Comparative and Correlation Analysis of Experimental Work for Developing Organisational and Managerial Competences in University Teachers

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Abstract

This article reports on the development of a framework for university teachers' organizational and managerial competence. The work is based on the content analysis of scientific research in new generation educational program management, ways for expanding the functions of university teachers and transforming their activities with due regard to the modern reality of higher education institutions. This competence is an integrative teacher's personality trait that reflects four structural components: value and motivation-based component, cognitive component, designbased component and knowledge-based component. Expert surveys were conducted in 2017-2019 to provide empirical support for the structural components. The sample included over 280 respondents at Samara University. Means and methods for university teacher organizational and managerial competence formation were assessed within the scope of an advanced training program (ATP) named "Educational Program Management", implemented by the Professional Competence Development Centre of Samara University. The content of the ATP's sections was developed, and teaching methods contributing to the development of indicators of the relevant competence components were identified. Summative and formative assessments of the level of competence development used self-evaluation by a sample of 140 teachers, organizing the educational process at 35 departments of the University. A correlation analysis of summative and formative assessment data was carried out to establish ties between the components of organizational and managerial competence.

Keywords: higher education program, university teacher, organizational and managerial activity, organizational and managerial competence, competence approach.

Сравнительный и корреляционный анализ опытно-экспериментальной работы по формированию организационно-управленческой компетентности преподавателя вуза

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Аннотация

Контент-анализ научных исследований в области управления образовательными программами нового поколения, выделение основных направлений расширения трудовых функций и трансформации видов деятельности преподавателя вуза в современных реалиях высшей школы послужили основанием для разработки авторской структуры организационно-управленческой компетентности преподавателя вуза. Данная компетентность представляет собой интегративную характеристику личности преподавателя, представленную в совокупности четырех компонентов - ценностно-мотивационного, когнитивного, проектировочного и экспертного. С целью эмпирического обоснования значимости показателей структурных компонентов организационно-управленческой компетентности преподавателя вуза в качестве руководителя образовательной программы были проведены экспертные опросы (2017-2019 гг.). Выборку составили более 280 респондентов. Апробация системы средств и методов формирования организационно-управленческой компетентности преподавателей вуза проводилась в рамках дополнительной профессиональной программы «Управление образовательными программами», реализуемой в Центре развития профессиональных компетенций Самарского университета. Целью формирующего и констатирующего экспериментов было выявление уровня сформированности компонентов организационноуправленческой компетентности преподавателей Самарского университета путем самооценки. Выборку составили 140 представителей профессорско-преподавательского состава, обеспечивающих образовательный процесс на 35 кафедрах университета. На следующем этапе был проведен корреляционный анализ данных формирующего и констатирующего экспериментов с целью установления связей между компонентами организационно-управленческой компетентности.

Ключевые слова: образовательная программа высшего образования, организационноуправленческая деятельность преподавателя вуза, организационно-управленческая компетентность преподавателя вуза, компетентностный подход.

Introduction

Current trends in higher education (increased openness of education systems, extension of external and internal integration processes, educational space digitisation, shift from mono- to inter- and transdisciplinary research, development of network interaction, etc.) affect the approaches to assessment of educational programs' competitiveness and cause transformational changes in a university teachers' job functions. Currently, such processes as personal growth (self-development) and self-evaluation of scientific research

work, introduction of novelties and innovations have been growing in significance. The focus of the human resource policy of a modern educational institution is on its competitiveness, achieved through improvement of professional competence of the staff, as well as through building a highly skilled and resilient workforce.

At this stage of development in higher education, innovative strategies used in educational program management acquire special urgency. It is through the prism of functioning of the higher education program that one can form an opinion on how efficiently the university attracts and spends resources, how management and infrastructure of an educational institution respond to the stakeholders' needs, and how effective the HR policy is. The main aspects influencing the competitiveness of a modern educational program that meets individual, regional and federal needs and the requirements of international standards are:

- brand and public image of the university;
- education program quality;
- academic staff qualification;
- management and learning technologies;
- economics of education program.

In today's dynamic environment, educational institutions have been rearranging or transforming their organizational structure, creating new types of employer-employee interactions, enhancing organizational, human and educational capital, enabling social initiatives, and building new working relationships.

Currently, educational institutions due to the standard nature of teaching, as representatives of the professional bureaucracy - at least those involved in innovationbased research - tend to adhocracy. A focus on convergent or deductive thinking while performing monotonous cyclical activities does not contribute to innovation. Therefore, when there is a need for conventional knowledge and skills, the professionals often work independently, but to generate new knowledge and skills they have to be united into multidisciplinary teams and work groups. Inequality in the external environment of an institution encourages it to adopt selective decentralization to differentiated work constellations, in other words, an administrative adhocracy structure.

Modern education management, according to researchers (Baranova, 2016; Chandra, 2015), implies a re-examination of the functions and activities of teachers, initiation of their organizational and managerial activities as educational program managers, who are competent in program design, implementation, quality assessment and competitiveness assurance. As a result, the traditional activities of a university teacher (teaching, research and procedure development, organization and planning) are complemented by the need to design business processes, such as quality assurance in educational program management, organizational and methodical activities to support students as educational program consumers, monitoring the performance of the educational program, and technical aspects of the marketing activities. Consequently, modernization of the management of the higher education programs underlines the need for scientific search for new means, techniques and methods, and the development of the teachers' organizational and managerial competence.

Purpose and objectives of the study

The conceptual phase of the research had the objective of justifying and developing the recommendations for research and practice aimed at upgrading the teachers' competences. The purpose of the summative and formative assessments was to identify the level of development of these competences in teachers at Samara University. Correlation analysis was then used to evaluate the relationship between the components in the structure of teachers' organizational and managerial competence to prove the performance characteristic integrity.

Literature review

The findings of scientific research and practical experience accumulated to date create certain prerequisites for the development and testing of practical models for promoting university teachers' organizational and managerial competence. Many scholars have contributed to the understanding of such competences as an integral component of teachers' professional training (Zimina, 2004; Pedan, 2014; Sharipov, 2010; Blaskova et al., 2015; Batrakova, Bordovsky & Tryapicyn, 2013). These scientists believe that this integrated characteristic displays a complex of knowledge, skills and personal traits that a teacher needs so as to organize and manage learning, projects, research and other types of student activities. A modern university teacher should have a command of the "methods of analysis and diagnostic techniques of results from the learning activities, project activities, problem-solving activities, search activities, reproductive and productive activities" (Zhukovsky, 2012, p. 180).

The awareness of effective management problem-solving tools, professional knowledge and work-related leadership experience are important instruments for the head of an educational institution or a structural unit (Berlim, 2007; Bozina, 2013; Borovikova, 2010; Reznik, 2008).

The following scholars contributed to the comprehension of the competence-based approach, which serves as the methodological basis of our study: Burgoyne (1989), Prahalad and Hamel (1990), McClelland (1998), Woodruffe (1991), Spencer and Spencer (1993), Hartle (1995), and Beaumont (1996).

In view of growing demands for qualitative programs of higher education with a combination of key parameters that are significant and necessary for consumers, the management system is faced with the task of staffing for on-going reorganizations. Firstly, this applies to teachers, most of whom lack the organizational and managerial competence that ensures educational program management, active participation in its content, structure, concept development and further implementation.

It should be noted that there is no unique interpretation of the concept of a "university teacher's organizational and managerial competence" in the scientific literature. Additionally, extra development effort is needed for the methodical and implementation components of purposeful development, and further diagnosis of the teachers' competence when acting as an educational program manager. In our opinion, an effective means of solving these tasks should be specially organized training that contributes to formation of such skills as: content knowledge operation, activity design and modelling based on the integration of knowledge from the different spheres that are part of professional activity of a university teacher" (Kirsanov & Kondrat'ev, 2009, p.83).

Methodology

The authors used the content analysis of scientific research in new generation educational program management, ways for expansion of functions of university teachers and their activities transformation in the context of modern realities of higher education institutions as the basis for the development of the organizational and managerial competence framework. This competence is an integrative personality trait that reflects four structural components – a value and motivation-based component, cognitive component, design-based component and a knowledge-based component.

The expert surveys were conducted between 2017 and 2019 to provide empirical support for the structural components of these competences. Discussions and interviews with the heads of structural subdivisions of universities showed that a modern institution needs highly qualified specialists capable of self-assessment, ready for research, and aiming at professional and personal growth. The following challenges were expected to be met during the expert survey:

• empirically confirmation of the importance of organizational and managerial competence of the university teacher for effective management of educational programs;

• Identification of effective methods for developing these competences as part of the advanced training system offered at university.

The empirical justification for the importance of the organizational and managerial competence of teachers was based on the analysis of opinions of four groups of respondents (n=280):

• managers of educational programs of different higher education institutions in Samara ("external evaluation");

- teachers of Samara University ("internal evaluation");
- managers of educational programs of Samara University ("internal evaluation");
- heads of departments and faculties of Samara University ("internal evaluation").

The study ensured that the first sample of respondents (managers of educational programs of different higher education institutions in Samara) was representative, by including educational institutions offering training in various areas, and by experts having significant experience (n=42). The second sample included the teachers of Samara University (n=105). The third group of respondents (n=101) included the managers of educational programs of Samara University. The inclusion of the managers of educational programs developed for different levels and fields of study ensured that this sample was representative. The fourth group of respondents (n=32) included the heads of the department of Samara University. The total number of responses exceeds 100%, because following the survey methodology, respondents could mark several response options. The survey results are presented in Table 1.

As shown in Table 1, the respondents put a high value on the practical skills crucial for research. An analysis of the responses offered by the respondents of all groups allowed us to conclude that the indicators of the greatest importance were: awareness of the regulatory framework and innovative approaches to educational process organization; delegation of authority and acceptance of feedback; adoption and implementation of managerial decisions; activities aimed at conflict resolution during educational program development; diagnostics of competitiveness and effectiveness of educational programs.

These competencies refer to the main stages of the management cycle: planning, motivation, support, monitoring and assessment of the results achieved. The analysis of the survey results allowed us to analyse the distribution of all competencies in each area of activity of the managers of educational programs and define the subject matter and content of advanced training programs aimed at improving the level of organizational and managerial competence.

The findings of the research allow us firstly, to confirm the importance of indicators of structural components of teachers' organizational and managerial competence, and secondly, to prepare methodical support for developing organizational and managerial competence within the Samara University advanced training system.

Skills and Abilities of Educational Program Managers		Degree of Manifestation (%)			
		Group of Respondents *			
	1	2	3	4	
Teamwork skills	52.0	51.2	48.2	45.6	
Interest in managerial experience of other divisions of educational institution	22.5	27.8	24.2	21.5	
Creative initiative promotion and innovation in educational program development	34.2	35.0	34.1	33.7	
Adoption and implementation of managerial decisions	53.0	49.0	43.4	41.6	
Awareness of regulatory framework and innovative approaches to educational process organization	46.7	55.0	50.2	51.2	
Mediation for conflict resolution during educational program development	55.9	54.2	57.7	53.2	
Methodical issues in educational program planning	37.2	32.0	35.3	29.5	
Delegating authority to solve tactical and strategic tasks and receiving feedback	47.0	46.8	48.2	42.0	
Document flow management	12.6	22.2	23.2	21.2	
Educational program management evaluation	36.7	42.0	45.3	40.0	
Diagnostics of educational program competitiveness and effectiveness	56.0	55.6	54.7	56.7	
Monitoring success of educational programs	39.6	38.8	34.2	31.3	

Table 1. Findings of the expert survey conducted to assess the significance of indicators of organizational and managerial competence of teachers

* Groups of respondents: 1 – managers of educational programs of different higher educational institutions of Samara; 2 - teachers of Samara University; 3 – managers of educational programs of Samara University; 4 – heads of departments and faculties of Samara University

A modern university teacher should be prepared to solve organizational and managerial problems in the design and implementation of competitive educational programs. The study of this problem involves many research objectives among which is the formation of university teachers' organizational and managerial competence (Table 2).

Component	No.	Criteria	
Value and motivation- based component	1	Interest in creating innovative educational programs and products	
	2	Need for teamwork	
	3	Need for communication and integration with colleagues	
	4	Interest in organizational and managerial activities	
Cognitive component	5	Awareness of the regulatory framework of higher education	
	6	Awareness of the fundamentals of managerial theories	
	7	Awareness of the fundamentals of HR management and conflict resolution	
	8	Awareness of the fundamentals of educational programs economics	
	9	Awareness of the innovative methods and training techniques	

Table 2. Structure of university teachers' organizational and managerial competence

Design-based component		Ability to design learning and teaching materials and educational programs support		
		Ability to plan resource support of educational programs		
		Ability to determine the budget of the educational program		
	13	Ability to design the content and structure of the educational		
		program (conduct marketing)		
Knowledge-based component	14	Ability to monitor and evaluate the quality of educational programs		
	15	Ability to evaluate the competitiveness of educational programs		
	16	Ability to calculate the profitability of educational programs		
		Ability to conduct an examination of the compliance of the educational program with the Federal State Educational Standard		

The level of development of the components of a university teacher's readiness for effective management of educational programs can be assessed through training seminars, and interviews. It is extremely important, while teaching teachers the basic principles of development and implementation of educational programs, to shape such qualities as systematization, mobility, flexible thinking, and the ability to diagnose organizational and managerial problems. The formation of a range of skills and abilities that are part of the structure of organizational and managerial competence can be achieved through the use of active and interactive teaching methods. The development of system analysis skills, shaping of managerial decision-making skills, as well as training in effective intra-group and interpersonal interactions can be achieved through employment of business games, situation analysis, group discussions, and trainings.

The proposed structure of organizational and managerial competence of a university teacher developed with due regard to the analysis of innovative activities has been used as a content-related and methodological basis for the development of teacher advanced training programs aimed at solving the strategic priorities of the university, improvement of the efficiency of new generation educational program management, and involvement of all stakeholders in the implementation of educational programs.

Results

The means and methods for developing a university teacher's organizational and managerial competence were assessed through the advanced training program (ATP) "Educational Program Management", implemented by the Professional Competence Development Centre of Samara University. The purpose of the program was to prepare students for effective interaction during the design and implementation of competitive educational programs. Based on the proposed structure of organizational and managerial competence (the value and motivation-based component, cognitive component, design-based component and knowledge-based component), the content of the ATP's sections are the economics of education, educational programs, educational program quality and competitiveness), and teaching methods contributing to the development of indicators of the relevant competence components. Relevant applications of active and interactive methods (training, organizational games, brainstorming, case study, group discussion, problem-based lecture, round table, debate, etc.) and teachers' personal experience were developed.

Summative and formative assessments, including self-assessment, were conducted to determine the level of development of the value and motivation-based component, cognitive component, design-based component and knowledge-based component of the competences. This sample included 140 teachers, organizing the educational process in 35 departments of the University.

The students were assessed before and after they successfully completed the advanced training program. When processing the survey findings, the mean index for self-assessment (J) was calculated (a number between -1 and +1 inclusive, where "-1" is the minimum value of the indicator, and "1" is the maximum value of the indicator). In order to confirm the effectiveness of the proposed system, and to find correlation between the four components of the competence structure, a correlation analysis of the findings of summative and formative assessments was carried out. The Pearson correlation coefficient was used as an indicator of the magnitude of the statistical relationship. The level of statistical significance at 0.05 was used to assess reliability of correlation between variables.

According to the findings of the summative assessment, the mean index for selfassessment of the value and motivation-based component is 0.31. It follows that the teachers underestimate the importance of organizational and managerial work for implementing competitive educational programs - the need for communication and integration with colleagues (J=0.37), and interest in organizational and managerial activities were low (J=0.26). In the findings of the formative assessment, the mean index value for self-assessment increased to 0.74. This demonstrates positive attitude of teachers to organizational and managerial activities, in particular to the creation of innovative educational programs and products (J=0.81) - the dominant indicator.

The educational technologies used in the implementation of advanced training programs enable the development of motivation for organizational and managerial activities, for management of a team of like-minded people to design education tools. Problem-based and debate-learning strategies contribute to the development of students' self-assessment, to their understanding of the importance of their professional activities with due regard to innovations, and the development of skills necessary for coordinating teamwork while implementing educational programs.

According to the findings of the summative assessment, the mean index value of the cognitive component of organizational and managerial competence of teachers (J=0.31) showed the students' knowledge deficiency in management theories (J=0.30) and economics of educational programs (J=0.26). This can be explained by the fact that the fundamentals of HR management policy, education management and conflict resolution theory, as a rule, are taught at the advanced training courses for managerial staff of educational institutions. In addition, many students lack experience in structural unit management.

The inclusion of such sub-units as "Financial Management in Higher Educational Institutions", "Academic Management of Educational Program", "Administration of Educational Program", "Estimation of the Economic Efficiency of the Educational Programs of the HEI's Structural Unit" helps to overcome the cognitive barrier manifested in the lack of knowledge of new aspects. At the same time, a high value of the indicator "awareness of higher education regulatory framework" (J=0.4) confirms the judicial competence of the teachers, which is important when working with an educational program as a social norm. According to the findings of the formative assessment, the mean index value of the cognition-based component has increased to 0.72, which demonstrates the developed information potential.

Barriers to a teacher's organizational and managerial activity are due to specifics of the activity and lack of maturity of the design-based component of organizational and managerial competence, as evidenced by the mean index value (J=0.26), and in particular, low-level skills in educational program budgeting (J=0.2), resource planning (J=0.24), and design of HEIs educational program content and structure (J=0.26).

The findings of the formative assessment, showed that the mean index for the selfassessment of an adult increased (J=0.71), which means that teachers are involved in project activities, which contributes to the learning of the sub-units "Educational Program Project Planning", "Educational Program Design", "Educational Program Financial Responsibility Centre Establishment", "HEIs Financial Management", etc.

The summative assessment, showed that the indicator for "the ability to design teaching and learning materials and educational programs support" (J=0.32) has the highest value. This is easy to explain, since teachers first of all are qualified to teach a particular subject rather than to act as managers, and their standard activities do not include educational program design. In the formative assessment, the option (J=0.78) "to design the content and structure of the educational program" has the highest value, and the "ability to determine the budget of the educational program" showed the greatest increase (three times).

The summative assessment indicated that the expert-based component is insufficiently structured. This is confirmed by the mean index for self-assessment (J=0.24). Such options as "the ability to calculate the profitability of educational programs" (J=0.2), "the ability to monitor and evaluate the quality of educational programs" (J=0.23) have the lowest values.

From the summative assessment, the mean value of the index for self-assessment of the expert-based component increased significantly (J=0.64). This demonstrates the effectiveness of the training methods and techniques. And if, based on the results of the summative assessment, the ability to assess an educational program for compliance with the Federal State Educational Standard dominates in the structure of the expert-based component, then the ability to evaluate the competitiveness of educational programs dominates according to the data of the formative assessment (J=0.7).

From a comparison of the findings of summative and formative assessments, the dominant indicators of each component of the organizational and managerial competence of a teacher and directions for their improvements can be identified (Table 3).

Component	Mean index value		Dominant Indicators	
	SA	FA	SA	FA
Value and motivation-based component	0.31	0.74	Need for communication and integration with colleagues	Interest in creating innovative educational programs and products
Cognitive component	0.31	0.72	Awareness of the regulatory framework of higher education	Awareness of the fundamentals of the educational program economics
Design-based component	0.26	0.71	Ability to design teaching and learning materials and educational program support	Ability to design the content and structure of educational programs
Knowledge-based component	0.24	0.64	Ability to conduct an examination of the conformity of an educational program with the Federal State Educational Standard	Ability to assess the competitiveness of educational programs
Mean value	0.28	0.70		

Table 3. Dominant indicators in the structure of university teachers' organizational and managerial competence

In particular, the value and motivation-based component is characterized by a noticeable increase in interest in creating innovative educational programs and products. The cognitive component is marked by the awareness of the fundamentals of the educational program economics. The design-based component is exemplified by the change of the vector to the educational program budgeting. The dominant indicator of the expert-based component is the ability to assess the competitiveness of educational programs. The assumption of an increase in the indicators of the components of the organizational and managerial competence of university teachers through the process of implementing the "Educational Program Management" program was confirmed by the formative assessment for different categories of students.

A comparative analysis of summative and formative assessments' findings revealed differences in the dominant indicators. So, the formative assessment unlike the summative, showed the changes in the value and motivation-based component aimed at increasing interest in innovative educational programs and products creation, the cognitive component is marked by educational program economics, the design-based component is characterized by vector changed to the budgeting of educational programs, while the dominant indicator of the knowledge-based component is the ability to assess the competitiveness of educational programs.

Correlation analysis was used to evaluate the relationship between the components in the structure of organizational and managerial competence of a university teacher to demonstrate the performance characteristic integrity. The relationships between the components of organizational and managerial competence structure of the Pearson correlation coefficient, which lies between -1 and 1, were analysed using the summative and formative assessment matrices.

The findings of the correlation analysis of the summative assessment data, showed a link between value and motivation-based component and cognitive component expressed by "interest in creating innovative educational programs and products" (1), "need for teamwork" (2), "awareness of the regulatory framework of higher education" (5). At the same time, the self-development of a university teacher as a manager of an educational program is related to the "interest in organizational and managerial activities" (4) and "need for communication and integration with colleagues" (3). Thus, a university teacher strives for continuous learning of the management theories and fundamentals of the educational program economics.

At the same time, correlations between "ability to design learning and teaching materials and educational programs support" (10) and "ability to monitor and evaluate the quality of educational programs" (14) are quite weak. University teachers have the potential to design qualitative educational programs but do not strive to create a competitive educational product. We found no relationship between the cognitive and the design-based components.

No correlation between the design-based component and the knowledge-based components was identified. The "ability to design the content and structure of the educational program (conduct marketing)" (13) and the "ability to evaluate the competitiveness of educational programs" have a weak correlation. However, there is a weak link with the "ability to conduct an examination of the compliance of the educational program with the Federal State Educational Standard". The greatest number of correlation relationships refers to the following indicators: (5) "awareness of the regulatory framework of higher education" – 8 links; (12) "ability to determine the budget of the educational program" – 7 links and (13) "ability to design the content and structure of the educational program (marketing)" –5 links (Table 4).

Component	Summative Assessment	Formative Assessment
Value and motivation-based component	↑	Ť
Cognitive component	+	↓ ↑ ↑
Design-based component	≜	↓ ↑
Knowledge-based component	+	↓ ↓

Table 4. Relationship of components of organizational and managerial competence of a university teacher (based on correlation analysis)

Within the formative assessment, the correlation coefficients between the value and motivation-based component and cognitive component have increased. The analysis of the formative assessment correlation matrix revealed additional relationships between the components as follows: cognitive and design-based (R=0.71); cognitive and knowledge-based (R=0.56) as shown in Table 5.

Correlation Coefficient	Summative Assessment	Formative Assessment
R _(value and motivation - cognitive)	0.35	0.60
R _(value and motivation - design)	0.10	0.24
R _(value and motivation - knowledge)	- 0.14	0.15
R _(cognitive-design)	- 0.15	0.71
R _(cognitive-knowledge)	- 0.12	0.56
R _(design-knowledge)	0.27	0.65

Table 5. Correlation Coefficient Values

Thus, having undergone advanced training, the university teachers developed the necessary skills in the design and expertise of the educational programs, but these managerial and organizational competencies have not gained professional value. The formative assessment proved the hypothesis concerning the growth of the organizational and managerial competence of the university teachers after attending the advanced training courses in "Educational Program Management".

The effectiveness of the implemented system of developing organizational and managerial competence of the university teachers was confirmed by the increase in scores indicating the maturity of the components.

Conclusion

This study:

• analysed the prerequisites and conditions for the development of the organizational and managerial competence of university teachers through implementing a strategy aimed at increasing the competitiveness of higher education programs;

• provided empirical evidence of the relevance of the main components of the organizational and managerial competence of the university teachers based on the expert survey of four groups of respondents;

• developed practical and scientific recommendations aimed at improving the level of organizational and managerial competence of university teachers (as an advanced training program);

• developed and tested learning and teaching materials designed for educational process during the implementation of the advanced training program, as well as for various training courses and seminars held by the structural units of the university.

The validity of the research findings was confirmed by the practical implementation of the results in the educational process of Samara University. However, there are a number of controversial issues and potential risks associated with the implementation of the methodology for building teachers' organizational and managerial competence. In particular, the management of higher education programs needs to be optimized.

Management decisions should address the staffing for ongoing reorganization, utilisation of such mechanisms as staff selection and training in educational program management. The formation of new structural units for the management of educational programs, such as educational program departments and training offices, is a vital issue. Thus, under the changing conditions of the educational environment, educational institutions are being restructured, developing new educational programs for competitive training of specialists to meet new requests of the educational process stakeholders.

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