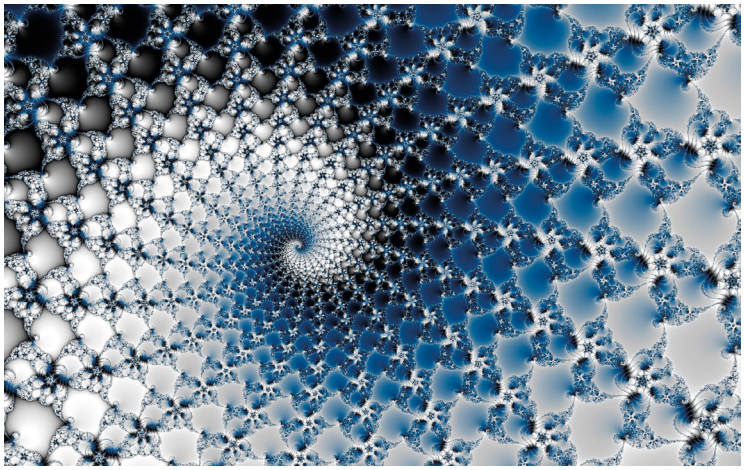
Convegni

Scienze e Tecnologie

Project Management

Driving Complexity
PMI® Italian Academic Workshop

edited by
Fabio Nonino, Alessandro Annarelli, Sergio Gerosa
Paola Mosca, Stefano Setti



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21. Favouring resilience in increasingly complex environments. Development of an adaptive approach for Large Engineering Projects Management

Franca Cantoni, Edoardo Favari

No contemporary organization is sheltered against complexity (Weick and Sutcliffe, 2001; Cunha and Cunha, 2006). In addition, all the organizations' perception is that the level of complexity is increas-ing. (PMI, 2013). As Giustiniano and Cantoni (2017) state: "Contempo-rary organizations are increasingly asked to deal with high levels of envi-ronmental uncertainty, complexity and equivocality, struggling not only with strong competitive pressures but also with increasing uncertainty relat-ed to socio-political and economic trends. When organizations and their members are confronted with crises, economic distress and 'ugly' surprises, resilience is crucial to their survival. In this sense, promoting resilience has become a major strategic concern for organizations." To face crisis and in-stability in a complex, polymorphic and competitive context, enter-prises need a new perspective being able to combine the "company-centric" logic, in which efficiencies are the highest priority, with the "customer-centric" one, wherein the structure and behaviour of the whole enterprise cannot neglect consideration of full knowledge of the various customer segments (internal and external) with which it interacts. Given these premises, to face this environmental instability and complexity, working for projects and in teams is nowadays habit (Martone et al., 2018). Indeed, workers are constantly asked to man-age a higher number of simultaneous and even more complex and complicated projects to satisfy and retain demanding clients with higher expectations in terms of service quality (Ayres, 2010) and thus ensuring success.

The need for "adaptive" methods for managing projects, in con-

trast to the traditional "predictive (waterfall)" ones, has arisen since the 90's in the software industry and its milestone is the "Agile Manifesto" published in 2001 (PMI, 2001). In these years several methods to manage agile projects have been developed (Schwaber 1995; DeCarlo, 2004; Augustine, 2005) and this trend helped the predictive methods to evolve (PMI, 2017) (including agile methodologies into waterfall project life cycle).

Starting from this picture, it is clear that there is a strong demand for methodologies enabling organizations to face complexity through adaptive methodologies (Miller, Lessard, 2000).

Currently available adaptive project management techniques have demonstrated, along more than two decades of application, to be critically more effective than the predictive ones in the very specific field of software development; in the last ten years these adaptive techniques have been extended to several others fields, such as R&D or organizational change projects. Today it is generally accepted that a project managed by predictive techniques could also include agile methodologies in some minor part (PMI, 2017), but the most of large engineering projects still have no options than applying a predictive life cycle. At the same time, Large Engineering Projects (LEPs) are facing increasing complexity and uncertainty, so that the application of predictive techniques is even tougher, and the need for adaptive methodologies in this field of project management is stronger than ever. Resilience – here intented as the process followed to anticipate, respond, adapt to, and/or rapidly recover from a disruptive event (Mallak, 1997, 1998; Vogus & Sutcliffe, 2007) - is increasingly becoming an essential feature for organizations involved in large engineering projects. The Authors of this work strongly believe that new adaptive project management techniques are currently essential to practitioners to favour resilience in their upcoming projects.

In this sense, the research is addressed at understanding how adaptive project management techniques, beyond agile, can support and favour organizational resilience in increasingly complex environments such as Large Engineering Projects (LEPs)

Our hyphotesis are here illustrated:

H1: Agile and adaptive project management techniques (currently available) can help resilience in software projects and in several other fields (R&D, organization change, design, etc.) but can't be helpful

for LEPs Management facing complexity and uncertainty

H2: Complexity features faced by Large Engineering Projects requires different approaches than the one in the boundary of agile projects (due basically to the dimension of LEPs in terms of economic value, effort and duration, variety of stakeholders involved and their geographical distribution, the nature of their deliverables, the nature of standard international contracts for these projects (eg. FIDIC books….)

H3: It is possible to improve organizational resilience by operating on macro and micro features, so that making the organization adaptive to emerging uncertainty.

Design/methodology/approach

The Authors started sharing their experience in management, resilience and in project management both at academic and practical level, comparing literature and their own previous works concerning complexity and uncertainty environment. In particular, comparison have been made between the organizational theory for resilient organization (Giustiniano & Cantoni, 2017) and the self-organizing teams in project management according to social network analysis theory applied to complex project environment (Favari, 2012; Favari, 2013). The Authors take into account the epistemological problem on investigating complexity, which requires the observer not to be external to the phenomenon, but to be part of it, and the multilevel approach that must be able to connect together contradictory experiences to logic systems. (Morin, 2008).

Findings

This study points out that to make an organization resilient and adaptive to continuous and unexpected environmental change, effort must be made to develop adaptive techniques, in addition to agile techniques, to manage Large Engineering Projects.

Originality/value

This work investigates a field of project management that still has no strong and comprehensive methodology: adaptive (resilient) project management approach to industry and construction projects with increased complexity environment. The result includes overpassing the system theory models in describing complexity, opening to new approaches. In fact, "*although system theory covers the main features of an organization, it is still too generic and not sufficiently exhaustive and accurate to explain and interpret resilient organizations. Managerial theories, individually considered, are not able to explain resilience. In fact, none of them is able to deal with the phenomenon of resilience and all its behavioural and structural features. Instead, theories from other fields can better cope with the phenomenon itself, and with its implications for behaviours and structures*." (Giustiniano & Cantoni, 2017).

Practical implications

The paper already include recommendation that can be immediately applied to project management teams and their organizations in order to improve their response to complexity issues and to make them resilient to uncertainty and emerging problems.

Research limitations/implications

This paper represents the preliminary work of a huge research program. In the following stages the Authors are cooperating with industrial organizations on their project management team to find quantitative indicators to refine and validate their current findings.

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