

Hybrid Competencies Model for Managing Innovation Projects

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Abstract

Today, many organizations often face the problem of selecting rational necessary methodologies for an effective program, portfolio and project management. As a rule, in specific unique conditions for the implementation of programs and projects, it is difficult for organization methodologists to choose a methodology "suitable" for the goals and scope of the functional coverage of projects from the methodologies presented on the global "market". If applying systematically approaches the problem of creating a methodology, then it is obvious that a "boxed" product in such a situation cannot be ideally suited, since this product was developed for certain application conditions that do not coincide with the specifics of the organization. This problem sets the task for project management methodologists to either adapt the "box" methodology or develop their own, for the specifics of the projects of this organization, under the conditions in which it operates. Considering management methodology as the language of effective stakeholder interaction, the importance of using classical methodologies is a priority. A sound project management methodology will guide the project manager through a controlled, manageable and visible set of activities to achieve project results. However, the development of a new qualitative methodology is a very costly undertaking that requires highly qualified methodological resources, versatile professional experience, time, etc. In professional cases, when solving this problem, managers-methodologists follow the path of adapting existing methodologies. Adaptation of methodologies can go with the use of convergence and/or hybridization.

Keywords ¹

Innovation project, competencies, hybrid model, managing projects, information technology

1. Introduction

The situation is different with the use of hybridization methodologies. In conditions of low maturity of PM, if there are professional methodologists in the organization, the hybridization of PM methods can be very effective. An experienced PM methodologist can take two or more PM methodologies that are not directly suitable for the implementation of enterprise portfolio projects, create an optimal hybrid version of a single methodology, selecting from each of the original methodologies those elements that are necessary for the specifics of a particular project portfolio of a given enterprise.

In this process of creating a hybrid methodology, the developer, using Occam's principle, cuts off "unnecessary" elements (functionally unclaimed or elements that duplicate functions) of methodologies. Thus, the hybridization of methodologies is the result of the active influence of methodologists on the initial "input" set of methodologies.

In conditions of a high level of maturity of PM, both convergence and hybridization of methodologies can be used. In this combined process, convergence can proceed as a synergistic objective action of methodological transformation with a relatively insignificant ("passive") influence

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of methodologists, and hybridization, on the contrary, is realized with the active influence of a methodologist acting like a sculptor, cutting off everything "superfluous" from a stone-blank.

In general, from the point of view of time parameters and changes in management structures in the development of PM methodologies, convergence technologies can be conditionally classified as evolutionary, and hybridization technologies as revolutionary. It should be noted that convergence and hybridization can be carried out simultaneously, giving a synergistic effect.

Both convergence and hybridization imply the creation of a methodology for complex multifunctional projects, consisting not only of a relatively small set of basic elements, but of an expanded set that meets the whole variety of project characteristics, criteria for its success, and features of the organizational structure in which it is implemented. That is, both of these technologies are effective for "heavy" multi-element methodologies.

Convergent technologies for the development of PM methodologies are relatively well developed (see, for example, [6, 7]), here we touch on them only partially, and we will dwell a little more on some aspects of hybridization technologies for PM methodologies.

Hybridization of PM methods in the context of digitalization and artificial intelligence environment

The most fruitful application of hybridization of PM methodologies in the life of a digital society, is in automatic systems, in particular in cyber management systems.

Almost all existing project management methodologies are designed for the human environment, the ordinary human intellect. However, artificial intelligence is still significantly different from human intelligence. The main differences between artificial intelligence and natural intelligence are, first of all, in empathic, and sensory abilities, the use of a complex of sensations, the analysis of non-verbal information flows, in the use of the collective unconscious and hereditary (genetically transmitted) information space. In some PM methods, an important role is assigned, for example, to such management decision-making tools as intuition [10] and altered states of consciousness [11]. Naturally, we do not have the right to transfer traditional PM methodologies to the cyber management environment, to install them one-on-one into artificial intelligence.

In today's digital society, there is a great need to develop new PM methodologies. And at the current stage of these developments, hybridization can be the most effective. After creating a pool of PM methodologies for the digital environment using hybridization methods, it makes sense to use convergence mechanisms as well.

There is a need for the development of intelligent PM methodologies that generate control methods in natural, artificial and combined intelligence environments.

The difference in the hybridization of the development of PM methodologies is that in these methodologies both objects, subjects, and management processes are fundamentally different.

If in traditional PM methodologies we do not think about many aspects including, for example, in the "Subjects of management and behavioural competence" block that affects decision-making, then in the hybrid methodologies "Natural-artificial intelligence", these aspects require careful development. Hybrid methodologies "Natural-artificial intelligence" need to expand the elements that are the structure of the functional behavioural properties of artificial intelligence.

The following goal-setting concepts - are "result, value, output and outcome, performance". Expectations and accepted concepts focused development projects on the result - result, added value (value) - value, product and result - output and outcome, performance efficiency within the remainder of the life path of the product and organization – performance. Each of the concepts takes its place in the general system of development of knowledge systems and project management methodology.

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methodologies. Thus, the hybridization of methodologies is the result of the active influence of methodologists on the initial "input" set of methodologies.

2. Analysis of recent research and publication

In conditions of a high level of maturity of PM, both convergence and hybridization of methodologies can be used. In this combined process, convergence can proceed as a synergistic objective action of methodological transformation with a relatively insignificant ("passive") influence of methodologists, and hybridization, on the contrary, is realized with the active influence of a methodologist acting like a sculptor, cutting off everything "superfluous" from a stone-blank.

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The difference in the hybridization of the development of PM methodologies is that in these methodologies both objects, subjects, and management processes are fundamentally different [12].

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There are five application principles of hybrid project, program and portfolio management methodology (Figure 1).

A. *The principle* of centralization project, program and portfolio management is the concentration of strategic and most important decisions.

The advantages of centralization include decision-making by those who have a good representation of the work of the company as a whole, occupy high positions and have extensive knowledge and

experience; elimination of duplication of work and the associated reduction in overall management costs; ensuring a unified scientific and technical, production, marketing, personnel policy, etc.

The disadvantages of centralization are that decisions are made by persons with poor knowledge of specific circumstances; a lot of time is spent on the transmission of information, and it is lost; lower-level managers are practically eliminated from making decisions that are subject to execution.

B. The principle of decentralization project, program and portfolio management is the delegation of authority to a lower company management body (structural unit, official) to make decisions or give orders on behalf of the entire company or unit within certain limits. The need for this is due to the growth in the scale of production and its complication, when not only one person, but also a whole group of people is not able to make and control all decisions, and even more so to carry them out. Decentralization has many advantages, among the main ones being the possibility of quick decision-making due to the involvement of middle and lower-level managers, the absence of the need to develop detailed plans and the weakening of bureaucratization.

At the same time, with decentralization, there is a lack of information, which inevitably affects the quality of decisions made; the scale of thinking is changing and the circle of interests of managers is narrowing - feelings can take precedence over reason; the unification of rules and decision-making procedures becomes more difficult, which increases the time for coordination and "shaking". The higher the degree of decentralization, the greater the independence, and independence of grassroots units, which can lead to disintegration and separatism. That is why decentralization can be allowed only within certain limits. A large company should be more decentralized because the number of decisions made in the centre and the number of their approvals grow exponentially and eventually exceed the technical capabilities of the management system.

The need for decentralization increases in geographically dispersed organizations, as well as in an unstable and rapidly changing environment, since there is often not enough time to coordinate with the centre of actions that must be carried out immediately. Finally, the degree of decentralization depends on the experience and qualifications of the managers and employees of the respective departments. The more experienced and qualified people are on the ground, the more rights they can be given, the greater responsibility placed on them, and instructed to make difficult decisions on their own.

C. The principle of coordination project, program and portfolio management of the activities of structural divisions and employees of the company. Depending on the circumstances, coordination is either entrusted to the units themselves, jointly developing the necessary measures, or may be entrusted to the head of one of them. However, most often, coordination is entrusted to a specially appointed leader, who has a staff of employees and consultants.

D. The principle of using human project, program and portfolio management competence is as follows:

- the bulk of decisions are made not by the entrepreneur or the chief manager unilaterally, but by employees of those levels of management where decisions must be implemented;
- performers are focused primarily not on direct instructions from above, but limited areas of action, powers and responsibilities;
- higher authorities solve only those issues and problems that lower ones are not able (or do not have the right) to solve.

E. The principle of effective use of project, program and portfolio management stakeholders. As you know, the sphere of influence of business includes a whole range of related activities. The specialists who perform them are called satellites (companions, assistants) of the business. They contribute to the company's relations with the outside world: contractors, and the state represented by its numerous bodies and institutions.

3. Convergence, integration and actualization processes in the hybridization of project management methodologies

At the present stage, the basis of project management can be a new philosophy - the philosophy of instability, which radically changed the concept of the world structure, rethought the role of chaos in the world, considering it as a source of order and organization, legitimized the principles of pluralism, relativism, indeterminacy. The philosophy of instability postulates the idea of abandoning monism,

logocentrism, and linearity, but the starting point of its worldview and methodological strategies is the idea of openness, plurality, multivariate and nonlinear worldviews, chaos and chance as creative principles. This is because society now has a variety of worldviews and philosophical principles of interpretation and management practices, defined as organizational and organizational activities of people.

The methodological basis of the convergent approach to project management is also formed by general scientific approaches and methods (systemic, functional, institutional, historical, comparative, etc.), which will contribute to a comprehensive and comprehensive analysis of the phenomenon of management. New opportunities for improving and developing innovative approaches to project decision-making to ensure the success of the project will create and use their subject area (Figure 1).

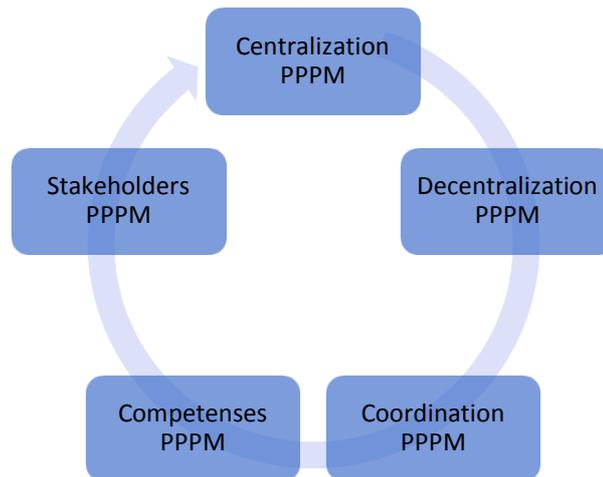


Figure 1: Application principle of the hybrid project, program and portfolio management methodology

Thus, the effectiveness of a convergent approach to project management depends largely on the personal determinant: only a creative, diverse, result-oriented person who does not shirk responsibility for decisions, can succeed in project activities. In addition to professional knowledge and skills, a modern manager must have personal competencies that are especially relevant in conditions of economic instability: resilience, responsibility, discipline, ambition, determination, and propensity to innovate.

The question is not whether “traditional” PM methodologies and “new, Agile” for development information technology methodologies can be combined. Here the problem is rather in terminology and the replacement of simple entities. In modern business, it is widely believed that there are “old” and there are “new” project management methodologies. If we consider the actual essence of the applied “old” methodologies, then it consists of the use of well-planned, developed packages of documents for the entire life cycle of the project. Documents, starting from the concept, technical specifications, tasks, passport, project charter and up to an integrated project management plan with all regulations and systematically developed management processes (for example, following PMBoK PMI, ICB4 IPMA, Agile and PM2). We will consider the development of competence in the context of the implementation of innovative projects and programs. At the same time, information and communication technologies will be the key driver. The main hypothesis of the study is that the key factor in the successful implementation of innovative projects and programs is the active development of a system of competencies in management processes, the creation and migration of values based on modern project management methodologies such as PMBoK 7 [6], P2M [5], contain certain solutions for the hybridization of the waterfall model and Agile methodology. Today, these decisions do not have the necessary scientific foundation and are formed based on intuition and good practice. This project management option is used in those enterprises where there is a professional pool of managers, methodologists, and project management specialists and where there is no “rush” in project implementation, thanks to a well-developed business strategy and high-quality planning. In such organizations, managers tend to be in control. In cases where the level of maturity of business management is not high, where the professionalism of people managing projects is not sufficient,

when there are problems with planning resources, time, etc., when there is a rush, or an emergency, managers move on to the so-called manual control. In conditions of time pressure, which, as a rule, has arisen due to the lack of professional long-term business planning (when there is no well-developed planning strategy or project implementation, there is no clear common understanding of the goals and tasks by the participants), the project team works without a detailed high-quality technical task, managers begin to apply technologies (methodologies) of "agile" management. Agile management methodologies are used in cases where the manager does not control the situation, but vice versa, when the goals and objectives of the project are adjusted, change during its implementation, and when methodological tools and means change on the go.

The success of projects and programs can only be managed by focusing on the vectors of value creation for various stakeholder groups, using trends to accelerate development, the convergence of knowledge, timely change in management paradigms, and understanding the philosophy of life cycles [5]. Each of these elements is a component of the success of programs, and the formula for success is determined through the synergy of their interaction [6].

The return from a proactive to a reactive management method is associated with the transformation of a challenge into a problem. The period of proactivity is the period of transformation of a call into a problem. The approach to evaluating the proactive period is used in software systems development projects based on the Agile methodology. For example, in such a definition as proactive protection of a project or program, means a set of technologies that are used in information and communication systems. The main goal is to identify potentially dangerous software and eliminate its influence or the program code itself within running software systems. Unlike other technologies, they alert and attempt to block dangerous activity rather than detecting a known malicious program on the system. At the same time, a model of active bifurcation points is used, which are tied to life cycle events and change the priorities of the project or program components for the implementation of one of the strategies - anti-crisis, stabilization and sustainable development.

The philosophy of stakeholder management is based on the fact that their claims are legitimate and therefore subject to accounting. At the same time, it should be noted that those interpretations of the stakeholder concept that limit the legitimacy of their claims should be rejected on economic grounds, as they ignore the fact that the organization's resources are limited. Unlimited satisfaction of requirements is impossible since this will cause a shortage of an exchange product. For their part, the interested parties in many cases do not intend to give up their claims without resistance. In practice, this leads to the emergence of political processes in relations between groups, in particular, to the struggle for the distribution of material and other benefits.

Let us consider a generalized model of infrastructure programs being implemented by companies from several countries.

Projects substantiate the expediency of using genomic representations of portfolio management methodologies, programs and projects of the organization [5,6].

We will analyze the application of genomic representations of management methodologies, taking into account the existing problems of financial organizations, and the turbulence of the internal and external environment. We will divide the problems into four groups: goal definition, goal achievement, organizational competence and organizational behaviour.

As an example, consider the phased formation of methodologies. The use of interaction mechanisms depends on the level of maturity of project management in the organization [10]. At low levels of maturity, the methodology is not needed in full and may not be represented by all elements. At high levels of maturity of organizations implementing large-scale, complex programs and projects, a methodology is needed that has the whole set of elements containing all the variety of necessary elements. That is, for the most complex and hypothetically diverse portfolio of programs and projects, the methodology approaches a "hypothetically comprehensive system".

The knowledge carrier of the methodology is formed according to this model. The formalized model of the genome of the methodologies is written as follows.

In this model, we distinguish two mechanisms: systematization within each level and harmonization between the levels of the model.

The harmonization mechanism provides system processing of models of each level. At the same time, the elements of each level are systematized based on the adjacency matrix.

The integration mechanism ensures the formation of a holistic model of the hybrid methodology. Such integration depends on the specifics of each methodology that is included in the hybrid.

The actualization mechanism implements comprehensive testing of the hybrid methodology for gaps and ambiguities.

The convergence mechanism ensures the interpenetration of best practices (solutions) within the applied methodologies.

The updating mechanism is preparing a hybrid implementation methodology.

Each of these mechanisms has a complex structure, and entry and exit functions. Such mechanisms will be defined in detail in future publications by the authors.

For example, relationships at the first level between principles and approaches are systematized by an adjacency matrix. At the same time, the elements of the matrix determine the system compatibility of individual principles and approaches. A value of 0 determines the inconsistency of the elements or the absence of their mutual influence, 1-full consistency and maximum mutual influence. Similarly, matrices are formed at other levels of the model. The task of the systematization mechanism is to determine the system compatibility of the selected elements of the methodologies. In this case, the term "genetic code of a project (program)" will mean its system model, which includes the initial idea of the "vision" of the product of the project or program, an integrated process for the development of a certain functional activity, built for the entire life cycle of the project, tools for its interaction with the external environment. At the same time, the genomes of project management methodologies, and project and program portfolio management have the same helical structure for different content.

On this basis, the methodology of convergent development in the management of innovative digitalization projects has been formed [10]. The methodology determines what is a necessary attribute of convergence (interpenetration), these are structural or functional changes in project management systems. It should be noted the presence of an immanent feature of a convergent management system that establishes a long-term balance of competence of the team and other participants in the innovative digitalization project relative to each other. The main advantage of the convergent model of competency development in management lies in the possibility of simultaneous use of the potentials of various competency-based management methodologies for the effective interaction of participants in an innovative project. Following the indicated mechanisms and methods, we single out three main concepts for studying and determining the convergence of management systems for innovative digitalization projects [14]:

- acquisition by the system, the characteristics of other systems are studied under the influence of innovations and external factors over time (evolution).
- approximation of the characteristics of innovative systems and competencies for their development as a result of mutual movement towards each other.
- determination of the degree and measure of similarity of systems in the "as is" state to assess the necessary competencies [16].

The first and second concepts consider the parameters of the system in a dynamic state, and the third - is in a static state.

The first concept is displayed as the evolution of competencies, the result of which is convergent similarity. This means the similarity of the competencies of management systems, based not on their industry characteristics, but on a close set of features that have formed independently in different digitalization systems. The main reason for convergent evolution is the similarity of the nature of the influence of external factors on these competency systems.

Since project management is one of the types of human activity, accompanied by the use of a certain arsenal of competencies within the framework of methods, tools and tools for practical implementation, there is a whole range of conceptual models that have been formed based on numerous experimental studies and theoretical generalization of the best world practice. The chronology of the development of competency systems and project management methodologies reveals the gradual application of interdisciplinary integrated approaches associated with the awareness of the negative consequences of excessive focus on the narrow specialization of competencies and insufficient use of methods for their synthesis [17].

Since interpenetration occurs as a result of ensuring the innovativeness of digitalization processes in various fields of science, technology, education, etc., it is an interweaving and interaction of

competency elements. At the same time, organizational pathologies are formed regarding the interaction of competencies [18].

The second concept is related to the process of formation of new systems of competencies due to the convergence of the characteristics of systems. This happens in digitalization projects as a result of the mutual movement of competencies toward each other. In this case, the key issue is the sustainability of development and the flexibility of the system of competencies [19].

To implement the second concept, it is necessary:

- to determine the main components of the process of convergence of competencies of management systems in the formation of new methodologies;
- propose criteria for comparing the system characteristics of objects in their convergence concerning competencies [20];
- highlight the main methods of comparison and analysis of systems that can be used in the formation of new competencies of project management methodologies.

Developed using the convergent approach of competencies, methods and models become practically the only way to create and use innovative methodologies in the field of IT and digitalization project management [21]. It should be borne in mind that it is impossible to use the methodology that is used in other systems without performing a thorough analysis of the competencies of the systems for the convergence of their main characteristics. The driving force behind the development of digitalization systems and the creation of new competency systems is the creative force of the innovation process, as the interaction of the environment and the individual in the formation of a technologically mature organization [22]. Such a force generates violations of the static balance of the cyclical flow of the life of the system and raises it to a completely new level. At the same time, managerial innovation methodology is the main creative action, and the digitalization project manager is the leader and strives to break through to success through a wide range of new competencies. Such processes open up the ability to think in terms of new competencies, act quickly and confidently, and understand intuitively. Creativity, realized through innovative behaviour, contains not only experimental actions with new technologies, and management methods in digitalization projects, but also the ability to separate from the totality of possible competencies that are most suitable for effectively solving the tasks set.

Intuitive creativity is a logical consequence of the competent preparatory work of the mind, intense substantiation of the problem, idea, and design. This type of creativity is characterized by the following competencies as integrability, integrity, completeness of its results, a high level of foresight and proactivity, providing intuitive creativity of real nature and orienting digitalization projects towards technological breakthroughs [23].

To achieve success in the competent solution of innovative problems, new requirements are formed for the personality of the project manager, taking into account his competence and ability for innovative thinking, the ability to use systems convergence models in the formation of new methods for making unique decisions in project and program management. Many leading domestic and foreign scientists are engaged in the questions raised. But in most cases, their research is reduced to the issue of choosing the best methodology from the existing ones for certain conditions, and the issue of expanding competencies through the methods of convergence and integration of systems of various branches of science is practically not considered.

The third concept provides tools for determining the degree and measure of similarity of systems in the "as is" state to assess the necessary competencies for the successful management of innovative projects for the implementation of information technologies and the digitalization of social activities. Digitalization projects are managed in a certain environment, which is a complex of various (economic, technological, social, cultural, etc.) factors [24]. In a broad sense, management is a fundamental general functional property of the objective world, organic and inorganic nature, and conscious and elemental forces, which are characterized by the qualities of regularity, expediency, goal-setting and purposefulness for the result of action [25]. At the same time, the convergence of competencies set for today is objective. Indeed, on a single conceptual basis, the diversity of such complex processes as innovative development, digitalization, the evolution of society, culture, management, and the like are being studied. The study of the philosophy of innovative strategies for the development of project management competencies should be carried out taking into account the

convergence of the humanitarian and natural paradigms, which are associated with the departure from rigid traditional rational models of cognition and changes in the criteria of rationality. This thesis is inherent primarily in the development of digitalization competency markets and the introduction of information and communication technologies as key drivers of development.

We will consider the development of competence in the context of the implementation of innovative projects and programs. At the same time, information and communication technologies will be the key driver. The main hypothesis of the study is that the key factor in the successful implementation of innovative projects and programs is the active development of a system of competencies in management processes, and the creation and migration of values based on the competence of managers. Competence structures are considered as dynamic system that changes under the influence of innovations and innovative projects and programs, as a system of competencies is subject to development and erosion simultaneously due to the influence of external and internal factors. The application of modern methodologies for managing the development of complex socio-economic systems is increasingly associated with the use of innovative ideas, methods and approaches borrowed from other sciences. Transdisciplinary is becoming the main feature of the sciences that study complexity and evolution. The current state of economic, social, and technical systems creates new requirements for digitalization and management processes, and decision-making within the competence of stakeholders. To do this, analogy methods are actively used to create new methods and decision-making models borrowed from other areas of knowledge. To enable the use of such methods, it is necessary to consider:

- the degree of complexity of control systems in various industries;
- degree of convergence of these systems;
- competence and innovative thinking of the stakeholders of the innovative project.

The convergence hypothesis is a statement that no matter how different management systems are in the process of innovative development, inefficient outdated competencies are discarded while retaining effective ones and introducing new competencies that innovative projects and digitalization products need. Therefore, competencies after gradual selection become relatively similar. This is largely facilitated by the innovative development of knowledge systems, methodologies, techniques and technologies, which reduce the difference between the management systems of various industries, creating a single methodological basis, while taking into account the specifics of projects and programs. At the same time, according to the convergence hypothesis, if the control object at the initial stage is farther from the position of stable equilibrium, the rate of its development will be higher than that of the system that is closer to the equilibrium state. Accordingly, in the long run, differentiation can be smoothed out. A process that is opposed to convergence - "divergence" is used in control systems to determine movement along different trajectories. At the same time, fundamentally new competencies appear that require the development of the competence of stakeholders

In recent years, the understanding has come that project management, is a special art that can be distinguished and studied. Project management methodology is completely different from the purely technical methodology that is often associated with most projects [5]. In real life, there are many aspects of a project that lie outside the boundaries of technical areas and that need to be organized with the greatest possible care and attention. That is, to achieve the goals of the project with optimal use of resources and maximum satisfaction of project participants, such non-technical aspects of projects must be well managed, and this largely depends on the competence of project managers and project management teams [6].

Project management is not something extraordinary - it is the most effective means of achieving results. For better or worse, depending on the skill, intuition and luck of managers, projects should always be manageable.

The situation is most obvious in the case of project management in the construction industry, in numerous government organizations, aerospace research, medicine, electronics, etc. Unfortunately, different people put different meanings into the term project management, and, naturally, there are different opinions about what and who is involved in such management. Related to this is a certain diversity of the new and dynamically developing profession of project manager. As a result, however,

it is difficult to find a real connection here, especially where modern, innovative, interdisciplinary coordination is needed [7].

Projects are carried out by people with their respective skills and abilities. But the number of people and their qualifications change during the life cycle of the project following the level of effort involved. Consequently, many of the project participants are required only for a relatively short time. Therefore, the project should be led by a team led by a project manager [7].

In real life, the project team is also required only temporarily. However, much attention must be paid to the selection and coordination of its members, ensuring that they clearly understand the roles and responsibilities in the temporary organizational environment. This is where human resource management comes into play.

Consequently, there is a need for a constant forecast of the final result, including the consumed resources. Based on such a forecast, especially if the forecast is poor, it is possible to change direction by applying control.

Control makes sense if all project participants clearly understand their roles and responsibilities - the result of careful planning and coordination. In addition, the current state of the project becomes apparent after its comparison with the planned one. Often such a comparison can only be made by interpreting both the external and internal design environment. All this relates to communication management.

But the presence of people and communications is not enough to successfully implement the projects, programs and portfolio of projects [8, 9]. We also need services provided by people. It is common knowledge that the project manager must devote most of his time to aligning the responsibilities of the staff and the objectives of the project [10].

The uncertainty of projects is an objective factor and is associated with probability and risk. A professional project manager will take steps to reduce the possibility of realizing a less favourable outcome by reducing the risk of the project if this can be achieved effectively. This brings us to the need for a concise understanding of the nature of the project in the first place, especially if it is innovation and cross-sectoral. All these functions are performed in risk management.

Any project starts with the idea of changing someone or something. Ideas for changing the world around us (including ourselves) appear in various areas of human activity - science, art, production, economics, everyday life, etc. These ideas can capture functions of various scales, from rebuilding the country's economy and renovating a factory to buying a vacuum cleaner. Some of these ideas provide the study of the secrets of the universe and the universe by mankind [11].

From this, it follows that the world of projects is limitless and can be defined in a huge number of various features that divide projects into categories: research, product development, cultural development, financial and innovation activities, etc.

From where and how the idea of the project is born, its characteristic features depend. We do not think about why a cat has a kitten, and an elephant has a baby elephant.

Projects are born in a certain environment and very often in the same agony as all living things. The environment of the project "feeds" it with various ideas, approaches, tools, resources (including money) and means of solving the problems of the project - it forms the environment of the project. As for a person, clothing, housing, habitat and communication, etc. form an environment.

The specifics of managing innovation projects and the problems of dynamic leadership lies in the particular innovation of the tasks that project managers constantly have to solve, and the low level of performance culture among project participants: customer, investor, financing organizations, project managers, project performers, surrounding organization, control services (technical, financial, tax, etc.).

In this case, project management is considered a universal language of communication between project stakeholders. From the unambiguous and professionally correct understanding of the language of project management, the result of the implementation of an innovation project largely depends on the selected criteria (time, cost, quality, etc.).

The main problems of managing innovation projects are formed around the following factors [12]:

- customer requirements for the project and increasing their competence. At the same time, the principle "appetite comes with eating" works;
- the innovation of the resulting products or projects. This innovation is considered an objective property of the system, which requires the decentralization of management functions and the

use of hierarchy as a means of dealing with the innovation of management tasks. Typically, in such a management scheme, a significant number of conflicts arise when decisions are made by managers of the same level. Every manager tries to "pull the blanket over himself";

- relationship and mutual influence with the external environment of projects (economic, political, environmental, social, cultural environment). Such connections quite often negatively affect the progress of the project.
- degree of uncertainty and risk. In innovation projects, the degree of risk is always much higher, as it is balanced by the effect of project implementation. Here the folk wisdom "you have to pay for everything" works [13];
- organizational restructuring. Such restructuring is inevitable since the project management system must reflect changes in the control object, which consist of changes in the structure of the reorganization. This is an objective property of any innovation project, and the absence of changes in an innovation project during its implementation is "not the rule, but the exception";
- frequency of technology change. This property is determined by the significant duration of the project, on the one hand, and the desire of the customer to obtain a result that corresponds to the latest technological advances, on the other. The inevitability of replacing technical and technological solutions makes it possible to meet the customer's expectations of the type "I want this, but I don't know what";
- planning and pricing errors. These errors are an essential attribute of any innovation project. In this case, project managers are always under the "crossfire" of the designers, the customer and the contractors. This triangle is the source of most of the problems that arise in the process of project monitoring.

3. Competencies intelligent model for managing innovation projects

In real practice project managers apply a conceptual model with five domains of competencies:

1. Emotional Intelligence (EI) competencies of Result Orientation, Initiative, Flexibility, and Self-Confidence;
2. Social Intelligence (SI) competencies of Empathy, Influence, Networking, and Distributed Team Leadership. They also showed significantly more cognitive competencies in Systems Thinking and Pattern Recognition;
3. Cognitive Intelligence (CI) competencies being key to effectiveness in Acquisitions of knowledge, Creativity and Innovation, Artificial Intelligence and Modeling in an organization;
4. Business intelligence (BI) competencies like Strategy, Culture and Values, Planning and Control, Opportunity and Risk Management.
5. Technical intelligence (TI) competencies: vision of the product and result, technical, technological and organizational solutions in the implementation of the project, work in conditions of uncertainty and innovation, clear definition of boundaries and work with the context.

The hybrid model of Competencies Intelligence for managing Innovation Projects is shown in Figure 2. The approach to achieving a particular goal depends on the situation. The guiding intelligence principles are the elements of the prospective competency as well as the technology solution used to build the solution. This choice starts with what the best is already available and then what needs to be built on top of that. This will be the technological architecture. We also face complexity and uncertainty, which means that every situation requires a different approach. Therefore, the various Agile approaches are commonly referred to as "Frameworks", they are the starting point from which the approach must gradually evolve. When you start a project, you study the lessons learned, choose a certain structure, and realize that this choice is an assumption that has not yet been proven to be correct. Work empirically when testing this assumption or hypothesis through an experiment. Such a hypothesis must be formulated in such a way that it can be falsified. We often adjust in small steps and sometimes you need to radically change the way of working. A clear, inspiring and supportive vision for the product or result to be delivered gives meaning to the higher goals the organization wants to achieve. It provides direction and sets boundaries. When there are many uncertainties and a changing context, it is often impossible to specify goals and requirements

for the result. Therefore, the command continues to communicate with the user. The focus and boundaries of the product vision allow us to constantly improve it with the help of sub-goals. We then work in a plan-do-check-act mode until we achieve results. Consider the mechanisms of intellectual support for 5D models based on their Smartification. Emotional intelligence is supported by the Smartification mechanism based on flexibility, self-management, emotional contagion, and result orientation competencies. Smartification of the socio-intelligence mechanism is determined based on the active use of social networks, distributed teams, and empathy. Smartification of cognitive intelligence is based on Acquisitions of knowledge, Creativity and Innovation, Artificial Intelligence and Modeling in an organization.

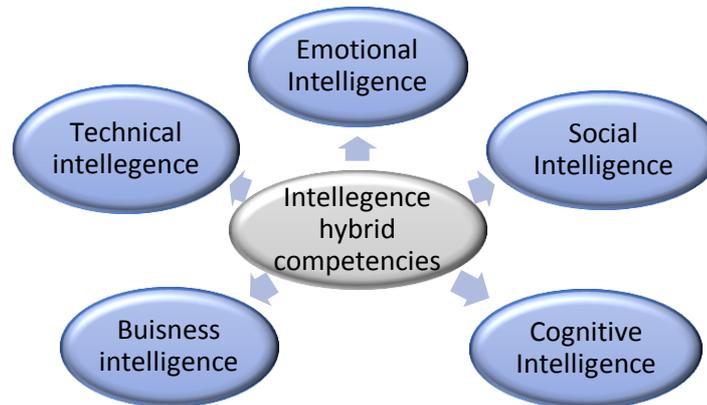


Figure 2: The hybrid competencies intelligence model

Smartification Business intelligence mechanisms are based on competencies Strategy, Culture and Values, Planning and Control, Opportunity and Risk Management. Smartification Technical intelligence mechanisms based on the competencies Vision of the product and result, Technical, technological and organizational solutions in the implementation of the project, Work in conditions of uncertainty and innovation, Clear definition of scope (boundaries) and work with the context.

4. Conclusion

The proposed hybrid Intelligence Competencies model for managing Innovation Projects includes five domains of competencies. These domains are the emotional, social, cognitive and baseness and technical competencies. Each domain has a set of basic interrelated competencies. Hybridization process gives the possibility to develop Intelligence mechanisms for the hybrid model. To support of the success an innovation project, a benchmark level of competencies assessment is used. It allows for the identification of the low level of some competencies and, at the stage of project initiation, plans the necessary corrective actions to develop insufficient project competencies. The example of the program for the preparation of masters with double diplomas confirmed the effectiveness of the proposed model. The given step-by-step process model allows us to successfully carry out innovation projects. The following issues should be highlighted as areas for future research:

- hybridization of competence domain by intelligence mechanisms for managing innovation projects;
- managing the uncertainty in the value creation process of innovation project;
- creation of effective assessment models and tools for each domain of competence.

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