Engineering peculiarities of flagship universities’ construction management systems in the face of modern challenges in the Russian Federation

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Abstract. The article provides information on the construction of higher education institutions’ consolidation taking Don State Technical University as an example. The socio-economic conditions of the construction area, where the investigated changes have taken place, are presented. Particular engineering characteristics of the flagship university management coordinating activities’ work and role, are demonstrated. The acute technical problems and management tasks are described. The data in the literature on the large higher education institutions management construction in the Russian Federation, is summarized. The relevant legislation and state initiatives in construction industry are analyzed. The construction of the flagship universities success is compared on the basis of assessments given by the Expert Board of the Ministry of Architecture of the Russian Federation. The construction management tasks of Don State Technical University are studied at empirical level in the context of actual challenges in the country. Proficient civil engineering management of the flagship university is realized within the given timeframes from the strategic point of view. On the other hand, a global task of the construction managing board at a large university is a flexible and relevant reaction to modern challenges, no matter which sphere generates them. In any case it is important to maintain high quality of intra-university cooperation, to develop information and communication contacts and especially efficient communications between HEI’s employees and managing structures. It is evident that it is necessary to use various principles in the flagship university construction management: the only possible approach for an invariant system is the clearly structured civil engineering hierarchy and strong centralization, it is recommended to use the horizontal construction management potential and decentralization for variable elements. The invariant vertical construction management system has proved its efficiency. In the meanwhile, the model’s variable elements need to be improved. The civil engineers will have to realize the potential of structural-and-communicative approach in construction management at a qualitatively new level, to renew the HR-managements tools, to promote self-administration, to increase the brand capitalization.

Introduction
Engineering peculiarities of the flagship universities’ construction should be considered in close connection with construction management system. In recent years, the construction of the higher education formation large Russian centers in general should be recognized as completed. To date, the experience of the universities that have received the status of federal, flagship and those included in the program “5-100” has been evaluated. The analysis of relevant information makes it possible to
draw two general conclusions. First: the consolidation of the higher professional education institutions is fully consistent with the current socio-economic situation, is able to generally improve the quality of educational services provided by the universities and creates the conditions for increasing the domestic universities’ competitiveness at the international level [1]. This can be reached by the well-organized construction management system. Second: the civil engineering management of the largest Russian universities should adequately and promptly respond to the challenges of global and national scale. First of all, of course, we are talking about strengthening our position in the market of educational services (regional, domestic, global), achieving economic and financial success of the organization. This is especially true for the universities specializing in the engineering staff’s training. At the same time, one of the most important management tasks of any large university is to increase the value of the organization as a brand.

Materials and Methods
In this work, we study and summarize the data from scientific and applied literature on the higher professional education large organizations’ construction management in the Russian Federation. Taking into account the widest public response and the active discussions that accompanied the processes of combining the higher education institutions, the authors examined the engineering peculiarities of the modern flagship universities’ construction management. In addition, the relevant legislation, government initiatives in the field of civil engineering, existing international and domestic standards are analyzed. In retrospect, the extinction of the extensive growing trend in the number of higher education institutions in Russia, the transition to enlargement and concentration are considered. The success of the core universities is compared based on the estimates of the Expert Council of the Ministry of Architecture of the Russian Federation. On an empirical level, the construction management tasks of the Don State Technical University are considered in the context of the current challenges of the Russian and global construction management system.

Research results
The universities operating in the territory of modern Russia have to constantly solve the problem of maintaining their own identity in the face of increasing competition [2, 3]. The organizations applying for the effective implementation of these tasks focus their main efforts and resources in two areas: improving the construction conditions and mastering the management innovative approaches. In this regard, it should be noted that the university management system’s modernization is one of the requirements made by the Ministry of Education and Science of the Russian Federation for the educational institutions participating in the “Supporting Universities” project [4]. We are talking about the state higher education institutions established by the government agencies or executive authorities and funded from the budgets of various levels. This fact underlines the high level of professional and civic responsibility of the university management for the results of their activities [5]. Thus, the operational and strategic management of the university as a whole and its units involves the management processes’ coordination and harmonization with the socio-economic realities of local, regional and federal scale. It is obvious that, from the point of view of strategy, quality management is conceived in the framework of a certain continuum [6, 7, 8]. On the other hand, no conjuncture can be considered in statics, which means that a flexible and adequate response to the current challenges of our time [9] should be recognized as the global task of a higher educational institution’s managerial superstructure, regardless of which sphere these challenges generate (science, economics, politics, demography, public institutions, etc. can be noted as examples).

In any case, it is necessary to constantly maintain the high quality of inter-university interactions, develop information and communication connections, and in particular productive communications between employees and management structures of the university [10, 11]. In this case, the administration of such interactions should take into account not the general university, but the university specifics of the corresponding working and managerial procedures determined by the simultaneous implementation of two permanent processes: diversification of curricula and
individualization of teaching methods [12]. The obvious parallels in this case with the management of a large holding are quite justified. It should be recognized that the domestic theory of management of a diversified university has not yet been sufficiently developed, and episodic, arbitrary filling of the gaps available in this field cannot serve as a conceptual basis for the full-scale updating of breakthrough management technologies in the industry. In this situation, as a rule, the opposite phenomenon is observed: university management is progressing, realizing the practical tasks (mostly narrow-profile), fixing, generalizing statistics, and then scaling up the well-established management methods.

In view of the foregoing, the following conclusion seems logical: the universally supported assertion of insufficient funding as the main problem of domestic universities is not certain. Upon the closer examination, the factor determining not only competitiveness, but also the preservation of a university as an organization, is the managerial leadership viability. This is all the more correct since the responsibility area of any management (production, political, etc.) includes the resources attraction and their optimal use. Obviously, in this case we are talking not only about financial, material, administrative resources, but also about human, cultural, institutional, etc. We believe that it is likely that with management based on the advanced fundamental scientific research and innovative approaches, the university’s competitiveness will be enhanced and can become a derivative of the correctly built internal and external communication processes [10, 11]. The converse statement will also be true: illiterate, inconsistent administration will not yield any positive results even with sufficient funding.

From our point of view, one of the most acute management problems of a higher educational large institution is an imbalance of interests and sentiments in the team, as well as the distorted vertical and horizontal communications between the employees [10–12].

One of the proper economic organizational components is the real cost of the organization in the providing educational services’ process, which for obvious reasons increased after the Russian Federation joined the Bologna process [13, 14]. The administrative infrastructure of domestic universities received an additional load due to the global, multi-level restructuring of internal and external administrative procedures [15, 16]. Note that the most significant innovations in the field of the educational services’ domestic standardization are associated with the competency-based approach’s introduction and a quality management system. Moreover, if the main vector of the Bologna process is the educational systems’ convergence in the participating countries, then the concept of “rapprochement” in this context is used rather formally. It should be recognized that we are talking about one-way traffic - the approximation of the Russian standards to the European ones, and in some cases, resource, institutional, cultural, organizational and other differences are not taken into account.

Speaking about the challenges faced by the modern Russian higher education system, it is necessary to mention the general destabilizing effect of the crisis in the economy and geopolitics. It is no coincidence that the expert community has formed the opinion that the continuous decline in the number of students in the Russian universities that started after 2008 is due not only to demographic factors, but also to the global recession, which in one way or another affected all major business entities, regardless of their activity field and ownership form. It is also logical that some researchers convincingly prove the stabilizing, “healing” potential of these processes.

It should be clarified that at the previous stage, the Russian system of vocational education was faced with an extensive increase in the number of universities. New educational institutions were constantly opening in various localities, and this had a special socioeconomic meaning: young people living in problem regions got access to education, were busy, and thanks to this, most of the young people who finished school adhered to a socially acceptable line of behavior. In addition, people with higher education could get jobs in such educational institutions, retained seniority and paid taxes. However, by 2008, the uncontrolled expansion of educational organizations lost their market sense. In the new realities, the resources dispersal among the educational institutions that are difficult to account for was already unacceptable. The financial, personnel, material and technical components of the education system began to concentrate around the universities that are able to survive, develop, meet
not only the domestic socio-economic paradigm, but also the requirements of the European educational practice. In other words, the educational institutions that adequately respond to the challenges of our time have received a new development momentum.

A number of the universities have acquired federal status, the issue of national research universities has been resolved at the government level, and the “5-100” project [17] has been initiated to support the educational institutions that intend to compete with the world industry leaders. So, in February 2019, the Government of the Russian Federation announced the number of subsidies to the universities participating in the project: in 2019, 9.9 billion rubles were distributed among 21 organizations of higher professional education [18].

In addition, from 2018 to 2024, the state will spend 785 billion rubles on the national Education project. The main declared goal of this comprehensive program is to achieve the global competitiveness of the Russian education. According to the plans of the Government, the Russian Federation should enter the top ten countries of the world with the highest quality of general education [19].

Of course, some of the projects included in this complex, one way or another are related to higher education. In the regions, the most successful local universities should become the guides of this ideology, platforms for the relevant tasks’ practical implementation. Among them, a special role belongs to the flagship universities. The complex of educational services offered by such universities is formed taking into account the needs of the regional economy [4]. One of the reference university’s performance indicators is the preservation of the intellectual and professional potential of the population within the territory on which the educational institution operates. Highly trained specialists trained in such a university are successfully employed and stay in the region after graduating from the institution. The state purposefully supports the universities capable of coping with this task and having a convincing development program. The expert council under the Ministry of Education and Science of the Russian Federation draws up a list of core universities that receive very serious budget subsidies. In addition, the core universities can attract financial assistance at the regional and local levels.

At one time, based on the flagship universities’ actual achievements, the Expert Council made a decision on differential funding. The most successful universities of the first group (participating in the start of the project in 2015) received the maximum subsidy for the implementation of their development program - 120 million rubles a year. The Ministry of Education specialists have chosen four universities: Don State Technical University (DSTU), Vyatka State University, Ufa State Petroleum Technical University and Oryol State University named after I. S. Turgenev.

The participants in the second group of the flagship universities received 80 million rubles each. Based on the activities monitoring results, one regional flagship university was denied the full state funding.

The second wave of competitions was held in 2017. As a result, another 8 core universities received 100 million rubles each.

It should be emphasized once again that the above-mentioned amounts are not allocated to support the current activities of the university, but rather to the implementation of its development program.

The successes of DSTU, recognized at the level of the Ministry of Education of the Russian Federation, made it possible to legislatively consolidate the special role of the university at the regional level. In February 2018, the Legislative Assembly of the Rostov Region adopted the law “On the interaction of government bodies of the Rostov region and the flagship university of the Rostov region”, designed to regulate the interaction of regional government bodies and the DSTU [20]. The common goal of this joint activity is personnel and scientific support of the socio-economic development in the Rostov region.

In particular, it is planned to use the reference university’s potential in solving the tasks stipulated by the projects “Strategy-2030” and “Strategy-2035”.

The regional law also defines private, specific goals of cooperation:
— increasing the competitiveness of goods and services offered by the local enterprises and organizations;
— development and implementation of the projects supporting the main directions of social and cultural policy, as well as the activities aimed at maintaining and improving the health of the population in the Rostov region;
— supporting the regional industrial clusters’ development, etc.

Following the logic of integration into the regional economy [21, 22], the university management took the certain organizational steps, in particular, significantly transformed the work of the collegial deliberative governing body of the university - the Board of Trustees. Since 2018, the main focus of its activity has been the development program’s harmonization of the core university with the economic interests of the Rostov region. The Council brought together the prominent representatives of the regional business community, science and the clergy.

Thanks to the performed work, the Don State Technical University has taken a prominent position in the information space at the local and federal level.

The so-called media activity of the university has increased by 50%. For comparison: according to the “Medialogy” system, in 2017 DSTU was one of the five most popular flagship universities in the media, and in 2018 it was in the top three. It is important to clarify that there were 51 core universities in the Russian Federation in 2018. At the same time, the Interfax information group recognized DSTU as the third strongest university in terms of media activity already in 2017 (these are the results of the IX annual National University Ranking compiled by the Interfax specialists).

Summary

A special place that the Don State Technical University occupies in the system of Russian education and in the socio-economic infrastructure of the Rostov region makes high demands on the university management. The construction management subsystem should qualitatively coordinate the implementation of diverse tasks: financial, economic, engineering, etc.

A developing competitive university should, on the one hand, maintain the stability and continuity of the traditional management system, and on the other hand, if necessary, flexibly and quickly update and reform management, in any case with regard to its special functions.

One of the most important questions of the general management of a support university: to what extent can a construction management system have individual characteristics and how much should it be standardized? The best solution to this problem seems to be the implementation of the so-called “structural-genetic” control model. The University as an organization providing educational services, and as an economic entity should fully comply with all the rules, norms, standards and regulations governing technical and economic activities. However, some elements of the system may retain with the individual characteristics. Thus, the need to apply various management principles becomes obvious: for an invariant system, the only possible approach is a clearly structured construction management vertical and strong centralization; for variable elements, it is recommended to use the potential of horizontal control and decentralization. It is also clear that in the first case we are talking about the strictly formalized management processes, in the second - about the less formalized management processes.

At the present stage of the Don State Technical University’s development as a flagship university in the Rostov Region, the invariant vertical construction organization management system has proved its viability and effectiveness [11]. In this case, the variable elements of the model need to be improved. Construction management will have to deal with the following tasks at a qualitatively new level:
— fully realize the potential of the structural and technical approach [23] to administration;
— introduce the best practices and HR management tools;
— stimulate self-government;
— increase the DSTU brand’s capitalization.
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