

Exploring Perceptions and Practices in Organizing University Scientific Research

Cristian Marius Toma

“Grigore T. Popa” University of Medicine and Pharmacy Iasi, Romania
„Alexandru Ioan Cuza” University of Iasi, Romania
tomamariuscristian@yahoo.com

Irina Teodora Manolescu

„Alexandru Ioan Cuza” University Iasi, Romania
iciorasc@uaic.ro

Vasilica Toma

“Grigore T. Popa” University of Medicine and Pharmacy Iasi, Romania
vasilicatoma40@yahoo.com

Abstract

Universities are considered the main centers for the national research base, paving the way for the development of transdisciplinary projects, crucial in the context of the complex challenges facing society. The organization of scientific research must prioritize the human factor and involve establishing the departments involved in university scientific research and the connections between them. This paper presents the perceptions of academic staff at a medical university regarding the organization and implementation of research within the university and the sources of research funding.

The results highlight a clear orientation towards interdisciplinary research, albeit conducted within the organization itself, and a weak prioritization of fundamental research. Additionally, funding through international grants is seen as less accessible than national funding, despite the medical field being considered a priority in the funding programs. The research findings are relevant for decision-makers in the field of research funding at both the national and organizational levels.

Key words: research and development; grants; research funding; collaborative environment

J.E.L. classification: I23, O32

1. Introduction

Worldwide, knowledge is recognized as a critical factor for global competitiveness in the 21st century. According to this perspective, successful societies are those most capable of leveraging knowledge for performance and competitive advantage, as well as attracting international talents, new businesses, and investments. The imperative for a society grounded in knowledge is crucial in the context of the European Union and national government agendas aimed at fostering sustainable economic and social development. This becomes particularly significant as a proactive response to the challenges posed by the global economic crisis. (European Commission, 2010, p.17). The evolution of society into a knowledge society has positioned universities at the center of creativity and human learning, crucial for the survival of our planet. The forces influencing the activities of universities have grown in complexity and are continuously accelerating (EUA, 2021, p.3).

In many countries, universities have become the primary centers for the national research base, paving the way for the development of transdisciplinary concepts increasingly seen as crucial in the face of the complex challenges confronting both national and global societies. Universities function on a multifaceted and interdependent spectrum: delving into the most theoretical and intricate realms of knowledge, concurrently pursuing the practical implementation of discoveries; examining, revitalizing, and progressing inherited knowledge from preceding generations; and endeavoring to

establish robust principles of reasoning and action that they impart to successive generations of students (Boulton *et al.*, 2008, p.4). Thus, universities operate both in the short term and on a longer horizon.

Universities differ from enterprises in that they lack a clearly defined product and standardized processes designed for cost-effective production. Instead, universities produce a broad range of outcomes (Boulton *et al.*, 2008, p.4): through research, they introduce new possibilities, and in the realm of teaching, they mold individuals. These two dimensions synergize, giving rise to emergent capacities that align with the demands of the era. They assimilate and generate the potential for advancement through ideas and individuals poised to influence an as-yet-unknown future. Objectives in a fragile balance - excellence, innovation, sustainability, community orientation—must be incorporated into research activities to access limited and highly competitive funding (Percic *et al.*, 2021, p.229; Talmaciu *et al.*, p.353).

The enduring factors contributing to the success of universities elucidate why, in the age of globalization, these institutions are regarded as significant national assets on a global scale. Governments across the world recognize them as crucial fountains of new knowledge and inventive ideas, sources of skilled personnel and reputable accreditation, catalysts for innovation, magnets for talent and international investments in a region, advocates for social justice and mobility, and contributors to social and cultural vibrancy. Thus, in recent decades, the opinion has firmly been established among governments worldwide that higher education and high-quality, internationally competitive research are essential conditions for long-term success in the globalized knowledge economies (Boulton *et al.*, 2008, p.5).

2. Theoretical background - university scientific research

Like in any field of activity, organizing scientific research conducted at universities involves the human factor and entails determining the positions and departments involved in university research and the connections between them. Scientific research activity carried out in universities is conducted in accordance with the regulations of the respective universities and current legislation, either individually or in research collectives operating within various types of research structures. Although the external environment that stimulates research is essential, the internal mechanisms of universities become decisive in the success of research projects (Battaglia *et al.*, 2021, p.13).

Scientific research is a necessity for knowledge and can be achieved through innovation, thus becoming the engine for increasing economic competitiveness and human well-being (Gâlea, 2021, p.14). In the current period, unfortunately, we increasingly face unforeseen situations: exceptional health situations, a reduction in resource levels, and an aging population. In this context, scientific research becomes a necessary and important resource for addressing or improving these challenges. Scientific research is a creative activity undertaken systematically with the aim of expanding the volume of knowledge, including knowledge about humans, society, and culture, and using them to conceive new applications (Gâlea, 2021, p. 22).

The umbrella term Research and Development (R&D) encompasses three distinct categories of activities: basic research, applied research, and experimental development. Basic research involves both experimental and theoretical work primarily focused on gaining new insights into the fundamentals of observable phenomena. This type of research is conducted without specific consideration for any immediate application or practical use (OECD, 2015). Basic research analyzes properties, structures, and relationships based on which hypotheses, theories, or laws are formulated and tested. The results of basic research are not generally sold; they are published in scientific journals or disseminated to interested parties. Experimental development involves creative and systematic work aimed at increasing the body of knowledge, including knowledge about humans, culture, and society, and using this knowledge to create new applications (OECD, 2015). Applied research involves conducting original investigations with the goal of acquiring new knowledge. Nevertheless, this form of research is primarily oriented toward addressing a specific practical purpose or objective. Experimental development, on the other hand, entails systematic work built upon existing knowledge garnered from research or practical experience. It aims to generate additional knowledge directed at creating new materials, products, or devices, developing innovative processes, systems, or services, or significantly enhancing those already in existence or implemented

(OECD, 2015).

Scientific research conducted by universities, influencing knowledge development and human resources, stands as a fundamental pillar of socio-economic advancement. A key determinant in the socio-economic role of universities is the enhancement of innovative capacity, leveraging the creative potential of both faculty and students through the application of knowledge, products, and technologies in the economic sphere. Given their specific societal functions, universities are tasked with formulating scientific research programs oriented towards new directions and priorities in science, overseeing research teams and fostering centers of excellence. The formulation of managerial solutions is challenging and marked by significant dynamism (Toma, 2010, p.405). Society should acknowledge the pivotal role of universities as vital entrepreneurial institutions, possessing unparalleled capacity and adaptable responsiveness to a multitude of contemporary, often interdisciplinary challenges, while also serving as compelling attractors for top-tier talents. (LERU, 2012, p.4).

It has been demonstrated that there is a strong correlation between direct financial stimulation of universities and their performance (Medeleanu *et al.*, 2020, p.69). The possibility of accessing external funding sources through specific instruments - research projects - can induce other positive effects at the organizational level (Manolescu, 2005, p.9), such as gender equality (Apostoaie *et al.*, 2019, p.215). Funding systems and specific instruments are important in all spheres of society (Ozili, 2021, p.457), but for research - a field that requires significant sums, especially during critical moments and without a clear promise of remuneration for capital contributors - they become vital. The clearer the criteria for evaluating and selecting research projects are for the researchers involved, the more accessible funding through external programs becomes (Toma *et al.*, 2013, p.306; Toma *et al.*, 2016, p.418).

3. Research methodology

We will now present the perceptions of academic staff from "Grigore T. Popa" University of Medicine and Pharmacy in Iași regarding university scientific research as a general approach, information about the organization and implementation of research within the University, and the funding sources for university research. The primary instrument used is a questionnaire with predefined and open-ended responses, completed by 74 faculty members conducting research within the university.

In the university environment, the realization of scientific research and, implicitly, its performance and efficiency, are conditioned by the academic staff's own conception of research and their perceptions of how and where it is carried out. These opinions and perceptions can be more or less different from the ideas, principles, and objectives proposed and assumed by the university through its framework documents regulating scientific research activity (University Charter, Strategic Plan, regulations, reports). This implies that the potential benefits for the university arising from scientific research depend on how academic staff actually approach scientific research when they believe they are pursuing the university's research objectives.

According to the Rector's Report for the academic year 2021-2022 (UMF, 2022, p.138), scientific research activity constitutes a fundamental component of the mission of "Grigore T Popa" University of Medicine and Pharmacy in Iași, as outlined in the strategic plan and the university's charter. The academic community at the university consistently supports the essential principle that a higher education institution must be a significant producer of scientific novelty, both fundamental and applied, within the specific context of its educational role and the formation of elites. Research and development activities are carried out in accordance with the University Charter of Medicine and Pharmacy "Grigore T. Popa" in Iași and are based on the strategy of promoting multidisciplinary research and the priorities of new technologies. University scientific research is conducted either individually or in research collectives within faculties, interdisciplinary research platforms, and scientific research and excellence centers (UMF, 2022, p.138).

University scientific research is perceived in various ways by those involved in research at "Grigore T. Popa" University of Medicine and Pharmacy in Iași. Thus, depending on the perspective from which respondents approach this concept, they view university scientific research as representing: an activity or a set of activities, a component, a process, a method, a tool, a mode of

expression, a vocation, an evaluation criterion.

4. Findings and discussion

The first set of questions aimed to capture respondents' perceptions regarding the general characteristics of research processes conducted at the university.

In response to the question "What do you believe can be considered university scientific research?" respondents defined university scientific research by referring to various aspects related to this concept: organization and functioning, realization, features, forms, functions, effects, or results.

Fourteen out of the 74 respondents defined university scientific research from the perspective of organization and functioning. Summarizing the opinions of the respondents, viewed from this perspective, university scientific research represents the totality of contracted or non-contracted research activities conducted under the auspices of a university and utilizing the research infrastructure (laboratories, research centers, etc.) provided by the respective university or other partnering institutions.

From the perspective of those who conduct it, university scientific research, in the respondents' vision, represents the totality of research activities carried out by university faculty, researchers, doctoral students, and students.

Some respondents defined university scientific research from the perspective of how it is conducted, mentioning: rigorous and meticulous investigation based on scientific principles; consulting the bibliography; developing research projects; creating scientific papers; filing invention patents.

The definitions provided by the respondents highlighted the following characteristics of university scientific research activity: complex, highly specialized, and professional, carried out in teams, generative and transmitter of novelty, with a mandatory character for academic staff.

In terms of the functions it fulfills, according to the academic staff engaged in research at UMF Iași, university scientific research serves the following functions:

- General: observation of phenomena, validation of the descriptive conceptual framework of various study disciplines, creation or generation of new knowledge, and transfer of this knowledge to society to address current societal needs.
- Specific to medical sciences: a source of scientific evidence for medical practice and health policies.
- Related to human resources: development of research skills and abilities; training of future researchers; fostering creativity; promotion of interdisciplinary and teamwork; criterion for evaluation or component of performance evaluation in academic activities; complementing or supplementing teaching activities.
- Organizational: promotion of excellence and competence; criterion for university evaluation; indicator of national and international visibility; instrument for continuous institutional adaptation to socio-economic challenges.

Five respondents view university scientific research as a component of higher education with the aim of educating students to acquire the necessary skills for scientific research, involving faculty in generating innovative ideas and contributions, and creating or generating and transferring new knowledge to society.

In terms of expected effects or results, the most important ones emerged as follows:

- General: generating novelty in any field of knowledge; accumulating new knowledge through the observation of new phenomena and obtaining new results; achieving results with an impact on scientific and technological progress and practical relevance; achieving results with economic, social, cultural impact, in health and environmental protection; identifying new areas with potential applications in everyday life.
- Specific to teaching: obtaining results that can be used in teaching activities; for teaching – more effective and attractive teaching methods; leveraging the creative capacity of faculty.
- Specific to medicine: optimizing diagnosis and patient therapy; obtaining knowledge that can be useful for the development of prevention, diagnosis, and treatment possibilities.

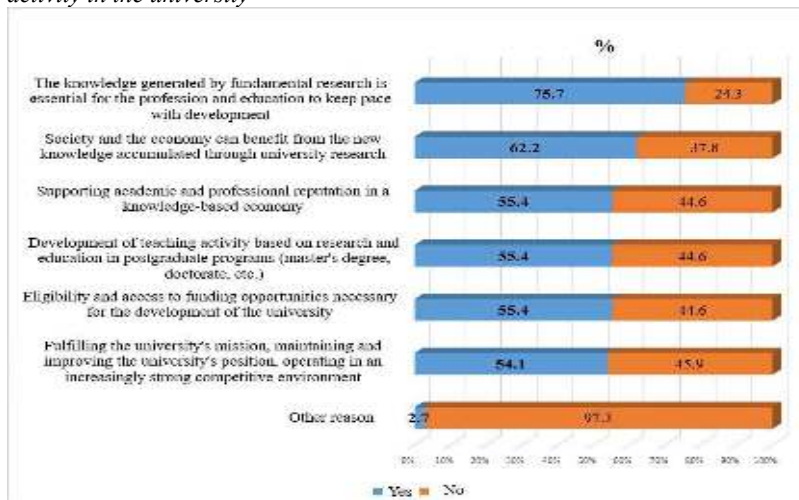
- Organizational: increasing innovative capacity; increasing competitiveness of universities; developing research infrastructure; supplementing financial resources; producing articles, books, manuals.

In response to the question "Why do you consider research activity necessary in the university?" the responding researchers argued for the necessity of research activity in their university based on the provided response options (6 predefined arguments), with the possibility of offering an option not listed (figure no.1).

The main argument justifying the necessity of research activity, in the researchers' opinion, is the generation of knowledge perceived as essential for the profession and education to keep pace with development. 75.7% of the total 74 respondents chose the response option "Knowledge generated by fundamental research is essential for the profession and education to keep pace with development," recording the highest number of responses. The second argument in justifying the necessity of research activity is the benefit brought to society in general and the economy in particular through the accumulation of new knowledge. Among all researchers, 62.2% of respondents chose the option "Society and the economy can benefit from new knowledge accumulated through university research." The other arguments have slightly similar weights, therefore, in the respondents' opinion, they are perceived as having equal importance.

A proportion of 2.7% of respondents provided new arguments for justifying the necessity of research activity in the university, namely: establishing collaborative relationships with other institutions, obtaining funds necessary for university activities, and promoting excellence within the university.

Figure no. 1. Distribution of responses regarding the arguments motivating the necessity of research activity in the university



Source: authors' contribution

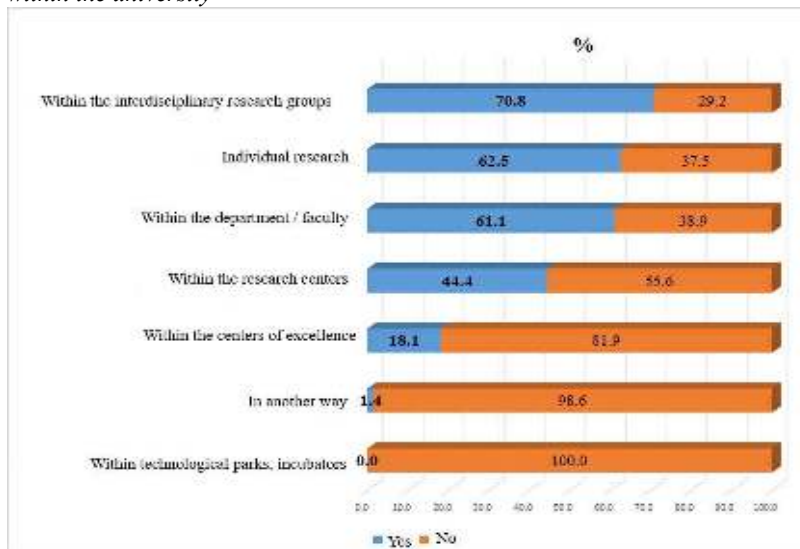
The organization of research within the university takes place in various forms (individual research, department/faculty research, interdisciplinary research group research, etc.). Out of the total 74 respondents, 2 respondents either did not know or did not want to answer the question "How is research organized in the university where you carry out your activities?". Therefore, the number of respondents with valid responses is 72 (figure no.2).

The majority of respondents believe that, in the university where they carry out their activities, research is organized within interdisciplinary research groups (70.8% of respondents with valid responses chose this option). Other forms of research organization at UMF Iași are individual research (62.5% of respondents) and research within the department/faculty (61.1% of respondents).

Research within centers of excellence involves a limited number of researchers. This situation is reflected in the evaluation, with a small proportion of respondents choosing this option (18.1% of the total 72 valid respondents).

None of the surveyed individuals chose the option of organizing research within technology parks or within incubators, given the profile of the university considered in the study. This result can be argued by the fact that complex projects often require partnerships with organizations outside the academic sphere, leading to the possibility of cultural barriers in collaboration (Manolescu *et al.*, 2014, p.335). Additionally, barriers to knowledge transfer outside the academic environment (Belitski *et al.*, 2019, p. 613) guide researchers towards interdepartmental and interuniversity networks. For university-industry collaboration, government incentives are considered vital (van Rijnsoever *et al.*, 2021, p.1942).

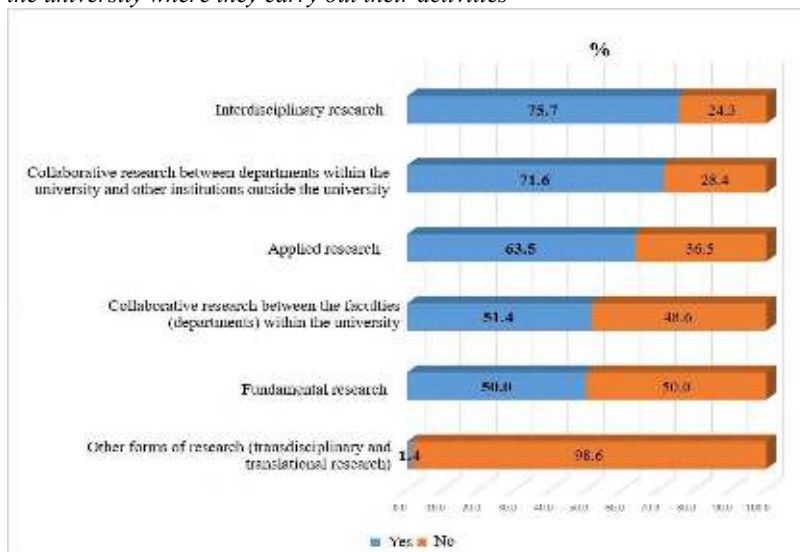
Figure no. 2. Distribution of respondents based on their opinion on the forms of research organization within the university



Source: authors' contribution

The distribution of Yes/No responses for each response option to the question "Which forms of research do you consider to be priorities for the university where you carry out your activities?" is presented in Figure no. 3.

Figure no. 3. Distribution of respondents based on their opinion on the prioritized forms of research for the university where they carry out their activities



Source: authors' contribution

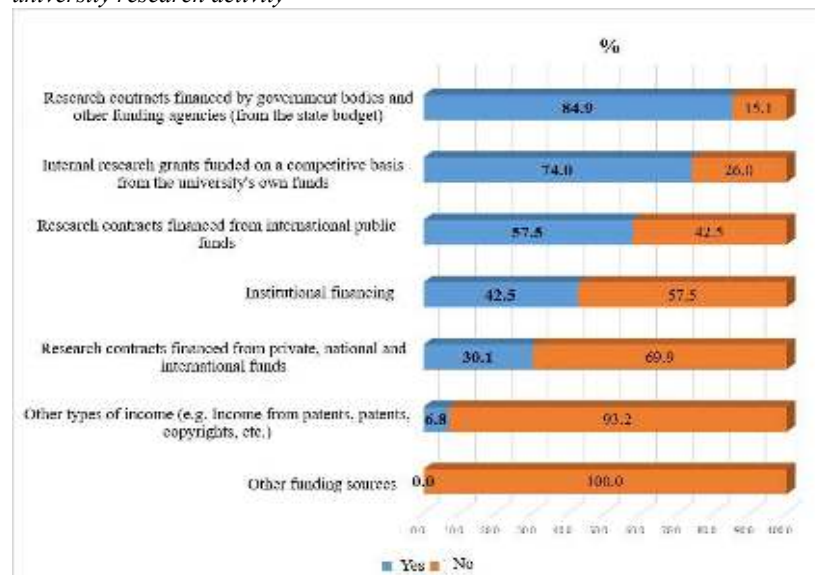
Respondents have indicated that, for the university where they carry out their activities, scientific research is a priority under all forms of research (out of all researchers, 73 respondents chose at least one of the predefined response options). However, one researcher provided a response other than those offered in the questionnaire, considering transdisciplinary and translational research as a priority for the university where they carry out their activities.

The largest proportion of respondents (75.7% of the total interviewed researchers) considered Interdisciplinary Research as a priority. According to the researchers, another high-priority area is research involving collaboration between universities (with 71.6% of total respondents perceiving Collaborative Research between university departments and other institutions outside the university as a priority). Among the five forms of research indicated in the questionnaire, Fundamental Research ranks last in priority according to respondents' opinions.

UMF Iași was among the first universities in Romania to organize an internal competition for research projects. The first competition took place in 2009, and it has been held annually, with 15 competitions organized so far (the latest in 2023, with projects currently under evaluation). This internal research grant competition was intended to serve as an incentive for university faculty.

The evaluation criteria for projects submitted to the internal competition are similar to those used in national-level research project competitions. Minimum performance criteria, such as publishing scientific articles in WoS-rated journals and submitting research projects to national and international competitions, were imposed in the execution of internal research projects.

Figure no. 4. Distribution of respondents based on opinions regarding the main sources of funding for university research activity



Source: authors' contribution

Figure 4 provides a graphical representation of respondents' perceptions on this aspect, presenting the distribution of respondents based on their opinions regarding the main sources of funding for research activity. For the question "What are the main sources of funding for research activity in the university where you work?" from the survey questionnaire, 73 valid responses were recorded out of a total of 74 interviewees.

From the perspective of the majority (84.9% of respondents) of individuals involved in research at UMF Iași, it is observed that, in the case of this university, the main financial support for research activity comes from research contracts funded by government agencies and other funding agencies (from the state budget). At the same time, 74% of those interviewed believe that research activity is supported by internal research grants funded through competition from the university's own funds. A significant proportion of those surveyed (57.5% of respondents) believe that funding for research activity is based on research contracts funded from international public funds. This result aligns with findings from other studies (Guțu *et al.*, 2018, p.112; Toma *et al.*, 2011, p.2136), indicating that

universities do not efficiently leverage external funding resources through community programs.

5. Conclusions

This study aimed to illustrate important characteristics of the research system as perceived by relevant actors, those who initiate and carry out specific activities. Consulting researchers is an underutilized approach in shaping national and international strategies in the field.

Regarding the perception of academic staff at UMF Iași regarding university scientific research, it is perceived in various ways by those involved in research at UMF Iași. Depending on the perspective from which they approach this concept, respondents view university scientific research as representing: an activity or a set of activities, a component, a process, a method, a tool, a mode of expression, a vocation, an evaluation criterion. Respondents defined university scientific research in relation to various aspects of this concept: organization and functioning, realization, features, forms, functions, effects, or results.

The academic staff of UMF "Grigore T. Popa" in Iași captured the following features of university scientific research activity: complex, highly specialized, and professional, carried out in teams, generating and transmitting novelty, with a mandatory character for academic staff.

The main argument justifying the necessity of research activity, according to researchers (75.7% of them), is the generation of knowledge perceived as essential for the profession and education to keep pace with development. The second most mentioned argument (by 62.2% of respondents) in justifying the need for research activity is the benefit to society in general and the economy in particular through the accumulation of new knowledge.

The majority of respondents believe that, in the university where they carry out their activities, research is organized within interdisciplinary research groups (70.8% of respondents with valid answers chose this option). Other forms of research organization at UMF Iași include individual research (62.5% of respondents) and research within the department/faculty (61.1% of respondents).

The largest proportion of respondents (75.7% of all interviewed researchers) considered Interdisciplinary Research as a priority. According to researchers, a priority is also given to research involving collaboration between universities (71.6% of total respondents perceiving Collaborative Research between departments within the university and other institutions outside the university as a priority). Of the five forms of research indicated in the questionnaire, Fundamental Research ranks last in the respondents' opinion as a priority.

From the perspective of the majority of staff involved in research at UMF Iași, the main sources of financial support for research activities in this university are: research contracts funded by government agencies and other funding agencies (from the state budget) (84.9% of respondents); internal research grants funded through competition from the university's own funds (74% of interviewees); research contracts funded from international public funds (57.5% of respondents). The results obtained show that researchers are aware of the main sources of funding for scientific research activities in the university.

The complexity of the field, inherent uncertainty, and heightened dynamics, with the evident influence of disruptive factors, justify additional efforts in consulting and analyzing the perceptions and interests of all relevant stakeholders in university research. This is necessary to find long-term solutions with net positive effects on society as a whole.

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