

## Information Portal of the Diversified Structure of High-Tech Business as a Complex Object of Copyright in the Virtual Space

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### Suggested Citation:

Gumerova GjuseI I., Shaimieva Elmira Sh. (2016). Information Portal of the Diversified Structure of High-Tech Business as a Complex Object of Copyright in the Virtual Space, *Journal of Advanced Research in Law and Economics*, (Volume VII, Winter), 8(22): 2010 – 2027, DOI: [10.14505/jarle.v7.8\(22\).11](https://doi.org/10.14505/jarle.v7.8(22).11). Available from: <http://journals.aserspublishing.eu/jarle/issue/archive>.

### Article's History:

Received September, 2016; Revised October, 2016; Accepted November, 2016.  
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### Acknowledgements:

The authors are grateful to Professor Doctor Stefan Hüsig, the Chair holders for Innovation Research and Technology Management at the Chemnitz University of Technology for valuable advice and comments of the paper. The authors are grateful to Professor Dr. Thomas Steger, Technical University Regensburg, for their comments during the preparation of the manuscript.

### Abstract:

In this study are generated: methodological support of management of high-tech business (conceptual framework, the classification of enterprises), methodological support of the information portal as an object of management of enterprises of high-tech businesses. The paper examines the institutional provisions of the information portal as part of a multimedia product as a complex object of copyright; formed the definition of 'information portal' as part of a multimedia product, its characteristics in conjunction with the virtual property in the broad, narrow sense; the structure of the information portal highlighting the mandatory and optional parts; conducted case studies of seven portals of foreign and Russian enterprises of high-tech business, which as a diversified structures operating in high,- middle-tech kind of economic activities, and also in the field of knowledge-intensive services; carried out diagnostics of the official website of the company at the twenty-one criteria in a mandatory, additional parts of an information portal; developed the site of a diversified structure with the using of tools of strategic management (strategic management areas, product portfolio). The empirical base of the research are the official sites of the diversified high-tech business structures of Germany, Russia, USA. The study extended and confirmed the hypothesis about the activity, product portfolio diversified structures of high-tech business. As a result the study developed the concept of 'enterprise high-tech business' based on rankings of Thomson Reuters (USA) and 'TekhUspekh' (Russia); developed the concept of the 'information portal of the enterprise high-tech business' as part of a multimedia product as a complex object of copyright; the

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structure of the information portal of the enterprise of high-tech business as the object of its management in the virtual space; developed recommendations to management of the JCS 'Zawod Elecon' (Kazan, Russia) in the field of information portal.

**Keywords:** high-tech business management, informational portal, strategic management areas, product portfolio, classification of high-tech businesses.

**JEL Classification:** O30, O33, M13.

## Introduction

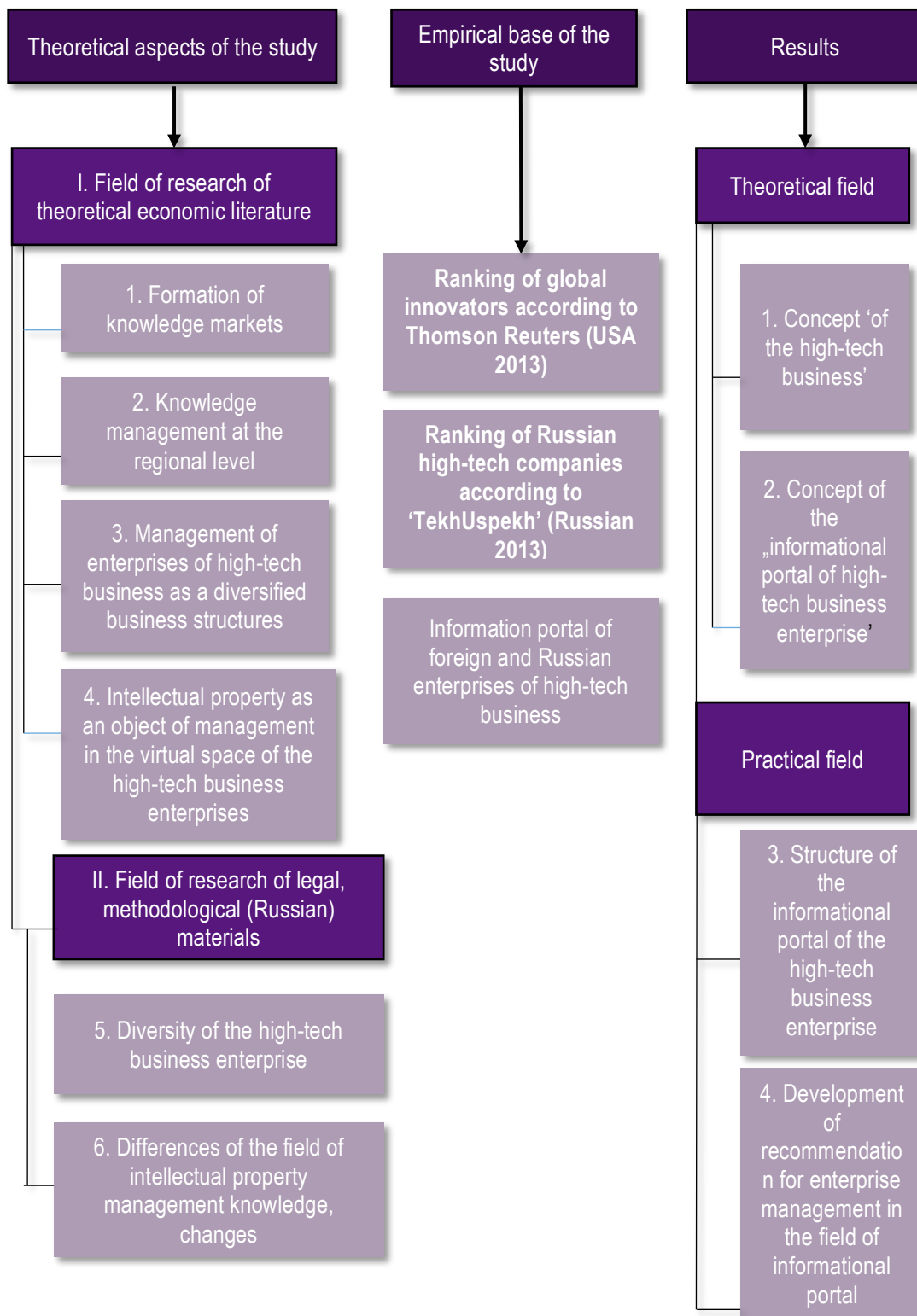
Information portal of the high-tech enterprise is a science-intensive tool of its management, reflecting the inclusion of the enterprise in the knowledge market. The information portal of the high-tech business enterprise become a competitive regional advantage in the virtual space (Aranguren and Larrea 2011) that represent in a systematic way the level of involvement of areas of the company's management in its development (production, human resources, innovation, change) (Betz 2014). The information portal as part of a multimedia product as a complex object of copyright has a virtual property consisting of an object, used in the virtual space. The study of the information portal as a science-intensive tool of the enterprises of high-tech business in the virtual space is little-studied topic with a meaningful point of content, from the point of view of diversification of enterprises of high-tech business (Filippov and Panov 2105). The authors of this paper carried out the unification of information portals within the case study of the information portals of foreign, Russian high-tech companies as a diversified business structures of the industry, knowledge-intensive services, was nominated and confirmed hypothesis of the research, formed the gaps scientific and practical topics for future research in the context of the questions of this study.

## 1. Research question

### 1.1. Review of the theoretical sources

In this paper the authors used the following two groups of sources: scientific-theoretical and legal, methodological materials. The review of scientific-theoretical sources is carried out in the following four areas, where there are high-tech business enterprise: formation of knowledge markets; knowledge management at the regional level; management of enterprises of high-tech business as a diversified business structures; intellectual property as an object of management in the virtual space of the high-tech business enterprises (see Figure 1).

The most important works in the foreign economic literature in the area of knowledge market building, which the authors used in this work, are the following: Lesser (Lesser 2000), Romer (Romer 1990), Teece (Teece 1981, 1996), Adizes (Adizes 2013). The authors share the point of view of Lesser (Lesser 2000) in part of the importance of social capital for enterprises operating in the conditions of development of knowledge market, which transforms social capital in reputational currency, which enables its lifespan (Analytical report 2015). In the works of Teece (Teece 1981, 1996) knowledge managing is considered from the point of view of international knowledge transfer of the functioning of enterprises on the knowledge market based on the properties of know-how. The study of these questions is reflected in the international activities of enterprises of high-tech business, characteristics of the company's high-tech business, the characteristics of its invention. Romer (Romer 1990) in endogenous growth theory assumes that the development of the enterprise in the long term depends on new knowledge, the accumulation of which in the enterprise is presented in the managing intellectual property in the real and virtual spaces. In the methodology by Adizes (Adizes 2013) special attention is paid to issues of organizational learning in enterprises, issues of conflict-free implementation of changes in the organization. Implementation methodology by Adizes promotes life expectancy of organizations, including of high-tech business.



**Figure 1.** The structure of the study: theoretical aspects, empirical basis, results

In the field of knowledge management at the regional level businesses of international, Russian scale, the authors relied on the following works: Davenport (Davenport 2002), Weick (Weick 1991), Westley (Westley 1990),

Wooldridge, Floyd (Wooldridge and Floyd 1990), Herstad, Pålshaugen, Ebersberger (Herstad *et al.* 2011), Popov, Wlasow (Popov and Wlasow 2006, 2007). The regional dimension of the management model of high-tech business enterprises in the development of a global knowledge economy is examined in works of foreign and Russian scientists during the period from 1945 at the present time. The authors of the present work is based on periodization of the process of becoming a knowledge economy based on Popov, Vlasov (Popov and Wlasow 2006, 2007), according to which in Russia since 2008 is developing a system of indicators to monitor the development of the knowledge economy, correlated with the practice of collecting statistical information of Russian companies. The research by Davenport (Davenport 2002) devoted to analysis of production of knowledge in Siemens, based on organizational learning in the corporate culture of the organization. In the works of Westley (Westley 1990), Wooldridge, Floyd (Wooldridge and Floyd 1990) is studied the role of middle management in strategy implementation, managerial decision-making in the change process in relation to large bureaucratic organizations that are faced with a dilemma of inclusion or exclusion of managers from the above mentioned processes. The legal structure of the organization (hierarchical/bureaucratic or organic/adaptive) creates barriers or – on the contrary – opportunities for knowledge production on average, the highest level management of the organization. In the work of Herstad, Pålshaugen, Ebersberger (Herstad *et al.* 2011) examines the issues of innovation cooperation (innovation collaboration between financial center (capital region location) and regional enterprises on the example of Norway.

In the present work in the field of management of high-tech business enterprises as a diversified structure, the authors consider as base the following studies: Aranguren, Larrea (Aranguren and Larrea 2011), Betz (Betz 2014), Milner (Milner *et al.* 2006; Milner 2009). In the work of Aranguren, Larrea (Aranguren and Larrea 2011) research the concept of constructing regional advantage, based on the necessity for the main stakeholders to interact at the regional level, though there is an opinion about the sufficiency of the innovative subjects at regional level. This allows constructing the regional advantage in the sphere of high-tech businesses management, and will characterize the high-tech business at international and regional markets, thus increasing their international and regional ratings. Studied in the work of Betz (Betz 2014) the issue of control in the management of socio-economic systems developed by the authors in the need to provide information about the company in part responsible for belonging to the high-tech business on its information portal. Albert, Bradley (Albert and Bradley 1996) characterize intellectual capital as a competitive advantage of the organization, transforming information, and human resources in knowledge. The influence of cognitive and technological similarities of the companies on the development of the knowledge economy justifies the need for the establishment of the General requirements in the field of information portal. The need for diversification of high-tech enterprises in terms of management of its intellectual resources was noted in Ivanov, Baranov (Ivanov and Baranov 2011). In the works of Milner (Milner *et al.* 2006; Milner 2009) the necessity and the ways of revision of purposes, mechanisms and regulations relevant to the creation, dissemination intellectual resources, the study of new forms of organization of knowledge management are based. The approach taken in the work of Milner (Milner 2009) is one of the basic in the present work, aimed at the revision, the development of the concept of 'enterprise of high-tech business' based on the analysis methodologies of the international and Russian ratings of the enterprises-innovators with identifying the weak (implicit) signals of a strategic knowledge-based management. The evolution of the concept of 'the high-tech enterprise' from 1985 to present time reflects the dynamics of development of understanding of the studied economic activity: indicators number of scientific and technical workers, RandD spending to specific kinds of economic activities in the methodological materials of the OECD, Russian Federal state statistics service (Methodological materials 2011; Science, technology and innovation in Europe 2008). In the work of Stähler (Stähler 2002) is noted increasing the numbers of publications about the concept of 'business models' in the digital economy, which refers to commercial activity of companies in the real, virtual spaces based on the architecture of value creation of the product with the use of information technology. 'The architecture' of the enterprise to create value of the product in the knowledge economy implies diversity of supply as a way to increase the economic potential of enterprises (Makarov 2003).

In the field of intellectual property management in the virtual space of the high-tech business enterprises the authors used works by Lednev (Lednev 2012), Litvishko (Litvishko 2012), Kuzin, Kutepov (Kuzin and Kupetov 1996), Makarov (Makarov 2003), Pascal (Pascal 2015). Intellectual property objects as constituents of knowledge/labor/capital markets (Makarov 2003) show specific features of their management in the corresponding types of economic activity, which dominate in the fifth-sixth technological structure. Professional sport as a sport of highest achievements, including football, is nowadays a type of economic activity, which is based on: achievements of high-tech industry (precision engineering/nanotechnologies/bio-pharmaceutics, etc.); applying science-intensive services (medicine/scientific-consultative services); is characterized by: using

(absorbing/transforming) of science-intensive production; management system of high-technology business, including intangible assets management (Litvishko 2012); producing the professional sports products with a large share of science-intensive component, used in both real and virtual spaces (Lednev 2012). Thus, the components – characteristics of professional sport as a kind of high-tech business – have the common denominator, the science-intensive component as the basis of intellectual property objects, effective management of which is realized in the process of internationalization of the legal form on the enterprise (Pascal 2015).

As part of the review of legal, methodological materials, in this paper the authors used the methodological materials on the elaboration of innovative development programs of joint stock companies with the state participation, state corporations and federal state unitary enterprises (Methodological materials 2011); the long-term target program in the areas of improving productivity at the enterprises of machine-building and petrochemical complexes (Long-term target program 2013), development of market of intellectual property (Long-term target program 2011). The programmes implemented at regional level do not consider the diversity of high-tech business, do not differentiate the spheres of intellectual property management, knowledge management do not detail the criteria of intellectual property objects of general purpose. The authors identified a lack of scientific elaboration and practical implementation issues associated with the management of intellectual property in the real and virtual spaces, methodological provision of management of high-tech business in the field of information portal. Based on the study of theoretical sources, the authors generated the following hypotheses of this study:

- **Hypothesis 1:** The activity of enterprises of high-tech business is implemented in the high,- medium,- low-tech kinds of economic activities that is provided by the diversified structure of the company;
- **Hypothesis 2:** Product portfolio of high-tech business enterprise as a diversified structure is formed in three product groups according to their technological level (high - medium, - low-tech), including industry and knowledge-intensive services.

The research objectives of this work are the following in the theoretical and practical parts:

- (1) development of the concept of 'the high-tech business enterprise';
- (2) methodological support of management of high-tech business in the field of information portal:
  - information portal as a complex object of copyright in the virtual space;
  - the concept of 'information portal of high-tech business enterprise' as the subject of management in a virtual space: the structure of the site.
- (3) development of recommendations for the management of the high-tech business enterprise in the field of information portal.

## 2. Research methodology

The structure of this study, including theoretical aspects, empirical base, the results of the study are presented in Figure 1. The empirical base of research for the study of theoretical questions used ratings of global innovators by Thomson Reuters (USA) (Thomson Reuters 2013), a rating of high-tech companies in the Russian Federation 'Tekhuspekh' (Russia) (Top 50 of 'TekhUspekh 2013); for the solution of practical problems used information portals of following seven Russian and foreign enterprises of high-tech business: 'Lockheed Martin' (diversified structure, area of activity – Aeronautics, new technologies), BASF (diversified structure, field of activities – chemical industry), LLC 'Leoni Zavolzhie' (area of activity – automotive wiring); group of companies 'Rusagro' (diversified structure, area of activity – agriculture), JSC 'RusHydro' (the area of activity – energy complex), the OJSC 'KAMAZ' (field of activity – heavy-duty trucks), OAO Zavod Elekon' (diversified structure, the dominant area of activity – engineering) (see Appendix 1, Tables 6, 7)<sup>5</sup>. The object of research is the management of high-tech businesses enterprise. The subject of research is the information portal of the high-tech business enterprise on the example of JSC 'Zavod Elekon' (Kazan, Tatarstan). The study used general scientific methods of theoretical and empirical knowledge: analysis, synthesis, classification, logical method, method of deduction, induction, scientific abstraction, generalization. Based on the analysis of theoretical literature, the authors identified gaps, questions of the present study consisting of topics for future and current studies (see Table 1).

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<sup>5</sup> The choice of informational portals was carried out by the authors on the basis of the following criteria: availability of an information portal; information portal as an object of intellectual property; the diversification of production structures. It should be noted that the degree of diversification as the development of production in one or several economic activities (depending on their technological level) in this work are not considered.



**Table 4.** The identification of gaps, the future research questions the present study

Research fields	Research gaps in the field of research and offers directions for further research
1.The formation of knowledge markets	1.1 Identification of trends in international knowledge market. 1.2 Identification of the trends on the Russian knowledge market. 1.3 Justification the possibility of using the regularities of the development of international markets for the Russian knowledge market, Identification of knowledge market characteristics.
2.Knowledge management at the regional level	2.4 Diversification of enterprises of high-tech business. 2.5. The involvement of staff as an integral part of social capital in the process of knowledge production.
3. Management of enterprises of high-tech business as a diversified structures	3.6 The legal structure of the enterprise of high-tech business, ensuring its diversification as the core competitiveness 3.7 The concept of 'enterprise high-tech business' as a methodological basis of its management. 3.8. Product portfolio of high-tech business enterprise.
4. Intellectual property as a control object in the virtual space of the high-tech business enterprises	4.9 The concept of 'information portal of high-tech business enterprise' as a methodical foundations of management of intellectual property in the real and virtual spaces. 4.10. Information portal of the high-tech business enterprise as an indicator of knowledge management 4.11 Information portal of the high-tech business enterprise as a complex object of copyright as part of a multimedia product (for the Russian protection conditions of objects of intellectual property).

*Text* – is investigated in the present study

The logic of this study lies in the following four stages:

- Stage 1: a research of field of theoretical economic literature, legal, methodological (Russian) materials. The result of the first stage are: the defining spaces, topics for future research in the context of the research questions with the nomination of two hypotheses (see Figure 1, Table 1);
- Stage 2: study empirical base of research in the development of two basic concepts in the theoretical field, to develop the structure of the information portal of the enterprise (see Appendix 1, Tables 6, 7);
- Stage 3: carrying out the case study on the diagnosis of information portals of foreign, Russian enterprises of high-tech business (see Tables 3, 7, 8). The formation of critical observations on the information portal of the enterprise that is the subject of the present study (see Table 3).
- Stage 4: development of recommendations for the management of the high-tech business enterprise in the field of information portal; confirmation of the hypotheses of the study (see Tables 4, 5).

### 3. Results

#### 3.1. Methodological support of management of high-tech business: a conceptual framework, classification of enterprises

In order to study the first hypothesis of this work the authors analyze the ratings of high-tech companies on Russian and international levels, operating in the global high-tech space, using the author's classification of high-tech businesses enterprises. The basis of the ratings analysis are the ratings version of high-tech companies by Thomson Reuters (USA) and 'TekhUspek' (Russia) as of 2013. The result of the analysis of the ratings is the development of the concept of 'enterprise high-tech business', the classification of enterprises of high-tech business.

A high-tech business enterprise is interpreted as an enterprise obtaining income from value management regardless of the type of its economic activity. The paper identifies three groups of companies: the first one is company engaged in the high-tech science-intensive type of economic activity (industrial production and science-intensive services of high level). The second group is engaged in middle- and low-tech type of economic activity in the field of industrial production and science-intensive market services, implementing high-tech businesses management, which results in the high level of technological development of the enterprise. This is achieved by a business model (or managerial knowledge) implemented in those enterprises. The third group is mixed. This group includes the following companies of high-tech business: (a) science-intensive services of low level; (b)

market services of less science-intensity; (c) low-tech economic activity of industrial production; (d) science-intensive businesses, whose functioning can be attributed to the 1<sup>st</sup> or 2<sup>nd</sup> group.<sup>6</sup> The common criteria of high-tech businesses are: high market value of the company, based on the knowledge economy objects management: enterprise brand, explicit and implicit knowledge, personnel; life span of the company. Thus, high-tech businesses are enterprises obtaining profit from the company cost management regardless of their type of economic activity (low-, middle- or high-technological). Therefore, on the basis of the conducted analysis it can be argued that the activity of enterprises of high-tech business is implemented in the high-, medium-, low-tech kinds of economic activities that is provided by the diversified structure of enterprises of industrial production and knowledge-intensive services.

### **3.2. Methodological support of the information portal as an object of management of the enterprise high-tech business**

Under 'methodological support of the information portal' in the article is understood the following scientific research works: study of the institutional provisions of the information portal as part of a multimedia product as a complex of objects of copyright (in relation to the Russian legal database); development of structure of the portal of the enterprise of high-tech business; carrying out case study of information portals of the enterprises of high-tech business in the Germany, USA, Russia; development of the official website of the diversified structure of high-tech business.

#### **3.2.1. The institutional provisions of the 'information portal' as part of a multimedia complex as an object of copyright**

Information portal as part of a multimedia product as a complex object of copyright reveals the following two basic (primary) classification criteria: (a) presence of virtual property in the object, (b) the application in the virtual space. Under the 'virtual property' in the narrow sense in this paper is understood the information object, the rights to which belong to one or more owners. The establishment of the right of ownership and disposition of virtual property is possible in two ways: when creating information of the object; during the transfer (in writing, with the conclusion of the respective agreement or with the consent of the user with the user agreement).

In the broad sense of the word 'virtual property' in the work is understood the use of intellectual property in the virtual space, which is an essential characteristic of complex subject matter of copyright contains the virtual property in their composition (or virtual property in the narrow sense of the word), and optional characteristics for the complex of objects of copyright, having in composition of virtual property (Table 2).

The concept of 'complex object as the result of intellectual activity according to Article 1240 of the Civil Code of the Russian Federation includes the following protected results of intellectual activity: the motion picture, other audiovisual work, theatrical performance, multimedia product, database<sup>7</sup>.

Consideration of the basic signs of the difficult things is necessary for understanding a legal category of complex objects of intellectual property rights. The researchers have identified the following criteria to determine complex things:

- it consists of heterogeneous things, so as a complex could not be considered as a set of similar items (art gallery, library, etc.);
- components that comprise a complicated thing is not physically connected (TV, consisting of homogeneous parts, from a legal point of view is not a difficult thing);
- the totality of things constitutes a whole which is used as a General purpose;
- each of the parts that make a complex thing that can be used independently for the same purpose, as in complex things.

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<sup>6</sup> Depending on the sphere of research and patents in proper types of economic activity. Besides, it should be noted that this group could be divided into two subgroups.

<sup>7</sup> There are two approaches to the study of the institutional provisions of the 'information portal', including its legal protection: (1) Information portal as part of a multimedia product as a complex object of copyright according to Article 1240 of the Civil Code of the Russian Federation; (2) The information portal includes the following groups of protected objects of intellectual property: the design of the site, the content or the content name, a computer program (or computer programs) and the database of the website. The present study used the first approach. (Civil Code of the Russian Federation. 2016).

Under multimedia product in this study is understood an interactive work created by using computer technology, multimedia (educational) technology<sup>8</sup>. According to Godra (Godra 2001) multimedia product is a standard classical work (audiovisual, literary, musical or graphic), converted into digital form with the help of tools data processing, including software, as well as in the vast majority of cases - the database. Article 1240, Part 1 of the Civil Code does not contain a clear definition of 'multimedia product'. Multimedia product as a complex object of copyright is based on the use, in particular, a special kind of computer technology that combines both traditional static visual (text, graphics) and dynamic (speech, music, movies, animation) information (Table 2).

Under the 'information portal as part of a multimedia product' in this paper means presented in electronic (digital) form a complex object of copyright as a protected result of intellectual activity that have the following composition, requirements, use:

1. Characterization composition: computer programs, literary, visual, theatrical, film components;
2. Characteristics according to the requirements of a complex object: matching at least three of the following four characteristics:
  - single entity (object) as the result of a single technology;
  - complex composition (structure) as the result of a single technology (in virtual property consisting of a complex object the result of intellectual activity);
  - virtual property in a part of a complex object of the result of intellectual activity;
  - virtual property as the using of intellectual property in the virtual space.
3. Characteristic use: the use of real, virtual, or both in real and virtual spaces. The following three characteristics of the four (a-d) suggest the presence of digitized versions of the media product as a complex object of copyright law (Table 2).

### 3.2.2. Concept of 'the information portal of the enterprise high-tech business', the structure of the site

In order to research the second hypothesis of the present work the authors have developed the concept and structure of the 'information portal of the high-tech businesses enterprise'; conducted case study on the diagnosis information portals of foreign, Russian enterprises of high-tech business (see Appendix 1, Table 6). As the information resource, an enterprise's official website is an integral part of the global circulation of goods and services of the enterprise. According to the structure of a high-tech company's official website, developed by authors: such management spheres as strategy, innovation, change, knowledge management play a significant role in the development of components of the website, showing that it belongs to a high-tech business, and forming a knowledge management system.<sup>9</sup>

The official website of the high-tech business enterprise is characteristic of its response to changes in the external environment, demonstrating the competitive advantages of the internal environment of the enterprise through the content of the site. Based on the analysis of information portals to foreign and Russian enterprises of high-tech business, the authors generated the concept, structure, information portal. Information portal of the enterprise high-tech business is subject to its intellectual property, reflecting mandatory, additional parts belonging to the high-tech business. The structure of the official website of the enterprise high-tech business, consisting of mandatory and optional parts, including the content part and the part that is responsible for belonging to high-tech businesses represented in the Appendix 1, Table 6.

<sup>8</sup> It is necessary to distinguish between 'multimedia product as a complex object of copyright' that means the characteristics is presented in Table 2, and 'multimedia software' that is not a complex object.

<sup>9</sup> The issues of technical design of the enterprise's website, as well as request forms are not considered in this paper.



**Table 5.** A complex object as the result of intellectual activity: extended classification criteria, types

A. Classification features	1. A complex object as the result of intellectual activity	2. Characteristic (a) A single entity (object) as the result of a single technology (b) Complex composition (structure) as the result of a single technology (c) Virtual property on a complex object the result of intellectual activity (d) Virtual property as the use of intellectual property in the virtual space	3. Components (e) Computer program (f) Literary components (g) Fine components (h) Theater component (i) Movie component	4. Examples *	5. The right of ownership in the two types of spaces: real* virtual			
					The regulation of Article 1240 of the Civil code of the Russian Federation, Part 4	The practice of using	The regulation of Article 1240 of the Civil code of the Russian Federation, Part 4	The practice of using
B. The types of complex objects of intellectual activities	I. The film (other audiovisual work)	2a, 2b	3f, 3g, 3h/3i	....	+	+	-	•
	II. Theatrical work	2a, 2b	3f, 3g, 3h/3i	....	+	+	-	•
	III. Multimedia product	2a, 2b, 2c, 2d	3e, 3f, 3g, 3h, 3i	Computer games	+	+	-	+/-
				Computer video games Sites on the Internet Business game <sup>10</sup>	+	+	-	+
IV. Database	2a, 2b, 2c, 2d	3e	...	+	+	-	+/-	

- \*- in the case of matching the characteristics to a complex object;
- in the case of digitization of the product;
- +/- the lack of research, regulatory, and legal information;
- + the regulation of article 1240 of the Civil code of the Russian Federation, Part 4; ...
- not considered in this stud
- the object of this study

**Source:** on basis of (Civil Code of the Russian Federation, Part 4. 2016.

### 3.2.3. Case study diagnostic information portals of enterprises of high-tech business

As a result of development of concept, structure, information portal of high-tech business enterprise the authors conducted a case study on the diagnosis of foreign sites, and Russian enterprises of high-tech business for 21 criteria (see Appendix 1, Tables 6, 7). As a result, the case study becomes clear: the best information portal for compliance with meaningful, additional parts of an information portal in general, and meaningful, additional parts

<sup>10</sup> There are the following types of business games: a simulation of the market environment; strategic and financial simulation with computer modeling; role-playing (drama) formats.

in the field, responsible for belonging to the high-tech business, is the website of the company 'Lockheed Martin' (USA) (20 and 11 points compliance criteria), JSC 'KAMAZ' (Russia) (19 and 9 points); the worst website is the website of JSC 'Zavod Elekon (Russia) (4 and 1 points of compliance), which resulted in carrying out of a case study on the example of the information portal of JSC Zavod Elekon, Kazan, Republic of Tatarstan. Analysis of the official website of OAO 'Zavod Elekon' conducted by the authors during the period 09.2013 - 01.2014 has identified a critical fields presented in Table 3.

In order to improve the official website of JSC 'Zavod Elekon' as a diversified structure, the authors generated the product portfolio of the enterprise based on strategic areas of management that reflect the functioning of the enterprise in high,- medium,-low-tech kinds of economic activities industry and knowledge-intensive services.

### 3.2.4. The development of the official website of the diversified structure of high-tech business using the tools of strategic management (strategic areas of management, product portfolio)

Under the strategic management area is understood to be allocated according to certain criteria, the segment and operating in this segment of the production unit (or enterprise in General). The allocation of strategic management areas must be specific to the production and sale of products, the demand, the possibility of positioning in the market.

On the basis of the process of forming strategic areas of management in JSC 'Zavod Elekon' for the period 1939-2014 the following theses are obvious in the development of strategic management area in this plant (Table 3). The product portfolio is a range of products both for today and for the near future. The analysis of the product portfolio of the company is required to produce the diversification of product, and thereby reduce the risks associated with the loss of business, or failure of a product from the product line. The development of a product portfolio based on market segmentation. The segmentation is the division of a market into groups of consumers who have similar characteristics, with the purpose of studying their reactions to a particular product, service, and selection of target market segments. In other words, segmentation, in the broadest sense, is a division of the market. The criteria of division may come from different factors: geographic, demographic, psychographic, and many other features, depending on the industry in which the process of segmentation takes place.

Tables 3, 4 show segmentation of products of the enterprise in terms of technological level, based on the classification of high-tech business activities. Thus, as a result of verification of the second hypothesis can be confirmed that the product portfolio of the high-tech business enterprise as a diversified structure is formed in three product groups according to their level of technological (high,- medium, low-tech), including industry and knowledge-intensive services.

**Table 6.** Criticisms to the official website of JSC 'Zavod Elekon' as a result of the diagnosis

Position in the structure of the website of the enterprise high-tech business	Point of criticism	Essence of criticism
I. Substantive information plan the official website of the company		
1.1 Presentation of the company as a management unit: evolution (history), management, structure, corporate governance ratings, geography	1. Fragmentary information about the history of the plant	In the 'History of the enterprise' block, information begins since 1948, at the same time the page of the Director General states that the enterprise celebrated 75th anniversary in 2014.
1.7. To stakeholders (shareholders, investors, partners)	2. The page for stakeholders is not informative 3. Information for shareholders of a company is presented in	The information does not reflect a real pattern of scientific, productive cooperation of the enterprise does not indicate the benefits and purposes of cooperation, the period of cooperation According to the information about major shareholders 25% shares of JSC 'Plant Elekon' has officially known company in the region; 65.1% of shares are owned by companies, whose official websites were not

Position in the structure of the website of the enterprise high-tech business	Point of criticism	Essence of criticism
	the form of draft materials	identified at the time of the study <sup>11</sup> .
1.5. Achievements of the company: in Russia, globally	4. The lack of consistency in providing information about the company's achievements	The information about the plant achievements on the website is chaotic, which does not reflect the actual results of the company in various areas of activity: labour productivity management, creation of collection scale models, corporate management in machine building.
<b>II. Scientific and practical plan official website of the company</b>		
1.2.1 Presentation of the company as a production unit: strategic areas of production (geography)	5. The lack of reflection of the diversity of the enterprise	The official website does not reflect the specifics of this enterprise, which is operating in high- and low-tech types of economic activities, and knowledge-intensive services.
2.5 A logo (emblem)	6. The emblem (logo) does not reflect the full name of the plant	This causes the consumer of the information, industrial services of this enterprise to a mistake, as on the territory of Russia the authors identified a significant number of businesses with the name 'Elecon', not having, most likely, no relation to JSC 'Zavod Elecon'
<b>III. Design plan of the official website of the company</b>		
2.6 The corporate style of the web-site	7. The lack of corporate style	The site format is a sample of handicraft production, not typical for the corporate style of a high-tech business with the status of 'industrial design' according to the requirements of the Civil Code of the Russian Federation.

Source: on basis of: Official website of JSC 'Zavod Elekon'.2014.

Table 7. The product portfolio of JSC 'Zavod Elekon': three groups of products, information for the website

A group of product portfolio	Strategic management area Codes of types of economic activity	The purpose of production/ activity (characteristics): general			The information shown on the website
		Specification of application fields			
<b>Product portfolio No. 1</b>					
High-tech types of economic activity of industrial production and science-intensive types of services of high level (SMA 1, 4)					
a. High-tech types of economic activity of industrial production	SMA-1  33	Two target areas  Industrial production			The information is provided in accordance with the internal regulations of the enterprise on the economic, technological security, agreed with the stakeholders of the enterprise
б. Science-intensive types of services of high level	SMA-4  73	Production of unique (high technology) equipment	Production of the branch industrial (high-tech) equipment	Serial production of (high-tech) equipment	
				Science-intensive services Science-intensive services in cooperation with enterprises and universities	

<sup>11</sup> The company owning of 9.9% of the shares of JSC 'Zavod Elekon' was not found by the authors.

Product portfolio No. 2. Medium technology types of economic activity of high and low levels of industrial production, market science-intensive services (SMA 1, 3, 5)				
a. Medium technology types of economic activity of high and low levels of industrial production	SMA-1	Purpose of application: products for civil use		Products for civil use (industrial production): -Assets (branches, cooperation, partners); -Production; - Characteristics of the market; -Brands; - Markets; - Presentations of products (illustrations); - Competitive advantages; - Stock quotes of an enterprise; - Management System: Qualities, staff management; - Development Strategy for the medium - long periods in high-tech areas; - Compliance with Russian, foreign standards of quality management.
	29	industrial	household	
B. Science-intensive types of services, market science-intensive services	SMA-3, SMA-5	Purpose of application: products for civil use		
	65, 70, 74	Market-oriented services; for the code (74.30.8) - the use of general-purpose products		
Product portfolio No. 3 Low-tech types of industrial production, science-intensive services of lower science intensity (SMA 2, 6, 7)				
a. Science-intensive services of lower science intensity	SMA-6	Purpose of application: products for civil use (market)		For civil services: - Assets (branches, cooperation, company partners, research and production base, laboratories); - The purpose of a service; - Competitive advantages; - Stock quotes of an enterprise; - Development Strategy for the medium - long term periods based on market indicators; - Management System: Qualities, staff management; - Compliance with Russian, foreign standards of quality management.
	51	Market-oriented services;		
Low-tech types of industrial production	SMA-2	Purpose of application: products for civil use (market)		
	22	Market-oriented works		
B. Activity not classified by the level of technology according to Rosstat	SMA-7	Purpose of application: products for civil use (market)		
	45	Market-oriented works		

SMA – strategic management area; OKVED – the All-Russia classifier of types of economic activity

31 – The subsection of OKVED; 31.61 – a part of a subsection;

Rosstat – Russia's official statistics institute

**Source:** on basis of: Russian classifier of main types of economic activity, 2016.

## Conclusions

We can summarize the results of the study as follows:

1. The concept of 'enterprise high-tech business', the classification of enterprises on the basis of the ratings by Thomson Reuters (USA) and 'TekhUspekh' (Russia) are developed;
2. The concept of the 'information portal of the enterprise high-tech business' as part of a multimedia complex as a copyright object (on Basis of Article 1240 of the Civil Code of Russian Federation) is formulated;

3. The structure of the information portal of the enterprise of high-tech business as the object of its management in the virtual space, reflecting the diversity of structures in industry and knowledge-intensive services is elaborated.
4. The recommendations to management of company JSC 'Zavod Elecon' (Kazan, Russia) in the field of information portal are developed:
  - to bring the enterprise logo and the corporate name in accordance with its current name;
  - to bring the official website of the enterprise to the level of international standards, basing on the authors' approach;
  - to provide information for stakeholders on the official website in the format of a valuable material;
  - to introduce a position of deputy head of the company, responsible for innovative development. For this company carried out diagnostics of the official website of the company, identified critical areas of management requiring its development in the enterprise; a start-up measures to improve the official website;
  - developed three product portfolio, the seven strategic areas of management.
5. The hypothesis about the activity of enterprises of high-tech business in a high,- medium,- low-tech-types of economic activities based on the methodologies of the ratings by Thomson Reuters (USA) and 'TekhUspekh' (Russia) are proposed and confirmed; about the product portfolio of high-tech business enterprise as a diversified structure, formed in three product groups according to their level of technological (high,- medium,- low-technology), including industrial and high-tech with the use of tools of strategic management.

The result of research is the new knowledge in the field of methodological support of management of high-tech business as the diversified structures of industrial production and knowledge-intensive services.

**Table 8.** Codes of types of economic activity (Addition to Table. 4)

Codes of types of economic activity	Types of economic activity of high-tech businesses	Characteristics of economic activity
33	Production of medical devices; measuring and controlling equipment, equipment for managing and testing; optical devices, photo- and video-equipment; watches	Industrial production: the economic activity of high technological level
73	Scientific research and development	Knowledge-intensive services
29	Production of machines and equipment	Industrial production: middle technological types of activity of high level
65	Financial agency	Knowledge-intensive services
70	Real estate operations	Knowledge-intensive services
74	All other types of services	Knowledge-intensive services
51	Wholesale trade, including trade through agents, except the trade of vehicles and motorcycles	Knowledge-intensive services of low level, including of market-oriented services of less knowledge-intensity
22	Publishing and printing, reproduction of recorded media	Low-technological types of economic activity (mining and manufacturing industries)
45	Construction	Activity not classified by the level of technology according to Rosstat

Rosstat - Russia's official statistics institute

**Source:** Authors' conception on the basis of: Russian classifier of main types of economic activity.2016; Science, technology and innovation in Europe. 2008.



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## Appendix 1

**Table 9.** Case study: diagnosis information portals of enterprises of high-tech business (Germany, USA, Russia) (as 11.04.16)

Informational portal of enterprise	Mandatory part												Additional part									
	A substantial part						A section showing the belonging to high-tech business						A substantial part	A section showing the belonging to high-tech business								
	1.1	1.2.1	1.2.2	1.3	1.4	1.5	1.6	1.7	2.1	2.2	2.3	2.4		2.5	2.6	1.8	1.9	2.7	2.8	2.9	2.10	2.11
Lockheed Martin (USA)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	-	+	+	+	+	+
BASF (Germany)*	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	+	+	**	+
OOO Leoni Zavolzhie (Russia) <sup>12</sup>	+	+	+	-	+	-	+	-	-	+	+	-	+	+	+	-	-	+	**	+	-	-
The group of companies Rusagro (Russia)	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	+	+	-	-	-	-
JSC RusHydro (Russia)	+	+	+	+	+	+	+	+	-	-	-	+	+	+	-	-	-	+	+	+	-	-

<sup>12</sup> 'OOO' (obschestvo s ogranitschennoi otvetsvennostju) is an abbreviation of the legal form of the enterprise, stands for: limited liability company



N	Mandatory substantial part	A mandatory section showing the belonging to high-tech business	
		responsibility (sustainable development)	issues (video)

**Source:** based on (Science, technology and innovation in Europe 2008; Methodology of calculation of indicators 2014; Russian classifier of main types of economic activity 2016).



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