Towards the development of a methodology for managing industrialization projects

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Abstract

This paper proposes an approach for developing a project management methodology to be applied on the specific context of industrialization projects. This particular type of projects comprise the development of manufacturing lines for products, the quality of the product itself being assessed the whole way through using the well-known stage-gate system (quality gates). Project management should then support the technical activities, but its role is sometimes not so clear. In this sense, the proposed approach for developing the project management methodology is intended to solve this issue, comprising the required steps for performing a detailed characterization of the current scenario, allowing for inconsistencies to be noticed and improvements to be identified.

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1. Introduction

Industrialization projects can be described as projects that are related to the design of a manufacturing line to produce a certain product, aiming at reducing production costs and increasing manufacturing efficiency/efficacy. Sometimes, the company may receive a request to industrialize several products with small differences between them (e.g., product variants belonging to the same product line), which brings a great deal of challenges per se\textsuperscript{1}. In any case, the industrialization process involves analyzing/understanding all product requirements, developing prototypes for increasing the maturity of the product itself before conceptualizing the manufacturing line. Usually, the clients (internal or external, depending on the origin of the request) participate on this process, receiving some prototypes to make their own evaluation, later providing feedback to the industrializing company, or even accompanying in situ testing of prototypes procedures. This feedback may cause alterations on the product, consequently originating new requirements to be satisfied for the product. New prototypes are then built and the process is repeated, until all client’s requirements are satisfied, only then allowing the process of developing the manufacturing line to initiate.

Along the industrialization process, the quality of the product should be assessed, which can be performed using the logic of stage-gates\textsuperscript{2}, commonly applied in new product development projects. These stage-gates represent events (gate) where a thorough assessment of the product and process is performed, preventing the project to evolve to the next phase (or stage) in case the project fails in accomplishing the specific stage-gate requirements\textsuperscript{3}. The stage-gate system is technically straightforward, where the project’s efficacy concerns prevail over its efficiency, not worrying about how the process of achieving a result went but actually in passing the final gate. As such, it presents considerable room for improvement.

Project Management (PM) practices, therefore, arose from the necessity of manufacturing companies to essentially manage change, contrasting to the functional management, where the main purpose is to continue the production with minimum disruption. This also has consequences on the different profiles of managers, having the project manager a more pro-active attitude towards change while the functional manager a more reactive one\textsuperscript{4}. The different management profiles may create problems inside a manufacturing organization when the need for a certain change arises, exacerbating the lack of synergy between the two approaches.

As a way to tackle the abovementioned issue, this paper presents an attempt to answer the following research question: How to develop a PM methodology specially devoted for industrialization projects? Following the reasoning of “one size does not fit all”\textsuperscript{5}, this paper proposes the cornerstones towards a new PM methodology for industrialization projects. In addition, it is relevant to actually understand that even inside the context of industrialization projects, these may vary from company to company, being the idea here to propose a “generic” approach that each company would be able to implement/adapt to their specific case.

This paper is then divided as follows: Section 1 - introduction, presenting an overview of industrialization projects and the existing gap in literature; Section 2 - literature review, where the value of PM and the need for standardization of PM processes become clearer; Section 3 – research approach, describing how the new approach for developing a PM methodology for industrialization projects was created; Section 4 – results analysis, presenting the new approach itself; and finally Section 5 – conclusions and future work.

2. Literature review

2.1. The value of project management

PM value is often discussed and even proclaimed in consulting and practitioner literature, although the actual value resulting from investments in PM has been hard to define and measure\textsuperscript{6}. One of the difficulties is to isolate the return from PM and return from other management concepts\textsuperscript{7}. As a result, PM joins the long line of initiatives (e.g. TQM, information systems, training and human resources) struggling to prove their worth to organisations\textsuperscript{8}.

The PM value concept itself is really hard to be defined as a simple set of quantitative parameters, since PM can impact different levels of an organization. It would definitely require more breadth of data, time and research to begin to understand what PM value is, which can be interpreted differently by different project stakeholders\textsuperscript{9}.

In this sense, the existing literature interprets in different ways the value that project management can bring. Tangible and intangible benefits\textsuperscript{10}, management effectiveness\textsuperscript{10} and project’s success\textsuperscript{11}, among others, have been
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