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When Project Meets Innovation: "PRO-INNOVA CONCEPTUAL MODEL"

• ABSTRACT •

At the macro and micro levels, governments, industries, and companies are constantly challenged by their stakeholders and customers to show relevance by adding a new value with innovative services, products, and solutions. The same stakeholders are simultaneously very demanding for the agile delivery of results with a high impact. Both competing and often contradictory demands can be challenging to be met by organizations. Innovating new and unique value often requires a different set of skill and environment (Reflective, creative process with the need for a reasonable time to experiment) than those required for delivering rapid projects (Time intensive and process-driven activity). This state of complexity is the main reason for the research study that is discussed in this article. A proposed conceptual framework to merge between some of the innovation and the project phases referred to here as "Pro-Innova" for short. It suggests a new theoretical model that integrates the innovation and project management activities, using some aspects of the design thinking and the system dynamics loops. It focuses on the complementary and shared aspects found in both areas to address the challenges, limitations, and contradictions as well as the complexity each area (Innovation and Project) has on its own.

INTRODUCTION

Several researchers argued for the perspective that project management should focus on processes, modelling, and optimizations to perform control and contribute to standardization (Turner et al., 2010). This could be attributed to the influence project management had when it first started as a branch from operation research theories and therefore had some historical links to some early nineteen (1911) management science concepts during the Taylorism era which suggested human work as close as possible to machines in the factory. Looking at the project activities through the lens of processes is a way to coordinate work across functions. However, it increasingly hinders the quest for innovation and risks the adaptability factor that is critical aspects of new management to deal with complexity and unpredictable operating environments (Rayasam, Renuka, 2008). The definition of what is to be considered a project seems to have been widely accepted across most industry sectors and around the world, making it easier to define and process. However, the challenge with projects nowadays is that many are often failing to deliver on what all involved stakeholders would consider as a "satisfactory result." This goes beyond the traditional project definition that pays attention to the processes related to project cost, time and scope. And, on the other hand, the reasons behind the failure of many projects around the world despite the clarity in processes and definition of scope, cost, and timelines (Economist Intelligence Unit, 2009). No one can ignore the fact that organizations today are still perplexed to put the words innovation and project in the same sentence. Innovation is often perceived within organizations as the free flow, unstructured and borderless work that requires the genius of the people involved in producing the next big idea. While the project term is still commonly perceived to a very structured and defined scope and processes that don't tolerate deviations and regularly rejects creativity that is considered "out-of-scope." Still, the real unanswered questions are:

- Why don't many innovations work to see the light (market: customers, users or citizens)?

and

- Why do several important projects fail? Despite the defined processes and scopes.

Looking at it the other way around, what makes innovation work? And what makes the project successful? Could organizations and governments benefit from the structure of the projects to make great ideas a reality? And can the inspiration behind a great idea define and drive projects' success? We also recognize that organizations are dense with several internal and external interdependencies, objectives and goals. Within this organizational density, innovation and projects are arguably the most complex work an organization undertakes with the human factor at its highest, connected processes and networked organizational structures. Therefore exploring a relationship between these two complex undertakings will require applying simplification through an effective use of design thinking and dynamic systems to try and explain any relationship through the feedback loops and interactions. Although it's a challenging objective to advance this area, it can be seen as a potential unique angle to further examine the relationship and links between innovation cycles and project management. The integration between project management and innovation research is very limited, opening the door for more research work to be done to examine a stronger link between the two areas (Brady & Hobday, 2012). The primary objective of this article is rethinking the traditional project management concepts by conceptualizing a new theoretical model, which brings the discipline of project management closer to the field of innovation. We argue that project is a critical enabler for the creativity to materialize and for the innovation cycle to get completed. This paper is structured in 4 sections. The first and second section describes the research context and the organization paradox related to project and innovation. The third section presents the context framework: Pro-Innova model. And the last fourth section shows the main conclusions and some new research avenues.

1. RESEARCH CONTEXT: PROJECT AND INNOVATION RELATION

Conceptually, the core thought of innovating something new is somehow linked to what projects are intended for that's to create something unique and not repetitive. Both are in a way used by organizations for the core idea of development (Brady & Hobday, 2012). Innovation and change in organizations are often reliant on projects, examples of one-time initiatives to launch new products or new processes. The project could be argued as the means by which innovation takes place, hence is a key way of organizing innovation.

By the same token, innovation is a major output of certain kinds of projects. And therefore projects could be managed differently based on their initial intent. The intention for innovation could trigger a change in the way projects are being managed in comparison to the traditional way of managing most of the production-type of projects, which are very well scoped and defined right at the project initiation phase.

Project managers and teams are in a continuous struggle to define their role in projects which has different intentions as many are still in the thinking that a project is a project irrespective of the context and intent. In a recent Harvard Business Review, a project manager was positioned in 4 different roles based on the degree of reliability of the business plan and the conformity to existing growth strategic plans (Pedersen & Ritter, 2017). It is the exploration project missions when a project has no clear and define business case, with just a high-level intention for success, which is often not in conformity with existing company strategies, is the one vulnerable to failure and is, therefore, the interest of this research.

At other spectrum is innovation, the creation of something both novel and helpful that can be a new product, service, process, model, or a new way of organizing. Whatever form innovation takes, people often think of it as a chance occurrence, a brainstorm by one of those rare individuals who are creative, but the actual process of innovation is more complex than this (Hill et al., 2014). Innovation attracted more research attention compared to the project management area. The focus, however, was majorly in the technological innovation area (Brady & Hobday, 2012).

A major challenge with innovation in today's global environment remains somehow consistent with those discussed by some fathers of innovation research. Schumpeter argued that the prediction of business cycles and the success of business models are highly dependent on the model ability to predict future cycles after careful consideration of historical events and trends (1939). Similarly, Friedman argued that the solidity and reliability of a model are assessed based on its predictability factor more than its assumption. He also distinguished between new and improved innovation (Friedman, 1953). The Schumpeterian innovation emphasized the point that innovation is not just about technology, as it includes other things such as imagining new combinations of the firm resources and capabilities (Galunic & Rodan, 1996).

Innovation models started to evolve through different generations (Rothwell, 1992). And unlike projects that achieved some degree of clarity in definition and process flow, innovation lacks a precise definition and way to conceptualize, which is a leading cause for why many great ideas don't see the light of becoming a real product or service (Chunka Mui, 2012).

In between project and innovation, as we started to analyze and closely look at their respective features, trends, benefits, and challenges. Besides the perceived contradiction described in the introduction section of this paper, we also began to detect some similarities and complementarities all at the same time, which leads us to explore further the interaction and relationship between the two areas in an attempt to contribute to solving the complexity faced by modern companies.

On the complementary traits, what innovation is missing regarding clarity in definition and process is what projects seem to excel at with some clear and widely consented definition and agreed processes that the innovation area is still searching for. Looking at the similarities, it is seen that today's modern organizations are trying to use both innovation labs, R&D centres as well as the project and program offices to break from the traditional organizational structures. All with the hope to improve coordination questions for a final deliverable that is new, unique and different.

According to the Rothwell innovation generations (1992), it is likely that the first generation of R&D push model is associated with the defence projects, due to the required science push version of innovation. As the use of project spreads from the military into business, more attention started to be paid to customers under the name of a market pull model. However, the second and third generation innovation models have not affected project management's approaches at large. The fourth-generation model of innovation made a significant development in project management practices. The high levels of cross-functional integration in this model

led to the emergence of different models of project organization such as matrix management and the emergence of various leadership requirements for project teams.

More recently, research in this relationship started to attract more attention, by questioning the value and relevance of the traditional project management processes to achieve exploratory missions in organizations (Lenfle, 2014), which offered a starting point for arguing for alternative ways to manage projects that are aimed at innovation. However, the study didn't pinpoint a clear model that can be conceptualized and used by organizations. New research in 2016 done by Mahmoud-Jouini and co-authors (2016), used some elements of design thinking within project context to foster innovation (Mahmoud-Jouini, Midler, & Silberzahn, 2016) yet again while it highlighted the interaction, it didn't offer a specific frame to bridge between the two areas.

Some of the common design thinking tools and the task they achieve (Liedtka, 2014) combined with the use of system dynamics to simplify the complexity from adding the two disciplines together (Jay W. Forrester, 1994), we think could benefit the potential integration between projects and innovation. This would include, use of visualization such as the charts, graphs, and storytelling, observing and thorough understanding the users, organized collaboration such as brainstorming and mind mapping, creating and agreed assumptions, and finally prototyping by making the ideas more tangible, and piloting through field experimentation with the stakeholders.

At the more practical level, governments, industries, and organizations are always challenged by their leaders, stakeholders, users, and customers to show relevance by adding value with new services, products, and solutions. At the same time, the same stakeholders are very demanding for the agile delivery of these results with high quality. Both are competing, and often contradictory demands that can be very challenging to be met by organizations (Rosenbusch, Brinckmann, Bausch, 2011). Especially since creating new and unique value often requires a different set of skills environment (Reflective, creative process with the need for a reasonable time to experiment) than those required for delivering rapid results (Time intensive and process-driven activity).

2. ORGANIZATIONAL PARADOX

With this complexity, companies, industries, and governments face two primary spectrums: the quest for delivery or search for creativity as shown in **figure 1**. They often decide to focus on only one side of the two spectrums, as an example, the delivery of rapid results (products or services) on time and agile fashion while ignoring the continuous need to create new and unique value to their stakeholders, and the other way around would also apply. This situation is often the reason why many firms struggle to sustain its activities for the long-term. Industries start to struggle and get merged into other advanced sectors. And government falls into an economic downturn (Rodrik, 2016).

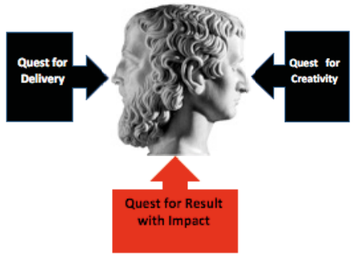

FIGURE 1. Organizational Paradox

This state of complexity caused by the contradictory nature of the two increasingly stakeholder-demanded areas (**Figure 2**). One Innovation) that is intangible, hidden and dependent on the organizational ability to realize new value through the brainpower and organizational intellectual capital (Edvinsson, L. and Malone, 1997), and another (Project) that is often tangible, scope-defined and can be realized through established processes (PMI, 2004).

The human factor represented in skill requirements, i.e. being creative & reflective, yet agile & discipline, for the two areas (Innovation & Project) that at times contradict each other, yet are required to interact together. Another point is on how the two areas' process areas and organizational structure, i.e. being open and flat yet scope-defined and structured, could be potentially interlinked inside the same organization with the objective to satisfy the internal and external stakeholders. The theoretical model is therefore aimed to assist organizations, industries, and government in meeting theoretically increasing stakeholder demand for creating new value (Innovation) while delivering results (Projects) that sustainably benefit the economic and social levels (Impact) (see **figure 2**).

3. CONCEPTUAL FRAMEWORK

The particular angle of the research is the concept

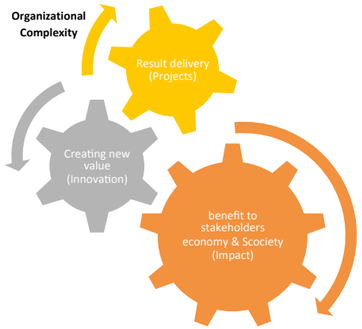

FIGURE 2. Organizational complexity

of "Innovation Projects with Impact" (See **figure 3**). It aims to build on and go beyond the current project management degree-one research categorized by Navarre (1989), as well as advancing from the fifth generation in innovation models described by Rothwell (1991/92/94) by exploring the interrelation of the two areas. This work also benefited from the research that has been done in "business projects," and "product development projects" (Artto & Wikstrom, 2005), by specifically studying the "innovation project" and their impact on the firm, industry, and country levels.

The proposed conceptual framework is to challenge traditional project management processes and organization by attempting to design-think the innovation and the project phases and activities referred to here as "Pro-Innova" for short. The research argues, validates and proposes this new theoretical model, using some aspects of the system dynamics loops to move away from the waterfall sequential process blocks that could limit our ability to imagine and paint a new framework of project collaboration through the use of process ontology (Chia, 1997; Rescher, 2012). The focus was to analyze the complementary and shared traits found in both areas (Innovation and Project) to address the challenges, limitations, and contradictions as well as the complexity each area has on its own.

FIGURE 3. Innovation Projects with Impact

As illustrated in **figure 4**, the proposed theoretical framework (Pro-Innova) hypothesizes that projects that are aimed for innovation need to be conceptualized and managed differently from traditional projects. The ultimate objective here is to try improving the innovation realization as well as increase projects' rate of delivery success. The integration between both areas is therefore needed in the context of modern management.

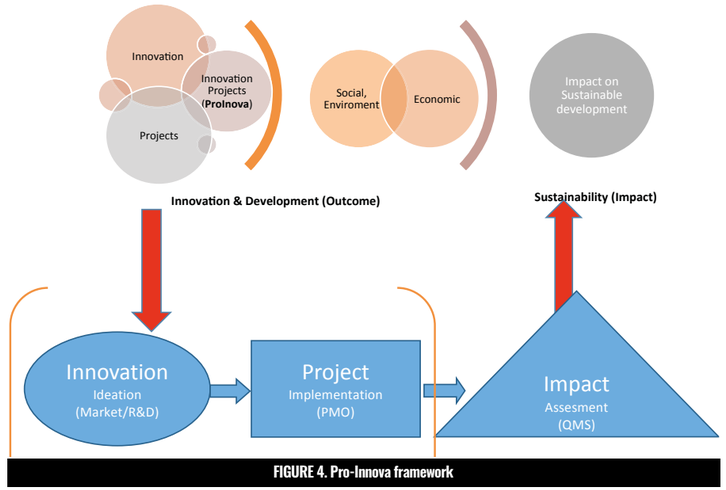

FIGURE 4. Pro-Innova framework

Initially, the Pro-Innova framework proposes to start including the innovation's ideation phase, borrowed from the innovation processes (Desouza, Dombrowski, Awazu, Baloh, Papagari, Jha, & Kim, 2009) as the independent variable of the Pro-Innova framework. This phase becomes the new starting point for any project that intends for significant innovation, instead of starting the project with the traditional planning, scheduling, and controlling sequential activities (Lewis, 2001; Söderlund, 2002), which historically came after the ideation and market study/business case phases had been already finalized. Traditionally, projects start after the market research and ideation activities, causing a major disconnect between what was intended and what is finally delivered hence impacting new ideas to become a reality as well as project's success in the more general term (Heising, 2012).

The other new addition in this model is to add the project's implementation phase (dependent variable of the Pro-Innova framework) to be linked to the starting innovation's ideation phase, which traditionally lacked this integration and often stopped at the R&D and market intelligence and scanning stages. This addition allows the ideation and implementation to work together from the start to the end of the cycle, hence motivate the project to achieve the intended goals. Since it is now starting to be involved from the ideation phase, hence better understand the rationale and intention for the project. It also allows the innovation (R&D) to act as an internal sponsor for the project implementation since it is now a connected phase within the innovation grand and extended cycle.

Lastly, the Pro-Innova model extends beyond frameworks like design thinking to suggest the closure of the project is at the impact assessment of the final deliverable, and not the traditional project closure phase. This way the innovation project work is assessed based on the impact of the idea and not just the project short-term outputs (Matta, Ashkenas, 2003) as in the time and cost performance indicators at the traditional project deployment stages.

It's inappropriate to underestimate the theoretical and practical difficulty in integrating these two complex areas "Innovation & Projects" (If we are also to exclude the third area "Impact"). Projects are cooperation structure, in achieving some common operation through the association of some actors for a common goal. The problem of coordination attracts attention to different kinds of challenges, which are dealt with by the use of classic coordination mechanisms (Van de Ven, Delbecq, & Koenig, 1976).

Although projects are in some work conceptualized as knowledge collectivities (Lindkvist, 2005; Ahern et al., 2014);, this does not mean that all projects are seen as being similar. It, therefore, requires implementing a version of contingency model into it. Shenhar and Dvir (2007) argued that to study different types of projects and various solutions to the coordination problem, the key fact is "Contingency Factors," such as Uncertainty (driven by the market and technological changes), Complexity, and Pace.

The Pro-Innova framework also addresses this complexity by considering "Designed Thinking" approach. Designers have traditionally focused on creating or enhancing the integration between idea and implementation. Recently, they have begun using design techniques to deal with more complex problems. As an approach, the design thinking analyzes capacities we all have, but that is overlooked by more conventional problem-solving practices. Not only does it focus on creating products and services that are human-focused, but the process itself is also human-oriented. This approach relies on our ability to be intuitive, to recognize patterns, to create ideas that have emotional meaning as well as being functional, and to express ourselves in media other than words or symbols (Brown & Katz, 2009). It is clear that nobody wants to base an organization on feeling, intuition, and inspiration, but an over-reliance on the rational and the analytical can be just as risky. The integrated approach at the core of the design thinking process could provide a third way. Pro-Innova adds to design thinking the impact assessment aspect; it also looks for all opportunities and not just problem-solving.

In the Pro-Innova framework, design thinking can be assembled by using some of the nine project perspectives (Contingency, optimization, modelling, success, governance, marketing, behaviour, process & decision). More specific to this research question, the ones we have described at the project conceptual & theoretical definition section: Human behaviour, success in business and contingency factors (Turner et al., 2010).

This conceptual framework (Pro-Innova) analyzes and considers the role of the complexity in the integrated system. Addressing the question of how a single project could incorporate several project perspectives all at the same time, to take an idea into action alongside managing the very often unpredictable human factor within the project and with outside stakeholders. Defining and realizing the meaning of the project success with all the different conflicting interest from the various stakeholders. All while looking at the project within the business context

and understand the relationship between its outcome (the new product development) in the innovation cycles. And finally, making sure that it is adaptive to the different context and changing environment, at the same time, still being able to stick to the project baseline.

The Pro-Innova theoretical framework explores the engineering concept of system dynamics (Jay W. Forrester, 1994) to help understand those different interactions and dynamics between the various design-thinking assembled perspectives to create an end-to-end cycle with linked loops starting from ideation to the final impact, passing through the implementation factory.

Human	Success	Business	Contingency
Examples: Sponsor (High interest - High Influence)	Outcome: financial value of the new product	New Product development	Customer feedback
Government (High influence – Medium interest)	Impact: Socio-Economic value	Sustained Development	Regulatory requirements

TABLE 1. Pro-Innova 4-perspective system dynamics matrix

The below visualization of the proposed theoretical and conceptual Pro-Innova framework attempts to illustrate the adaptability and system dynamic interaction between the research model (Interaction between innovation cycle and project phases) and the four perspectives to have the general idea of the overall scope of the Pro-Innova framework (see **table 1** and **figure 5**).

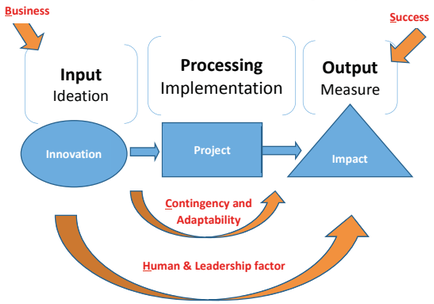

FIGURE 5 - Pro-Innova Adaptive System & 4-Perspectives

4. CONCLUSIONS

Our research identifies a unique area within projects that were rarely discussed in research that is when organizations are managing vague, ambitious, and outside the box exploration missions with little clarity on the scope, timeline, and resources. As shown in **Figure 6**, our proposed Pro-Innova framework is best at used when the degree of originality in the innovation ideation is very high, while the discipline and agility for project implementation are also high.

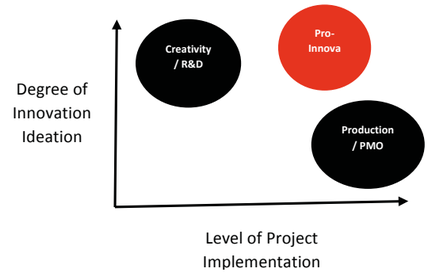

FIGURE 6 - Pro-Innova Unique Position

The proposed theoretical model (Pro-Innova) to help analyze the interrelation between innovations and projects shows that Pro-Innova is a framework that could potentially aid innovators in their struggle to materialize their ideation cycle while assist project leaders to make sense of their delivery work. The model attempts to assist at the macro level to balance the forces from the two polar disciplines within the organization, industry, and country. The Pro-Innova tries to break down the complexity by bringing the two areas of idea creation and project implementation with a particular look at 3Cs:

1. Creation of new concepts and ideas
2. Coordination within the organization to deliver effectively and efficiently &
3. Communication and engage with all the internal and external industry or global stakeholders for a higher impact with success.

However, it is worth noting that major work is still required to zoom down from the theoretical framework into a new and more practical management system that details how Pro-Inova could be operated with detailed processes, system, roles and organizational design. This should include a comprehensive resource & competency study to avoid straining existing resources by doing more than one task they used to perform, e.g., project managers becoming Pro-Innova leaders with innovation responsibilities they didn't know o have before and vise versa.

In this light, we are currently collecting empirical evidence through case studies and survey to further detail the Pro-Innova model and its variables (Idea creation & Project delivery impact), and assess its viability at the organizational level.

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