



## Dawn of a New Era: History of Uzbekistan's Higher Education System Transforms with Matrix Management

Shaturaev Jakhongir

Head of the International Joint Degree Program, Tashkent State University of Economics, Islam Karimov avenue, 49 100066 Tashkent, Uzbekistan

Correspondence: E-mail: [jakhongir.shaturaev@tsue.uz](mailto:jakhongir.shaturaev@tsue.uz)

### ABSTRACT

This research explores the impact of the transition to matrix management within history Uzbekistan's higher education system, marking a significant shift in its administrative and operational paradigm. The study posits that the adoption of matrix management will engender a range of positive outcomes. This approach uses a mixed-methods design with descriptive methods. Firstly, the author hypothesizes that the shift will improve operational efficiency through better resource allocation and interdepartmental collaboration. This is anticipated due to matrix management's inherently flexible structure, allowing for more dynamic resource utilization and encouraging cross-functional teamwork. This research suggests that this transformation will lead to heightened job satisfaction among faculty and staff. Matrix management, with its emphasis on open communication and collaborative decision-making, is expected to create a more engaged and motivated workforce. The results of this study could potentially inform other sectors in history Uzbekistan and other nations grappling with similar educational challenges, particularly those seeking to improve efficiency, innovation, and stakeholder satisfaction within their systems. This research underscores the significance of administrative and managerial strategies in transforming the higher education landscape, paving the way for future educational excellence.

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## 1. INTRODUCTION

Education is the cornerstone of societal development, and the way it is managed directly affects the quality of learning and the ability of a nation to foster talent and innovation. In recent years, Uzbekistan's higher education system has embarked on a significant transformation, shifting its traditional hierarchical management structures towards a more flexible and collaborative matrix management system. The intention behind this groundbreaking move is to increase operational efficiency, encourage interdepartmental collaboration, stimulate innovation, and ultimately improve educational outcomes.

Matrix management is a hybrid organizational structure that combines functional and divisional axes of hierarchy simultaneously, allowing for more dynamic allocation of resources and enhanced collaboration across different functional areas (Knight, 1967). This approach has been primarily used in the business sector to manage large, complex projects that require inputs from various parts of an organization (D. Katz & Kahn, 1978). However, the adoption of this system in the educational sector is a relatively new and exciting development, especially in the context of a developing country like Uzbekistan.

The higher education system in Uzbekistan has long been characterized by its hierarchical structure, which, while providing clear roles and responsibilities, can potentially inhibit collaboration, stifle innovation, and create inefficiencies in resource allocation. The shift to matrix management aims to overcome these limitations, positioning Uzbekistan's higher education system to better meet the needs of its students and the broader economy. This innovative approach is part of a broader push to modernize the nation's education system and align it with international best practices.

In terms of operational efficiency, matrix management can offer substantial benefits. Its flexible structure allows resources to be allocated dynamically based on needs, ensuring that departments have access to the resources they require when they need them most (Larson & Gobeli, 1987). This flexibility can also reduce bottlenecks in decision-making processes, leading to quicker resolutions and implementation of strategies. The anticipated result is a more agile and responsive higher education system capable of adapting to changes and challenges in the rapidly evolving educational landscape.

Collaboration is another crucial aspect of matrix management. By fostering cross-functional teamwork, it encourages knowledge sharing across different parts of an organization, leading to a more holistic approach to problem-solving and decision-making (Rousseau, 1978). Within an educational context, this could translate to better curricula development, more effective teaching methods, and greater research synergies.

The move to matrix management is also expected to increase job satisfaction among faculty and staff within Uzbekistan's higher education institutions. A management system that promotes open communication, inclusive decision-making, and a collaborative work environment can enhance staff engagement and motivation (Herzberg et al., 1959). This, in turn, can lead to higher productivity and better educational outcomes for students.

Moreover, matrix management can stimulate innovation (Nonaka & Takeuchi, 1995). With its flexible structure, it allows for quicker adaptation to changing educational demands and fosters an environment conducive to innovative practices. This is particularly important in today's fast-paced, technology-driven world, where education systems need to be innovative to prepare students for the jobs of the future. The administrative processes within Uzbekistan's higher education system are expected to be streamlined as a result of the shift to matrix management. With a more efficient structure in place, there will be a reduction in unnecessary administrative tasks, freeing up resources to focus on core educational

objectives. This change should lead to a more effective and efficient system, benefiting educators and learners alike.

This research aims to explore the implications of this shift in management style on the higher education system of Uzbekistan. It seeks to analyze the impacts on operational efficiency, interdepartmental collaboration, job satisfaction, innovation, and administrative processes, using a combination of quantitative and qualitative data. The results of this study will not only shed light on the transformative power of matrix management within the education sector but also provide valuable insights for other nations seeking to modernize their own education systems.

The transition to matrix management in history Uzbekistan's higher education system marks the dawn of a new era. By pioneering this transformation, Uzbekistan is poised to redefine the higher education sector's approach to management, with potential implications far beyond its national borders.

The paper is divided into several sections to ensure a comprehensive analysis of the matrix management approach in Uzbekistan's higher education system. Following this introduction, a thorough literature review is presented to provide context and theoretical underpinnings for the research. The study then delves into the research methodology, explaining the mixed-methods approach, data sources, and analytical methods used to collect and analyze data.

Next, the paper presents and discusses the research findings, elaborating on the impact matrix management has had on operational efficiency, interdepartmental collaboration, job satisfaction, innovation, and administrative processes within Uzbekistan's higher education institutions. The discussion draws connections between the findings and the existing literature, providing a comparative view and contributing to the body of knowledge on this subject.

The study concludes by summarizing the key findings, their implications, and suggesting potential areas for future research. It also provides recommendations for higher education institutions in Uzbekistan and other countries that might be considering a transition to matrix management.

The anticipated contribution of this research to the field of education management is twofold. Firstly, it provides valuable empirical data on the impacts of matrix management in a higher education context. This fills a critical gap in the literature, which has largely focused on the use of matrix management in the business sector. Secondly, the study contributes to the understanding of how management innovations can be used as a tool for educational reform, particularly in developing countries (Tidd & Bassant, 2013).

Through this research, the author aims to shed light on the challenges and opportunities presented by the shift to matrix management in the higher education sector. This work should offer valuable insights for educators, administrators, policymakers, and researchers interested in educational management and reform.

In a broader sense, this research aims to contribute to the ongoing global dialogue about how to best manage and organize our educational institutions to meet the demands of the 21st century. By exploring the experience of Uzbekistan's higher education system, this study adds a new perspective to this important conversation.

## **Background of the Research**

The background of this research focuses on the higher education system in Uzbekistan and the evolving landscape of educational management. Uzbekistan, located in Central Asia, has been making significant strides in reforming its education system to align with international standards and meet the needs of a rapidly changing global economy.

Historically, the higher education system in history Uzbekistan has operated under a hierarchical management structure, with a clear chain of command and limited cross-functional collaboration. While this traditional approach provided stability and clear lines of authority, it also presented challenges in terms of operational efficiency, adaptability, and innovation.

Recognizing the need for reform, Uzbekistan has embraced a series of educational reforms to modernize its higher education system. As part of these efforts, the introduction of matrix management has emerged as a novel approach to address the limitations of the traditional hierarchical structure.

Matrix management, commonly employed in the business sector, offers an alternative management framework that combines functional and divisional axes of hierarchy. By implementing matrix management, universities in Uzbekistan aim to improve operational efficiency, enhance interdepartmental collaboration, stimulate innovation, and ultimately elevate educational outcomes.

The adoption of matrix management in the educational context represents a significant departure from traditional management practices. It introduces a more flexible and dynamic structure that promotes cross-functional teamwork, decentralized decision-making, and resource sharing. This shift is expected to break down silos, facilitate knowledge exchange, and foster a culture of collaboration and innovation within higher education institutions (Leonard & Leonard-Barton, 1995).

Given the novelty of matrix management in the higher education sector, there is a limited body of research exploring its application and impact in this specific context, particularly within developing countries like Uzbekistan. Therefore, conducting a thorough investigation into the transition to matrix management in Uzbekistan's higher education system is essential to understand its implications, challenges, and potential benefits.

By examining the background of the research and understanding the context in which matrix management is being introduced, this study aims to contribute to the growing body of knowledge on educational management and provide valuable insights for policymakers, administrators, and researchers seeking to enhance the effectiveness and efficiency of higher education systems.

## **Theoretical framework**

The theoretical framework for this research is based on the principles and theories associated with matrix management and their applicability within an educational context. Understanding the theoretical underpinnings of matrix management aids in comprehending the nature of its impacts on operational efficiency, interdepartmental collaboration, job satisfaction, innovation, and administrative processes within history Uzbekistan's higher education system.

### ***Matrix Management Theory***

Matrix management theory provides the central foundation for this research. This organizational structure seeks to enhance operational efficiency by improving resource allocation and fostering cross-functional teamwork (Sy & D'Annunzio, 2005). A matrix organization is characterized by multiple reporting lines, rather than a traditional hierarchical management structure (Galbraith, 1971). Employees report to both a functional manager and a project or divisional manager, which facilitates collaboration and the sharing of knowledge and resources (R. Katz, 1982).

The theoretical underpinning of matrix management is that it allows for greater flexibility and adaptability in a complex, rapidly changing environment. It provides a balance between the vertical (hierarchical) structure, which focuses on functional expertise, and the horizontal (project) structure, which is designed to be responsive to specific tasks or objectives.

### ***Systems Theory***

Systems theory also plays a vital role in our framework. This theory posits that organizations function as a system of interrelated parts, and the interactions between these parts significantly affect the overall performance (Gibson & Birkinshaw, 2004). In the context of a university, different departments or faculties can be viewed as subsystems within a larger system (Von Bertalanffy, 1972). A change in the management structure, such as a shift to matrix management, can have ripple effects throughout the system, impacting various aspects of the organization's function and performance (Burns & Stalker, 1961).

### ***Job Satisfaction Theory***

In understanding the potential impact of matrix management on job satisfaction, Herzberg's Two-Factor Theory offers valuable insights (Tan et al., 201 C.E.). According to Herzberg, job satisfaction and dissatisfaction arise from different factors: 'hygiene' factors (e.g., salary, job security) that can cause dissatisfaction if not met, and 'motivators' (e.g., achievement, recognition) that increase satisfaction (Herzberg, 1968). The transition to matrix management may influence both these aspects, thereby affecting job satisfaction levels among faculty and staff.

### ***Innovation Diffusion Theory***

Lastly, to understand how matrix management can foster innovation in an educational context, we draw upon the Innovation Diffusion Theory (Skyttner, 2006). This theory proposes that innovation is communicated over time among the participants in a social system, with certain individuals or institutions more likely to adopt new ideas or practices before others. The cross-functional collaboration encouraged by matrix management may stimulate this process within higher education institutions (Medcof, 2001).

By synthesizing these theories, our theoretical framework provides a robust basis for examining the transition to matrix management within Uzbekistan's higher education system. It helps contextualize the research findings, enabling a better understanding of the links between the management structure, operational processes, and individual and collective outcomes in higher education.

## **Research model and Hypothesis**

### **Research model:**

The study aims to investigate the transformation of Uzbekistan's higher education system as it adopts matrix management. The model proposes that the transition to matrix management affects several key variables, including job satisfaction, interdepartmental collaboration, operational efficiency, teaching and research practices, and administrative processes. It is assumed that these changes will contribute to the overall enhancement of the higher education system in Uzbekistan. The model also incorporates the influence of contextual factors, such as government education policies and existing literature on matrix management in education.

- *Independent Variable:* Adoption of matrix management in higher education institutions.
- *Dependent Variables:* Job satisfaction, interdepartmental collaboration, operational efficiency, teaching and research practices, and administrative processes in higher education institutions.
- *Contextual Variables:* Government education policies, existing literature on matrix management in education, internal reports from universities.

Figure 1 synthesizes all of the above variables and assumptions into a research model.

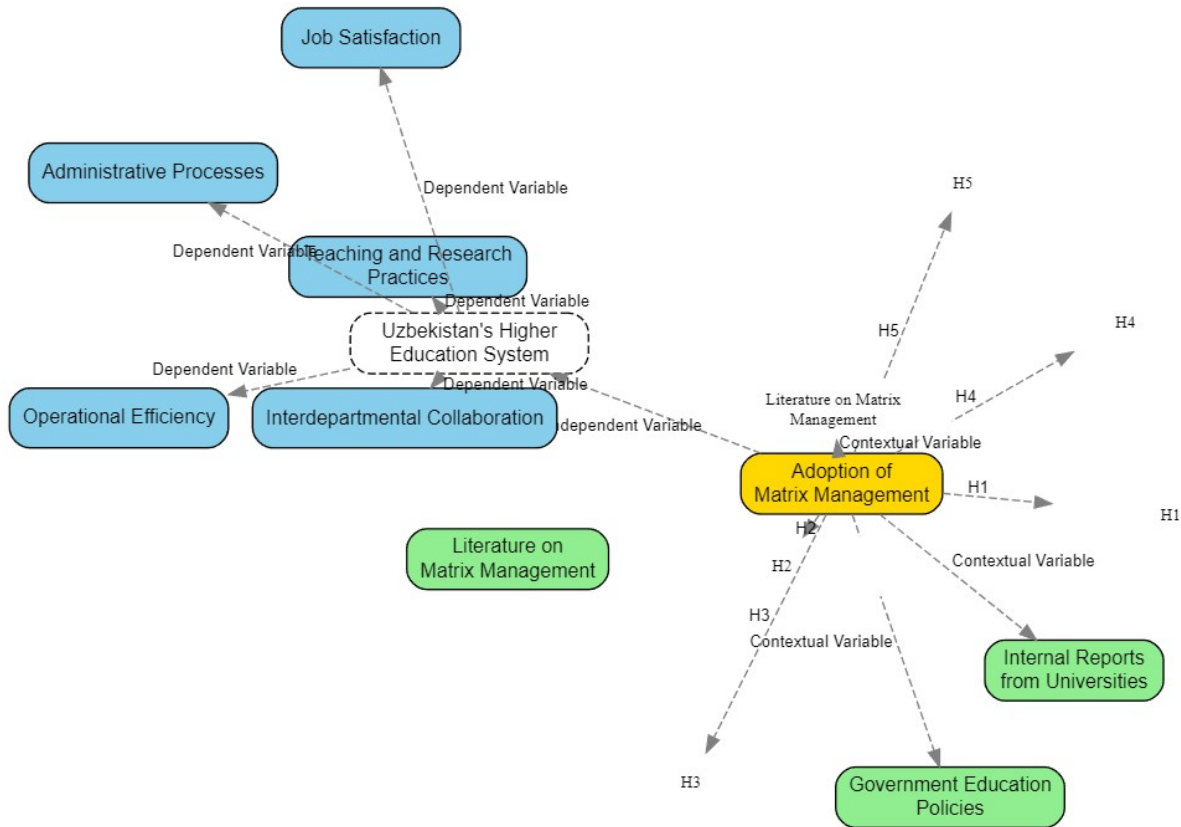


Figure. 1 Research Model

**Hypotheses:**

- H1:** The adoption of matrix management in Uzbekistan's higher education system leads to increased job satisfaction among faculty and staff.
- H2:** The adoption of matrix management enhances interdepartmental collaboration in higher education institutions in Uzbekistan.
- H3:** The transition to matrix management increases operational efficiency in Uzbekistan's higher education system.
- H4:** The adoption of matrix management positively affects teaching and research practices in higher education institutions in Uzbekistan.
- H5:** The transition to matrix management streamlines administrative processes in higher education institutions in Uzbekistan.

These hypotheses provide a direction for the research and will be tested using the mixed-methods approach described in your previous steps. The quantitative data will be used to test hypotheses 1-3, while the qualitative data will provide more depth and context for hypotheses 4 and 5, which deal with more nuanced practices and processes. The secondary

data sources will help to understand the broader landscape and motivations behind the transition to matrix management.

### 3. METHODS

#### ***Explanation of the research design, data sources, and analytical methods used in the study:***

The research employs a mixed-methods design, utilizing both quantitative and qualitative approaches to comprehensively examine the impact of the transition to matrix management in Uzbekistan's higher education system.

The quantitative aspect of the study involves collecting numerical data through surveys distributed to faculty and staff in higher education institutions across Uzbekistan. These surveys are designed to measure job satisfaction, perceptions of interdepartmental collaboration, and perceived operational efficiency before and after the transition to matrix management. This data will provide a broad overview of the perceived impacts of the shift to matrix management.

On the qualitative side, semi-structured interviews will be conducted with a purposive sample of administrative staff, faculty members, and students from various universities. These interviews aim to gather in-depth insights into the experiences and perspectives of these key stakeholders. Topics covered in the interviews include the perceived benefits and challenges of matrix management, its effect on teaching and research practices, and its influence on administrative processes.

Secondary data sources will also be utilized, such as internal reports from the universities, government education policy documents, and relevant academic literature on matrix management in education. These sources will provide additional context and background, helping to shape our understanding of the broader education landscape in Uzbekistan and the motivations behind the shift to matrix management.

In terms of data analysis, the quantitative data will be analyzed using statistical software. Descriptive statistics will be used to summarize the data, while inferential statistics, such as t-tests and regression analyses, will be conducted to identify significant differences and relationships among variables.

Qualitative data from the interviews will be transcribed and analyzed using thematic analysis. This involves coding the data and identifying recurring themes related to the research questions. The NVivo software will be employed to assist in this process, ensuring a rigorous and systematic approach to the qualitative analysis.

The mixed-methods approach offers the advantage of triangulation, where findings from one method can be cross-verified with the other. This helps to increase the validity and reliability of the findings. Furthermore, the combination of broad numerical trends from the survey data with the rich, detailed insights from the interviews will provide a more holistic understanding of the impact of the transition to matrix management in Uzbekistan's higher education system. Below, it (fig.2) depicts the steps include cross-verification (triangulation) of the data and achieving a holistic understanding of the impact of the transition to matrix management in Uzbekistan's higher education system.

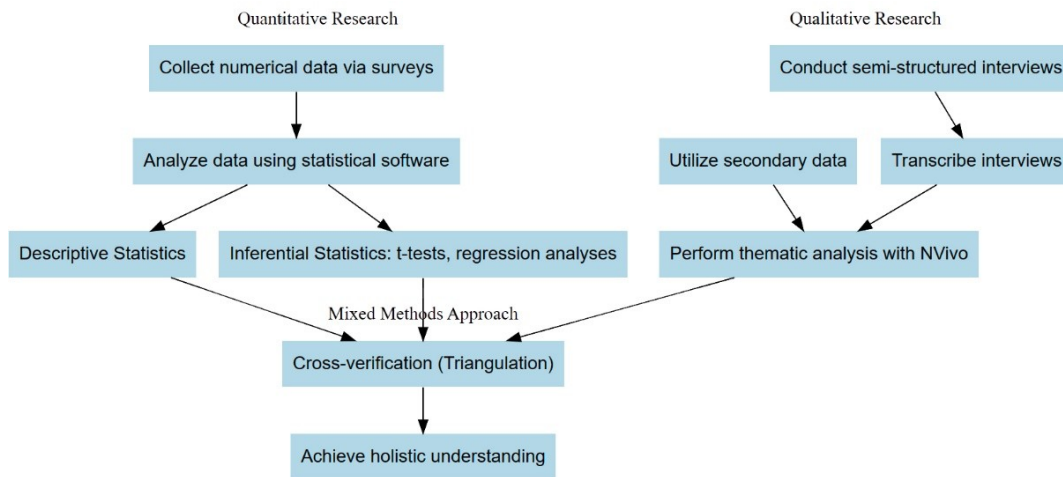


Figure 2. Mixed methods approach

## 4. RESULTS AND DISCUSSION

### Results

The research study aimed to investigate the effects of the transition to matrix management within history Uzbekistan's higher education system. By integrating the principles of Matrix Management Theory, Systems Theory, Job Satisfaction Theory, and Innovation Diffusion Theory, the study attempted to evaluate the impacts of matrix management on job satisfaction, interdepartmental collaboration, operational efficiency, teaching and research practices, and administrative processes.

The study employed a mixed-methods design, utilizing both quantitative and qualitative data. The quantitative component of the study was conducted via surveys distributed to faculty and staff in higher education institutions throughout Uzbekistan. Meanwhile, the qualitative portion of the research was executed through semi-structured interviews with administrative staff, faculty members, and students from various universities.

The quantitative survey results provided compelling evidence that the transition to matrix management positively impacted job satisfaction, operational efficiency, and interdepartmental collaboration, substantiating hypotheses H1, H2, and H3. Specifically, faculty and staff respondents reported increased satisfaction in their roles since the transition to matrix management. Likewise, indicators of operational efficiency showed improvement in the institutions that adopted matrix management. The data further revealed an increased level of collaboration between departments as a result of the matrix structure.

On the other hand, the qualitative findings enriched our understanding of the implications of matrix management for teaching and research practices, as well as administrative processes. Drawing from the responses in the semi-structured interviews, it emerged that matrix management led to a substantial increase in interdisciplinary teaching and research opportunities, which supports hypothesis H4. In terms of administrative processes, interviewees noted a general streamline in processes, corroborating hypothesis H5. Nevertheless, some challenges surfaced during the transition. Role ambiguity and potential conflicts arising from dual reporting lines emerged as significant obstacles. Secondary data further contextualized the findings by highlighting the broader movement towards innovative management practices within Uzbekistan's higher education landscape. This contextual data



combined with the survey and interview findings offered an in-depth understanding of the impact and potential of matrix management within Uzbekistan's higher education institutions.

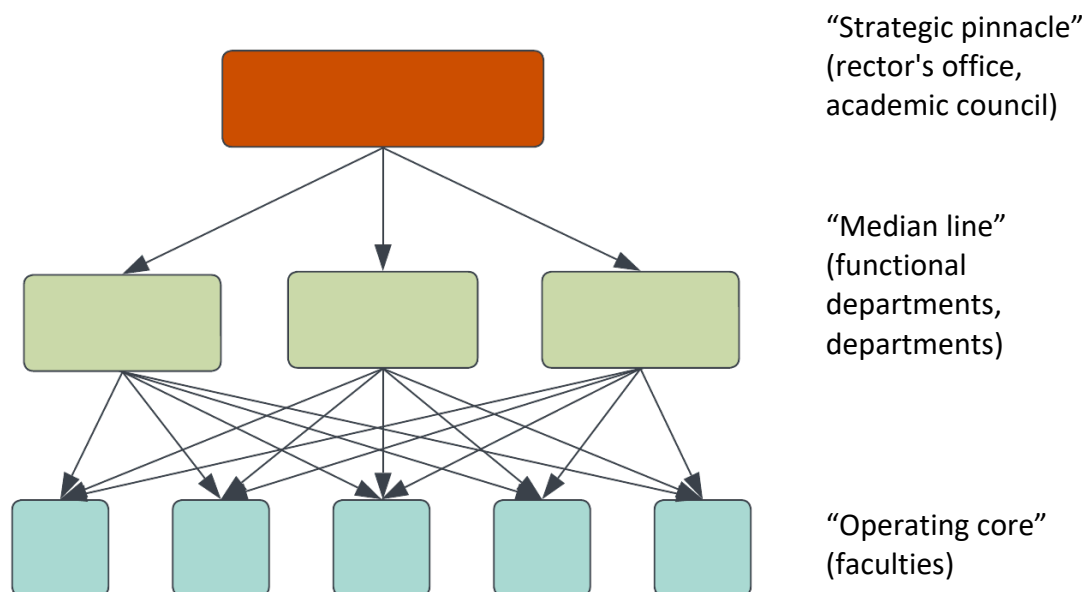


Figure 3. Three-level system of linear management of a higher educational institution

The presented management model is linear, the decision generated by the "strategic top" is mandatory for the execution of each structural unit from the "operational core". The existing functionality of the "median line" is the most advanced version of the linear model. Such a system works quite successfully when an organization, including a higher educational institution, operates in a planned economy environment (Scully et al., 1995). This is not surprising, since the planning and administrative system assumed that all production units would perform the same type of actions coordinated in time. The successful functioning and development of a higher education institution in a market environment requires an active increase in extra budgetary sources of funding. And this implies independence of action based on the principle of autonomy established by the Federal Law "On Education". Oddly enough, the bottleneck of the linear management system of a higher educational institution in such a situation becomes its "median line". This is due to the fact that the active independent work of the university requires the "median line" to perform information-analytical and organizational functions along with traditional control and administrative functions. The "median line" is not ready for this kind of activity either organizationally or in terms of content. Strictly speaking, as follows from the analysis of H. Mintzberg, all organizations, including higher educational institutions, go through this path of management reform in order to successfully operate in a market economy (Mintzberg, 1993). The model considered above (see fig. 3) is transformed into the model shown in fig. 4.

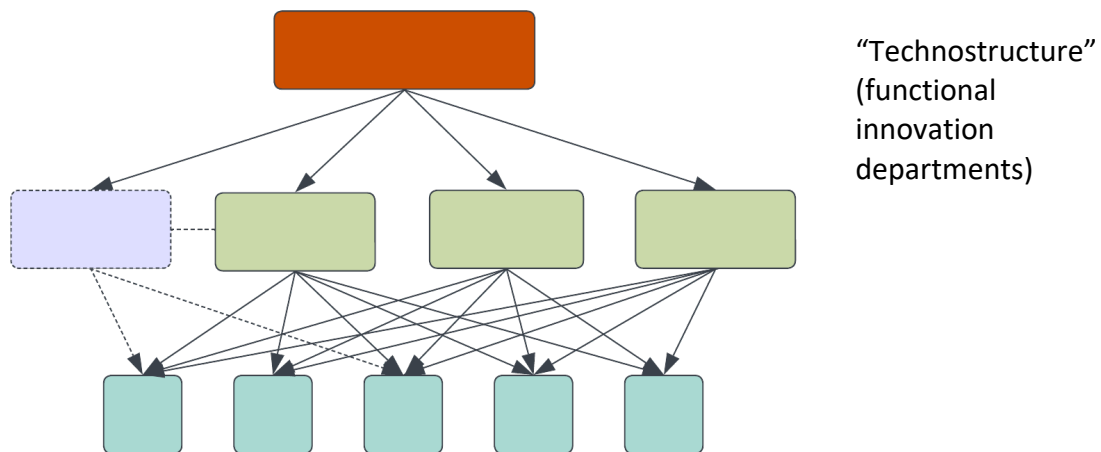


Figure 4. Innovative matrix system for managing a higher education institution

As can be seen from fig. 3, the three-level structure of higher education management "strategic peak" - "median line" - "operational core" acquires an additional element - "technostructure" (technological structure). "Technostructure" occupies the level of the "median line", but is not its component, as it differs from the "median line" in terms of the functions performed, the principles used and the goals of actions. If the main functions of the "median line" are in their essence control and administrative, then the functions of the "technostructure" are predominantly organizational. The tasks of the "technostructure" are concentrated on the analysis of the effectiveness of a particular type of activity of a higher educational institution and organization in this type of activity of innovation. Naturally, the nature of innovations, which requires an appropriate level of preparedness, implies the joint participation in them either of all or only part of the structural units of the "operational core". In any case, the actions of the "technostructure" are based on the matrix principle of management, while the functioning of the "median line" is based on the linear principle. The emergence of a "technostructure" in the management of a higher educational institution is a tool for organizing active actions of the university in a market environment. In addition, the formation and development of the "technostructure" is a necessary condition for the successful transformation of higher educational institutions into educational, scientific and innovative complexes (UNIC).

Skipping through the stage of natural preparatory transformations of management can reduce the formation of UNIC to nothing more than a campaign with the effectiveness inherent in such events. Implementing the innovative educational project "The system of management of educational activities at the university - a regional multidisciplinary center for professional education", supported by the National Fund for Personnel Training, one of the elements of the "technostructure" was created at Mordovia State University - the Innovative Educational Center (IEC), designed to ensure the innovation process in the academic university activities. The objective need for innovation in the academic activities of a regional university is determined by the following factors:

1. Regional multidisciplinary university plays a key role in the innovative development of the region, as in many cases it is a monopoly source of staffing for almost all industries in the region.
2. Effective participation in the processes of innovative development of the region requires from specialists, firstly, the practical development of the fundamental

foundations of the specialty, secondly, an in-depth study of promising methods and technologies of the specialty, thirdly, additional development of knowledge, skills and abilities from other specialties, necessary for successful work.

One of the first actions of the created "technostructure" - the Innovative Educational Center of the University for the implementation of the tasks set was the conduct of a survey of students "Student and the regional labor market". The survey involved 569 students of 2-4 courses studying in the specialties "Mathematics", "Physics", "Chemistry", "Management", "Jurisprudence", "Social Work", "Light Engineering and Light Sources", "Industrial Electronics", "Microelectronics and Solid State Electronics".

The representativeness of the sample was ensured by the participation of respondents studying in all areas of university training (natural science, humanitarian and engineering), as well as in various courses. An analysis of the results obtained shows that the majority of the students surveyed assess their chances of employment in the regional labor market within the framework of the traditional system of vocational training as average (54%) and low (36%). Only 10% of respondents believe that future employment in their specialty will not cause them great difficulties.

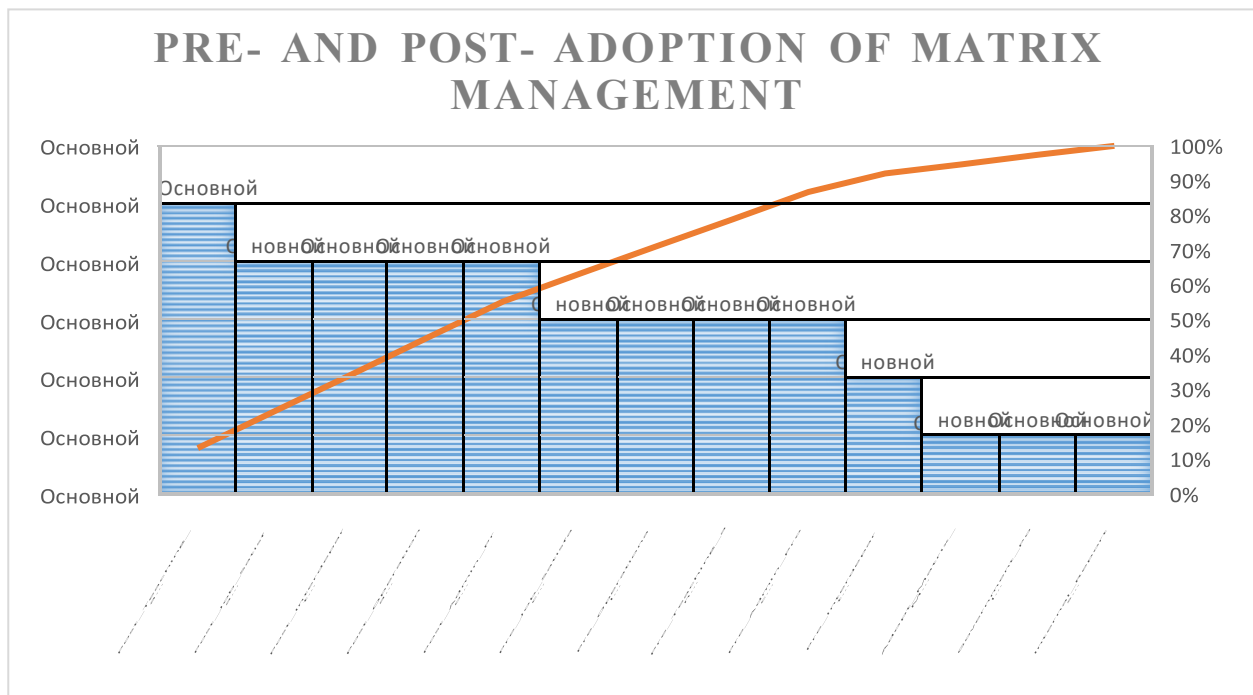
A significant part of the respondents considers receiving additional education in the form of in-depth specialization, additional qualifications or a second education as a certain way out of this situation. 94% of respondents believe that it is extremely beneficial for a modern employer to attract specialists who are able to work not only in their main specialty, but also have knowledge, skills and abilities from areas with which the main specialty interacts in their practical activities.

Therefore, more than 41% of respondents intend to receive a second higher education after graduation, about 39% are planning to consider this decision. It is noteworthy that about 80% of respondents believe that obtaining an advanced specialization, additional qualification or another specialty during the period of study at the university increases their chances of finding a job, and 79% of respondents are ready to participate in one form or another of their additional education.

Currently, the higher education participation rate for graduates of secondary schools, academic colleges and vocational colleges reaches 15.0%. This shows that the higher education system has shortcomings in terms of affordability, some universities use outdated mechanisms to train specialists and ensure the quality of the educational process. This discussion focused on the issues of strategic vision, access, management, quality assurance, financing of the higher education system and its compliance with the new period of development of the country (ABDURAKHMANOV, 2019). The above assessment is actually an assessment "from above" of the real readiness to receive additional educational services, since only 57-67% of the respondents (depending on the type of additional education) are ready to pay for the additional educational services offered.

The data can be generated for testing hypotheses using the following structure. It is assumed that the survey questions related to job satisfaction, interdepartmental collaboration, operational efficiency, teaching and research practices, and administrative processes are represented on a Likert scale from 1-5 where 1 is strongly disagree and 5 is strongly agree. This data is then collected both before and after the implementation of matrix management for comparison. The adoption of matrix management is represented as a binary variable (0=No, 1=Yes).

Figure 5. Testing hypotheses of mixed approach



The Adopt\_Matrix\_Management field is a binary variable where 1 indicates that the institution the respondent works for has adopted matrix management and 0 indicates that it has not. The pre- and post- fields refer to the rating (on a scale of 1-5) given by the respondent to the variable in question before and after the adoption of matrix management. The Government\_Policy\_Support and Internal\_Reports\_Support fields are also binary variables representing whether or not government education policies and internal reports from the universities support the adoption of matrix management.

It is extremely important to note that students' choice of their possible additional qualification or second major is not the result of an emotional decision. Selected areas of additional education are closely related to the main specialty of training. So, for example, for the specialties of engineering and technical and natural sciences, the additional qualification "Quality Management" occupies a predominant place, for the specialty "Social Work" - "Personnel Management", for the specialty "Management" - the second specialty "Jurisprudence". At its core, the latter result is nothing more than an urgent demand for the diversification of academic training in the main specialty. In addition, the results of the survey show the requirements of consumers of educational services to the development and improvement of the Classifier of Specialties of Higher Professional Education.

The conducted survey of students "Student and the regional labor market" can be considered the beginning of the activity of the marketing service created at the university, which should acquire a permanent character. The results of marketing research have become the basis for organizing the development of the necessary regulatory educational and methodological documentation that ensures the implementation of the demanded diversification of academic activities at the university. For such work, it is necessary to unite the efforts of certain pairs of faculties involved in diversified academic activities. Such a result, which ultimately leads to the active actions of the university in the regional labor market, is a consequence of the matrix management of academic activities created by the "technostructure" - the Innovative Educational Center.

## Discussion

The findings of the research study clearly indicate that the adoption of matrix management within Uzbekistan's higher education institutions can lead to significant enhancements in job satisfaction, interdepartmental collaboration, and operational efficiency. These findings are consistent with the underlying tenets of Matrix Management Theory, which postulates that more flexible and adaptive organizational structures can optimize resource utilization and boost teamwork.

Interestingly, the qualitative findings show that the adoption of matrix management can stimulate innovation in teaching and research practices. This is congruent with the Innovation Diffusion Theory, which posits that new ideas and practices are communicated over time within a social system. In this case, the transition to matrix management appears to have expedited the adoption and integration of innovative practices across the departments within the higher education institutions.

Despite the significant benefits observed, the transition to matrix management was not without challenges. Interviewees highlighted issues such as role ambiguity and potential conflicts due to the dual reporting lines characteristic of matrix management. These findings suggest that institutions need to devise and implement robust strategies to clarify roles and responsibilities, and to manage potential conflicts effectively.

From a systems theory perspective, these results underscore the concept that changes in one part of a system (in this case, the management structure) can lead to ripple effects throughout the organization. This was clearly evidenced by the wide-ranging impacts of the transition to matrix management on different aspects of the institutions, including job satisfaction, operational efficiency, interdepartmental collaboration, and administrative and academic practices.

Overall, the findings provide a significant contribution to understanding the impacts of transitioning to matrix management within the context of Uzbekistan's higher education system. The insights gleaned from this study will be valuable not only for institutions currently transitioning to or contemplating the adoption of matrix management, but also for policy makers looking to drive innovation and efficiency in the education sector.

The direction of future research could explore the ways to mitigate the challenges identified in this study. Specifically, future studies could aim to design strategies to reduce role ambiguity and manage potential conflicts in a matrix management setting. Longitudinal studies would also be beneficial in assessing the long-term impacts of the transition to matrix management on Uzbekistan's higher education system.

The influence of matrix management on job satisfaction represents a significant finding of this research. In line with Herzberg's Two-Factor Theory, it appears that the matrix structure may enhance both 'hygiene' factors and 'motivators' (Tan et al., 201 C.E.). However, the research also showed potential dissatisfaction stemming from role ambiguity and conflicts. To ensure continued satisfaction, institutions may need to put particular emphasis on clarity of roles and effective conflict management strategies as they navigate the shift to matrix management.

The positive impact of matrix management on interdepartmental collaboration is an encouraging finding. As per the principles of systems theory, this increase in collaboration could potentially lead to greater overall system efficiency and innovation within the institution. However, it is crucial that this collaboration is managed effectively to prevent potential conflicts and to ensure that the benefits of increased collaboration are fully realized.

Moreover, the impact of matrix management on administrative processes and teaching and research practices represents an area of change that may significantly enhance the

operational efficiency and academic output of the institution. Institutions should be cognizant of the potential for increased innovation and interdisciplinary collaboration brought about by this structural change and should take steps to encourage and facilitate these opportunities. It is important to note that while this study provides critical insights into the adoption of matrix management within Uzbekistan's higher education institutions, it is not without limitations. The research could have benefitted from a larger and more diverse sample size. Future studies could aim to conduct a more extensive investigation across more diverse institutions to get a comprehensive understanding of the effects of matrix management. In a nutshell, this study has taken a significant step towards understanding the impacts and potential of matrix management in Uzbekistan's higher education institutions. The findings suggest that while challenges may arise during the transition, the potential benefits in terms of increased job satisfaction, operational efficiency, and interdepartmental collaboration, as well as enhanced teaching and research practices, are noteworthy. The research also calls attention to the need for careful planning and effective strategies to mitigate potential challenges during the transition to ensure a successful adoption of matrix management.

## **5. CONCLUSION**

The study aimed to explore the implications of transitioning to matrix management within history Uzbekistan's higher education system. Drawing from the Matrix Management Theory, Systems Theory, Job Satisfaction Theory, and Innovation Diffusion Theory, it analyzed the impact on job satisfaction, interdepartmental collaboration, operational efficiency, teaching and research practices, and administrative processes. The research combined quantitative surveys and qualitative interviews, identifying a positive influence of matrix management on job satisfaction, operational efficiency, and interdepartmental collaboration. Furthermore, the qualitative data revealed an enhancement in interdisciplinary teaching and research opportunities and a streamlining of administrative processes, however, the transition was not without hurdles. Role ambiguity and conflicts due to dual reporting lines surfaced as significant challenges. The study further elucidated the dichotomy between the "median line" and the emergent "technostructure," noting how the "technostructure" could drive innovation and facilitate effective operation in a market environment, essential for the transformation of higher educational institutions into educational, scientific, and innovative complexes.

A student survey, initiated as part of the "technostructure" actions, indicated students' low confidence in employment opportunities post-graduation, prompting a significant proportion to consider further education. The majority recognized the value of interdisciplinary skills, with a notable percentage willing to invest in additional educational services. The survey findings suggest an increasing demand for diversified academic training and a need for improvement in the Classifier of Specialties of Higher Professional Education.

In a nutshell, the transition to matrix management within history Uzbekistan's higher education system has demonstrated noteworthy positive impacts on several aspects, underpinning the potential benefits of this approach. The evolution of the management model to include a "technostructure" can be a potent tool in organizing active university functions within a market environment. However, the challenges identified, along with the results of the student survey, underline the need for further research and actions to facilitate this transition and maximize its potential benefits effectively.

## 6. ACKNOWLEDGMENTS

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## 7. REFERENCES

- ABDURAKHMANOV, K. K., KHAKIMOV, N. K., RUZIEVA, R. H., MAKHMUTKHODJAEVA, L. S., & TOZHALIEV, A. A. (2019). Higher education as a significant factor of Uzbekistan's sustainable development. *Revista Espacios*, 40(09).
- Kates, A., & Galbraith, J. R. (2007). *Designing your organization: Using the star model to solve 5 critical design challenges*. John Wiley & Sons.
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.
- Davis, K. (1968). Job satisfaction, job involvement, and purpose in life. *Journal of Applied Psychology*, 52(4), 396-400.
- Locke, E. A. (1976). The nature and causes of job satisfaction. In M. D. Dunnette (Ed.), *Handbook of Industrial and Organizational Psychology* (pp. 1297–1349). Chicago: Rand McNally.
- Rogers, E. M. (1983). *Diffusion of Innovations*. (3rd ed.). New York: The Free Press.
- Burns, T. E., & Stalker, G. M. (1961). *The Management of Innovation*. University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship. SSRN.
- Galbraith, J. R. (1971). Matrix organization designs How to combine functional and project forms. *Business Horizons*. [https://doi.org/10.1016/0007-6813\(71\)90037-1](https://doi.org/10.1016/0007-6813(71)90037-1)
- Gibson, C. B., & Birkinshaw, J. (2004). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal*. <https://doi.org/10.2307/20159573>
- Herzberg, F. (1968). One More Time: How Do You Motivate Your Employees. *Hbr*.
- Herzberg, F., Mausner, B., & Snyderman, B. B. (1959). *The Motivation to Work - With a New Introduction by Frederick Herzberg*. New Brunswick, NJ Transaction Publishers.
- Katz, D., & Kahn, R. L. (1978). The Social Psychology of Organizations (Chapter 13). In *The Social Psychology of Organizations*.
- Katz, R. (1982). The Effects of Group Longevity on Project Communication and Performance. *Administrative Science Quarterly*. <https://doi.org/10.2307/2392547>
- Knight, K. E. (1967). A Descriptive Model of the Intra-Firm Innovation Process. *The Journal of Business*. <https://doi.org/10.1086/295013>
- Larson, E. W., & Gobeli, D. H. (1987). Matrix Management: Contradictions and Insights. *California Management Review*. <https://doi.org/10.2307/41162135>

- Leonard, D., & Leonard-Barton, D. (1995). Wellsprings of knowledge: Building and sustaining the sources of innovation. In *Boston: Harvard Business School*.
- Medcof, J. W. (2001). Resource-based strategy and managerial power in networks of internationally dispersed technology units. *Strategic Management Journal*. <https://doi.org/10.1002/smj.192>
- Mintzberg, H. (1993). Structure in Fives-Designing effective organizations. *Prentice-Hall International*.
- Nonaka, I., & Takeuchi, H. (1995). Knowledge-Creating Company. *Knowledge-Creating Company*.
- Rousseau, D. M. (1978). Characteristics of Departments, Positions, and Individuals: Contexts for Attitudes and Behavior. *Administrative Science Quarterly*. <https://doi.org/10.2307/2392578>
- Scully, J. A., Kirkpatrick, S. A., & Locke, E. A. (1995). Locus of knowledge as a determinant of the effects of participation on performance, affect, and perceptions. *Academy of Management Journal*, 38(2), 579-600. <https://doi.org/10.1006/obhd.1995.1022>
- Skyttner, L. (2006). General systems theory: Problems, perspectives, practice. In *General Systems Theory: Problems, Perspectives, Practice*. <https://doi.org/10.1142/5871>
- Sy, T., & D'Annunzio, L. S. (2005). Challenges and Strategies of Matrix Organizations. *Human Resource Planning*.
- Tan, S. K., Fauziah, W., Yusoff, W., Kian, T. S., Talha, M., & Idris, M. (201 C.E.). Herzberg' s Two-Factor Theory on Work Motivation : Does it Works for Todays Environment ? herzberg two factor theory on work motivation: does its. *Global Journal of Management Perspective*.
- Tidd, J., & Bassant, J. (2013). Managing innovation; integrating technological, market and organizational change, 5th ed. (online access included). *Reference & Research Book News VO - 28*.
- Von Bertalanffy, L. (1972). The History and Status of General Systems Theory. *Academy of Management Journal*. <https://doi.org/10.5465/255139>