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Проектний менеджмент для академічних дослідницьких проектів: основні цикли та результати

Ключові слова: академічний дослідницький проект, класичний проектний менеджмент, змішаний проектний менеджмент, PMBoK, головний дослідник.

Key words: academic research project, classical project management, mixed project management, PMBoK, principal investigator.

Słowa kluczowe: projekt badawczy projekt akademicki, klasyczne zarządzanie projektami, zarządzanie projektami mieszanymi.

Introduction

In a last few decades, a significant amount of research funding is carried out through a project approach (in the form of funding for a specific project). There is a need to develop a project with a clear structure, starting with the problem grounding and ending with the expected results and outcomes. And when the funding starts, it's necessary to manage the project and ensure that all the planned steps are taken. It is also necessary to periodically report to the investors and donors, and at the end of the project – to provide the final report, drawing up accordingly, with certain parameters and results. So if there is a project, then there should be its effective management. Academic research projects (ARPs) need management.

ARP is a specific category of projects that are significantly different from the traditional projects for which the methods of project management were developed. Classical project management (PM) methodologies can only be applied to research projects partially, under certain conditions and with adaptation.

A significant amount of research is devoted to finding the answers to questions related to this topic. What are the challenges for effective ARPs management? Can the classical PM methods be used for research projects? If so, which tools and techniques are most effectively applied to scientific researches? If not – what can be offered to manage ARPs? How can these challenges be resolved and the effectiveness of ARPs be strengthened?

This paper presents an analysis of current researches in which key challenges and main findings of project management for ARPs are studied.

Key challenges and main findings

What type of project academic research project is? How research projects are defined and what are the main characteristics which differ them from other types of traditional projects? Exploring this topic, various authors use different terms to describe research projects: academic, university-based, individual, small-group, interdisciplinary, collaborative, scientific, large-scale research projects (table 1).

Table 1. Definitions of research project proposed by different authors

No	Term	Definition	Authors
1	Academic research project (university-based research project)	any undertaking intended to extend knowledge through a disciplined inquiry or systemic investigation, that at least partly carried out in an institution of higher learning.	Powers L.C. and Kerr G.*
2	Individual (or small group) research project	is typically initiated by the investigator, have clearly developed goals, but little, or no, formal structure, funded by individual investigator grants from a national research agency or equivalent, usually have short-term funding (2–3 years) and modest reporting requirements.	Kennett B.**
3	Multi / interdisciplinary research project	is a complex project which transcending discipline boundaries, is required more explicit effort to encourage the necessary levels of collaboration between researches with different backgrounds.	Kennett B.
4	Collaborative research project	a specific project type, where the work is planned, executed, and financed commonly by a consortium of public, academic, and private (industry) partners who share a common research interest and work across disciplinary, organizational, and national boundaries to achieve innovative results.	Lippe S. and vom Brocke J.***

Table 1. (cont.)

No	Term	Definition	Authors
5	Scientific research project	comprises a temporary endeavor that assembles resources in order to deliver a unique output (new knowledge) subject to specific 'quality' constraints and within a budget.	Riol H. and Thuillier D.****
6	Large-scale research project	has a clear and achievable research goal, is extremely complex, often involving uncertain technologies, typically involve a large number of stakeholders, researches and institutions, often involve relatively long time scales, and cost over \$50 million in total project costs.	Moore S. and Shangraw R.F.*****

* L.C. Powers, G. Kerr, *Project management and success in academic research*, RealWorld Systems Research Series 2009:2, available at SSRN: <http://ssrn.com/abstract=1408032>.

** B. Kennett, *Planning and managing scientific research: a guide for the beginning researcher*, Australian National University Press, 2014, 93 p.

*** S. Lippe, vom Brocke J., *Situational project management for collaborative research projects*, Project Management Journal, Vol. 47, No. 1, pp. 76–96.

**** H. Riol, T D. huillier, *Project management for academic research projects: balancing structure and flexibility*, International Journal of Project Organization and Management, Vol. X, No. Y, January 2015, pp. 000–000.

***** S. Moore, R.F. Shangraw, *Managing risk and uncertainty in large-scale university research projects*, Research Management Review, Vol. 18, No. 2, Fall 2011.

Despite this diversity of types of research projects, all could be characterized by the following features: delivering a unique output (new knowledge); has little, or no, formal structure; involve some degree of uncertainty and uneven progress; at least partly carried out in an institution of higher learning. In this paper ARP will be considered as project which has above mentioned characteristics.

The scientific research cycle includes five phases (idea conception, research plan, plan execution, dissemination of findings and project closure), which resemble the phases of project (Riol H. and Thuillier D.).

Project management is all about the process of getting a project completed on time, within budget, to the desired level of quality, and in a university environment where it is almost unheard of to be able to please everyone, to the satisfaction of as many stakeholders as reasonably possible¹.

Managing a project typically includes:

- 1) identifying requirements;
- 2) addressing the various needs, concerns, and expectations of the stakeholders as the project is planned and carried out;
- 3) balancing competing project constraints, such as scope, quality, schedule, budget, resources, and risk (Johnson A.M.).

¹ A.M. Johnson, *Improving your research management: a guide for senior university research managers*, Elsevier B.V., 2012, 156 p.

It is important question – how researchers manage their projects and whether conventional PM is suitable for this particular type of project. What is potential of PM practices in ARPs? Academics in their studies investigated whether and to what extent ARPs can be managed using classical PM principles, processes and tools particularly the PMBoK². PMBoK considered as the most popular used methodology among conventional PM approaches³.

Main findings of Riol H., Mustaro P.N. et al. researches are following:

- researchers do not use traditional, popular PM tools but intuitive, simplified and informal tools (possible explanations – tools are not used because researchers are not aware of them due to lack of any PM training; these tools might not work effectively in an academic context);
- principal investigators (PIs) consider time as a main constraint in research and human resources management as critical; researches are not well-equipped to foster team dynamics and capitalize on collective learning capabilities (lack of collective objectives and processes for evaluating team performance);
- PIs showed positive attitude toward PM for themselves but expressed concerns towards management practices at the expense of science (especially in the social sciences); depending on the context, researchers favour a more structured and/or flexible PM, they must strike a dynamic balance between structure and flexibility to manage their projects;
- 5 management areas are critical to ARP: procurement, communications, time management, people (complexity management) and project characteristics (uncertainty management); first three areas require project planning, two later areas are not documented in the PMBoK and should not be entirely ex ante planned.

A number of tools and techniques are available to assist in project management applied to the university environment:

- mind mapping, force field analysis, the Gantt chart, the RASCI chart and management by objectives (Johnson A.M.);
- a work breakdown structure for planning, charting the overall resource inputs required for the project, planning for risks and contingency, scheduling using project milestones, and using a costing scheme that converts resources into a common unit, e.g., U.S. dollars (Moore S. and Shangraw R.F.; Chin C.M.M. and Spowage A.C.);
- the project proposal (in the initiating process), communication plans (in the planning process), change request plans (in the execution and controlling process) (Chin C.M.M. and Spowage A.C.).

² P.N. Mustaro, R. Rossi, *Project management principles applied in academic research projects*, Informing Science and Information Technology, Volume 10, 2013, pp. 325–340.

³ C.M.M. Chin, A.C. Spowage, *Project management methodologies: a comparative analysis*, Journal for the Advancement of Performance Information and Value, Vol. 4, No. 1, 2012, pp. 106–118.

Riol H. and Thuillier D. draw attention to two factors that should be considered for successful PM implementation:

- 1) soft aspects (refer to the capacity and natural willingness of an organisation to integrate PM principles into its practices);
- 2) hard aspects (refer to the adequacy of PM tools and techniques in light of the managerial processes and tools already used in an organisation).

Baker and colleagues suggested the 12 „golden rules” of management success which could be applied to ARP:

- gain consensus on project outcomes;
- build the best team you can;
- develop a viable comprehensive plan and keep it up to date;
- determine the quantity of resources you’ll really need to get things done;
- have a realistic schedule;
- don’t try to do more than can be done;
- remember that people count;
- gain formal and ongoing support of management and stakeholders;
- be willing to change;
- keep others informed of what you are up to;
- be willing to try new things;
- become a leader⁴.

Researchers face challenges in each stage of managing ARPs: winning the project, defining the project, and managing the project. Project teams face the following challenges when managing academic research projects:

- 1) universities are not designed as project management organizations and therefore are not necessarily equipped to manage projects in an efficient manner; many academicians and administrators lack PM knowledge and skill sets to effectively managing their research projects (Chin C.M.M. and Spowage A.C.);
- 2) research does not progress in a linear fashion (the discovery paradox – meaning that discovery occurs in serendipitous ways), but existing management techniques are typically linear and prescribed;
- 3) research projects often require management across multiple disciplines and communications barriers may increase the project risk, also could occur anti-management (resistance to being managed), goal conflict between scientists and managers, difficulty with performance evaluation (Moore S. and Shangraw R.F.);
- 4) research project teams differ from traditional project teams in ways that cannot be ignored (Riol H. and Thuillier D.);
- 5) the problem of defining success (completion on time and on budget while meeting specifications); uncertainty and lack of clarity especially among the pro-

⁴ S. Baker, K. Baker, Campbell G.M., *Project Management*, Penguin, 2003, 421 p.

ject stakeholders regarding desired outcomes; lack of accountability structures (communication breakdown and bottlenecks, hardly-managed academics, extremely difficult task for project managers to establish authority) (Powers L.C. and Kerr G).

To address these challenges scientists made following proposals:

- knowledge of university project management is needed, and experienced research project managers are needed (Moore S. and Shangraw R.F.);
- according to Riol H. and Thuillier D. a dynamic type of PM, both structured and flexible, is necessary. This mixed PM allows the development of people and projects, and the achievement of initial project objectives: creative and diversified productivity (exogenous deliverable) and knowledge generated by learning (endogenous deliverable);
- Powers L.C. and Kerr G. suggest a framework comprising from three elements of PM to identify and manage ARP risks: a credible and recognizable definition of the desired project state; a credible and compelling measure of deviation from this desired state; a way to bring the project back on track.

Conclusion

There are similarities between the general management framework of ARP and classical PM but APR should not be managed based solely on the processes, tools and techniques of conventional PM. This assertion is also valid for agile project management methodologies. The combination of these two approaches during project implementation and throughout the project life cycle seems to be best solution for ARP management.

PM techniques designed specifically for university are lacking. This is a gap in need of further research. Dynamic research project management methods with adaptive approaches are needed for research projects. Some of the project management strategies would be suitable for use in the ARP, but a new set of methods should be developed.

The absence of PM knowledge (particularly in team management) is obvious, techniques related to collective learning and team development are valuable but their implementations are difficult. The perspective direction of ARP management development could be developing team effectiveness and self-management.

For further research, it would be interesting and useful explore the practice of managing ARPs in Ukraine first, then compare the results with the PM methodologies, relating it back to researchers and, on this basis, strengthen their PM skills and knowledge.

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Streszczenie

Zarządzanie projektem w akademickich projektach badawczych: główne wyzwania i perspektywy

Artykuł przedstawia główne wyzwania, problemy i perspektywy wykorzystania klasycznego zarządzania projektami w projektach badawczych. Ustalono, że akademickie projekty badawcze znacznie różnią się od tych, dla których opracowano metody zarządzania projektami. Uzasadniono, że klasyczne techniki zarządzania projektami (w szczególności PMBoK) mogą być częściowo wykorzystywane, pod warunkiem ich modyfikacji. Proponuje się połączenie dwóch podejść (klasycznych i elastycznych) zarządzania projektami w całym cyklu życia projektu jako optymalnego rozwiązania dla efektywnego zarządzania akademickimi projektami badawczymi. Obiecującym kierunkiem rozwoju zarządzania projektami dla tego typu projektów może być rozwój efektywności zespołowej i samodzielnego zarządzania.

Summary

Project Management for Academic Research Projects: Key Challenges and Main Findings

The article analyses the main challenges, problems and perspectives of using classical project management methodologies in research projects. It has been determined that academic research projects are significantly different from those for which project management methods were developed. It is grounded that classical project management techniques (particularly PMBoK) can be applied partially, under certain conditions and with adaptation. The combination of two approaches (classical and agile) of project management throughout the life cycle of the project is proposed as the best solution for efficient management of academic research projects. A promising direction for project management development for such type of projects can be the development of team effectiveness and self-management.