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Management of a complex research project in the context of implementing the university's overall strategy

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Abstract

The aim of the paper is to discuss the central issues associated with the implementation of a multidimensional research project in a university from a strategic management point of view. In the paper, it is argued that project management plays an important role in executing institutional strategy aimed at achieving research and academic excellence. The analysis provided in this paper is based on the academic literature review on some important strategic and project management concerns; it is also based on the author's experience as the leader of an international research project executed in Transport and Telecommunication Institute (Latvia) under the ERASMUS+ programme. The analysis performed in this paper allows the author to conclude that the challenges of managing a cross-disciplinary research project increase when the context is related to the complicated environment of a contemporary university. Within complex university settings, different inter-related strategies come into play for accomplishing competitive advantage of an educational organization, multidimensional research projects making their valuable contribution to achieving the university's strategic goals.

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Keywords: university; research project; strategy; functional area

1. Introduction

Today, many European universities are involved in complex research projects. Such projects make a valuable contribution to the development of an academic organization in the context of creating the European Research Area

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launched in 2000 for realizing the Lisbon Strategy (COM(2000) 6 final); higher education that is linked to research and innovation plays a vital role in sustaining economic growth and prosperity of any country (COM(2013) 499 final).

The aim of the paper is to discuss the central issues associated with the implementation of an international cross-disciplinary research project in a university from a strategic management point of view. In the paper, it is argued that the project management plays an important role in executing institutional strategy aimed at achieving research and academic excellence. The analysis provided in this paper is based on the academic literature review on some important strategic and project management concerns. It is also based on the author's experience as the leader of an international research project (LEARNIT), which is implemented under the ERASMUS+ programme by the consortium of three higher education institutions: University of Economics and Innovation (Poland), Klaipeda State College (Lithuania), Transport and Telecommunication Institute (Latvia). The innovative solution – special software for mobile devices proposed in the framework of the project – is intended for improving efficiency of the learning process by stimulating students' level of concentration. LEARNIT is a multidimensional research project that involves people of different professions and positions, as well as various organizational resources, managerial procedures and pedagogical tools.

The analysis performed in this paper allows the author to conclude that the challenges of managing a multidimensional research project increase when the context is related to the complicated environment of a modern university. Within complex university settings, different inter-related strategies come into play for accomplishing competitive advantage of an educational organization, cross-disciplinary research projects making their valuable contribution to achieving the university's strategic goals.

2. Literature review

2.1. Strategic management in the context of achieving competitive advantage in higher education

A review of academic literature linked to strategic management reveals that the role of strategic management in modern organizations is very important (Thompson & Strickland, 2003; Morden, 2007; Jeffs, 2008; Harrison & St. John, 2009; Hill & Jones, 2011; Hill & Jones, 2012). Strategic management comprises the analysis, decisions and activities aimed at generating and sustaining competitive advantage of an organization (Dess & Lumpkin, 2002). The organizational strategy is associated with the creation of the main long-term goals, the implementation of actions and allocation of resources that are needed for achieving the established goals (Koontz & Weihrich, 2010); it is also related to the analysis of both the external and internal environment an organization (Capon, 2008). Strategic objectives are based on an analysis of the current market situation and opportunities, because they are associated with a company's competitive situation (Kotler, 2000).

Strategic management in a modern university is associated with creating institutional policies, which are directed towards enlarging its potential for change in the constant pursuit of quality (Tabatoni, 2002). Today, higher education managers face many challenges: they have to have to a) balance their philosophies with labour market priorities (The State of Higher Education 2013: Executive Summary, 2013); b) provide new opportunities to students in the context of lifelong learning, etc. (COM(2003) 58 final; COM(2007) 61 final; Report to the European Commission on Improving the Quality of Teaching and Learning in Europe's Higher Education Institutions, 2013; c) increase the university's research and education excellence and improve its international attractiveness.

Therefore, managing strategy in higher education supports the implementation of its key activities: teaching, research, social and economic service (Watson, 2000); this presupposes that educational management has to be with the purpose or aims of education (Bush, 2007). It should be mentioned that the accomplishment of education-specific organizational goals requires using a special approach to developing strategies aimed at the accomplishment of competitive advantage and academic (research) excellence. From a strategic management perspective, higher education managers have to find the most efficient ways to balance their university's position in terms of internal strengths and weaknesses against external opportunities and threats (Stukalina, 2015/a).

The intellectual context of strategic management includes many conceptual elements, as strategic management deals with a variety of practical issues (Nag et al., 2007). Several strategies can be created with the aim to provide

competitive advantage (Hill & Jones, 2012); so the overall strategy of a university may include a number of strategies intended for ensuring the competitiveness of the educational organization (Moldovan, 2012).

2.2. Project management from a strategic point of view

Project management can be defined as enabling the "planning, scheduling and controlling" of the activities to be done for accomplishing project objectives (Lewis, 2002), though different organizations may have their own definition of this term (Newton, 2015). A project can be understood as the "response to a need, the solution to a problem … that promises a benefit"; it is temporary in nature and involves a well-defined set of tasks (Heerkens, 2002). The common characteristic of all projects is the transformation of some concepts and activities into new achievements (Lock, 2007). For successfully completing a project managers need a strategy; according to Artto et al. (2008), project strategy is a "direction in a project that contributes to success of the project in its environment".

Project strategies can be presented as part of a hierarchy of strategies and objectives; there are three basic levels over which a project is managed – the integrative level, the strategic or administrative level, the tactical or operational level; the strategy for accomplishing the objectives at each level will indicate the objectives at the next level down (Turner, 2009). Since projects are employed as a means of achieving an organization's strategic goals (Anantatmula, 2010), every project should have a clear relationship to the organization's strategy; to align projects with the strategic goals of the organization is critical for project success; project managers have to understand their organization's mission and strategy (Larson a & Grey, 2011).

All projects are supposed to be organizationally-embedded (Engwall, 2003), so an overall organizational strategy will provide the "boundaries" for a particular project; its goals and results must be related to an organization's vision; the following question should be addressed: "How will this particular project support the achievement of an organization's strategy aimed at achieving competitive advantage?" (Longman & Mullis, 2004). Project strategy, as any organizational strategy, is associated with competitive advantage or survival of the organization in the external environment (Artto et al., 2008). In this context, project management needs careful planning and action to generate the appropriate conditions for successful project implementation, and to use the corresponding strategy to direct and the dynamic nature of project work (Longman & Mullis, 2004). In other words, managers have to align project management with organizational strategic objectives. Senior managers decide on a concrete project taking into account the institutional logic of the external environment, which influences their overall strategy (Maoret et al., 2011). As the organization understands what projects are essential to its operation, strategic planning comes to be more reliable, because the "objectives and high-level deliverables it is based on are strategically aligned" (Callahan & Brooks, 2004).

3. Managing a complex research project in the context of the university's strategy implementation

3.1. Management of an international research project in the agenda of creating the European Research Area

Internationalization and globalization make contemporary higher education institutions to search for human capital, financial resources to boost international competitiveness (Mohrman et al., 2008). On the one hand, universities are tools of globalization influence; on the other hand, they are also affected by major changes associated with globalization (Huisman et al., 2001).

As international research projects can be regarded as significant instruments for generating new ideas in the context of creating the European Research Area, European higher education institutions undertake many complex research projects and establish international consortia for achieving a reputation of research-intensive universities, which can be considered as one of the most important strategic goals of a modern higher school. This is due to the fact that in the knowledge-based society, the research university becomes a "key institution for social and economic development" that expands its activities by founding professional schools, establishing new research units (centres, departments); this process demands creating "responsibility-centered" strategies for keeping separate units responsible (Mohrman et al., 2008). As projects become more essential to corporate strategy and competitive advantage, being a

means of formulating strategic moves for achieving strategic goals (Davies et al., 2011), new ambitious research projects are undertaken by European universities. They are also a good way to attract international funding, young academic talents and outstanding researchers from all over the world.

Performing the strategic selection of research projects senior managers have to answer the following questions: "How will a concrete project contribute to the implementation of the overall university's strategy?", and "How to make the project's strategy aligned with the university's strategic goals?"

3.2. Management of a cross-disciplinary research project: the implementation framework

In the context of the university's strategy implementation, research projects are the concrete actions that the educational organization undertakes to execute its strategic plan aimed at achieving research and academic excellence in the extremely competitive global environment. In the agenda of developing the concrete project's strategy and creating an overall action plan, project managers must address various issues including a) performing analysis of the project internal and external environment; b) identifying strategic resources and key functional areas; c) scheduling a set of actions to be taken for the project realization and managerial procedures to be used in the process.

The management of a research project is also concerned with managing the creation of new knowledge, sharing and dissemination of existing knowledge within the concrete settings (Ernø-Kjølhede, 2000). As effective communication links the project units together (Heerkens, 2002), to stimulate activities towards establishing the project communication scheme in the integrated organizational environment the whole set of knowledge management instruments can be utilized including planned (structured) knowledge transfer schemes and unplanned knowledge transfer schemes (Cheng et al., 2010). Thus, the research project implementation is executed in the framework that is built around various elements and different managerial tools (see Fig. 1). The proposed research project implementation framework is composed of a set of inter-related processes aimed at enhancing management practices for achieving project goals in the framework of executing the overall strategy.

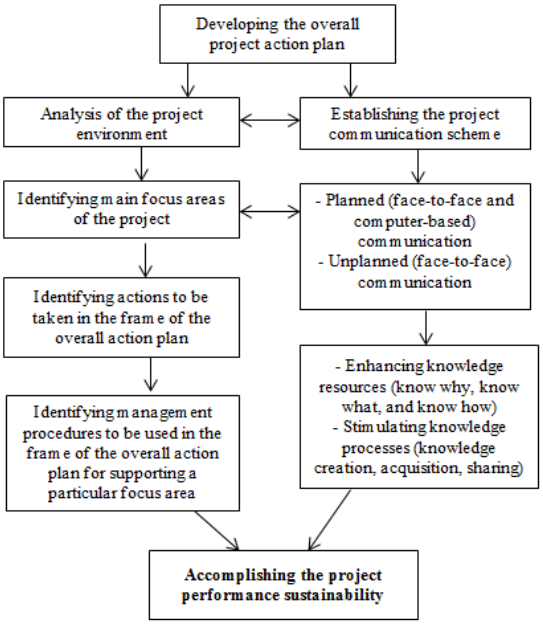

Fig. 1. Research project implementation framework.

4. Identifying key project functional areas

4.1. Applying the holistic approach to managing a cross-disciplinary research project in the university

Educational management, being focused on the aims of education, is closely related to sustaining and increasing competitiveness of an academic institution (Bush, 2011). These aims are actually multi-faceted, and include social, cultural, moral, academic aspects (Fiddler, 2002), as central activities of a university involve teaching, research and community service (McBurnie & Ziguras, 2009).

Strategic management of an academic institution can be viewed as a holistic process, as it is not possible to concentrate on academic success excluding a concern about other aspects (Shattock, 2003); management of a university embraces several aspects: financial, administrative, operations, etc. (Griffin, 2012). So it occurs in different functional areas of an organization, and it is directed at achieving synergy necessary for accomplishing education-specific organizational goals (Stukalina, 2014). Strategic initiatives aimed at achieving competitive advantage, i.e. academic and research excellence, are implemented in different units of a contemporary university and at various management levels (Stukalina, 2015/b). Competitive advantage may be accomplished by concentrating the resources on particular priority areas, which can be further developed into different focus areas; the areas of competitive advantage are identified using the holistic approach to strategy development and implementation, the rationale being to establish specific strategic goals and allocate heterogeneous resources more efficiently (Stukalina, 2015/a).

Contemporary universities are complex non-linear and multi-level structures (Stukalina, 2010/a), so any project in the higher education area is implemented in a complicated and dynamic organizational environment. The project work environment, being an integral part of the university environment, is complex and dynamic. The organizational context is one of the most important factors of a project's success (Callahan & Brooks, 2004).

The project management process demands the formation of a small organizational structure (the project team), which can be considered as "a microcosm of the larger organization" (Heerkens, 2002). It must necessarily follow that the project environment, being a small-scale version of an academic institution, can also be viewed as a complicated phenomenon. The increasingly cross-disciplinary nature of modern research projects brings new challenges for project managers in the university settings, where project participants (scientists, teachers and sometimes students) often have both departmental and project responsibilities. The educational environment of a contemporary university is supposed to be conducive to implementing a cross-disciplinary research project, since a variety of resources from different areas can be engaged, and autonomous experts with particular research interests can be involved in performing the project's activities and evaluating its outcomes.

LEARNIT is a fine sample of a multidimensional research project that can boost both the academic and research excellence of a university. In the framework of managing such a project, it is crucial to identify key functional areas involved in the project implementation and to create an effective coordination mechanism across the university. This is due to the following:

- Research projects are not always amenable to common project management methods (Lock, 2007).
- Cross-disciplinary projects engage people from different departments, professions and positions; this calls for strong integration of all available resources that is heterogeneous in nature.
- If students are actively engaged in the project, the project results are too dependent on their contribution to the project.
- Projects involving ICT are rather sophisticated and require appropriate management of all potential difficulties (Murray, 2011).

Therefore, the holistic approach to managing a cross-disciplinary research project seems to be best suited for university settings, the closely interconnected project areas corresponding to the main functional domains of a higher education institution.

4.2. Using a function-centric approach to the implementation of a complex research project

Let us continue with a discussion of the different approaches to project organization. The so-called "pure" project organization, which presupposes that the project becomes an independent body with its own technical staff and administration, is not efficient if the organization is implementing a number of projects at the same time; in this case, each project may not be completely equipped and supplied by all necessary resources (Dušan, 2008). It is obvious that research-intensive universities undertake multiple projects at the same time, so managers responsible for different research projects need the integrated resources of an educational environment to be at their disposal at any time.

The functional type of the project management organization implies that the project is implemented in one functional part of an institution; it offers the most flexibility in using the staff, but this method does not allow using the holistic approach to the management of complex projects (Dušan, 2008). In the matrix-based form of the project management organization, a simultaneous focus is put on multiple perspectives, and specialists from organizational functional areas are brought together to perform a task on a temporary basis in a project team (Horney & O' Shea, 2009); this will enable managers to use the holistic approach to the management of a complex cross-disciplinary project. Besides, the matrix can be regarded as a more flexible method, since it is included into the organization that already functions, and it should be adjusted to the project's needs (Dušan, 2008).

As a project involves management of diverse objectives and perspectives (Heerkens, 2002), and multiple inhomogeneous resources are used for supporting implementation of the project (Turner, 2009), we assume that matrix-based method is more suitable to the managing of a complex a research project in a university. In the frame of a cross-disciplinary project implementation in the university, special emphasis should be given to generating and sustaining excellence of different constituents associated with these objectives and perspectives; they include scientific, academic, technological and managerial aspects. The academic and research strengths of the project are based on a diversity of organizational resources. These include tangible, semi-tangible, non-tangible resources (Stukalina, 2008; Stukalina, 2010/a; Stukalina, 2010/b), the so-called "human capabilities" – "the right people with the right skills" (Longman & Mullins, 2004) being an essential prerequisite for the project's success.

For addressing different functional-level issues we propose using a function-centric method in the framework of applying the matrix-based form of the project management organization, which presupposes identifying key focus areas of the project that corresponds to the main functional areas of a modern university. We construe the notion "functional area" more broadly than just a functional department of an organization. The project focus areas are associated with basic functional domains of a university, where functional area-specific strategies are implemented (Stukalina, 2014), a functional strategy being defined as an action plan for running a functional activity within a business (Thompson & Strickland, 2003), however, the goals set by educational organizations are supposed to be quite immaterial as distinct from the goals set by a particular business (Hechanova & Cementina-Olpoc, 2013).

Thus, functional strategies are developed for accomplishing functional area-specific strategic goals. As opposed to the corporate-level strategic goals, functional area-specific strategic goals result from the corporate-level goals and are aimed at creating a constructive educational environment that embraces the following functional domains (Stukalina, 2014):

- University services and facilities (a combination of tangible, non-tangible and semi-tangible resources).
- Education (a combination of tangible, non-tangible and semi-tangible resources).
- Research (a combination of tangible, non-tangible and semi-tangible resources).
- Staff (non-tangible resources).

Strategy implementation demands achieving synergy between functions and business units (Hunger & Wheelen, 2010). In business, cross-business synergies embrace two corporate performance effects: those resulting from the vertical relationship between the corporate center and the businesses and from the horizontal relationships between the businesses; leveraging operative resources across their related businesses leads to the performance advantage of an organization (Knoll, 2008). Similarly, the success of a cross-disciplinary research project executed in a university

is linked to attaining a synergistic effect, and the anticipated synergistic result is supposed to be attributable to close cooperation between the basic functional domains of the higher education institution.

In this regard, the project must be aligned with applicable management functions executed in the context of developing and implementing functional area-specific strategies: a) the university facilities management function; b) the staff management function; c) the research management function; d) the educational activities management function. Every function is supported by specific procedures to be employed for achieving the project's strategic goals.

Implementation of a cross-disciplinary research project occurs in the above mentioned functional domains for many reasons. Cross-functional integration and coordination become possible, cross-functional learning is provided, and people feel more connected (Horney & O' Shea, 2009); so the highest flexibility in using both the staff and resources can be achieved. Besides, the project management will be able to employ the administrative resources, which results in the project's uniformity with the strategies and activities of the existing organization (Dušan, 2008). The higher the integration between the project functional areas, the more efficient is the project's performance. A cross-disciplinary research project must operate as a well-coordinated and flexible network based on collaboration. We assume that integration mechanisms for achieving synergy influence the project performance in much the same way they affect the corporate performance. According to Knoll (2008), they include continuous scanning of organizational environment, promoting horizontal perspective, domain experience and shared intuition, supporting flow of information across different businesses (domains); this leads to increased motivation, engaged decision-making, improved quality of horizontal strategies, enhanced efficiency of cross-business (cross-domain) collaboration, fostered organizational learning and cross-business knowledge.

Key functional areas of a multidimensional research project, the expected project outcomes and anticipated long-term effects of project outcomes in terms of the university performance are described in Table I.

Table 1. Project functional areas, expected project outcomes and anticipated long-term effects.

Project functional area	Expected project outcomes	Anticipated long-term effects of project outcomes
University infrastructure	ICT-based project infrastructure that can be further employed in the educational process and for research purposes	Enhanced ICT capacity of the university
Educational component	Advanced ICT-based instructional tools tailored to the project requirements, which can be further adjusted for developing multidisciplinary programmes in the agenda of lifelong learning	Increased enrollment rates, including enrollment of international students
Research component	Well-equipped research laboratory and the innovative software, which can be extensively used in both the study and research processes	Enhanced reputation of a research-intensive university
Staff	Recruiting and retaining first-rate academicians and researchers for maintaining the project sustainability	Acknowledged authority in research-led teaching

Thus, as the functional-based activities are performed, specific integrated project outcomes are generated in the agenda of the project overall plan. In a broader sense, the expected project outcomes are closely related to long-term effects, which will determine basic university activities over time. The net result is supposed to be enhanced academic and research excellence of the higher education institution in the context of achieving competitive advantage in a turbulent and unpredictable modern international environment.

4. Conclusions

This paper has discussed some important issues related to the management of an international cross-disciplinary research project in a university in the frame of implementing the university's overall strategy aimed at accomplishing research and academic excellence. It has been argued that a multi-faceted research project can make its valuable contribution to achieving the university's strategic goals, project management being an integral part of the inclusive management of a modern higher education institution.

The analysis provided in this paper allows the author to draw the following conclusions. The challenges of managing a multidimensional research project increase in the context of the complex environment of a university. The increasingly cross-disciplinary nature of contemporary research projects brings new challenges for project managers, as project direct stakeholders (scientists, teachers, IT specialists, financial specialists, students, etc.) frequently have both departmental and project responsibilities. The project environment is a small-scale replica of a higher education institution. Cross-disciplinary research projects have to be implemented in different functional domains of an educational organization, the focus being put on multiple perspectives. It enables project managers to employ the holistic approach to the management of the project implementation for adjusting the integrated educational environment resources (tangible, non-tangible and semi-tangible) to the project's requirements.

Therefore, different inter-related strategies come into play for accomplishing sustainable project performance, special emphasis being placed on maintaining excellence of various organizational resources associated with scientific, academic, technological and managerial aspects. For addressing the functional-level issues project managers can apply a function-centric method in the frame of the matrix-based arrangement of the project management organization, which presupposes identifying main focus areas of the project. The project key focus areas are associated with basic functional domains of a university, where functional area-specific strategies are implemented: infrastructure, education, research and staff. The project must be aligned with applicable management functions executed in the context of developing and implementing functional area-specific strategies. A project strategy involves the actions to be taken in the framework of the project plan for reaching the explicitly stated project outcomes. They, in turn, are closely related to the anticipated long-term effects so that both the university and the community will have certain benefits from the project outcomes in the form of a new product or service.

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