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*Illiashenko Sergii^{a, b}, Shypulina Yuliia^a, Illiashenko Nataliia^c***APPROACH TO ASSESSMENT OF PREREQUISITES FOR INNOVATIVE
DEVELOPMENT OF INTELLECTUAL BUSINESS¹**^a National Technical University "Kharkiv Polytechnic Institute", Kharkiv, Ukraine^b University of Economics and Humanities, Bielsko-Biala, Poland^c Sumy State Pedagogical University named after A. S. Makarenko, Sumy, Ukraine

The article is devoted to developing an approach to identifying and assessing the sufficiency of prerequisites for the innovative development of intellectual business. The composition of internal and external prerequisites for innovative development of intellectual business in Ukraine is specified. Unlike existing approaches to internal prerequisites, the innovative culture of the intellectual business organization (innovator organization) is included, and the external ones include the innovative culture of its economic partners and contact audiences. This allows for assessing the level of innovation readiness of market entities (innovation process entities). Methodological principles for assessing the level of internal and external prerequisites are developed: assessment methodology, assessment scale. Decision tables are proposed for choosing the type of innovation development strategy depending on the ratio of the components of internal prerequisites (innovative capital and innovative culture of the innovator), as well as the ratio of innovative culture of the innovator and innovation consumers. A table of managerial decision-making has been developed regarding the feasibility of developing and implementing projects for innovative development of intellectual business according to selected types of strategies, depending on the correlations of its external and internal prerequisites. The principles for managing the choice of innovative development strategies and forming innovative development projects for intellectual business have been developed: a conceptual management scheme, a criteria base, the sequence and content of procedures for making managerial decisions. The obtained scientific results, conclusions, and recommendations in total deepen the principles of innovative management of enterprises and institutions in the conditions of the fourth industrial revolution and the transformation of technological ways. In particular, in terms of developing a methodological approach to assessing the sufficiency of external and internal prerequisites for managing the choice of innovative development strategies for enterprises and institutions of intellectual business, and the formation of relevant innovative projects.

Keywords: intellectual business, innovative development, development prerequisites, intellectual products, intellectual services, intellectual capital, innovative culture.

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Introduction and statement of the problem

The Fourth Industrial Revolution (IR4.0), which is strengthening, has brought the knowledge sector to the forefront of the global economy. A characteristic feature of IR4.0 is the intellectualization of all spheres of human activity, which involves the production and dissemination of new knowledge, its implementation in innovative intellectual technologies (production, consumption, etc.), and products (goods or services). The ability to create new knowledge and commercialize it, directly (as intellectual property products) or indirectly (as innovative intellectual products) [5], determines the competitiveness of national economies, their industries, individual enterprises, and institutions. In this context, the intellectualization of business activities of business entities is considered a driver of their innovative development and the national economy as a whole. However, as world practice shows, the development of intellectual business requires a set of certain external and internal prerequisites. Accordingly, the problem of determining the composition of the specified groups of prerequisites and developing an approach to assessing their adequacy for the development of specific types of intellectual business is urgent. The turbulence of the modern economy development, associated with IP4.0 and changing technological ways, ignites the innovative development of intellectual business. This will allow not only to adapt to changes in the external micro- and macroenvironment, but also to program these changes.

Analysis and research of publications

The issues of determining and analyzing the prerequisites for the development of intellectual business have been studied by many scientists. Slastyanykova [13] identified intellectual and creative abilities of a person and investments in the human capital of an enterprise as the main prerequisites for intellectual business. Makedon [11], based on the results of the analysis of trends in the development of the world market of business intellectual services in the conditions of IP4.0, noted that an important prerequisite for market growth is the ability of the consumer to perceive these services. Lagodienko [9] investigated intellectual resources to be the key prerequisite for the development of business structures. They include: intellectual and creative abilities of personnel; their knowledge, skills, practical skills; corporate culture, etc. Ivanova, Ivanov [6] define the internal prerequisites for the development of intellectual business, which include intellectual capital and knowledge. Shpenova [14] investigated the internal and external prerequisites for the development of intellectual business in Ukraine. She indicates the

intelligence and creative abilities of personnel as internal; the system of science and education, production, business structures, state regulation, legal system as external prerequisites. Krupina [8] analyzed external factors that influence the development of intellectual business in Ukraine. In general terms, these are: economy and politics; law; international cooperation and globalization; attitude to intellectual business; prestige of innovative and intellectual activity; STP. Similar factors are identified by Makalyuk, Voloshyn [10]. Maksymenko, Komandrovskaya [12] substantiated the influence of educational, information and communication, scientific and professional activity on the effectiveness of intellectual and innovative development of Ukraine. They established a correlation–regression relationship between the expenditure share of gross domestic product on scientific and research and development work, as well as the share of innovation implementation in Ukraine. Korytko [7] proposed an approach to assessing the level of intellectual capital of an enterprise (as a whole and in terms of its structural elements) for choosing a strategy for its innovative development in the context of digitalization of the Ukrainian economy. Strielkowski [15] used mathematical modeling to substantiate the positive impact of intellectual capital subsystems (human, structural, and customer capital) on the efficiency of small and medium–sized enterprises in countries with transition economies. Ausat et al. [1] determined that intellectual capital and innovative work of personnel affect the efficiency of creative activity of small and medium–sized enterprises in Indonesia. Gross–Goiacka et al. [2] investigated the impact of intellectual capital on the sustainable development of small and medium–sized businesses in Poland. They proved that the human component of innovative capital has the greatest impact.

Summarizing the results of the analysis of literary sources, it can be noted that their authors have studied certain aspects of the problem of determining the prerequisites for the development of various types of intellectual business in the knowledge economy. In most works, the intellectual capital of the enterprise is singled out as the main internal prerequisite. There is no unified view on the composition of external and internal prerequisites. At the same time, the essence and content of some of the outlined prerequisites are not sufficiently disclosed. The issues of assessing the level of internal and external prerequisites remain insufficiently studied, which does not allow for a reasonable management of the choice of development strategies for specific types of intellectual business.

The purpose of the article

The purpose of the article is to develop a new approach to assessing the sufficiency of external and internal prerequisites for managing the choice of strategies for the innovative development of intellectual business, as well as the formation of relevant innovative projects.

Main material

To achieve the outlined purpose, the following set of research tasks has been formed:

– clarification of the composition of internal and external prerequisites for the development of intellectual business in Ukraine;

– development of methodological principles, including a system of indicators and a criteria base for assessing the feasibility of internal and external prerequisites;

– development of methodological principles for managing the choice of innovative development strategies and the formation of intellectual business development projects.

Analysis of literary sources, as well as the experience of forming and developing intellectual business gave grounds to outline the set of its internal and external prerequisites. The results of their systematization are presented in Tables 1–2.

Table 1

**Internal prerequisites for the development of intellectual business
(composed by the authors based on data [3])**

| Prerequisites | Essence and content |
|--|--|
| Intellectual capital of a business (enterprise or institution), including: | The set of intellectual resources and the abilities to implement them, which determines the ability to produce, perceive, update, and use new knowledge, implement them in innovative products and technologies, create and develop intellectual business |
| – human capital | – living knowledge and creative abilities of personnel |
| – organizational (structural) capital | – knowledge embodied in intellectual property objects, the system of organization and management, and the ability to implement them |
| – capital of relationships | – knowledge embodied in a system of mutually beneficial relations with market entities, and the ability to implement them |
| Innovative culture of an innovative organization (enterprise), including subsystems: | Mechanism of socio-cultural regulation of innovative behavior of the personnel of the innovative organization, which determines its ability to perceive, use and produce innovations |
| – organizational | provides mutually coordinated creative cooperation of the personnel of the innovative organization in the creation, use, and dissemination (commercialization) of innovations |
| – motivational | motivates the personnel of the innovative organization (innovation project team) to innovative activity, actualizes the system of motives |
| – intellectual and creative | provides the acquisition, updating, development, and transfer of knowledge and experience relevant to the existing conditions, taking into account the trends of their change, the formation and modification, selection, and consolidation of stereotypes of effective innovative behavior of personnel |

In the constantly changing conditions of the modern economy, the survival and development of business, especially intellectual, demands active innovation activity. Accordingly, one of the important prerequisites for the development of intellectual business is the innovation culture of both the innovative enterprise and other market entities (innovation process entities). From these positions, the innovation culture of the enterprise should be attributed to internal prerequisites, and the innovation culture of other innovative entities (market entities) to external ones.

External prerequisites (Table 2) relating to trends in the development of scientific and technological progress, the market, as well as state stimulation and

regulation of innovation activity, can be specified by their components. In particular, state stimulation may include the following components (methods): legal support; financial and economic support; organizational support; planning (state priorities, state orders, etc.); political support; social support, etc.

To assess the level of prerequisites and their elements specified in Tables 1–2, a scale is proposed, presented in Table 3. The levels of sufficiency of external and internal prerequisites highlighted in Table 3 are matched with the levels of risk within the implementation of innovative development projects by intellectual business organizations.

Table 2

**External prerequisites for the development of intellectual business
 (composed by the authors based on data [3, 4])**

| Prerequisites | Essence and content |
|---|--|
| Trends of scientific and technological progress (STP) | STP (in particular, digital technologies IP4.0) causes technological transformations that radically change industries and markets, initiates changes in production (service provision), and consumption |
| Trends in market processes development | Aggravation of consumer problems (actual or predicted), which motivates their consumer behavior towards innovations that solve these problems |
| Innovation culture, market entities, incl. subsystems: | Mechanism of socio-cultural regulation of innovative behavior of people (subjects of the innovation process, contact audiences, the general public, etc.), which determines their ability to perceive, use and produce innovations |
| – organizational | provides mutually agreed creative cooperation of subjects of the innovation process in the creation, dissemination, perception, and use of innovations |
| – motivational | motivates market subjects (economic counterparties, contact audiences), the general public to perceive and use innovations |
| – intellectual and creative | provides the formation and modification, selection and consolidation of stereotypes of effective innovative behavior (market subjects, the general public, etc.) |
| State regulation and stimulation of innovative activity | Stimulation of the creation and consumption (use) of innovations. |

The expert method is proposed to be used for assessment. Managers and leading specialists of the analyzed organizations (enterprises or institutions) of intellectual business should be involved as experts. Comprehensive assessments of the level of intellectual capital and innovation culture are calculated as the weighted average of the assessments of their components. The weightage of the components is determined by experts. Integral assessments of the levels of internal and external prerequisites are calculated as the weighted average of the assessments of their components.

Based on the results of the assessment of the internal and external prerequisites levels, decisions are made on the feasibility of developing and

implementing intellectual business development projects. The corresponding decision table is proposed (Table 4).

Table 3

**Verbal–numerical scale for assessing the level of
 sufficiency of the prerequisites for the development of
 intellectual business (author’s development)**

| Prerequisite sufficiency level | | Prerequisite implementation risk level |
|--------------------------------|---------------|--|
| Numerical scale | Verbal scale | |
| 0.81–1.0 | High level | Minimum |
| 0.51–0.8 | Average level | Increased |
| 0.01–0.5 | Low level | High |

Table 4

**Table of decisions on the feasibility of developing/adjusting and implementing intellectual business development projects
 (author’s development)**

| Level of internal prerequisites | Level of external prerequisites | | |
|---------------------------------|---|--|--|
| | high | medium | low |
| high | 1. High chances of project implementation. Minimal risk | 2. Good chances of project implementation. Minimal risk | 3. Low chances of project implementation. High risk. |
| medium | 4. Good chances of project implementation. Minimal risk | 5. Average chances of project implementation. Increased risk | 6. Problematic option (requires clarifying research) |
| low | 7. Low chances of project implementation. High risk. | 8. Problematic option (requires clarifying research). | 9. No chances of implementation. |

An approach to managing the choice of innovative development strategies for an intellectual business organization and the formation of relevant innovative

projects has been developed. Its generalized scheme is presented in Fig.

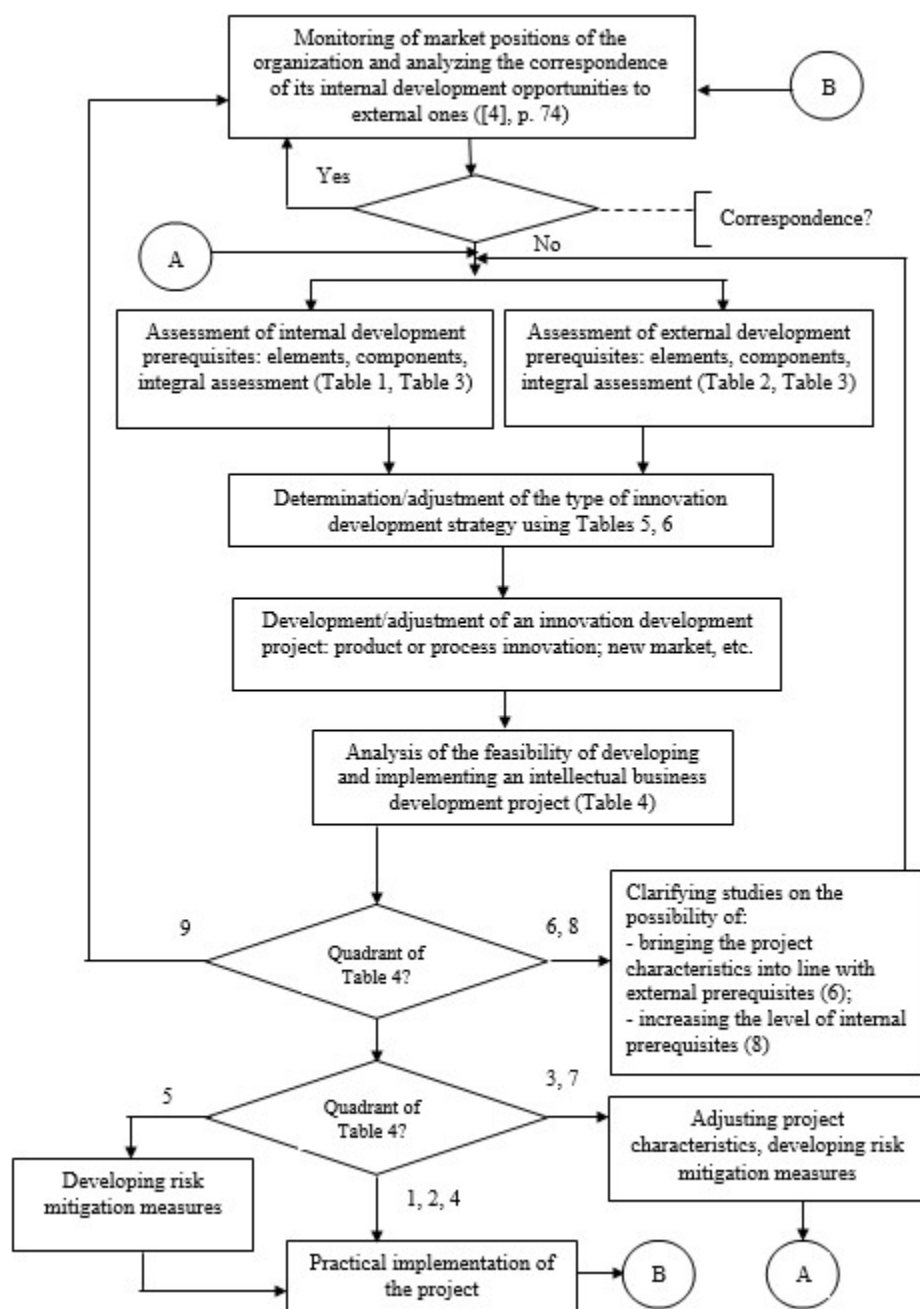


Fig. Scheme of management of the choice of innovative development strategies and the formation of projects of innovative development of intellectual business (author's development)

To determine the promising types of innovative development strategies of intellectual business, it is proposed to use decision tables (Table 5–6). The strategies indicated in Table 5–6 include [3]: defensive – implementation of improving innovations to maintain satisfactory market positions and development

in line with market trends (catch-up development); moderate-offensive – following best experiences of innovative activity of the market leader (following the leader); aggressive-offensive – implementation of radical innovations (advanced development).

Table 5

Table of decisions for choosing the type of innovative development strategies of an intellectual business organization depending on the level of its internal prerequisites ([3] modified)

| Organization's innovation culture, level | Organization's intellectual capital, level | | |
|--|--|--|-----------------------------------|
| | High | Medium | Low |
| Low | Defensive | Problematic option (requires further research) | No chance of success |
| Medium | Moderately offensive | Moderately offensive or defensive | Defensive |
| High | Aggressively offensive | Aggressively offensive | Moderately offensive or defensive |

Table 6

Table of decisions for choosing innovative development strategies depending on the level of innovation readiness of the intellectual business organization and its consumers ([5] modified)

| Innovative culture of consumers | Innovative culture of consumers | | |
|---------------------------------|---------------------------------|--|-----------------------------------|
| | High | Medium | Low |
| Low | Defensive | Problematic option (requires further research) | No chance of success |
| Medium | Moderately offensive | Moderately offensive or Defensive | Defensive |
| High | Aggressively offensive | Aggressively offensive | Moderately offensive or Defensive |

In line with the types of innovative development strategies identified using Table 5–6, innovative projects (projects for innovative development of intellectual business) should be developed. Fig. shows the sequence and content of procedures for assessing the sufficiency of internal and external prerequisites for the implementation of innovative projects. Management decisions and activities are proposed for different ratios of the levels of sufficiency of internal and external prerequisites for innovative development of intellectual business (Table 4).

Conclusions

Summarizing the above, the following conclusions can be drawn:

- the composition of internal and external prerequisites for the development of intellectual business in Ukraine has been clarified. The turbulence of the modern economy drives an innovative development strategy of intellectual business, which requires a certain level of innovative readiness of market entities. Consequently, the internal prerequisites include the innovative culture of the intellectual business organization (innovator organization), and the external prerequisites include the innovative culture of its economic partners and contact audiences;

- methodological principles for assessing the sufficiency of internal and external prerequisites for the innovative development of intellectual business in the permanently unstable conditions of the modern economy have been developed. In particular, the verbal–numerical scale for assessing the level of

sufficiency was proposed; each of the selected levels of sufficiency has been matched with the levels of risk associated with the implementation of innovative development projects. A table for making management decisions regarding the feasibility of creating and implementing innovative development projects for intellectual business, depending on the ratios of the levels of its external and internal prerequisites has been developed;

- an approach to managing the choice of innovative development strategies for the intellectual business organization in the conditions of technological transformations of the modern economy, as well as to managing the formation of relevant innovative projects, has been developed. It includes: a conceptual management scheme; the sequence and content of management procedures. Decision tables are proposed for choosing the type of innovation development strategy depending on the ratio of the levels of the components of internal prerequisites (innovative capital and innovative culture of the innovator), as well as on the ratio of the levels of the innovative culture of the innovator and consumers of innovations.

The results obtained in total deepen the principles of innovation management of enterprises and institutions in the conditions of IP4.0, in particular, in terms of developing a methodological approach to assessing the sufficiency of external and internal prerequisites for managing the choice of innovative development strategies of intellectual business and the formation of relevant innovative projects.

Further research should be aimed at forming the principles of the organizational and economic mechanisms for managing innovative development strategies of intellectual business in the knowledge economy.

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ПІДХІД ДО ОЦІНКИ ПЕРЕДУМОВ ІННОВАЦІЙНОГО РОЗВИТКУ ІНТЕЛЕКТУАЛЬНОГО БІЗНЕСУ

Ілляшенко С. М., Шипуліна Ю. С., Ілляшенко Н. С.

Статтю присвячено розробленню підходу до ідентифікації і оцінювання достатності передумов для інноваційного розвитку інтелектуального бізнесу. Уточнено склад внутрішніх і зовнішніх передумов інноваційного розвитку інтелектуального бізнесу в Україні. На відміну від існуючих підходів до внутрішніх передумов включено інноваційну культуру організації інтелектуального бізнесу (організації–інноватора), а до зовнішніх – інноваційну культуру його економічних контрагентів і контактних аудиторій. Це дозволяє оцінити рівень інноваційної готовності суб'єктів ринку (суб'єктів інноваційного процесу). Розроблено методичні засади оцінювання рівня внутрішніх і зовнішніх передумов: методика оцінки, оціночна шкала. Запропоновано таблиці рішень для вибору типу стратегії інноваційного розвитку залежно від співвідношення рівнів складових внутрішніх передумов (інноваційного капіталу і інноваційної культури інноватора), а також від співвідношення рівнів інноваційної культури інноватора і споживачів інновацій. Побудовано таблицю прийняття управлінських рішень щодо доцільності розроблення і реалізації проектів інноваційного розвитку інтелектуального бізнесу в руслі обраних типів стратегій у залежності від співвідношень рівнів його зовнішніх і внутрішніх передумов. Розроблено засади підходу до управління вибором стратегій інноваційного розвитку і формування в їх руслі проектів інноваційного розвитку інтелектуального бізнесу: концептуальна схема управління, критеріальна база, послідовність і зміст процедур прийняття управлінських рішень. Отримані наукові результати, висновки і рекомендації у сукупності поглиблюють засади інноваційного менеджменту підприємств і установ в умовах четвертої промислової революції і трансформації технологічних укладів. Зокрема, в частині розроблення методичного підходу до оцінювання достатності зовнішніх і внутрішніх передумов для управління вибором стратегій інноваційного розвитку підприємств та установ інтелектуального бізнесу та формування відповідних інноваційних проектів.

Ключові слова: інтелектуальний бізнес, інноваційний розвиток, передумови розвитку, інтелектуальні продукти, інтелектуальні послуги, інтелектуальний капітал, інноваційна культура.

APPROACH TO ASSESSMENT OF PREREQUISITES FOR INNOVATIVE DEVELOPMENT OF INTELLECTUAL BUSINESS

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The article is devoted to developing an approach to identifying and assessing the sufficiency of prerequisites for the innovative development of intellectual business. The composition of internal and external prerequisites for innovative development of intellectual business in Ukraine is specified. Unlike existing approaches to internal prerequisites, the innovative culture of the intellectual business organization (innovator organization) is included, and the external ones include the innovative culture of its economic partners and contact audiences. This allows for assessing the level of innovation readiness of market entities (innovation process entities). Methodological principles for assessing the level of internal and external prerequisites are developed: assessment methodology, assessment scale. Decision tables are proposed for choosing the type of innovation development strategy depending on the ratio of the components of internal prerequisites (innovative capital and innovative culture of the innovator), as well as the ratio of innovative culture of the innovator and innovation consumers. A table of managerial decision-making has been developed regarding the feasibility of developing and implementing projects for innovative development of intellectual business according to selected types of strategies, depending on the correlations of its external and internal prerequisites. The principles for managing the choice of innovative development strategies and forming innovative development projects for intellectual business have been developed: a conceptual management scheme, a criteria base, the sequence and content of procedures for making managerial decisions. The obtained scientific results, conclusions, and recommendations in total deepen the principles of innovative management of enterprises and institutions in the conditions of the fourth industrial revolution and the transformation of technological ways. In particular, in terms of developing a methodological approach to assessing the sufficiency of external and internal prerequisites for managing the choice of innovative development strategies for enterprises and institutions of intellectual business, and the formation of relevant innovative projects.

Keywords: intellectual business, innovative development, development prerequisites, intellectual products, intellectual services, intellectual capital, innovative culture.

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