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The Structure of Organization and Management of the Research at Universities in the USA

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The study aimed to identify the features of the structure of organization and management of the research at universities in the USA so that those features are used as variables in further research. The study used the method of content analysis of qualitative type to identify patterns of the structure of organization and management of the research in universities in the USA. It was found that the structure of organization research management at universities in the USA relies on four domains such as scientific, organisational (institutional), financial and legislative. The university research activity in the USA is regulated by federal law. The research office is involved in proposal development, negotiation, and management of the award, ensuring regulatory compliance regarding intellectual property protection and technology transfer, communication of policies and processes, dissemination of funding opportunities, and the sufficient level of committed effort dedicated to a project and certification. The office draws the emphasis on compliance with the below-outlined areas such as fiscal – cost transfers and sharing, direct charging, effort, financial and income monitoring and reporting, and research – animal subject (IACUC) and human subject (IRB) protections, conflicts of interest, environmental health and safety, export controls, invention disclosure, and reporting, scientific overlap and misconduct. The structure of organization and management of the research is based on the above collaborative work which is called shared governance with the bottom-up management approach. Further research is needed in the bottom-up management application prerequisites to be used in Ukraine.

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Keywords: *bottom-up management, higher education, research management, shared governance, universities, USA.*

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Introduction

The ways of organization and management of the university research have changed profoundly worldwide and, in the USA, particularly, over the last decades (Ewart & Ames, 2020; van Helden, 2010; Walsh et al., 2019). University research is becoming more complex to coordinate, interdisciplinary, and commercialized (Walsh et al., 2019). This raises the need for assistance in handling operational and administrative parts of research that include compliance with research regulations, raising funds, data management, certification of research involving human subjects, and publishing. A variety of offices involved in managing research are found at universities across the USA (Lombardi et al., 2017). Those offices cover pre-and post-award management, contractual arrangements, and can include any functions related to Intellectual property, business development, spinout companies, and technology transfer. The research activity in universities in the USA has become crucially important for building a reputation and public image of quality excellence along

with having financial gains. The intentions and shift of higher education in Ukraine to adopt the more efficient educational models used in the USA created the gap for this research.

The effectiveness of organization and management of the university research is revealed in the literature (Lombardi et al., 2017; Aghion et al., 2009; Shattock, 2003). The properly-organized academic research creates a competitive academic environment which increases the quality of both instruction and science. It attracts sectoral funds and eliminates the borders between education and students' job-to-be. Aghion et al. (2009) opine that the type of the university governance structure, in general, and governance of the research in particular, influences the research output and its quality. According to the Association of Governing Boards of Universities and Colleges (2017), shared governance which consists of the Research Committee (or Research office) is equally used in public and private, profit and non-profit universities. The shared governance was found to involve social and institutional contexts and tend to exercise bottom-up management. Dellavalle (2017) states that the concept of governance is based on the 'ascending' paradigm of the legitimacy of public power.

In literature, shared governance is defined as having equal rights to governance, or consultation, or rules of engagement, or a system for aligning priorities (Bahls, 2014). In the university settings, it is viewed as the institutional culture that relies on the collaborative involvement of governing boards, commissions, senior administration, faculty staff, and students in decision-making processes to make it quicker and more effective. The shared governance is supposed to engender collective ownership and responsibility for the overall inputs and outputs of the university's activity through increasing the level of employee investment in the institution's success (AGB, 2017). Its principles have been developed to protect scholars and teachers in terms of their status, academic freedom, and independence. Those principles, amongst others, are as follows: short-term managerial and political considerations should not influence the academic decision; shaping and implementing the university curriculum and research policy, selecting academic colleagues and judging their work are best done by faculty and professional staff; making decisions on setting goals, allocating resources, choosing top officers and guiding student life is worthless without the involvement of the front-line personnel (bottom-up management).

The conception of shared governance public power that uses bottom-up management is explained by Thomas Hobbes. He suggested that freedom and equality in the rights of individuals is a fundamental source of authority in a just order of social life (Martinich, 2004). The above conception seems a credible educational reforms option for the Ministry of education in Ukraine. It would help to surmount bureaucracy and societal debates caused by the persistence of the inherited top-down governance culture in education and research (Khelifi, 2019). It looks like an adjustable springboard for the higher education system reform in Ukraine. However, the literature review found limited relevant local literature revealing the use of the approach to managing research.

The study aims to identify the features of the structure of organization and management of the research in universities in the USA so that those features are used as variables in further research.

Methods and Materials

The method of content analysis of qualitative type was used to identify patterns of the structure of organization and management of the research at universities in the USA (Luo, 2019). This research method was used because it is recommended for the systematic collection of data from web content and social media posts (Williamson & Johanson, 2018). Additionally, this method was

proved to ensure unobtrusive data collection, transparency, reliability and replicability, and high flexibility (Luo, 2019).

Eight highly-ranked US universities that occupy a different position in national higher education governance were randomly sampled for the analysis (UniRank, 2021). These were as follows: University of California, American University, Stanford University, University of Michigan, University of Pennsylvania, Northwestern University, University of Wisconsin-Madison, and the University of Washington.

The content analysis of webpages of the research offices was conducted using the criteria which were as follows: position of the university in national higher education governance; type of institutional governance including research; and level of enforcement of the law and regulations. The purpose of the analysis was to identify the features of the structure of organization and management of the research at universities in the USA and to identify whether those features differ across the selected types of educational institutions.

Table 1.

US universities' web pages reviewed

University	Name of a page	Position of university in national higher education governance	Type of institutional governance including research	Level of Enforcement of the Law and Regulations
University of California (2021)	Office of Research	A public research university, semi-state body; Academics and Expert Committee-governed	Shared governance	Mid (related to the source of funding)
American University (2021)	Office of Research	Private (non-profit) research university; Stakeholder-governed (governing boards)	Shared governance	Low (high level of autonomy)
Stanford University (2021)	Office of Research Administration	Non-profit private higher-education institution; Stakeholder-governed (governing boards)	Shared governance	Low (high level of autonomy)
University of Michigan (2021)	U-M Office of Research (UMOR)	Non-profit public state higher-education institution; governed by Academics and Expert Committee	Shared governance	Mid (related to the source of funding)

University of Pennsylvania (2021)	Office of Research Services	Non-profit private higher-education institution; Stakeholder-governed (governing boards)	Shared governance	Low (high level of autonomy)
Northwestern University (2021)	Office for Research	Private non-profit higher education institution; Governed by Stakeholder Board	Shared governance	Low (high level of autonomy)
University of Wisconsin-Madison (2021)	Research	The public higher education institution	Shared governance	Mid (related to the source of funding)
University of Washington (2021)	Research	The public higher education institution	Shared governance	Mid (related to the source of funding)

It is noticeable in Table 1 that shared governance is used in all selected universities and US legislation ensures a sufficient level of academic autonomy for the universities.

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Findings

It was found that generally, research management at universities in the USA relies on four domains such as scientific, organisational (institutional), financial and legislative. In general, the university research activity in the USA is regulated by federal law such as the Office of Management and Budget (OMB) Uniform Guidance, Bayh-Dole Act, USDA/AWA (Animal Welfare Act), and PHS/OLAW (Office of Laboratory Animal Welfare), OHRP (Office of Human Research Protections), and CFR (Code of Federal Regulations). It is also regulated by the State Regulations and Laws that are related to indemnification, insurance, arbitration/jurisdiction, record retention, ethics, and personnel practices. The university research is supposed to comply with university policies (University of California, 2021).

As can be noticed in Figure 1, the first two domains combine the activities such as proposal development, negotiation, and management of the award, ensuring the regulatory compliance regarding intellectual property protection and technology transfer, communication of policies and processes, dissemination of funding opportunities and the sufficient level of committed effort dedicated to a project and certification.

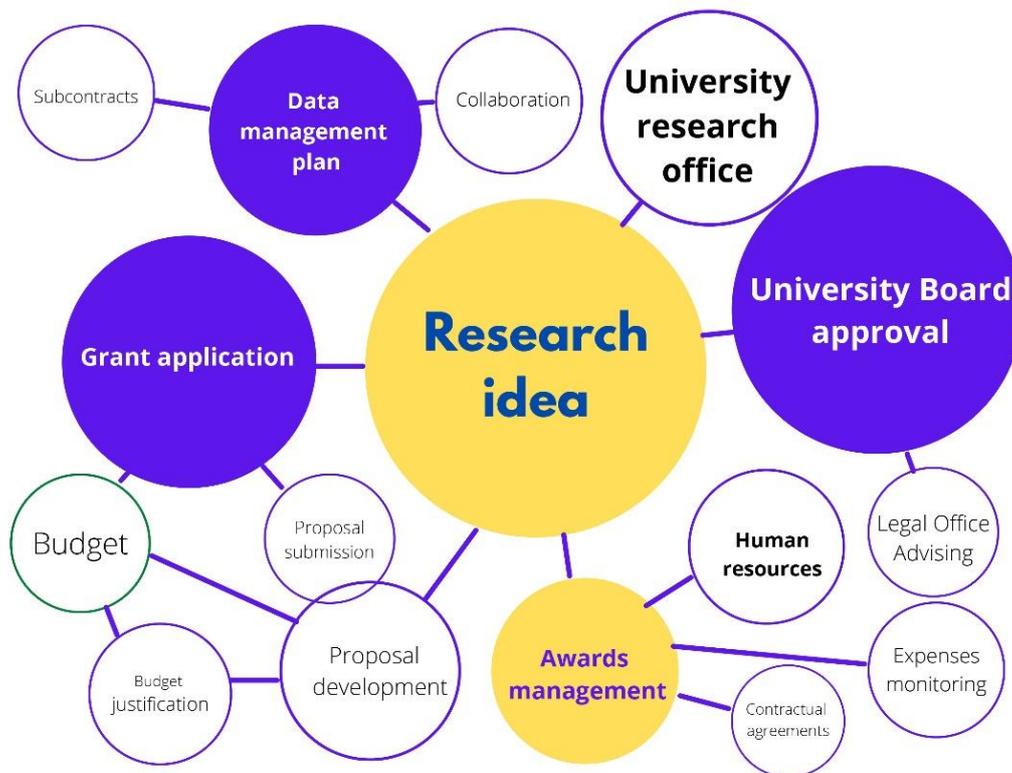


Figure 1. General scheme of research management at universities in the USA (Source: adapted from Lombardi et al., 2017; Stanford University, 2021)

With regard to the third and fourth domains, the structure of organization and management of the research at universities in the USA draws the emphasis on compliance with the below-outlined areas such as fiscal – cost transfers and sharing, direct charging, effort, financial and income monitoring and reporting, and research – animal subject (IACUC) and human subject (IRB) protections, conflicts of interest, environmental health and safety, export controls, invention disclosure and reporting, scientific overlap and misconduct (Aghion et al., 2009).

The research office is intended to enhance faculty and staff success in obtaining external funding for research, training, and service activities and to assist in the management of awards. The ‘lifecycle’ of the research project managed by the research office and including pre-award and post-award phases is presented in Figure 2.

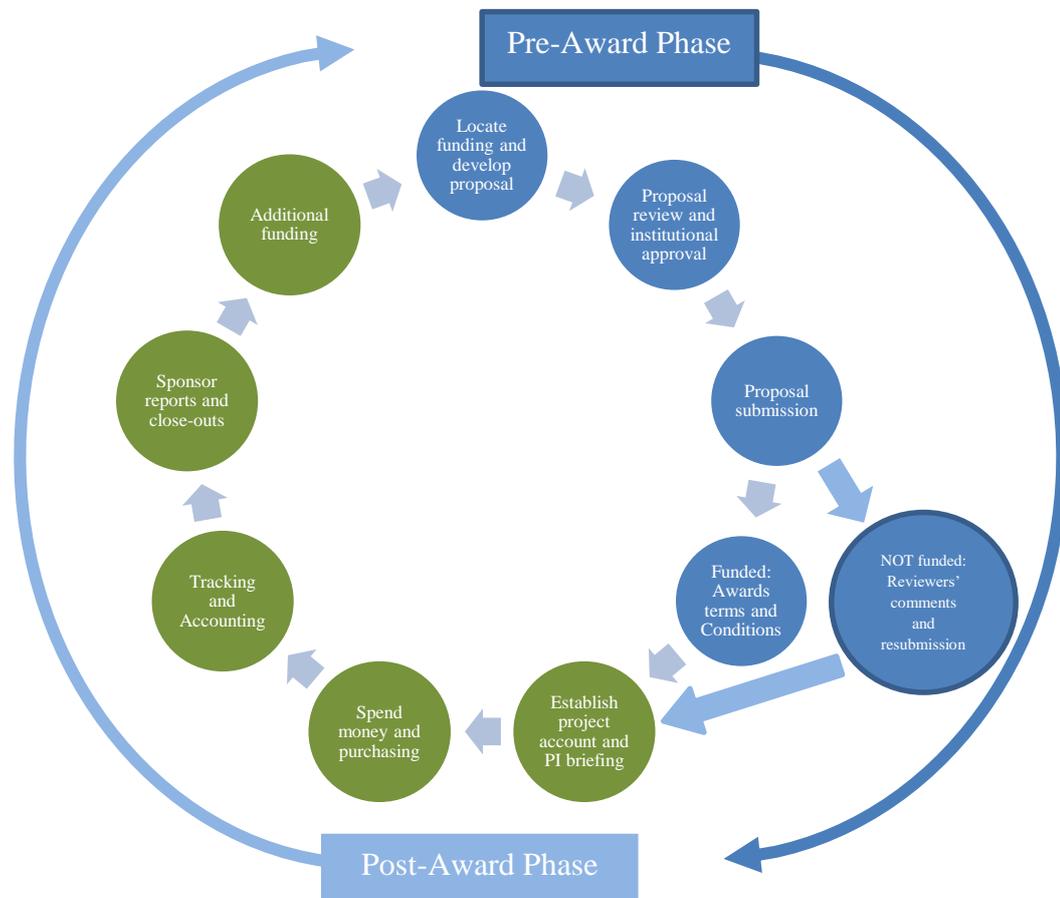


Figure 2. The 'lifecycle' of the research project managed by the research office and including pre-award and post-award phases (Source: adapted from American University, 2021; Aghion et al., 2009; Shattock, 2003)

Overall, as can be seen in Figure 2, the structure of organization and management of certain research projects at universities in the USA relies on a team that involves a principal investigator, an authorized organizational representative (AOR), and a research administrator.

The principal investigator (PI) is expected to manage and perform the science. This person is in charge of identifying funding opportunities, proposal preparation, review and accept terms and conditions in partnership with the Office of Grants and Contracts Administration (OGCA), managing the administration and science of the award, and fulfilling and certifying effort commitments.

The authorized organizational representatives (AOR), who are typically the Dean/Director and Unit Administrators (or Offices), are authorized to sign contracts on behalf of the university. This person assures that the work fits the department's mission. They provide general oversight for proposals including budget review, review, and approval of limited PI status, verify the PI's eligibility/availability, verify approval of regulatory compliance protocols, and approve the cost-sharing/matching which means "the portion of project costs not paid by Federal funds" (Cornell Law School, 2021). They also verify resources and facilities, manage efforts, ensure that salary is charged correctly and salary cost transfers are avoided, and oversee the financial management of awards.

The research administrator is supposed to support the business aspects of the grants and contracts and coordinates activities. Usually, there several of them are involved in one project. These people are from the Office of Grants and Contracts Administration (OGCA), Office of Intellectual Property and Commercialization (OIPC), Office of Research Integrity (ORI), Human Resources department, Procurement, and Contract Services Department, Office of Finance and Accounting, and the Risk Management Department. These people provide institutional leadership through advising and training, review, sign and submit proposals, negotiate, accept and sign agreements for funding (e. g. federal, non-federal agencies, non-profits, universities, etc.), ensure effort reporting and other non-financial compliance, issue invoices for all charges, manage revenue, match checks/sponsor deposits received in OGCA directly with correct projects, and manage the deposit payments.

As one can see in Figure 3, the key elements that improve operational and administrative effectiveness of the structure of organization and management of the research are based on the above collaborative work which is called shared governance with the bottom-up management approach.



Figure 3. Key elements of the structure of organization and management of the research which is based on the above collaborative work of a principal investigator, an authorized organizational representative, and a research administrator (Source: adapted from American University, 2021; Aghion et al., 2009; Shattock, 2003; Stanford University, 2021)

The shared governance that is based on bottom-up management eliminates the oversight (control-based) model of educational institution organizations because oversight is not considered management (Feldman et al. 2021; El-Khawas, 2002). It sets academic and curriculum standards, introduces academic freedom, ensures exercising research project team primacy in decisions on academic personnel to have collective bargaining.

Limitations of the study

The method of content analysis of qualitative type can be considered a limitation to the study because of reductiveness, and its certain level of subjective interpretation (Luo, 2019).

Conclusions

The important task for the USA universities is to build and enhance research capacity by creating an environment in which research can flourish. This paper mapped out key elements in the structure of organization and management of the research at universities in the USA as the sound structure along with high quality research administration and management can help in sustainable developing of university research potential.

There is no single model for the structure of organizing and managing research at universities because of the differences in institutional culture and history, in institution's strategic and operational plans, in financial support or legislative limitations of university as an organization. However, there are generic elements in the university structure of organizing and managing research on which institutions rely when handling operational and administrative parts of research.

A central role for support, information and guidance for internal research as well as for external research funders belongs to the research office. It serves as a key structural and organizational component to help create helpful working conditions for conducting research. As a type of institutional governance approach, shared governance with the bottom-up management is seen as an effective solution for the university research setting because it gives rise to collective ownership and responsibility for the overall university research performance and outcomes. More research is needed in the application of the concepts of shared governance and bottom-up management for research administration and management at universities in Ukraine.

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Структура організації та управління дослідженнями в університетах США

Шихненко Катерина, кандидат педагогічних наук, доцент, Інститут державного управління та наукових досліджень з цивільного захисту, завідувач кафедри мовної підготовки

Мета дослідження – виявити особливості структури організації та управління науковою роботою в університетах США, розглядаючи такі особливості як змінні у подальших дослідженнях. У роботі використано метод якісного дослідження – контент аналіз, що дозволив виявити моделі структури організації та управління дослідженнями в університетах США. Виявлено, що структура організації та управління дослідженнями в університетах США спирається на чотири аспекти, такі як науковий, організаційний (інституційний), фінансовий та законодавчий. З'ясовано, що у США наукова діяльність університетів регулюється федеральним законодавством. Дослідницький офіс бере участь у розробці пропозицій, перемовинах та управлінні грошовими винагородами, забезпечує дотримання законодавчих актів щодо захисту інтелектуальної власності та трансферу технологій, інформує про політику та процедури, про можливості фінансування, гарантує достатній рівень зусиль, спрямованих на реалізацію проекту, забезпечує сертифікацію. Дослідницький офіс зосереджує увагу на відповідності законодавству в питаннях, що стосуються таких аспектів як: фіскальні – трансфер та розподіл витрат, пряме відшкодування витрат, моніторинг фінансів та доходів, фінансова звітність; дослідницькі – захист тварин (IACUC) та людей (IRB), конфлікт інтересів, охорона здоров'я та безпека навколишнього середовища, експортний контроль, розголошення інформації про винаходи, звітність щодо наукових результатів, наукове дублювання та неналежне проведення досліджень. В основу структури організації та управління науковою роботою в університетах США покладено механізм спільної участі кожної складової в управлінні університетом (концепція *shared governance*) з підходом до управління «знизу вгору». Потрібні подальші дослідження зазначеної концепції та управлінського підходу за принципом «знизу вгору» для впровадження в український контекст.

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Ключові слова: вища освіта, спільна участь в управлінні, університети США, управління науковою роботою, управління за принципом «знизу вгору».