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VISION OF THE PROJECT OF MODELING INFORMATIONAL TRANSPARENCY OF SITES OF HIGHER EDUCATION INSTITUTIONS

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The openness of all activities of business entities, ensuring free access of stakeholders to the results of activities, complete disclosure of information online, form the basis for decisions by entities on further interaction. Therefore, one of the key today's challenge is to develop modern approaches, models and methods of studying information transparency as a phenomenon that is the source of modern reforms, digitalization, concepts of corporate governance, information society, social responsibility, quality and accessibility of education. The article is devoted to substantiation of the vision of the project of modeling of information transparency of sites of domestic institutions of higher education. In the course of the research the methods of project management, substantiation, financial analysis, synthesis, generalization, graphic were used. The authors propose the concept of modeling the information transparency of higher education institutions online in the context of digitalization of the economy. The concept is based on the principles and provisions of the strategy for the development of an open information society, social responsibility, corporate governance, modern reforms of the educational space and modern requirements for quality assurance in higher education, trends in digitalization of socio-economic processes. The scientific result represents a comprehensive vision of the project, the main idea of which is to ensure informational transparency of higher education institutions online through modeling and project management. The practical significance of the project vision is to substantiate the direction of changes in the parameters (content, structure, etc.) of higher education sites based on modeling the behavior of stakeholders, assessing information transparency of higher education institutions, their competitive advantages, site usability research, quality of educational services. actions of quarantine restrictions. The prospect of the study is the implementation of certain areas of modeling the information transparency of higher education institutions online.

БАЧЕННЯ ПРОЄКТУ МОДЕЛЮВАННЯ ІНФОРМАЦІЙНОЇ ПРОЗОРОСТІ САЙТІВ ЗАКЛАДІВ ВИЩОЇ ОСВІТИ

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Ключові слова:

інформаційна прозорість, заклади вищої освіти, сайт, проєкт, стейкхолдери, моделювання

Відкритість усіх напрямів діяльності суб'єктів господарювання, забезпечення вільного доступу зацікавлених осіб до результатів діяльності, повнота розкриття інформації онлайн, формують підстави для прийняття рішень суб'єктами щодо подальшої взаємодії. Тому одним з ключових завдань сьогодення є розробка сучасних підходів, моделей та методів

дослідження інформаційної прозорості, як феномену, що є витком сучасних реформ, діджиталізації, концепцій корпоративного управління, інформаційного суспільства, соціальної відповідальності, вимог якості та доступності освіти. Стаття присвячена обґрунтуванню бачення проекту моделювання інформаційної прозорості сайтів вітчизняних закладів вищої освіти. У ході дослідження використано методи проектного менеджменту, обґрунтування, фінансового аналізу, синтезу, узагальнення, графічний. Авторами запропоновано концепцію моделювання інформаційної прозорості закладів вищої освіти онлайн в умовах цифровізації економіки. В основу концепції покладено принципи та положення стратегії розвитку відкритого інформаційного суспільства, соціальної відповідальності, корпоративного управління, сучасних реформ освітнього простору та сучасних вимог до забезпечення якості вищої освіти, тенденцій цифровізації соціально-економічних процесів. Науковий результат представляє комплексне бачення проекту, головна ідея якого полягає у забезпеченні інформаційної прозорості закладів вищої освіти онлайн засобами моделювання та проектного менеджменту. Практичне значення реалізації бачення проекту полягає в обґрунтуванні напрямів змін параметрів (контент, структура тощо) сайтів закладів вищої освіти на основі даних моделювання поведінки стейкхолдерів, оцінювання забезпечення інформаційної прозорості діяльності закладів вищої освіти, їх конкурентних переваг, дослідження юзабіліті сайтів, якості освітніх послуг в умовах дії карантинних обмежень. Перспективою дослідження є реалізації визначених напрямів моделювання інформаційної прозорості закладів вищої освіти онлайн.

Statement of the problem

Informational transparency is an important socio-economic criterion of informational quality, high marks of which ensure the recognition of subjects or objects in the international arena of quality standards. That is why maximizing the parameters of informational transparency is a priority at the level of all socio-economic processes and systems that operate offline and online. Currently, institution of higher education operates in conditions of fierce competition for entrants and funding in general. Modern reforms of the educational space radically change the principles and structure of the education system in Ukraine, so the institution of higher education needs time to adapt and reconfigure the functioning in order to ensure the quality of educational services also in the online environment.

Also, the functioning of institution of higher education in the online environment requires immediate review in the context of the spread of remote learning, dynamic changes in the development of informational technology, targeting the informational transparency of the world as a whole. Digital technologies and skills of using them are a necessary and priority tool for ensuring the quality of education in modern economic conditions. The problem of providing institution of higher education them with and retraining of teaching staff remains partially solved by regions.

Considering results of existing research, the informational transparency of higher educational institutions is insufficient, which negatively affects the representativeness of the competitive image of institution of higher education online and the effectiveness of interaction with their stakeholders. The criterion-based, multidimensional assessment of informational transparency used by scientists proved the need for constant revision, updating of the set of parameters, expansion of the range of

applied methods of research of its aspects in the application of soft modeling methods in the context of corporate governance, informational society, social responsibility, rapid digitalization of educational space.

Ignoring the need to ensure a certain satisfactory level of informational transparency hinders the development of institution of higher education, complicates ensuring the quality of higher education under quarantine restrictions, the spread of distance learning and so on. Informational transparency cannot have standardized boundaries, as all institution of higher education are unique, and education reforms support the autonomy and uniqueness of the provision of educational services. However, the low level negatively affects the behavior of stakeholders, and the sites, as the main source and face of higher educational institutions, do not fill in and do not return their information needs.

Analysis of recent studies and publications

Ensuring informational transparency of economic entities in modern conditions, the development trends of which are characterized by global digitalization, studied in [1], is a prerequisite for the formation of an open environment with its inherent trust, coordinated and effective interaction between all stakeholders. This also applies to educational processes that actively operate online, where higher education institutions study the results of their activities, competitive advantages, interact through official websites with stakeholders, which is revealed in [2; 3; 4].

Systematic provision of informational transparency of higher education institutions is, on the one hand, a regulatory requirement of the state, on the other – the need to meet current trends and interests of stakeholders regarding a high level of competitiveness [5] in quarantine conditions, so the problem is relevant. Applied aspects of the study of informational transparency of higher

education institutions lie in the plane of tasks of assessing the level, state of supply, management, the results of which are presented in [6; 7; 8; 9; 10; 11], where the authors use a wide range of research methods. However, the category of informational transparency is subjective, so it is difficult to justify a universal and unambiguous way to ensure it, reliable assessment.

Objectives of the article

To substantiate the vision of the project of modeling informational transparency of higher education institutions' websites.

The main material of the research

Information transparency is the source of concepts of open informational society, social responsibility, corporate governance, modern reforms of educational space and modern requirements for quality assurance in higher education, trends in digitalization of socio-economic processes, so the study is based on relevant principles, modern views and interests of stakeholders. Analysis of existing research and publications has shown that informational transparency is considered by scientists as an economic category that ensures the openness of all activities of economic entities in relation to other economic entities, ensuring free access of all stakeholders to the results of the organization; and as a method of regulation, a component of public administration, the quality and effectiveness of which depends on the transparency of information. We propose to clarify its essence as a category that qualitatively characterizes the information in terms of

its accessibility, visibility, dissemination, informativeness, security, value for the user, the level of which is determined by the interaction between entities or objects that impose their own restrictions, regarding its target value. Its target level is determined in the process of interaction between stakeholders, the state of their information and communication security system, the presence of risks associated with its disclosure, concealment, dissemination, level of corporate social responsibility, etc.

Considering the high cost of services of involved specialists to ensure informational transparency and resource constraints of institution of higher education, important factors in the ability to ensure the functioning of the online entity are liquidity, solvency, profitability, business activity (Tables 1, 2).

An analysis of the financial condition of education, professional, scientific and technical activities of Ukraine for the period 2015–2019 was confirmed the deterioration of the situation in education since 2018, and in professional, scientific and technical activities – since 2019.

There is currently no single approved methodology for assessing an entity's informational transparency. Researchers use index and rating approaches, expert, market, analytical, accounting methods, surveys, web content analysis, verbal study of protocol, main components, critical discourse and regression, cognitive modeling. The results of their application are not exhaustive, they complement each other.

We offer a conceptual approach to modeling the informational transparency of institution of higher education, which is complex, taking into account the

Table 1 – Dynamics of values of financial indicators of education of Ukraine

Characteristic	2015	2016	2017	2018	2019
Current liquidity, %	162,1	123,3	131,6	119,2	115,1
Absolute liquidity, %	30	47,7	44,7	24,9	34,9
Coefficient of autonomy, %	59,9	62,3	63,1	69,7	63,6
Profitability of assets, %	2,6	4,4	4	1,4	0,7
Profitability of working capital, %	6,4	11,2	9,3	3,4	2,8
Net margin, %	1,9	4,1	2,4	0,9	0,3
Return on total assets, %	3,5	6,3	4,8	1,7	0,7
Asset turnover	1,8	1,7	1,7	1,6	1,6
Working capital turnover	2,5	0,8	2,9	1,9	1,4
Turnover of receivables	13,7	13,5	13,7	14,2	15

Source: according to the company YouControl [12]

Table 2 – Dynamics of values of financial indicators of professional, scientific and technical activity of Ukraine

Indicator name	2015	2016	2017	2018	2019
Current liquidity, %	137,5	135,8	136	135,6	125,2
Absolute liquidity, %	17,3	22,4	19	18,8	12,5
Coefficient of autonomy, %	48,7	47,3	48,6	50,8	46,4
Profitability of assets, %	0,3	0,8	0,9	0,9	0,8
Profitability of working capital, %	0,6	1,8	2	2,1	1,7
Net margin, %	0,9	1,5	1,6	1,7	1,4
Return on total assets, %	0,6	1,4	1,4	1,6	1,2
Asset turnover	0,8	1	0,9	0,9	0,8
Working capital turnover	1,2	1,2	1,3	1,3	0,9
Turnover of receivables	3,7	4,3	4,5	5	3,9

Source: according to the company YouControl [12]

subjective and object relations that arise in the formation and use of informational content of institution of higher education, Fig. 1.

The presented concept of modeling the informational transparency of higher education institutions online involves the search for reserves and appropriate ways to ensure the quality of higher education through the prism of research and taking into account the interests of stakeholders, requirements for reforming the educational space, the current online profile of the institution of higher education. The tools of research were methods and models of aspects of informational transparency of subjects, behavior of stakeholders as a manifestation of their interest and interest in a particular subject, assessment of site usability as a degree of satisfaction with the ease of use of the site when making decisions about further interaction. The advantages of the conceptual vision are not a direct assessment of the informational transparency of the institution of higher education, but a study of the system's response to its specific state, the existing structure, the search for effective interaction of subjects and objects of research in the online environment.

It should be noted that each of the freehold stakeholder groups – central and local government, enterprises, institutions and organizations as employers, management and administrative staff of institution of higher education, research and teaching staff, other educational institutions, graduates, students, entrants and their parents – will have

their priorities regarding the content of the institution of higher education website in accordance with their own needs and interests, but insufficient information transparency negatively affects the behavior of all groups of stakeholders online, which requires separate research.

To model the informational transparency of institution of higher education in the conditions of low level of informational transparency, it is proposed [7; 8; 11] to study the behavior of online stakeholders in terms of their interest in some methods of fractal and recurrent analysis. The frequency of queries of specific freelancers according to the Google Trends search engine is chosen as an indicator of the behavior of online freehold stakeholders. The results of R/S analysis and constructed recurrence diagrams allow to check the time series of the frequency of requests of specific institution of higher education for persistence and to characterize changes in interests and behavior of general freeholder stakeholders in the online environment at certain intervals in low informational transparency.

Since 68% of stakeholders get acquainted with institution of higher education through the site [13], it is necessary to evaluate the current interface of institution of higher education from the point of view of users. In this context, it is appropriate to use usability criteria to evaluate the public interface of institution of higher education, it is also possible to supplement the evaluation results by reviewing the interface of the information platform on which online learning is implemented. The

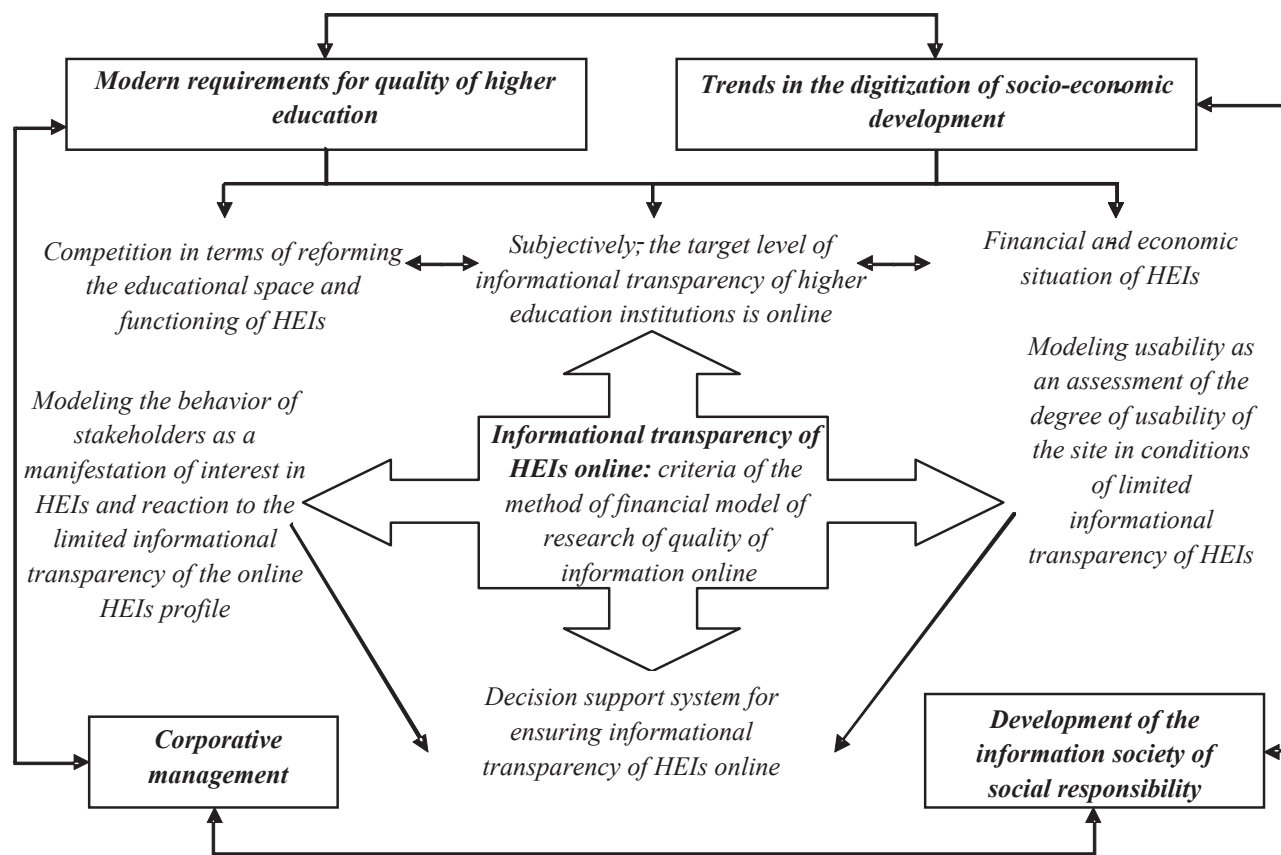


Fig. 1 – The concept of modeling informational transparency of higher education institutions (HEIs) online
Source: compiled by the author

general criteria of usability need to be reconsidered in terms of the peculiarities of the construction of institution of higher education and the requirements of stakeholders to their content. For example, on the institution of higher education site evaluate the page load speed, the availability of adaptive layout on mobile devices, homogeneity of the interface, ease of perception, freedom of access to Call to action buttons (i. e. the presence of feedback), optimization for the geography of the target audience, no forced content, animations, etc., adequacy of the button and its link, through the main menu, the possibility of registration through social networks and the presence of institution of higher education in them, the availability of proposals (invitations to study, participation in conferences, etc.), the cost of training, remarketing, simplicity of registration, personal account interface, quality graphic, text and color content and others.

Institution of higher education' sites will be evaluated according to usability criteria and a scale from 0 to 10, which will allow to obtain quantitative results. To substantiate the integrated or comprehensive assessment of informational transparency of institution of higher education, it is recommended to use the methodology of fuzzy inference according to Mamdani's algorithm, which will allow to obtain a quantitative indicator – the initial value of usability of institution of higher education site.

Considering the high cost of services of involved specialists to ensure informational transparency and resource constraints of institution of higher education, important factors in the ability to ensure the functioning of the online entity are liquidity, solvency, profitability, business activity. It is planned to assess the financial and economic situation of institution of higher education, opportunities to finance them, the transformation of information content, in particular, on the indicators of financial and market scoring of the information-analytical system YouControl [12]. It is advisable to take into account the limited access to data on state institution of higher education. In addition, the peculiarity of their financing and the regulation of costs significantly limits the subjects in making management decisions to make changes to the information content, the structure of the site institution of higher education. These issues are not a priority in the free forms of state ownership, but the leading free agents pay sufficient attention to the content of their sites.

The implementation of the concept makes it possible to justify ways to ensure informational transparency of the research subject, the practical implementation of which improves the interaction of higher education institutions and their stakeholders online. The tool of substantiation of ways to ensure informational transparency of individual institution of higher education online will be the methodology of scenario modeling by means of building a model of fuzzy logical conclusion about the ease of use of the institution of higher education site in the opinion of their stakeholders. In general, the conceptual approach is universal in terms of application, can be used for institution of higher education of all forms of ownership, funding structure and levels of accreditation. The approach to research of convenience of sites of institution of higher education can be used by all groups of stakeholders of institution of higher education.

Conclusions

The concept of modeling the informational transparency of online higher education institutions in the context of digitalization of the economy has been developed. It is based on the principles and provisions of the concepts of open information society, social responsibility, corporate governance, modern reforms of the educational space and modern requirements for quality assurance in higher education, trends in the digitization of socio-economic processes. The structure of the concept is formed from the subjective-objective processes of interaction of stakeholders in the educational space by means and methods of the online environment, which is determined by current trends and requirements for it in the country and the world. The main idea is to find reserves and appropriate ways to ensure the quality of higher education through the prism of research and taking into account the interests of stakeholders, the requirements of reforming the educational space, the current online profile of institution of higher education by studying aspects of informational transparency institution of higher education, behavior of stakeholders, evaluation of site usability. The conceptual vision focuses on the study of the system's response to a certain state of informational transparency, its existing structure, the search for effective interaction of subjects and objects of study in the online environment.

References

1. Mykoliuk, O., Bobrovnyk, V., & Kucherova, H. (2021, September). Development of Digital Technologies-Strategic Perspectives and Priorities. In *2021 11th International Conference on Advanced Computer Information Technologies (ACIT)*. IEEE. Pp. 346–350.
2. Hazelkorn E. (2012) European «transparency instruments»: Driving the modernisation of European higher education. *European Higher Education at the Crossroads*. P. 339–360.
3. Hofmann Y.E., & Strobel M. (2020) Transparency goes a long way: information transparency and its effect on job satisfaction and turnover intentions of the professoriate. *Journal of Business Economics*. № 90(5). P. 713–732.
4. Smyrnova-Trybulska E., Morze N., & Kuzminska O. (2018) Academic information transparency: from teachers' e-portfolio to upgrading the rankings of universities. In: *DIVAI 2018: Štúrovo, Slovakia, May 2–4, 2018* : Conference proceedings.
5. Hosseini M., Shahri A., Phalp K., & Ali R. Transparency as a Requirement, Bournemouth University, UK. Retrieved from: <http://ceur-ws.org/Vol-1342/03-Posters.pdf>
6. Hosseini M., Shahri A., & Phalp K. (2018) Four reference models for transparency requirements in information systems. *Requirements Engineering*. Vol. 23. No. 2. P. 251–275.

7. Kucheroва H., Didenko A., Kravets O., Honcharenko Y., & Uchitel A. (2020) Scenario forecasting information transparency of subjects' under uncertainty and development of the knowledge economy. *Machine Learning for Prediction of Emergent Economy Dynamics 2020* : Proceedings of the Selected Papers of the Special Edition of International Conference on Monitoring, Modeling & Management of Emergent Economy (M3E2-MLPEED 2020). Odessa, Ukraine, July 13–18, 2020. P. 81–106.
8. Kucheroва H., Didenko A., & Kravets O. (2019) Modeling information transparency of economic entities under uncertainty. *7th International Conference on Modeling, Development and Strategic Management of Economic System (MDSMES 2019)*. Atlantis Press. P. 201–205.
9. Kundeliene K., & Leitoniene S. (2015) Business Information Transparency: Causes and Evaluation Possibilities. *Procedia-Social and Behavioral Sciences*. Vol. 213. P. 340–344.
10. Stohl C., Stohl M., & Leonard P. (2016) Managing Opacity: Information Visibility and the Paradox of Transparency in the Digital Age. *International Journal of Communication*. Vol. 10. P. 123–137.
11. Williams A. (2014) A global index of information transparency and accountability. *Journal of Comparative Economics*. Vol. 43. P. 804–824.
12. Systema YouControl – onlajn-servis perevirky kompanij [YouControl system is an online company verification service]. Retrieved from <https://youcontrol.com.ua> [in Ukrainian]
13. Kudelya, M., Zherobkina, T., & Nazarenko, Y. (2020) Vybir vyschoi osvity pislia shkoly [Choice of higher education after school]. Kyiv : Analitychnyj tsentr Cedoc. [in Ukrainian]