



Technology Project in the Industrial Organization

Jan Holy

EasyChair preprints are intended for rapid dissemination of research results and are integrated with the rest of EasyChair.

October 27, 2023

Technology Project in the Industrial Organization

Ján Holý^{1*}

¹Czech Technical University, Faculty of Mechanical Engineering, Department of Enterprise Management and Economics, Prague, Czech Republic

Abstract: Since automation terminates of many dichotomies, including that between culture and technology, between consciousness and matter, spirit and nature, or reason and emotion, the future of work consists, as Marshall McLuhan observed, of learning a living in the automation age. This article seeks to connect the philosophical works of J. Habermas and A. Bogdanov to the practical domain of project management in industrial organizations with support of AI-powered language model ChatGPT. Its objectives include providing critical analysis, insights into communication, and practical recommendations to enhance project management practices in light of these philosophical perspectives. By combining insights from philosophy and project management, the article can contribute to a more interdisciplinary understanding of the challenges and opportunities of project management in industrial organizations. It may encourage scholars and practitioners to bridge the gap between philosophy and management theory.

Keywords: technology, automation, system theories, project management, industrial organization,

JEL classification: L15, M14, Z13

Grant affiliation: None

1. Introduction

As Habermas (1984) indicated in his work, when we use the expression "rational", we suppose that there exists a close relation between rationality and knowledge, our knowledge has a propositional structure; beliefs can be represented in the form of statements (Habermas, 1984). Yet, this proposal has two obvious weaknesses. On the one hand, the characterization is too abstract and on the other, it is too narrow. *"The rationality inherent in communicative practice extends over a broad spectrum,"* writes Habermas, *"it refers to various forms of argumentation as possibilities of continuing communicative action with reflective means"* (Habermas, 1984).

It should also be added, that in context of capitalist enterprise, or in modern state administration, it is the concentration of material means of operation under control of rationally calculating entrepreneur or leader, which is according to Habermas necessary condition for purposive-rational action to be institutionalized.

Habermas writes:

"From a historical perspective too, the 'progress' towards the bureaucratic state, adjudicating and administering according to rationally established laws and regulations is very closely related to modern capitalist development. The modern capitalist enterprise rests (internally) primarily on calculation. It requires for its existence a legal and administrative system, whose functioning can

* Corresponding author's email: jan.holy@fs.cvut.cz

be rationally calculated, at least in principle, on the basis of fixed general norms, just like the expected performance of a machine.” (Habermas, 1984)

Modernization can thus be viewed as societal rationalization, claims the author, and asks the following question:

“How is the institutionalization of purposive-rational action orientation in the domains of social labor possible?” (Habermas, 1984)

2. Method

Connecting the philosophical works of Jürgen Habermas and Alexander Bogdanov to the practical domain of project management in industrial organizations requires an interdisciplinary approach. Both philosophers emphasize the importance of communication, rationality, and the role of individuals in collective decision-making. With help of ChatGPT, and through description of the project stages like project initiation, planning, execution, monitoring, and closure in industrial organization, described from the perspective of Bogdanov’s organizational rationality and system design, where overall efficiency and effectiveness of project management processes is emphasized, I encourage a culture of continuous learning and adaptation within an industrial organizations, which can lead to more effective and ethical project management practices.

3. Project and its constraints

<! -- begin: Contemporary business, as well as science, recognize a project as carefully planned, individual or collaborative activity, carried out by a project team and led by project management to achieve a specific goal. <! -- cont: Accepted definition of a project as *“temporary work effort that produces a unique result”* (Rosenau, Githens, 2005), can be further supplement by the following attributes:

- <! -- cont: Projects are temporary, i.e., there is a beginning and end to the project.
- <! -- cont: Projects are unique, which means that the work product or processes that create it are novel or different.
- <! -- cont: Projects are progressively elaborated, which means that a project proceeds in steps or stages. -->>

<! -- begin: From the project management perspective, a project is a *“time sequence of events, or a collection of interrelated tasks performed over a period within a set budget or other constraints”*. (OpenAI, 2023). -->

<! -- begin: A project consists of a specific organized effort motivated by a *“specific opportunity, a specific problem, need, desire or discomfort,”* (OpenAI, 2023) which seeks to create a unique and innovative solution - a product, service, process, or scientific research. -->

<! -- begin: Every project has a beginning and an end and is considered a closed dynamic system performed in line with the 4Ps of project management: plan, processes, people, and power-->

<! -- begin: Project is also bound by certain constraints such as calendar, cost, and quality standards, each of which can be measured objectively during the project life cycle and exist and operate in an environment that can have a favourable or unfavourable impact on them. -->

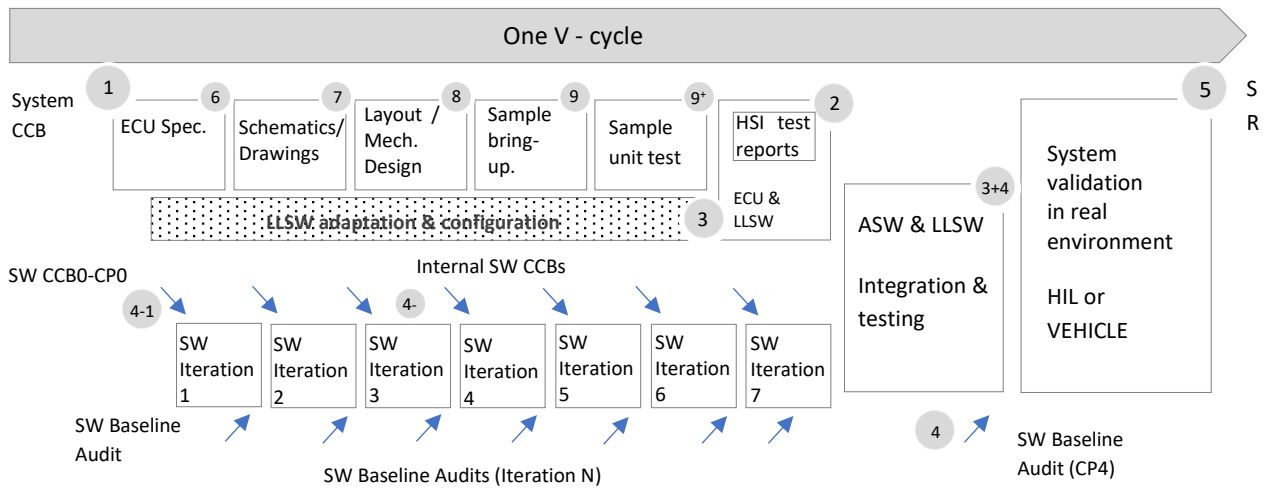


Figure 1: A typical product development cycle in industrial organization (System principles of project management, 2022)

<! -- begin: In business group α , a specific organizational process assets are deployed for the following project categories:

- <! -- cont: P0 – Serial life activity projects.
- <! -- cont: P1 – Customer application projects.
- <! -- cont: P2 – Advanced development & transversal projects.
- <! -- cont: P3 – Request & information projects.
- <! -- cont: P10 – Serial life activity projects using P1 manufacturing process -->>

<! -- begin: Request and information projects (P3) demonstrate, or contribute to demonstrate, technical feasibility and the market interest, while advanced development & transversal projects (P2) improve existing standard for P1 reuse.

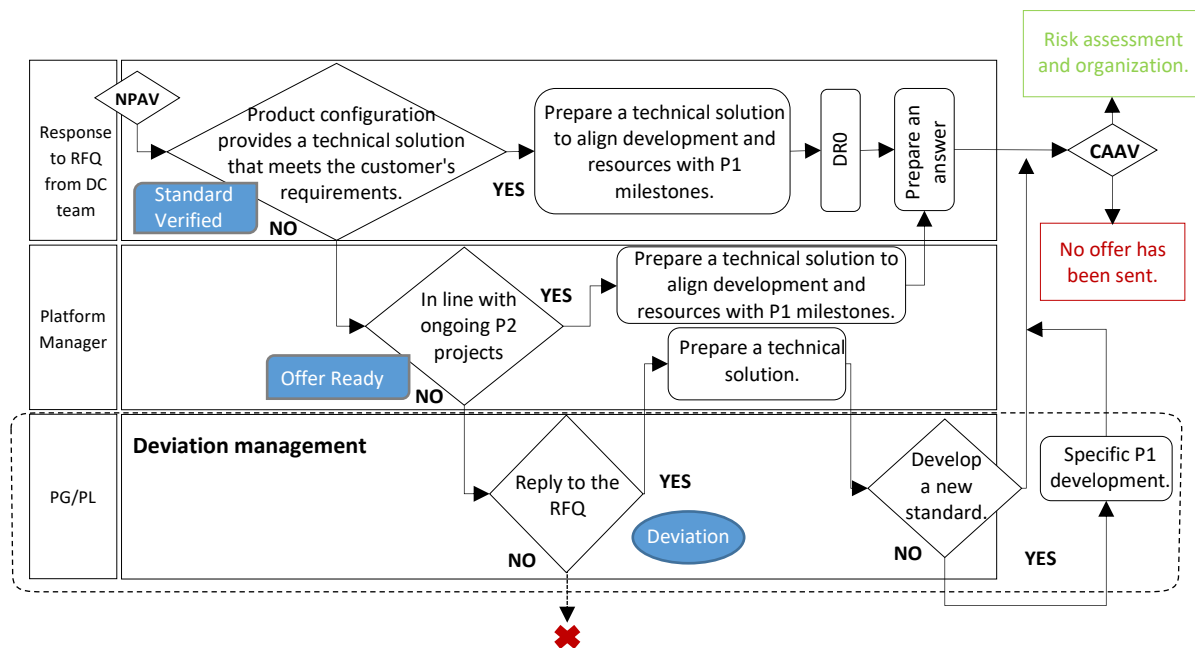


Figure 2: Innovation integration flowchart (CLEAN Project Management R. 3.1, 2022)

<! -- begin: Customer application projects (P1), develop product for serial production, by optimizing the re-use of existing elements, while serial life activity projects (P0) modify a product already in serial production, following the engineering change request/engineering change order (ECR/ECO) process after customer's approval. <! -- cont: Serial life activity projects using P1 process, i.e., P10 projects, modify a product already in serial production in significant way. -->>

<! -- begin: To facilitate effective R&D information transmission:

- <! -- cont: engineering committees are put in place to ensure engineering disciplines and platforms quick interaction and resolution.
- <! -- cont: issue resolution (action plans, resource decisions etc.) are submitted to project management and steering committees through R&D representative.
- <! -- cont: R&D operations committee is engaged in engineering assessment prior project steering committee's milestone approval (CPM2, 2020). -->>

Main () {Project management committee - PMC}

<! -- begin: Objectives of the project management committee are to review escalation points from PSC, where technical or economic issues escalated from project steering committee are presented by project manager.

<! -- begin: Project management committee takes also relevant decisions regarding:

- <! -- cont: business and resources decisions
- <! -- cont: portfolio profitability
- <! -- cont: project closure (CLEAN Project Management, 2022). -->>

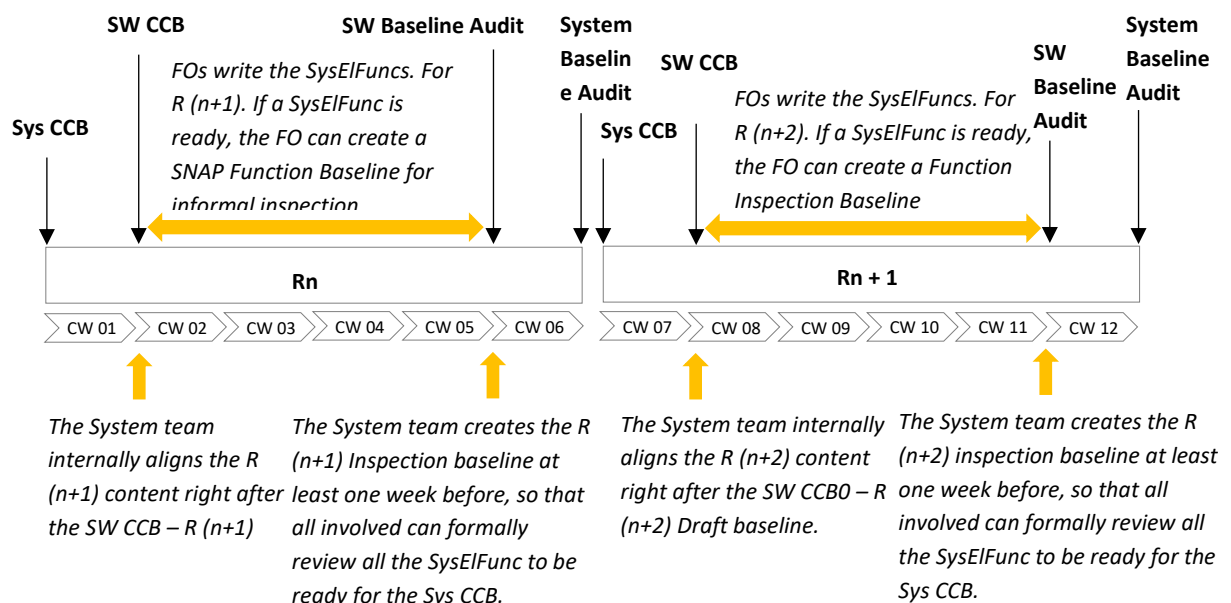


Figure 3: Working mode of the system team (System principles of project management, 2022)

4. Discussion and critical reflection

Tektology as the science of the structure of living organisms, structural morphology was described by Bogdanov (1921), as a general study of the forms and laws of organization of all elements of nature, practice and thought (Gare, 2000). According to him, we, humans, are the organizers of nature, ourselves themselves and their experiences.

According to ChatGPT 3.5, Bogdanov in tektology proposed, that there are universal principles of organization that apply not only to human society but also to nature as a whole. *“He argued that nature itself is an organized system, and humans are just one part of this larger organizational framework”* (OpenAI, 2023).

“Organizational science is characterized primarily and most of all by its point of view,” writes Bogdanov (Bogdanov, 1921), adding that all the peculiarities of its problems, methods and results derive from this. According to him, the difference from other contemporary sciences arises as soon as the question is uttered, and establishes two essential moments (Bogdanov, 1921):

- a) From an organizational point of view, any scientific question can be asked and solved, which the special sciences either do not do, or do it unsystematically, half-consciously, or only in the form of exceptions.
- b) The organizational point of view also raises new scientific questions that current special sciences are unable to consider, define or solve.

For example, complexes are combinations of elements with a certain structure that are able to resist the activities of other complexes, where a) if the complex has a greater effect against resistance than its elements, it is an organized complex, b) if it achieves the same effect, it is a neutral complex, and c) if its effect is less, it is considered an unorganized complex (Bogdanov, 1921).

Prof. Zelený commented on Bogdanov's concept of the complex, that it is not only a set, an aggregate (or vector) of components and their relationships'. *“It is a 'process or continuous flow of an independent component production process, chained in self-starting cycles of accumulation and degradation. ... [It] neither exists nor interacts with its environment: it is structurally connected with the environment, and thus develops its own environment and simultaneously evolves with it'.”* (Gare, 2000)

From this point of view, tektology could be, according to Gare (Gare, 2000), considered as a transcending, coordinating framework of concepts capable of guiding and giving meaning to specific research in the entire range of sciences – physical, biological, cultural, social and psychological.

On the other hand, it is also necessary to emphasize, that the ability of Bogdanov's tektology to predict the emergence of systems theories and complexity theories can also be used against it. According to Gare there are several fundamental features of tektology that support its radical potential. *“What is radical about seeing the world as consisting of processes rather than things or substances? What is so oppressive about conceiving the world as consisting of things and substances rather than processes”* (Gare, 2000)?

“The radical aspect of seeing the world as processes lies in its recognition of dynamism, interconnectedness, and temporality, while the oppressive aspect of viewing the world as things or

substances lies in its potential for reductionism, static thinking, objectification, and reinforcing dualistic perspectives” (OpenAI, 2023), answer the question ChatGPT 3.5.

“Tektology is radical because it consistently views the world as a world of processes,” answers the question Gare, “whereas systems theory and complexity theory, if they have been used in the interest of the ruling powers, are inconsistent in this respect and tend to assume that what really exists, whether systems or their components, are things.”

Gare continues:

“To begin with, the dualism that have emerged with hierarchical societies between what acts and what is acted upon, between consciousness and matter, between spirit and nature, or reason and emotion, can be overcome. All can be intelligibly conceived as aspects of processes and their relations.” (Gare, 2000)

However, for this to actually happen, for it to be possible to realize that the development of society, culture and knowledge are themselves processes in the world, such a conception of the world requires according to Gare first of all reflexivity. Reflexivity holding up the view that the development of culture and knowledge must be appreciated as part of the self-creation of humanity, involving the formation of relations between people, between society and nature, and between individuals and society (Gare, 2000).

5. Conclusion

The purpose of this article was to give a short description of the management of technology projects in industrial organization and by describing constraints embedded in project management methodology, through critical reflection, indicate to relevant restorative solution. From above it follows, that man and all his extensions constitute one interrelated system.

The interrelationship between man and his extensions, including language, requires therefore to pay more attention to what kind of extensions we create, since the relationship of man to his extensions, as observed also by Edward Hall, is a *“continuation and a specialized form of the relationship of organisms to their environment”* (Hall, 1982). However, when the process becomes extended it is also possible that extension takes over.

Automation in this context is not an extension of mechanical principles of fragmentation and separation of operations, but as Marshall McLuhan noticed, *“it is rather invasion of the mechanical world by the character of electricity”* (McLuhan, 1964). Our new electric technology, and computers in particular, now extends the instant processing of knowledge by interrelation that has long occurred within our central nervous system. It should however be noted, that since extensions are numb, the next logical step would be to build feedback (research) into them so that we know what is happening.

Only then it will be possible to create extensions paralleled by condition of speechlessness, which could confer, as McLuhan noted, a perpetuity of collective harmony and peace.

References

- Bogdanov, A. (1980). *Essays in Tektology: The General Science of Organization* (5 ed.). Intersystem Publications.
- Bogdanov, A. (2016). *The philosophy of living experience: Popular Outlines* (1st ed.). Haymarket Books.
- Cloutier, J., & Hutchinson, N. (2023). *Guide to the Systems Engineering Body of Knowledge (SEBoK)*, v (ver. 2.8). University of South Alabama: Systems Engineering Research Center. [https://sebokwiki.org/wiki/Guide_to_the_Systems_Engineering_Body_of_Knowledge_\(SEBoK\)](https://sebokwiki.org/wiki/Guide_to_the_Systems_Engineering_Body_of_Knowledge_(SEBoK))
- Gare, A. (2000). Aleksandr Bogdanov and Systems Theory. *Democracy & Nature*, 6(3), 341-359.
- Habermas, J. (1984). *The theory of communicative action: Reason and the rationalization of society*. Beacon Press.
- Hall, E. T. (1982). *The Hidden Dimension* (4 ed.). Anchor Books.
- IBM. (2022). *What is automation?* Ibm.com. Retrieved September 2, 2023, from <https://www.ibm.com/topics/automation>
- McLuhan, M. (2017). *Understanding media: the extensions of man* (4 ed.). Gingko Press.
- System principles of project management: Clean Project Management*. (2022) (3rd ed.).
- System principles of project management: Clean Project Management part. 2*. (2023) (4 ed.).
- OpenAI. (2023). *ChatGPT* (Mar 14 version) [Large language model]. <https://chat.openai.com/chat>
- Orlikowski, W. J. (1992). The Duality of Technology: Rethinking the Concept of Technology in Organizations. *Organization Science*, 3(3), 398-427. <https://www.jstor.org/stable/2635280>
- Orlikowski, W. J., & Scott, S. (2008). The entanglement of technology and work in organizations. *LSE Working paper series*, 47. <http://eprints.lse.ac.uk/33898/>
- Project Management Institute. (2017). *A Guide to the Project Management Body of Knowledge (PMBOK Guide)* (6 ed.). Project Management Institute.
- Rosenau, D. M., & Githens, G. D. (2005). *Successful Project Management: A Step-by-Step Approach* (1st ed.). J. Wiley.