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ESTABLISHMENT OF PROJECT MANAGEMENT AND INNOVATION POTENTIAL OF ENTERPRISES

СТАНОВЛЕННЯ ПРОЕКТНОГО УПРАВЛІННЯ ТА ІННОВАЦІЙНОГО ПОТЕНЦІАЛУ ПІДПРИЄМСТВ

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Since the end of the 1980s, the role taken by differentiation strategies in Western economies has been at the origin of significant changes in the organization of the design of new companies' products. These developments have given rise to an essential current of research which has highlighted the importance of the project management method in the performance of firms' design. The organization by project appears as the privileged organizational form in developing innovative products, services or processes. When approaching such a subject, the first difficulty to be resolved is the polysemy of the terms used, the words «projects» and «innovation» used today to describe very diverse realities. The historical markets of companies are increasingly saturated and push them towards high-growth countries, for which they innovate somewhat different from what they practice in their country of origin.

Keywords: management, project management, project model, innovation, competition.

З кінця 1980-х років, роль яку відіграють стратегії диференціації в західних економіках, стало причиною значних змін в організації розробки продуктів нових компаній. Ці розробки породили важливий напрям досліджень, який підкреслив важливість методу управління проектами у виконанні проектування фірм. Проектна організація виступає як привілейована організаційна форма в розробці інноваційних продуктів, послуг або процесів. Підходячи до такої теми, першою проблемою, яку потрібно вирішити, є багатозначність використовуваних термінів, слів «проекти» та «інновації», які сьогодні використовуються для опису дуже різноманітних реалій. Історичні ринки компаній стають все більш насиченими і штовхають їх до країн із високим рівнем розвитку, для яких вони впроваджують інновації, дещо відмінні від того, які вони практикують у своїй країні походження. У статті розглянуто визначення сутності проектної діяльності та наведено шість характеристик щодо тлумачення зазначеного поняття, та виділена динаміка проектної ситуації, а саме здатність діяти в рамках проекту, рівень знань щодо проекту та хід реалізації проекту. Історично було встановлено, що

управління проектами має два чітких організаційних впливи: спочатку англосаксонська розробка основних програм, а потім завдання розробки нових продуктів у промисловості. Зазначено доцільність формалізації «стандартної моделі» для проектування значущих проектів, яка включає організаційні та інструментальні аспекти для планування великих уніфікованих проектів та розглянуто її обмеження. Наведено порівняння принципів функціонування проектів. Зауважено, що прискорення темпів технологічних змін або бажання підкреслити класифікацію продукту спонукає компанії до розробки все більш інноваційних продуктів тому і управління проектами та конкуренція неможливі без інновацій. Сформовано найголовніші сфери інтересів для інноваційного менеджера, для того щоб вивести на ринок постійний потік нових інноваційних продуктів. Зроблено висновок, що інновації займають лідируюче місце в конкуренції між фірмами, та лежать в основі проектного управління.

Ключові слова: менеджмент, управління проектами, модель проекту, інновації, конкуренція.

Formulation of the problem in general

The globalization raises new questions because talents are more mobile, and that new forms of competition are emerging between the different actors. Several parameters are at stake: the nature of the innovations that must now be developed in this global context, the rapid deployment of innovation over a large perimeter, knowing how to organize and coordinate resources, the distribution of roles between subsidiaries and centre, and, finally, the mobilization of creative ecosystems. This field is not only empirical. It feels like a great deal of theoretical work.

Analysis of recent research and publications. There is a large number of published works devoted to the study of certain aspects of project management and innovation as T. Fujimoto, S. L. Brown, K. M. Eisenhardt, K. B. Clark, S.C. Wheelwright, Pierre-Jean Benghozi, R. G. Cooper, S. J. Edgett, E. J. Kleinschmidt and others have made significant contributions to the study of these issues [1–6].

Despite the considerable amount of research to date, the features of modern principles of management of innovation require further research.

Unresolved parts of the common problem.

The most recent results on the management of innovation emphasize that we do not have, on the one hand, the analysis of market needs and, on the other, the technical design of innovative products and services, but rather overlap and coupling between these two approaches.

The purpose of the article. This article highlights co-design, and rapid prototyping approaches, carried out with users thanks to new open innovation platforms. Iteratively collect customer feedback on actual uses, find solutions that integrate product and service and build innovative business models.

Presenting main material. We can define a project as «a specific approach that makes it

possible to methodically and gradually structure a reality to come. A project is implemented to meet a client's needs, where needs are to be undertaken with given resources». To characterize more precisely the nature of the project activity, French management science researcher Midler retains six characteristics [5]:

- firstly, an approach is finalized by a goal and strongly constrained. A project is defined first by the objective to be achieved, broken down in terms of performance, time and cost, and disappears with its realization;

- then, taking into account the uniqueness of the situation. Achievement of objectives assigned to the project presupposes integrating its singularity, which most often calls into question causes the modes of operation of the business actors of the company;

- thirdly, a matter of communication and integration of different logics. The logic of projects supposes, contrary to the Taylorian principles of division of labour, the combination of the expertise of the various players (research, marketing, production) from the definition of the target until the marketing of the product. The organization of cooperation between actors is, therefore, a vital point of the effectiveness of the project;

- moreover, a process of learning under uncertainty. A project is, in essence, a risky activity. You have to commit to the project to know if it will go to completion and where this term will be located precisely. The actors discover along the way problems and solutions according to a logic which response to the actors, surprises them and forces them to initiate new learning;

- in addition, convergence is an irreversible temporality. Unlike the horizon of professions, that of projects is limited by an end announced ex-ante. Between the beginning and end of the project unfolds a learning process that Midler described as an irreversible dynamic where we go from a situation, we don't know anything but where everything is possible to another. On the

contrary, the level of knowledge has reached its maximum, but all room for manoeuvre has been used (Figure 1).

– last but not least, an open and fluctuating space. It is impossible to define a priori the project's boundaries, which mobilizes different professions in the company and companies (a car manufacturer and his suppliers, for example).

The two traditions of project management. History of project management would involve going back to the realization of great works in Egyptian or Chinese antiquity to trace the emergence of the notion of engineer, from the Renaissance to pre-industrial society (17th–18th centuries) and industrial. We will focus here only on recent developments that correspond to the development of managerial knowledge on this mode of coordination specific to the project. There are two different organizational influences: the Anglo-Saxon engineering of major programs first, then the tasks of development of new products in the manufacturing industry.

Formalization of the «standard model» for significant projects engineering. In the United States, project management will be formalized as an autonomous doctrine on the occasion of significant military or space programs, and considerable development works of the 1960s, under the impetus of the American professionals united within the Project Management Institute (PMI, 1996). This «standard model» of the engineering of large unitary projects includes organizational and instrumental dimensions. On the plan organizational, it defines a framework of responsibility based on the master triptych

contracting authority, prime contractor and batch manager [2]:

– the client is the owner of the future work. He is responsible for the definition of objectives (in engineering terms, it defines the program or Specifications);

– the project manager assumes two roles: a role of architect and assembler: he takes responsibility for the choices of the overall design, it breaks down into work packages, a role in coordinating the construction of the work: organization of calls for tenders on lots, choice of contractors, planning, monitoring and control of the production of batches.

The batch managers ensure the performance of the elementary tasks of the set, and the model can work, for large projects, in a way nested: each batch can be considered in cascade as a sub-project. In terms of methods, the "standard model" of engineering combines a range of tools to break down a project, its planning and the control of costs. In terms of economic regulation, this model is based on apparent dissociation between the project owner, who assumes the risk of operating the work, and the project manager, who assumes the risk of implementation. The coordination between the various stakeholders, therefore, takes place within the framework of markets: the master project launches a call for tenders to retain a project manager based on the specifications charges that he has defined, the latter proceeding in the same way for the batch managers. The coordination between actors is therefore done here through contracts defined ex-ante. This model will assert itself in the engineering large unitary projects up to the end of the 1970s,

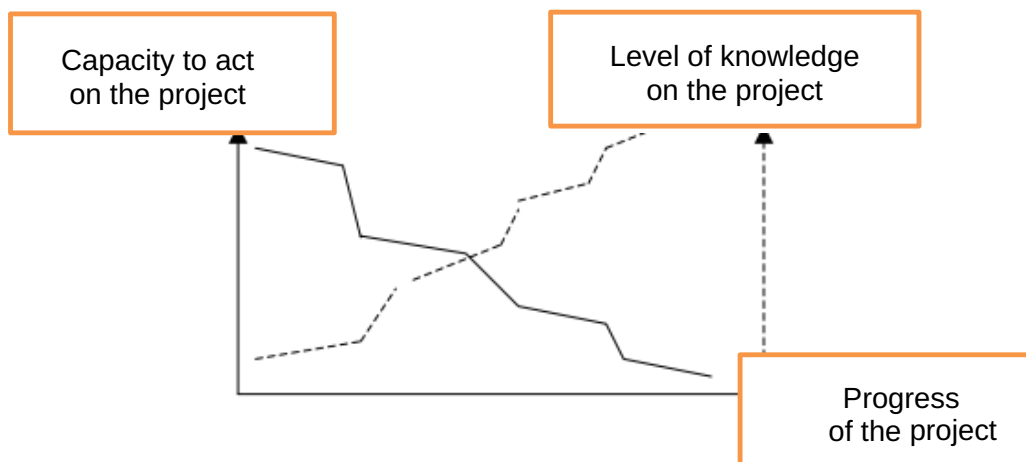


Figure 1. Dynamic of a project situation

Source: adopted from [1; 3]

which marked the beginning of a severe crisis for the sector. Several factors have combined their effects: the impoverishment of developing countries and the drying up of oil rents had led to a drastic reduction in the markets for major international projects at the very time when new extreme competitors, Orientals, came to compete with Western engineering firms that were once protected by their technical know-how. As a result, the world of significant projects becomes riskier, more demanding, and more constrained by a logic of efficiency and profitability, where political voluntarism exists. Three limits of the «standard model» will then appear:

1) First of all, the project manager/project owner split limits, which assumes that it is possible to define the target to be reached ultimately. But it is one of the contributions of design theories to have shown that the formulation of the problem (the specifications) is inseparable from the answer we will give. It is this heuristic between the different actors of the project that builds innovation.

2) Secondly, the limits of coordination by performance contracts between «black boxes». The principle of coordination is the meeting between the batch managers on the points initially planned (cost-quality-deadline). This does not allow adjustments between batch managers, whether it is the difficulty of meeting the objectives or the smoothing of committed resources. This Coordination mode does not organize the participants' solidarity in the face of the uncertainty inherent in any conception. On the contrary, it generally leads to an inflation of committed resources.

3) Furthermore, The economy of knowledge production necessary for design is not considered. The engineering model is fundamentally driven by demand, and if it makes it possible to coordinate existing skills, the production of knowledge necessary for implementing a «technology push» strategy is a stranger one.

The development of the project concept in the industries of large series. Projects for new products in manufacturing companies are developed in a very different coordination framework. We are here not in coordination with the market and contracts but in procedural coordination, which is deployed within large organizations. From the 1950s to the 1970s, projects new products and equipment, whether manufactured goods or chemicals, for example, were developed within the framework of so-called «functional»: the project passed successively to

the specialized departments at each stage of the product design process (market analysis, definition product functionality, product/process technical definition, purchasing, etc. There is no formalized approach or project actor.

Moreover, the emergence and development of project management in mass-produced industries began in the 1970s, when the number and complexity of the projects required better coordination and integration of various contributions to the project. We then see the creation of project manager roles, formalized reviews and, more generally, the adoption, within companies, of certain principles and tools of the «standard model».

Nonetheless, this model will know, at the end of the 80s, a new rupture, when it appears that the performance of Western companies in terms of the design of new products is not up to par with Japanese competitors in an economic battle which, more and more, is played out on the variety, the quality and the rapid renewal of catalogues through innovation. As a result, new approaches to project management are emerging, which give greater weight to the project manager, now called «project director», and aim to ensure more effective cooperation between the various contributors within the design process.

The concurrent model and innovation. This brief historical analysis has shown the origins and limits of the standard project management model in the context of the reactivity economy of the 80s. We then witnessed, initially mainly in the manufacturing industry, the emergence of new practices formalized by researchers under the term contemporary design or concurrent engineering. The challenge was to allow businesses to respond to new forms of competition playing out simultaneously on quality, variety, deadlines and innovation.

The empowerment of the project function. The first principle is the affirmation of the particular purpose of projects. The concept of «concurrent engineering» reflects the idea that all the company's functions must simultaneously contribute to the common goal. The project, more or less well-coordinated result of the know-how and strategies of the trades, becomes the central point of a design rationalization process.

Concurrent exploration of the different dimensions of the project. The implementation of «concurrent engineering» corresponds to recognizing the combinatorial nature of product design. There is indeed never a unique explanation for the success of a project. It is

always a compromise between markets, studies, research and production logic. This explains the emphasis on communication between different team members and approaches ranging from the «co-location» of participants on a set of validation processes involving future users of the product and installations.

Anticipation and continuity of interventions, keys to management of the uncertainty/irreversibility dilemma. This simultaneous exploration of all dimensions of the project aims to anticipate problems. The Midler clearly shows that there is no product development without risk or uncertainty, and, in terms of projects, we must resolve to learn while doing. In this situation, precipitation generally gives inferior results because we sometimes commit irreversible actions in ways without proven validity. The risks are numerous [5]:

- 1) Realizing too late that one has neglected promising paths.
- 2) Consuming wasted resources.
- 3) Seeing the implementation process tossed around by late modifications.

Modern approaches adopt a principle of maximum Anticipation during facing these risks, which aims to explore the different dimensions of a project before freezing its settings.

Area of the relevance of the model. While implementing these principles has undeniably improved the project performance on the cost/quality/deadline triptych, one can wonder if the concurrent model has led to more innovative product development. Nothing is less sure. Indeed, the pressure on the project managers leads to favouring proven solutions, which limit the risks weighing on the project. This raises questions about the adequacy of the concurrent model, in its form «heavyweight», to the development of innovative products. We then join the remarks made in 1993 by T. Fujimoto, who wondered about the field of the relevance of the model. It very rightly shows that we must not lose sight of the fact that the «heavyweight» model was born in the context of the automotive industry to meet the coordination problems posed by the design of a new vehicle. For him, automotive projects have four essential characteristics [4]:

- 1) A structurally complex product (composed of thousands of components) that presupposes bringing together multiple skills, which explains the number of people involved in development (several hundred).
- 2) A functionally complex product: the judgment criteria used by the customers to judge

a product are multiple and change all the time. To assure the «integrity» of the product is then a key point of performance.

3) Technical progress is characterized by rapid incremental innovations at the system level as a whole, most often of an architectural nature in the sense of Henderson & Clark (1990).

4) Product and process engineering are two different groups. Their integration is, therefore, a fundamental point of effective project management.

Project management and competition through intensive innovation. The acceleration of the pace of technological change or the desire to accentuate the differentiation of the product indeed leads companies to develop increasingly innovative products in their components and their architecture. The projects are then based directly on research and draft, contrary to the assumptions underlying the effectiveness of the heavyweight model.

Problems of innovative design. The shift to an intensive innovation regime raises new questions for design management. The challenge here is no longer to succeed in a solo project but to bring to market a steady stream of new innovative products. The manager must be interested simultaneously in the articulation of three spaces:

1) The space of innovative offers under development. This is about developing the knowledge necessary to create the offer and coordinating the contributions of the various actors involved in the development. The project is the typical organizational form of developing innovative offers.

2) The skills space serves as «sources of the development of innovative offers and a result of these developments». The projects will indeed use the knowledge and skills of the company to achieve their goals. But, at the same time, the project is a place to create new knowledge, which, in turn, can be used by the company in the course of its current activities or other developments.

3) The business strategy space that drives the two previous areas.

It consists of selecting the projects on the one hand and, on the other hand in, defining the skills to acquire or develop (Figure 2).

The organization of design for intensive innovation is a subject of study relatively recent in management science. Current research points to three central themes: the relationship between development projects and the upstream phases, the management of upstream projects, which

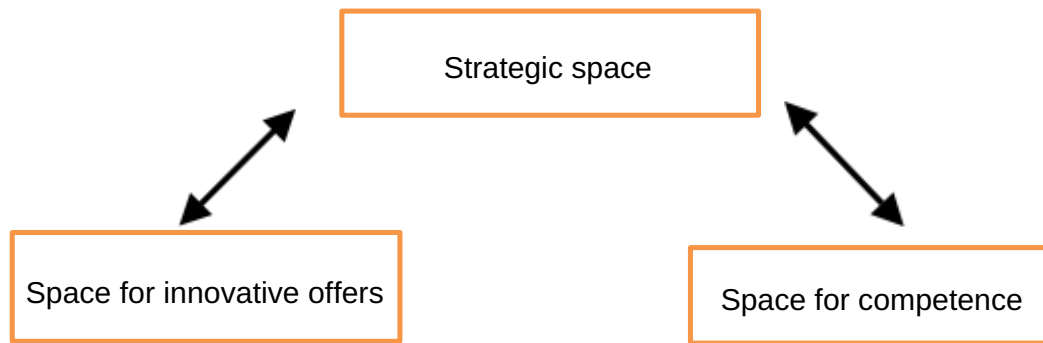


Figure 2. Areas of interest for the innovative manager

Source: developed by authors according to the data [6]

differs radically from product development, and finally, the issue of the strategic direction of the design process.

Conclusions. We can thus see how the growing place was taken by innovation in the competition between firms is at the origin of a movement of rationalization of a design process that unfolds downstream (development project of new products) and upstream (research and pre-projects). After a first stage where the principles of concurrent engineering have made it possible to go beyond the limits of traditional models' aspects of project management, we now see how this «revolution of design» questions the company's organization as a whole. The firm can no longer be satisfied with effectively managing a few projects. To market a regular flow of ever more innovative

products is the whole design process, from the strategy's definition to the research organization, which must be redesigned. We then see the development of an organizational learning process that unfolds within companies and between sectors. The different models are spreading reasonably quickly. This is an exciting and demanding field of study for management researchers. The real difficulty lies in going beyond the effects of the «managerial model» (Midler, 1986) to understand and integrate into the management of specificities specific to the company, sector or type of innovation developed. Ongoing research is thus drawing the outlines of a contingent design management theory since, as we have shown, the different models presented correspond to different types of innovations.

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