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Seweryn Spalek[1]

INNOVATIVE VS. INNOVATION PROJECTS IN ORGANISATIONS

Summary: Being innovative is a vital capability of organisations and societies nowadays. Companies run innovation projects as part of their strategies and assign significant resources to them. Moreover, there is a tendency to manage projects in an innovative, for example agile, way. Therefore, it is important to clearly understand the distinction between innovative and innovation projects. Both terms are explained in the article and cross relations are discussed. Moreover, the idea of managing innovation projects applying the innovative approach is presented.

Key words: Innovations, Innovative, Projects, Management.

Introduction

Innovations are nowadays the centre of attention of scientists conducting significant research[2]. Innovation projects occupy a special place among all ventures. Companies see them as an opportunity to increase their competitive advantage and the European Union made them the major theme of "Horizon 2020" when drafting the funding programme for research and innovation.

Despite there being many examples of innovation in the literature, the concept of innovation projects is variously defined by authors. However, they agree that innovation projects are of high risk with regards to their implementation. Moreover, there is a significant shortage of scientific works treating the issue of managing innovation projects with due prominence. Hence there is a need to discuss the best approach to that issue.

In innovation projects, the stakeholders' expectations regarding results are much higher than in other types of projects, while the risk of failure of innovation projects - significant, while they often operate under conditions of increased uncertainty. It can be assumed that the number of failed innovative projects is much higher than that presented by the Standish group in the

[1] *Faculty of Organisation and Management, Silesian University of Technology.*

[2] Horbach J, Oltra V, Belin J. Determinants and Specificities of Eco-Innovations Compared to Other Innovations-An Econometric Analysis for the French and German Industry Based on the Community Innovation Survey. Industry and Innovation. 2013;20(6):523-43; Eggert A, Thiesbrummel C, Deutscher C. Heading for new shores: Do service and hybrid innovations outperform product innovations in industrial companies? Industrial Marketing Management. 2015;45:173-83; Shu C, Wang Q, Gao S, Liu C. Firm Patenting, Innovations, and Government Institutional Support as a Double-Edged Sword. Journal of Product Innovation Management. 2015;32(2):290-305.

CHAOS reports[3], where the number of failed projects is markedly high and fluctuates at around 20%, while challenging projects (overrun budget/time or reduced scope) are around the noteworthy figure of 40%.

Innovation projects very often bridge different disciplines and establish new directions for the development of organisations. Therefore, they are at the cutting edge in the following areas[4]:

- Personalised medicine
- Distributed energy
- Pervasive computing
- Biomarkers for health
- Nanomaterials
- Biofuels
- Biomarkers for health
- Advanced manufacturing
- Universal water
- Carbon management
- Engineered agriculture
- Security and tracking
- Advanced transportation

Taking into consideration the high risk and uncertainty of innovation projects, the traditional approach to managing them seems to be insufficient. Therefore, a new innovative way of managing such projects should be applied. That approach should be called, '*innovative management of projects'*, which can also be described under the shorter term '*innovative projects'*.

In contradistinction to '*traditional project management'*, known as the waterfall approach[5], *innovative management of projects'* should include the newest methods and techniques, including the built-in agility concept[6].

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[3] Standish-Group. (1995-2015). CHAOS Report.

[4] Chiavetta D, Porter A. Tech mining for innovation management. Technology Analysis & Strategic Management. 2013;25(6):617-8; Nasr ES, Kilgour MD, Noori H. Strategizing niceness in co-opetition: The case of knowledge exchange in supply chain innovation projects. European Journal of Operational Research. 2015;244(3):845-54.

[5] Valimaki A, Kaariainen J, Koskimies K. Global Software Development Patterns for Project Management. In: O'Connor RV, Baddoo N, Gallego JC, Muslera RR, Smolander K, Messnarz R, editors. Software Process Improvement, Proceedings. Communications in Computer and Information Science. 422009.

As the terms "*innovative*" and "*innovation*" projects are often misused, the main goal of this article is to clearly define, systemize and underline the crucial differences between them.

Moreover, the research question (RQ) can be formulated: what is the best approach to managing innovation projects?

To fulfil the goal of the article and answer the research question, the elaborations based on the literature study are given.

1. Innovation Projects

There are various terms of innovation projects with a sizeable number of researchers discussing innovation projects only in the context of technology which, in the opinion of some authors[7] and myself, is nowadays grossly insufficient. Therefore, for the purposes of these considerations, I propose expanding the definition of innovation projects by incorporating the economic aspect of companies[8]. In this way, not only the product but also related processes and methods may be subject to innovation, as they contribute to the growth of the economic potential of the company. For the purpose of these elaborations, the typology of innovation projects proposed by Eppinger and Kastensson[9] was preliminarily assumed to be as follows:

- Incremental innovation projects
- Evolutionary innovation projects
- Revolutionary innovation projects

However, as noted by Jacoby and Rodriguez[10], incremental innovation is when the company wants to improve an existing product to an existing client, while evolutionary innovation is when the company wants to improve an existing product and offer it to a new client. Finally, revolutionary innovation is when the company wants to create a new product for a new client (Figure 1).

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[6] Dingsoyr T, Nerur S, Balijepally V, Moe NB. A decade of agile methodologies: Towards explaining agile software development. Journal of Systems and Software. 2012;85(6).

[7] Ericson Å, Kastensson Å, editors. Exploit and Explore: Two Ways of Categorizing Innovation Projects. DS 68-3: Proceedings of the 18th International Conference on Engineering Design (ICED 11), Impacting Society through Engineering Design, Vol 3: Design Organisation and Management, Lyngby/Copenhagen, Denmark, 15-1908 2011; 2011.

[8] Drucker PF. The discipline of innovation. Harvard Business Review. 1998;76(6):149-57.

[9] Ericson Å, Kastensson Å, editors. *op. cit*.

[10] Jacoby R, Rodriguez D. Innovation, Growth, and Getting to Where You Want to Go. Design Management Review. 2007(18):10-5.

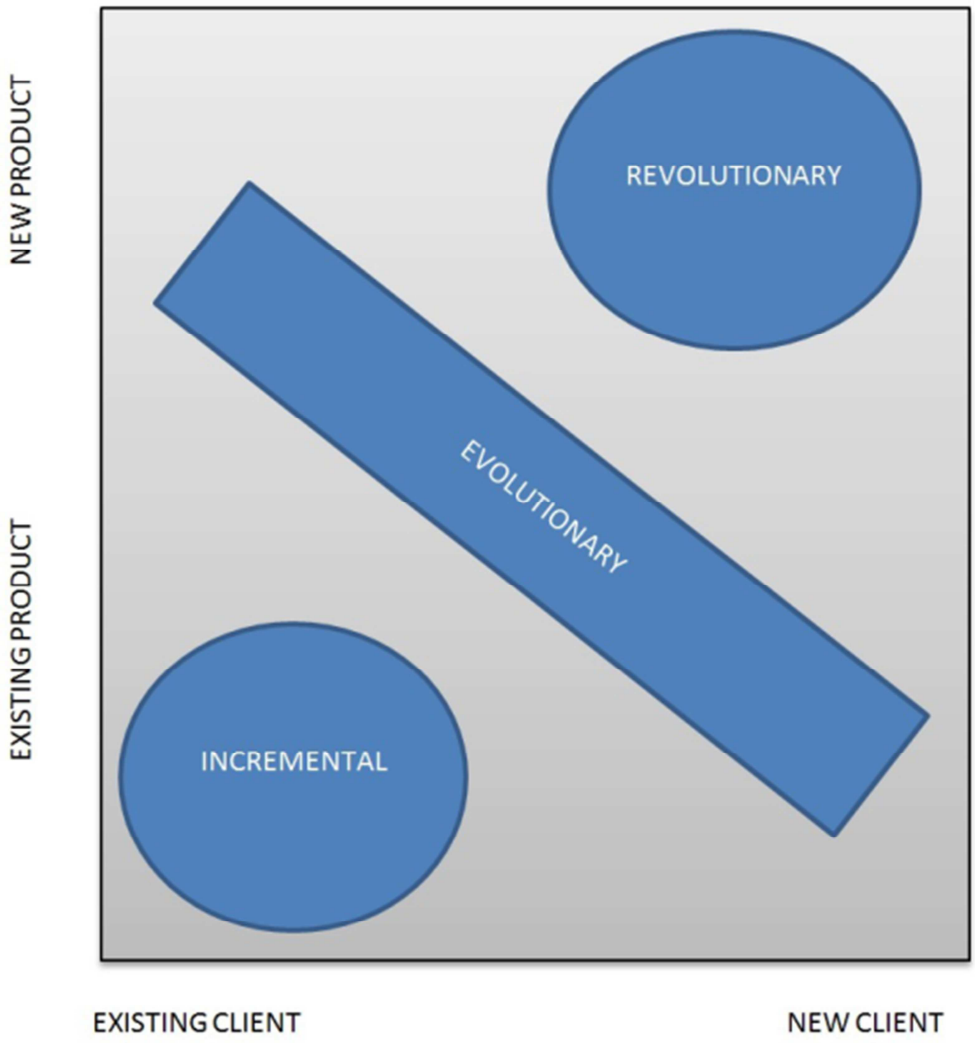

Figure 1. The typology of innovation projects;
source: taken from Jacoby, R., & Rodriguez, D. (2007). Innovation, Growth, and Getting to Where You Want to Go. *Design Management Review*(18).

There are several key characteristics associated with innovation projects. One of them is the hard-to-define scope of work. The other is that the goal of the project is very often described to a very high level and the details are hard or even impossible to define upfront at the planning phase. Those projects also frequently operate in a turbulent, dynamic environment with a high level of competition. Teams work under strict time pressure, which generates additional problems in communication flow and increases tension.

Therefore, innovation projects tend to be high risk projects and their outcomes are uncertain. Thus, risk management of innovation projects seems to play a key role in their execution. The notion of risk appears largely in publications on the implementation of innovations[11]. The authors emphasise its importance. However, they limit their deliberations to general statements on the importance of risk management, without conducting in-depth research and analysis.

In some publications on risk management in innovation projects, the authors propose the application of universal risk management methods[12], as defined in widely recognised standards such as *The Project Management Body of Knowledge - PMBOK*[13], *International Competence Baseline - ICB*[14], and/or focus primarily on the risk of technology in innovation implementation[15] or assume innovations as investment projects with particularly in-depth analysis of the financial risk pertaining to the investments[16]. This approach is currently insufficient and, as noted by Chandrasekaran, Linderman and Schroeder[17], it is necessary to go beyond the existing technological and financial risk framework in innovation projects.

Moreover, innovation projects are more likely to fail than other types of projects[18].

The framework of the current state of knowledge in the area of risk management in innovation projects can be divided as follows:

- Application of standard methods in risk management.
- In-depth analysis of technological risk in projects.
- Financial risk analysis in investment projects

Moreover, the groups of risk can be divided according to the source of origin[19]; as follows:

- Internal Risk, which includes risks associated with:

[11] Li C, Yan Y. Scientifically Understanding the Theoretical and Application Value of Innovation Method. Proceedings of the International Conference on Management and Engineering (Cme 2014). 2014:597-603; Bowers J, Khorakian A. Managing Risk in Innovation Projects. In: Ran B, editor.: Dark Side of Technological Innovation; 2013. p. 373-400; Hsiao SC, Hsiao L. Critical Success Factors in Cultural Innovative Society Construction. Revista De Cercetare Si Interventie Sociala. 2014;46:53-64.
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[13] PMI. A Guide to the Project Management Body of Knowledge (PMBOK® Guide) - Fifth Edition: Project Management Institute (PMI); 2013.
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[17] Chandrasekaran A, Linderman K, Schroeder R. The Role of Project and Organizational Context in Managing High-Tech R&D Projects. Production and Operations Management. 2015;24(4):560-86.
[18] Salerno MS, de Vasconcelos Gomes LA, da Silva DO, Bagno RB, Teixeira Uchoa Freitas SL. Innovation processes: Which process for which project? Technovation. 2015;35:59-70.
[19] Ericson Å, Kastensson Å, editors. *op. cit*.; Miorando RF, Duarte Ribeiro JL, Cortimiglia MN. An economic-probabilistic model for risk analysis in technological innovation projects. Technovation. 2014;34(8):485-97.

    - Company project management methodology.
    - The strategy of implementation of innovation in the company.
    - Human resources.
    - Organisational culture.
    - Knowledge Management.
- External Risk, which includes risks associated with:
    - Stakeholders of the project.
    - Market and competitors.
    - Collaborators.
    - Legal changes.

Moreover, taking into consideration the innovative nature of innovation projects, following Hillson[20], the modern approach to risk division into the following groups should be assumed:

- Threats - which represent a traditional, negative approach to risk in projects.
- Opportunities – which represent a new/innovative, positive approach to risk in projects.

This concept was recently appreciated in *The Project Management Body of Knowledge Project*[21], where risk is defined as ”an uncertain event or condition that, if it occurs, has a positive or a negative effect on a project objective” and “Project risk includes both threats to the project’s objectives and opportunities to improve on those objectives”.

Moreover, it can be assumed that risk management activities, such as identifying, analysing and responding to project risk, should include maximising positive and minimising adverse effects. Therefore, the following distinction of approaches to risk management can be drawn:

- In the area of threats
    - Avoidance
    - Transferring
    - Mitigation
    - Acceptance
- In the area of opportunities
    - Exploitation
    - Sharing

[20] Hillson D. Enterprise Risk Management: Managing Uncertainty and Minimising Surprise. Advising Upwards: a Framework for Understanding and Engaging Senior Management Stakeholders. 2011:57-86.
[21] PMI. *op. cit*.

- Enhancement
- Ignoring

The abovestated points describe, but are not limited to, the complicated and difficult nature of innovation projects, on a scale unlike the majority of traditional projects. It also shows that some non-traditional ways of managing innovation projects should be applied.

2. Innovative Projects (Innovative Management of Projects)

The traditional approach to project management has been applied since the 1960s. The methods and techniques proposed at that time are still used in modern projects. However, new functionalities were added or could possibly be developed as a result of information technology (IT) aided tools. Even complex programmes are successfully executed using Gantt charts and allow detailed planning practices of the entire project upfront[22]. The main characteristic of that approach is a precisely defined project goal and, therefore, the scope of work. This allows one to estimate the project's budget very carefully and secure the necessary resources from the outset. Once the project has been planned, the main focus is put on technical issues and trying to keep the projects on track, according to the assumed budget, time and scope[23]. Thus, there is also a high demand for monitoring and control of project progress in the traditional approach. Therefore, several approaches are used, where the earned value method (EVM) is an example[24]. In short, this approach could be described as managing *traditional projects*.

With the rapidly increasing number of projects within the last few decades, a significant number of them are innovation projects. This results from the changing business environment that companies operate in. The execution of a project according to the original plan is no longer sufficient for the company to maintain or increase its market share. The turbulent environment and the changing or difficult to explicitly define requirements, coupled with aggressive completion, require, in some projects, a new innovative approach. Those needs were noted by the authors of Agile Manifesto in the software development projects area. As an answer to those

[22] Eppinger SD. Innovation at the speed of information. Harvard Business Review. 2001;79(1):149-166.
[23] Spalek S. Finding a New Way to Increase Project Management Efficiency in Terms of Time Reduction. Inzinerine Ekonomika-Engineering Economics, 2014; 25(5): 538–548.
[24] Kim B-C, Reinschmidt KF. Combination of Project Cost Forecasts in Earned Value Management. Journal of Construction Engineering and Management-Asce. 2011;137(11):958-66.

needs, they proposed the following framework[25]: "We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value: (1) Individuals and interactions over processes and tools, (2) Working software over comprehensive documentation, (3) Customer collaboration over contract negotiation (4) Responding to change over following a plan. That is, while there is value in the items on the right, we value the items on the left more". Since Agile Manifesto, several authors have built on that and proposed the further development of this approach for managing projects in organisations[26].

The Agile approach is a core example of how to run *innovative projects* which are far different from traditional ones. In summary, innovative projects should be executed in organisations in response to prevailing business needs which are hard to define upfront in precise detail. There should be new approaches (e.g. Agile) and methods applied to innovative projects as the waterfall approach is inadequate to cope with projects operating in a rapidly changing environment or projects with built- in, constant redefinition of the requirements with a high level of competition.

3. Discussion

Innovation projects, as has already been stated, are projects which are far from traditional ones. Therefore, they need to be treated in a different way. That means that the way to manage them should be an innovative one, similar to that applied to innovative projects. Innovation projects, by their very nature, are of high risk. Their scope of work is very often difficult to rigidly define. The goal is often blurred. However, the business need to invent cutting-edge technology is clear in order to make salient progress and to undercut the competition. However, how to achieve it and how to manage these kinds of projects is a new challenge. The traditional approach to managing projects is most decidedly not able to address the specific needs associated with innovation project outcomes. Therefore, innovation projects should be managed in an innovative way, where the Agile approach could be one of them.

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[25] Beck K., Beedle M., van Bennekum A., Cockburn A., Cunningham W., Fowler M., Grenning J., Highsmith J., Hunt A., Jeffries R., Kern J., Marick B., Martin RC., Mellor S., Schwaber K., Sutherland J., Thomas D., *Agile Manifesto*, 2001, http://www.agilemanifesto.org/, accessed 25.09.2015.

[26] Dingsoyr T, Nerur S, Balijepally V, Moe NB. *op. cit*.; Oellgaard MJ. The Performance of a Project Life Cycle Methodology in Practice. Project Management Journal. 2013;44(4):65-83; Drury M, Conboy K, Power K. Obstacles to decision making in Agile software development teams. Journal of Systems and Software. 2012;85(6); Middleton P, Joyce D. Lean Software Management: BBC Worldwide Case Study. IEEE Transactions on Engineering Management. 2012;59(1):20-32; Batra D, VanderMeer D, Dutta K. Extending Agile Principles to Larger, Dynamic Software Projects: A Theoretical Assessment. Journal of Database Management. 2011;22(4); Holzmueller-Laue S, Goede B. Agile Business Process Management in Research Projects of Life Sciences. Perspectives in Business Informatics Research. 2011;90.

As the terms of innovative projects and innovation projects pertain various overlapping themes, they may well have something in common. Namely, innovation projects could be, or even should be, managed in an innovative way, or as innovative projects. Therefore, the common relationship between innovative projects and innovation projects is shown in Figure 2.

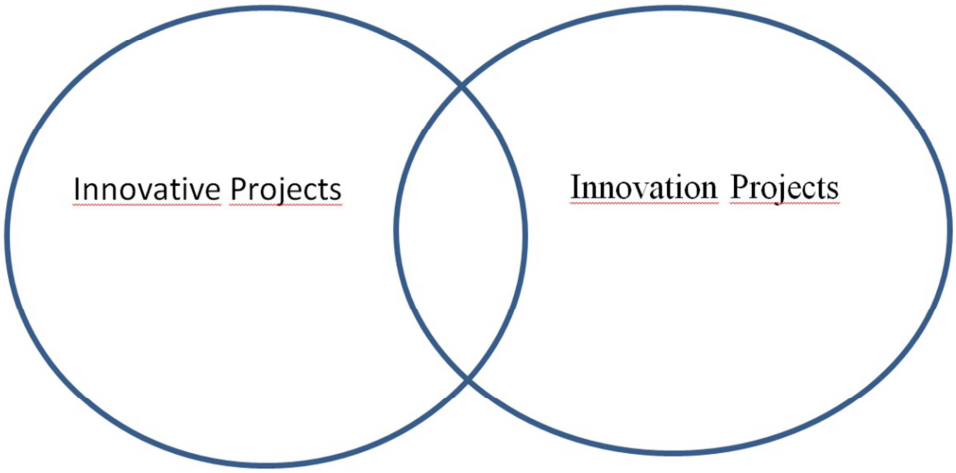

Figure 2. The common relationship between innovative projects and innovation projects;

In view of the abovementioned elaborations, the most recommended approach to managing innovation projects is by doing it in an innovative way. That means the innovation projects should be managed in an innovative way in order to increase their success rates. This answers the article's research question, outlined at the beginning of the article.

4. Conclusions

The scientific approach to managing projects dates back to the 1960s. At that time, projects were usually single-run entities with a clearly defined scope of work, time and budget. Moreover, they operated in a stable, predictable environment. Therefore, the major issues associated with managing such projects were technical ones or associated with limited resources. Thus,

traditional project management, based mostly on the waterfall approach, was sufficient and remains so for certain projects today. However, through time, the market underwent changes. The business environment of companies operating in many branches is highly turbulent, which has created frequent changes in project requirements and imposed new methods of managing such projects. Those new types of projects managed with new methods should be called innovative projects. In parallel, companies, or even societies (e.g. European Union), are desperately seeking innovations and they have initiated several innovation projects that should result in the development of brand new ideas, products or services or cutting-edge technologies. Those two worlds (Innovative projects vs. Innovation projects) can function together in synchronous harmony which means that innovation projects are managed in an innovative way. As this article focuses on clarification, systematization of terms and adding new knowledge by presenting the theoretical concept of managing innovation projects in an innovative way, it can also serve as starting point for further empirical research on current practices in managing innovation projects in companies.

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