggregate strategic indicator of intellectualization of the studied clinics; it is also based on determining the total volume of the integrated model according to following the formula:

$$V = \int_0^H \frac{S_\Delta}{H^2} x^2 dx = \frac{S_\Delta x^3}{3H^2} \Bigg| \begin{matrix} H \\ 0 \end{matrix} = \frac{1}{3} S_\Delta H \quad (6)$$

where V—aggregated strategic indicator of a company's intellectualization, (coefficient); S_Δ—the area of a company's intellectualization platform (coeff.), which is determined by the following formula:

$$S_\Delta = \frac{1}{2} sin \frac{360^\circ}{n} \cdot \left(a_{ni} \cdot a_{1i} + \sum_{m=1}^{n-1} a_{mi} \cdot a_{(m+1)i} \right) \quad (7)$$

where a_{mi}—sides of the basic leadership potential; integral evaluation indicators of potential components: skills (IP_S), capabilities (IP_C), and abilities (IP_A), which are calculated according to the formulas:

$$a_1 = \sqrt{IP_S^2 + IP_C^2 - 2 \cdot IP_S^2 \cdot IP_C^2 \cdot cos \frac{360^\circ}{n}} \quad (8)$$

$$a_2 = \sqrt{IP_C^2 + IP_A^2 - 2 \cdot IP_C^2 \cdot IP_A^2 \cdot cos \frac{360^\circ}{n}} \quad (9)$$

$$a_3 = \sqrt{IP_A^2 + IP_C^2 - 2 \cdot IP_A^2 \cdot IP_C^2 \cdot cos \frac{360^\circ}{n}} \quad (10)$$

where IP_S—integral indicator of skills potential evaluation, coefficient; IP_C—integral indicator of capabilities potential evaluation, coefficient; IP_A—integral indicator of abilities potential evaluation, coefficient; n—the number of leadership potential components in the context of assessing an enterprise's intellectualization.

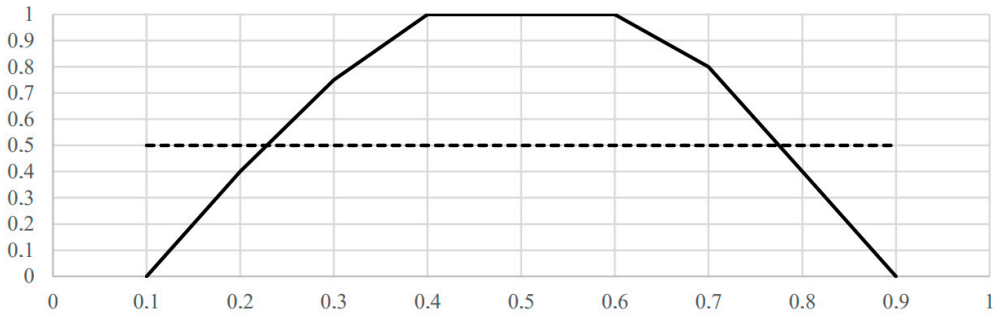

Figure 1. Membership function of the sample of experts. Source: generated by the authors.

To determine leadership potential based on intellectualization of the studied enterprises by its components, i.e., by skills, capabilities, and abilities, the model is proposed (Figure 2).

According to the presented model, the stimulation of leadership potential development based on an enterprise's intellectualization is represented as an angle (G^{SCA}) between the actual vector of intellectualization (Formula (11)) and the reference vector (Formula (12)) as follows:

$$\| G^{SCA} \| = \sqrt{IP_S^2 + IP_C^2 + IP_A^2} \quad (11)$$

$$\| 1^\backslash \| = \sqrt{1^2 + 1^2 + 1^2} \quad (12)$$

where G^{SCA}—the level of stimulation of leadership potential development, taking into account its components in the context of skills, capabilities, and abilities of a company; IP_S—integral indicator of skills potential evaluation, coefficient; IP_C—integral indicator of capabilities potential evaluation, coefficient; IP_A—integral indicator of abilities potential evaluation, coefficient.

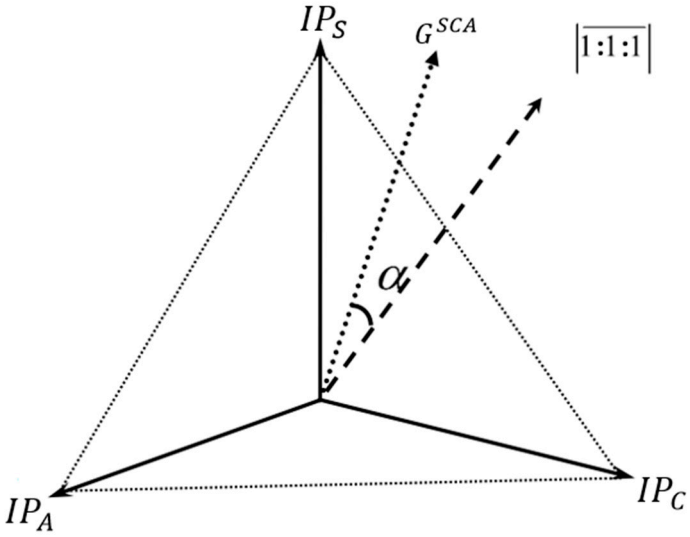

Figure 2. Model for assessing leadership potential based on an enterprise's intellectualization. Source: compiled by the authors.

The angle between the vectors of potential leadership assessment (potential of skills, capabilities, and abilities) is measured in degrees and determined by the following formula [52]:

$$\beta = arccos \frac{IP_S + IP_C + IP_A}{\sqrt{n} \cdot \sqrt{IP_S^2 + IP_C^2 + IP_A^2}} \quad (13)$$

where β—the angle between the actual and reference value of the i-th vector of leadership potential assessment; n—number of indicators to assess leadership potential.

The range of the angle is within $0 < \beta < \beta max$, where βmax is determined by the following formula:

$$\beta_{max} = arccos \frac{1}{\sqrt{3}} \quad (14)$$

The value is interpreted as follows: the closer the value of arccosine approaches 1, the greater the level of leadership potential development.

4. Results

Based on the questionnaire, the intellectualization problems of the studied companies were identified. Thus, in spite of the fact that 98% of respondents work in the field they are qualified for, only 77% are satisfied with their job, and there are none who are completely satisfied. At the same time, 96% of employees are not going to change their profession (Figure 3).

The formation of intellectual activity depends on the opportunities that individual employees and a company as a whole have. The survey showed that 72% to 88% of respondents deem professional plans and changes for the better to be feasible. All respondents want to work better and more efficiently, but 6.5% are ready to retrain. Answers regarding the presence of conditions (salary, level of automation, favorable circumstances—atmosphere in the team, management style) conducive to their successful work are shown in Figure 4.

At all of the studied companies, there are opportunities to increase staff activity, such as organizational conditions, technical and human resources, operational management, and so on. However, there is a very low level of material and moral encouragement of professional development, especially in such surveyed clinics as Aksis, Astra-Med, and AvisMed. More than 50% of Spektra employees believe their managers make unbiased personnel decisions, i.e., selection and promotion are based on qualifications and business qualities. When evaluating the potential capabilities of an employee, it is necessary to

take into account not only their successful performance but also their ability to develop professionally and learn. Professional abilities show personnel potential and significantly influence their motivation for further development. The survey showed that the number of selected abilities inherent in the respondents depends on a company, the level of education, length of service, etc. The graphical representation of personnel abilities for each of the studied companies is shown in Figure 5.

Based on the questionnaire data and leadership potential indicators, integral indicators for each leadership potential component were calculated and each company's leadership potential was assessed (Table 1).

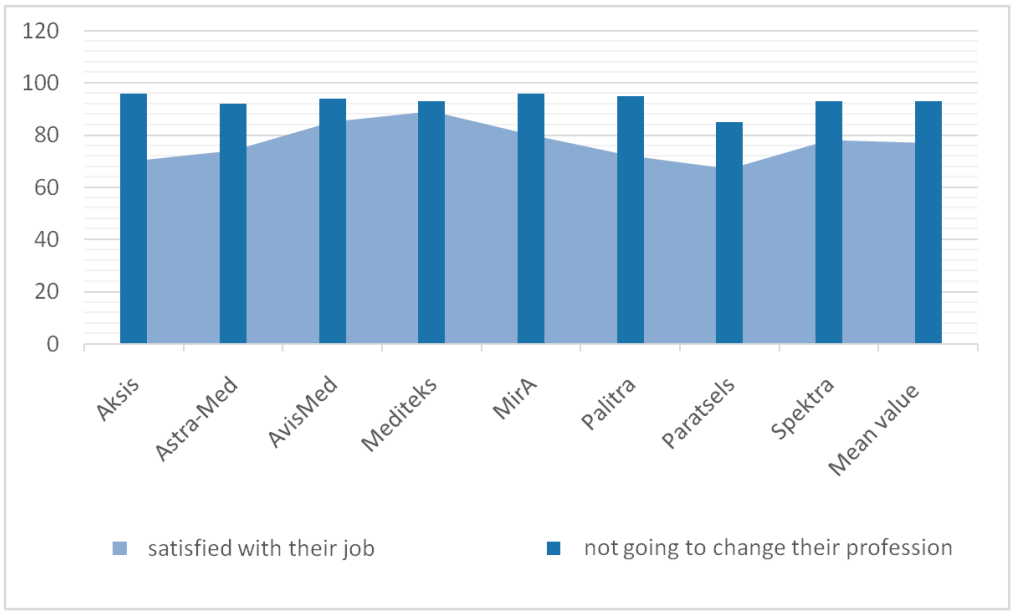

Figure 3. Results of questioning the personnel of the surveyed companies on job satisfaction. Source: Formed by the authors.

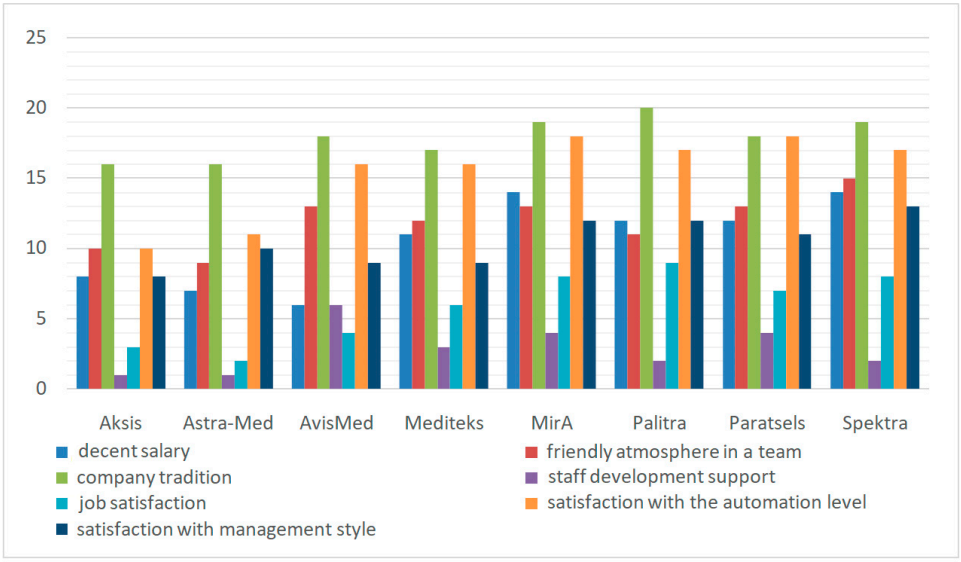

Figure 4. Opportunities to improve personnel potential according to the questionnaire results. Source: Formed by the authors.

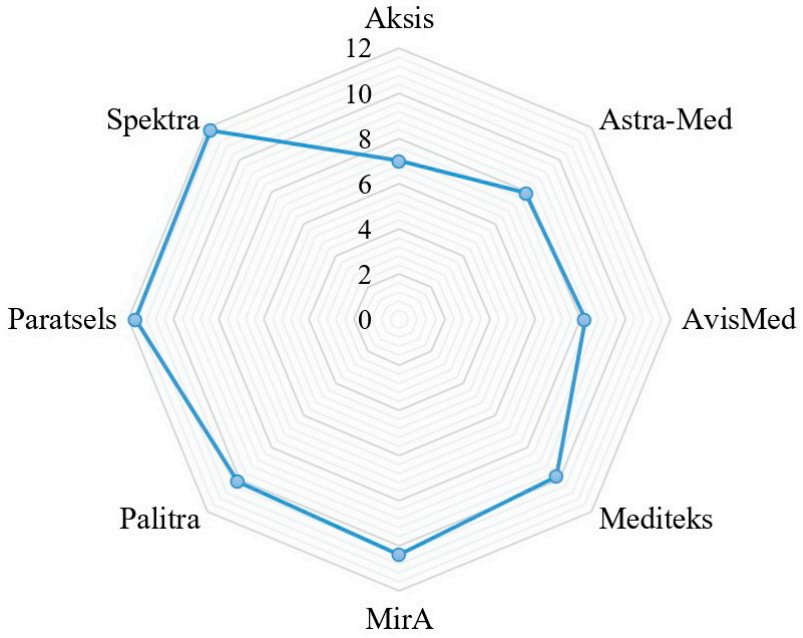

Figure 5. Employee development level of the studied companies. Source: Formed by the authors.

Table 1. Determining the level of leadership potential and its components in the context of intellectualization of the studied companies.

Company	IP_S	IP_C	IP_A	LP	The Level of Leadership Potential in the Context of a Company's Intellectualization
Aksis	0.55	0.76	0.47	0.59	Sufficient
Astra-Med	0.56	0.74	0.53	0.61	
AvisMed	0.53	0.77	0.54	0.62	
Mediteks	0.61	0.76	0.65	0.67	Acceptable
MirA	0.74	0.80	0.70	0.75	
Palitra	0.67	0.79	0.67	0.71	
Paratsels	0.72	0.80	0.78	0.77	
Spektra	0.77	0.82	0.78	0.79	

Note: IP_S—integral indicator of the intellectual potential (skills); IP_C—integral indicator of the intellectual potential (capabilities); IP_A—integral indicator of the intellectual potential (abilities); LP—integral indicator of leadership potential. Source: Formed by the authors.

The assumption is also made that individual indicators and elements of potential have the same effect on the overall level of leadership potential, and there is no need to determine the significance (weight) of each of the selected indicators. Figure 5 shows the values of IP_S, IP_C, and IP_A, and Figure 6 shows the distribution of the companies under consideration according to the overall integral indicator of leadership potential in the context of intellectualization.

As the results show, for more than 60% of the studied companies (Mediteks, MirA, Palitra, Paratsels, Spektra), the total integral indicator of leadership potential ranges from 0.67 to 0.79. According to the Harrington scale, this level is defined as acceptable; this can be associated with the fact that companies actively use their potential to increase the intellectual activity of personnel. The values of integral indicators of three companies (Aksis, Astra-Med, AvisMed) testify to insufficient intellectual activity management, as the total integral indicator of leadership potential varies from 0.59 to 0.61. Among the

outsiders was the Aksis company. This indicates that this clinic does not pay attention to increasing the value of its intellectual activity (Figure 7).

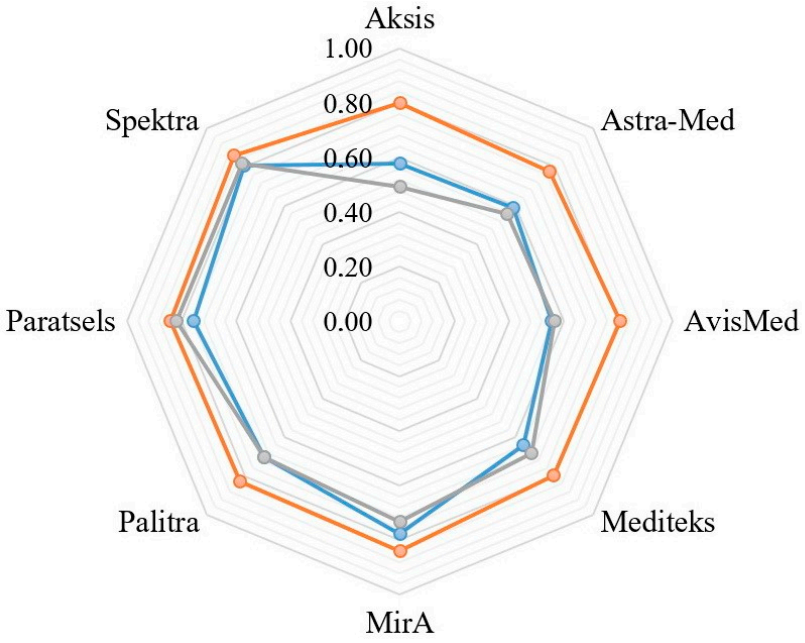

Figure 6. Distribution of the studied companies by integral indicators within potential elements. Source: Formed by the authors.

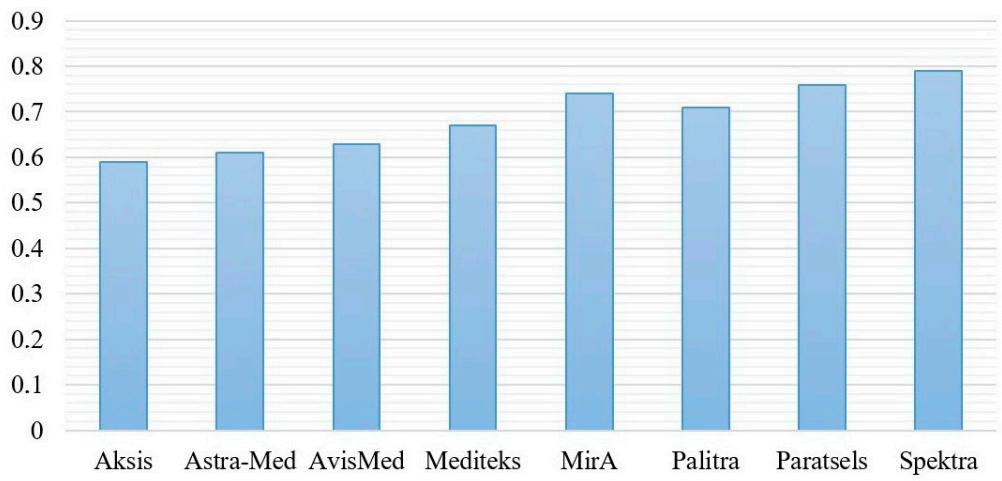

Figure 7. Leadership potential in the context of the studied companies' intellectualization. Source: Formed by the authors.

The matrix of pair correlation coefficients (Figure 8) allows one to conclude that there is a significant correlation between the S, C, and A integral indicators.

Based on the correlation analysis, one can state that there is a relationship between the factors and the components of the integral indicator of leadership potential. The strongest correlation is fixed between the indicators of skills and abilities (0.931). Among the components of leadership potential in the context of intellectualization, the indicator of ability potential has the greatest influence (0.982). The relationships identified are generally high, as they are above 0.75. This confirms the adequacy of a comprehensive approach to assessing leadership potential based on intellectualization. The comparison of the actual (Table 2) and critical value of the t-criterion allows one to state that with the probability 0.99, the correlation coefficients are significantly different from zero; that is, the selected potential components correlate with each other.

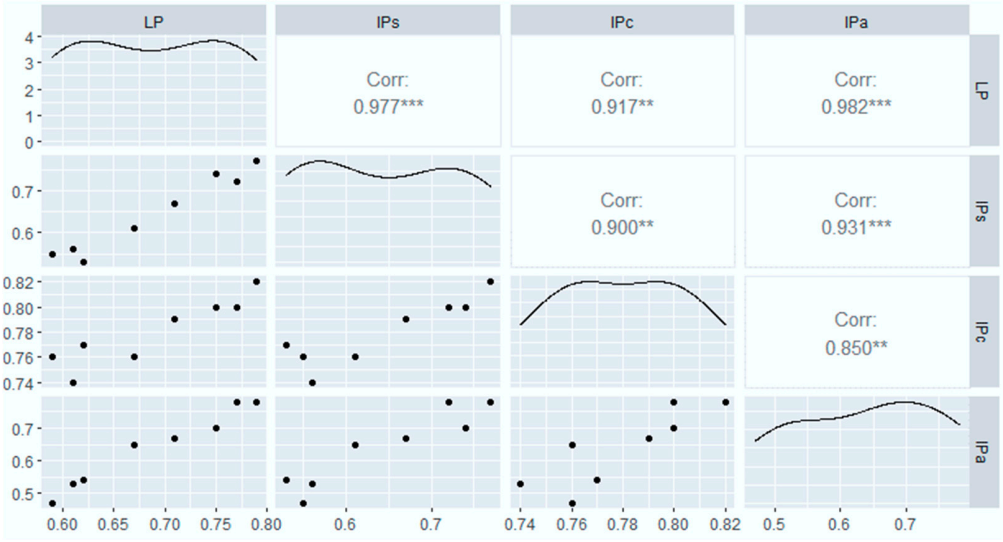

Figure 8. Matrix of pair correlation coefficients between integral indicators of leadership potential components and the total integral indicator of leadership potential. ** $p \leq 0.01$, *** $p \leq 0.001$. Source: Formed by the authors.

Table 2. Significance indicators of paired correlation coefficients.

Indicators	t_{obs}	t_{crit}; k for the Bilateral Critical Region
IP_S, IP_C	4.68	$t_{crit}(0.01, 6) = 3.73$
IP_S, IP_A	5.84	
IP_C, IP_A	3.76	

Source: Formed by the authors.

This test of the significance of sample correlation coefficients is necessary because the sample size is very small. Having obtained an overall integral indicator of leadership potential for each company under study, it is possible to rate them. The ranking methods provide an opportunity to compare enterprises with each other, not only with the established standard; they are based on ranking by a certain indicator from the best to the worst. Similarly, enterprises were ranked according to the values of integral indicators (Table 3).

The results of assessing leadership potential of the studied companies are presented in Table 4, and the diagrams in Figure 9 graphically demonstrate them.

Table 3. Ranking the companies under study by the integral indicator of leadership potential in the context of their intellectualization.

Company	IP_S		IP_C		IP_A		LP	
	Value	Rank	Value	Rank	Value	Rank	Value	Rank
Aksis	0.56	7	0.76	6–7	0.47	8	0.59	8
Astra-Med	0.57	6	0.75	8	0.54	6	0.62	6
AvisMed	0.54	8	0.78	5	0.55	7	0.63	7
Mediteks	0.62	5	0.77	6–7	0.66	5	0.68	5
MirA	0.75	2	0.81	2–3	0.71	3	0.76	3
Palitra	0.68	4	0.80	4	0.68	4	0.72	4
Paratsels	0.73	3	0.81	2–3	0.79	2	0.76	2
Spektra	0.78	1	0.83	1	0.79	1	0.80	1

Source: Formed by the authors.

Table 4. Assessing the area of basic leadership potential in the context of the studied companies' intellectualization.

Company	Sides of Basic Leadership Potential			Area of Basic Leadership Potential (*S*)
	a_1 (IP_S)	a_2 (IP_C)	a_3 (IP_A)	
Aksis	0.199	0.217	0.102	0.249
Astra-Med	0.186	0.190	0.111	0.224
AvisMed	0.209	0.207	0.106	0.255
Mediteks	0.195	0.196	0.149	0.280
MirA	0.224	0.218	0.194	0.391
Palitra	0.211	0.211	0.167	0.334
Paratsels	0.220	0.232	0.212	0.428
Spektra	0.237	0.239	0.223	0.474

Source: Formed by the authors.

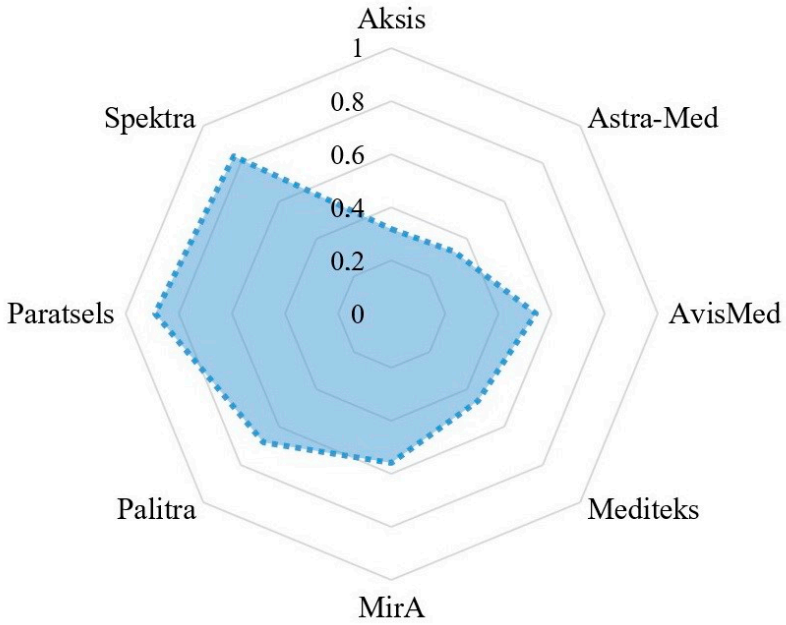

Figure 9. Coefficients of leadership potential based on the studied companies' intellectualization. Source: Formed by the authors.

Of all the studied companies, the highest scores were given to Paratsels and Spektra, 0.428 and 0.474, respectively; the lowest was given to Astra-Med, whose indicator of leadership potential area assessment is 0.224. The vast majority of the companies under study are characterized by a lack of balance between leadership potential components in the context of intellectualization, as the sides have different lengths.

The results of calculating the arccosine β and intellectualization coefficients (G^{SCA}) for the studied companies are shown in Table 5.

The graphical interpretation of the obtained indicators of leadership potential based on enterprises' intellectualization is shown in Figure 9.

The assessment of the leadership potential of the studied companies in the context of intellectualization according to three potential components (skills, capabilities, and abilities) allows for stating that the highest values of indicators are typical for the two studied clinics—Paratsels and Spektra—0.89 and 0.84, respectively. This demonstrates the harmonious intellectualization of activities (according to potential elements), that is, the level of skills determines the corresponding opportunities that stimulate the development of abilities of these clinics' staff. Thus, it is possible to accept the hypotheses formed. The

conducted research proved that increasing the efficiency of a company's intellectualization contributes to the increase of its leadership potential. At the same time, harmonization of intellectualization can stimulate the development of a company's leadership potential. Thus, increasing the level of intellectualization of general clinics affects their leadership potential, stimulating sustainable development in the context of health care.

Table 5. Coefficient of leadership potential based on companies' intellectualization according to S, C, and A groups of indicators.

Company	*arccos β*, Degrees	$1-\frac{\beta}{\beta_{max}}$	Reduction Factor (Ω)	Degree of Harmonizing Intellectualization (G^{SCA})
Aksis	83.24	−0.613	0.32	0.32
Astra-Med	82.73	−0.603	0.33	0.33
AvisMed	71.64	−0.388	0.54	0.54
Mediteks	75.69	−0.467	0.46	0.46
MirA	70.81	−0.372	0.56	0.56
Palitra	64.51	−0.250	0.68	0.68
Paratsels	53.73	−0.041	0.89	0.89
Spektra	56.46	−0.094	0.84	0.84

Source: Formed by the authors.

5. Discussion

The advantage of the conducted research is a comprehensive assessment of the level of intellectual components of enterprises' leadership potential. The proposed methodological approach to assess the level of enterprises' intellectualization based on quantitative and qualitative assessment of three components allows for making informed managerial decisions [53]. The study confirms the need for a symbiosis of qualitative and quantitative assessment, which provides a platform for making effective management decisions [54]. The study focuses on the fact that, in this aspect, the intuition and knowledge of the decision maker on the optimal strategy for managing an enterprise's intellectualization do not acquire special importance [55].

In the context of theoretical advantage, the proposed toolkit has many characteristics similar to those of the resource approach to the study of intellectualization as a set of intellectual resources: knowledge, competencies, information support, communication systems, databases, etc. [32]. The results obtained based on the proposed methodological approach allowed for accepting the first hypothesis, because, on their basis, it is proven that increasing the efficiency of a company's intellectualization contributes to increasing its leadership potential. The positive side of the proposed methodical approach is the possibility to identify the level of intellectuality of an enterprise's intellectualization components, which is of great importance when substantiating and implementing the directions of strategic development of a company's leadership potential [56]. This allows considering a set of factors rather than individual manifestations of intellectualization, such as intellectual property [16], professionalism and creative thinking [20] or the use of intellectual resources [33]. Therefore, this study, as an advantage, provides an opportunity to identify and combine the individual elements of leadership potential in order to identify the synergistic effect of their impact. This can help to identify promising areas to improve the level of intellectualization of an enterprise and its leadership potential as a whole [57].

The practical advantages of the study include the ability to justify the choice of the most effective strategy for managing the intellectualization of the studied clinics based on identifying real problems that create barriers to increasing the level of leadership capacity in this area and finding out the reasons for their occurrence [58]. A distinctive feature of the conducted research is also the possibility of forming reasonable conclusions about the harmony of intellectualization of activities, taking into account the constituent elements

of potential in the context of business intellectualization (skills, abilities, and capabilities) based on the developed linguistic scale [59]. According to this linguistic assessment scale, the intellectualization of the activity can be considered harmonious if the value of the boundary coefficient is exceeded [60]. Testing the proposed methodology allowed for accepting the second hypothesis of this study. It is confirmed by the obtained results, which proved that the harmonization of intellectualization can stimulate the leadership potential of a company.

Based on the presented methodical approach to the assessment of the level of intellectual leadership potential, taking into account an enterprise's three intellectualization components, it is also necessary to take into account the specifics of the investigated industry [61]. This indicates a limitation of the conducted research, as the approach is individual and the most optimal for the relevant industry and for a particular enterprise. To level this limitation in order to determine the system of key indicators for each of the components of intellectual potential in the context of leadership, there is a need to form a group of experts of the studied industry. Therefore, in order to conduct similar research on the materials of companies from another country, a new survey of experts is required, since the conditions for the development of enterprises may be different. Due to the diversity and specificity of business in different industries, this comprehensive approach cannot be universal since the processes of intellectualization and their significance may differ significantly in different industries [62,63].

6. Conclusions

The proposed methodological approach to assessing the studied enterprises' intellectualization allowed for identifying clinics with sufficient intellectualization. Since the studied companies are leaders in the market of medical services, it should also be noted that the results of this study can be used by the top management of companies in this area. This study proves that the intellectualization of general clinics affects their leadership potential and also contributes to their sustainable social development based on the increased efficiency of service provision.

The survey allowed for identifying the studied companies' intellectualization problems and opportunities of increasing personnel potential. The results of assessing personnel potential indicate that it is necessary to take into account not only the successful performance, but also the ability to develop professionally and learn. Professional abilities show personnel potential and greatly influence their motivation for further development. Defining indicators for three leadership potential components made it possible to calculate integral indicators for each component and assess the overall leadership potential for each company. This allowed identifying a group of companies, which are characterized by an overall integral indicator of leadership potential at an acceptable level. This can be explained by the active increase of personnel intellectual activity by the companies. A group of companies was also identified for which the value of integral indicators indicates ineffective management of intellectual activity.

The correlation analysis between the S, C, and A integral indicators confirmed a close relationship between these elements. The ranking of the studied companies by the integral indicator of leadership potential in the context of their intellectualization became the basis for determining the sides and area of the basic leadership potential of the studied companies. This made it possible to identify leaders and outsiders among the studied sample of clinics. The majority of the studied companies are characterized by a lack of balance between leadership potential components in the context of intellectualization, since the sides are of different lengths. The definition of leadership potential based on the S, C, and A indicators demonstrated that skills determine the capabilities that drive the development of the clinical staff. The results of assessing leadership potential based on intellectualization provide an information basis for the timely identification of "weaknesses" in intellectualization management.

The proposed methodological toolkit for assessing the impact of a company's intellectualization on its leadership potential provides an opportunity to identify priorities for the formation of competitive advantages of an enterprise, achieving strategic objectives, and forming leadership positions in the market. Its application can be an important step in improving the efficiency of medical institutions, which in turn contributes to the sustainable development of a country in the context of providing the population with quality medical services that meet modern market requirements. The implementation of the proposed intellectualization harmonization allows for the rational use of resources necessary to improve the effectiveness of clinics and their sustainability by identifying the most significant factors of leadership capacity.

The limitation of the conducted research is the specifics of the studied companies' functioning, namely the health care sector. To level this limitation in order to determine the system of key indicators for each of the intellectual potential components in the context of leadership, it is necessary to form a group of experts of the studied industry. Therefore, in order to conduct a similar study on the materials of companies from another country, a new survey of experts is required, since the conditions for the development of enterprises may be different. In addition, due to the diversity and specificity of business functioning in different industries, the proposed methodological approach cannot be universal and requires clarification of the system of key indicators, since intellectualization may differ significantly in different industries.

In the future, the study can consider the impact of other sustainable development components on a company's leadership potential. In this case, the methodology of assessing the impact of enterprise intellectualization on the level of leadership potential can be supplemented with a software tool for automated processing of the survey results and visualization of the obtained results.

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