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# Misfiring and still succeeding: Seeking success in megaprojects amidst changing regulatory environments

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## ABSTRACT

This paper analyses the complexities involved in planning and managing infrastructural megaprojects under changing regulatory environments. Through the case of the megaprojects by Autostrade, a motorway construction company, the paper illustrates that the notion of success is problematic and not easily defined when changes in regulations by regulatory bodies become sources of overflows, inducing changes in plans that had been previously agreed upon.

Since regulations are dynamic, there may be a limit to which the initial planning parameters are legitimate benchmarks for the actualized megaproject's cost, time, and quality. It follows that a megaproject's success can result in orchestrating actions and reactions that involve both the capability of envisioning boundaries and demolishing them. This has severe implications for the notion of success itself, which does not easily fall into the traditional perspective of goal fulfillment but rather is linked to the inability to perceive the project's incompleteness.

## 1. Introduction

Despite being a multidimensional strategic concept (Pinto et al., 2021; Shenhar et al., 2001), there is little consensus in the literature on what truly constitutes project success (Cooke-Davies, 2002; Volden & Welde, 2022). Traditionally, success in project management research has been associated with achieving the so-called iron triangle (Atkinson, 1999; De Witt, 1988; Keegan & Turner, 2002; Munns & Bjeirmi, 1996; Olsen, 1971), which involves managing the project within agreed time, cost, and quality constraints while adhering to the initially envisioned investment budget. The three dimensions of time, cost, and quality are fundamental elements in project planning and remain crucial in defining project success (Larsen et al., 2016; Park, 2021; Pollack et al., 2018; Watanabe et al., 2024; Zid et al., 2020).

However, project success parameters have evolved over the past few decades (Judge & Müller, 2005; Ika & Pinto, 2022; Turner & Xue, 2018; Williams et al., 2020; Winch & Cha, 2020), with more holistic views gaining prominence (Winch & Cha, 2020). These perspectives consider success not only in terms of the iron triangle but also in terms of social, environmental impact, and innovation (Cantarelli, 2022; He et al., 2019; Zhao et al., 2022). Contemporary perspectives on

megaproject success emphasize its complex and challenging nature, extending beyond the capabilities of the focal organization to achieve its goals and encompassing a commitment to the well-being of society (Gil, 2023).

Embracing this broader perspective, in this paper we expand the scope of megaproject management beyond traditional approaches that primarily view the megaproject management process as a “delivery system or a technique-laden toolbox” (Esposito & Terlizzi, 2023). Instead, we include politics, power relationships and regulations, which are shaped by the collective actions of a diverse array of stakeholders, each driven by different interests and behavioral logics. Organizational players must navigate this intricacy of interests and claims to pursue the success of these large-scale projects (Esposito et al., 2021, 2022; Esposito & Terlizzi, 2023; Samset & Volden, 2016). Our holistic perspective suggests that the components of project success, such as project success and project management success, which are often treated as distinct in literature (Baccarini, 1999; Samset, 2010; Zwikaël & Smyrk, 2012), are in fact inseparable.

Megaprojects, characterized by their large size, complexity, and high uncertainty levels (Flyvbjerg, 2014), indeed are critical to various stakeholders, including project owners, investors, and the general

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public. This multiplicity of interests together with the instability of the evaluative narrative over time (Winch & Sergeva, 2022), make the definition of success in megaprojects a complex and challenging task.

Planning plays a crucial role in project success by establishing essential elements during the front-end phase (Abdallah et al., 2022; Merrow, 2011; Miller & Lessard, 2000; Morris, 2009). Nevertheless, plans and their quantifications through budgets are merely inscription devices (Latour & Woolgar, 1979), defining events in abstract terms with limitations in their instantiation.

The planning process, often leading to escalations (Winch, 2013), is perceived as deceptive due to its difficulty in achievement. This perception is reflected in Flyvbjerg et al. (2009)'s famous slogan "over budget, over time, over and over again," which highlights the failure of megaproject planning, characterized by politics, misrepresentation, and deception rather than rationality (see also Flyvbjerg, 2011, 2014). Other explanations for escalations, or overruns, attribute them to "honest" mistakes and shortcuts which require rework (Love & Mathews, 2020, 2022; Love et al., 2022).

One source of budget overruns on projects is regulatory intervention (Merrow et al., 1981; Merrow, 1988; Winch, 2004). Since megaprojects' construction spans over long time horizons (Caldas & Gupta, 2017; Floricel & Miller, 2001; Kardes et al., 2013; van Marrewijk et al., 2008), regulations may not remain stable throughout their construction period, and can therefore bring surprises to megaproject management. This fact also changes the parameters of the megaproject, and as a result, the success of the megaproject needs to be re-evaluated when learning processes are involved in the unfolding of these temporary (Burke & Morley, 2016; Goodman & Goodman, 1976; Lundin & Söderholm, 1995), yet long-lasting and enduring organizations (van Marrewijk et al., 2016).

In this paper we want to contribute to the debate on megaproject success through a regulatory context angle. Then, among all the factors and changes in project environment which can produce overflows, we focus on regulatory changes. By regulations we mean all those instruments aimed at shaping collective action by the enforcement of public institutions and authorities at different level of governance (national, regional and local). High demanding regulatory contexts are a managerial concern (Esposito et al., 2021; Luftman et al., 2013). Regulatory interventions, which arise during the production of megaprojects, challenge what has been established in the project planning phase. In these situations, a research question arises: How do regulatory changes intervene in affecting megaproject success and shaping the way in which megaprojects affect their realization?

During production, the megaproject can reveal hidden properties compared to those taken into account during planning. When these properties start to move, new knowledge emerges that requires consideration, and new types of problems occur, some of which are provoked by changes in regulations. This challenges the original plan's costs, time, and quality, and project goals become fluid. Therefore, when considering megaproject success, an open reflection becomes how many surprising contingencies have to be taken into account by combining the "orderly world of plans and rules" with a possible "incoherent world of imagination, fantasy, and dreams" (March & Weil, 2005, p. 83).

To gain a deeper understanding of success and the long-term benefits of major program investments, Williams et al. (2020) recommend employing social theories, such as Science & Technology Studies or Actor-Network Theory, through in-depth case studies.

This paper aims to embrace this challenge in motorway construction megaprojects where regulatory changes generate escalations, drawing on elements of the science and technology sociologist Michel Callon's "sociology of associations" (Callon, 1998a; 1998b; see also Georg & Tryggstad, 2009).

The twin concepts of framing and overflow, as introduced by Callon (1998a; 1998b), offer a valuable lens for analysing the intricacies involved in planning and managing large infrastructure projects. Framing implies selecting a limited set of factors to formulate a plan and

isolating a specific phenomenon from the broader context of the world. However, this separation creates clarity at the cost of omitting relevant components of the world from the plan. In order to achieve clarity, attention must be narrowed down to a specific subset of entities within the world. While this allows for the envisioning of possible courses of action, it also brings about its own downfall because when the plan is put into action, it interacts with the broader world, and all the components that were previously omitted by framing enter the scene and haunt megaproject's time, cost, and quality. Overflows are then unexpected and novel effects that challenge the original framing of the project.

Breaking down these concepts and applying them to real-world project management situations, we could say that framing is like putting a boundary around a project. When planners create a project, they choose specific factors to focus on. For example, project managers may frame a motorway megaproject by focusing on factors such as construction costs, expected traffic flow improvements, and projected completion timelines. They might assess different construction materials and techniques, and develop plans based on these factors. In this framing, they may not give significant attention to potential changes in regulations. As the motorway construction progresses, overflows may occur due to unexpected changes in project's environment. The kind of overflows that this paper considers are the changes in regulations. For example, environmental regulations might tighten, requiring additional mitigation measures or design changes to minimize the project's impact on nearby habitats or water sources. Safety regulations might be updated, requiring modifications to the motorway's design or construction method, and so on.

In this scenario, the original framing of the motorway project did not fully anticipate or account for potential changes in regulatory environments. These regulatory changes challenge the project's original plan and could lead to delays, increased costs, and potential conflicts with stakeholders. This haunting, or deviation from established goals, is understood as overflows and is a result of the incompleteness and imperfection of the framing produced by planning instruments.

However, as sociologically inspired management control literature has pointed out, this incompleteness should not be regarded as a limit but as an engine of possibilities. It is because of this incompleteness that new courses of action and reactions can emerge, and creative pathways unfold (Busco & Quattrone, 2015, 2018; Jordan & Messner, 2012; Jørgensen & Messner, 2010; Millo & MacKenzie, 2009; Revellino & Mouritsen, 2015, Revellino and Mouritsen, 2017a). Therefore, project management may need to reframe and reinvest in time, cost, and quality to continue the project by consulting emerging possibilities and compromises. The sociology of associations can contribute to megaproject management research by encouraging the development of a more comprehensive knowledge perspective on project management and success (Kreiner, 2014). The duality of framing and overflow provides the opportunity to explore the extent to which success in megaprojects, isn't just about describing what happens, but also about making things happen. It helps us understand how megaprojects actually come to life.

This paper is based on a field study of Autostrade, an Italian company that manages and built the main Italian motorway network under a government license. The study shows that changes in regulations by regulatory bodies can create overflows, which induce changes to the firm's previously agreed-upon plans. Additionally, it highlights the need to revise the notion of project success when the unfolding of a megaproject is characterized by a learning process.

The paper contributes to the literature in three ways. Firstly, it adds to the literature in project management which considers success as an outcome, an organizational performance in opposition to failure (Asadabadi, 2022; Cicmil et al., 2006; Mento et al., 1987; Morris, 2013; Shenhar & Holzmann, 2017; Turner & Xue, 2018). While this literature causally correlates goals and courses of action to achieve targets and assesses organizational success, we propose a processual view of success which considers the complexities of how framing operates in social life and how, due to its incompleteness, it can provoke emergent entities

through the modification of its setting caused by overflows.

Secondly, it enriches recent project management research that acknowledges the constraining and enabling role of the regulatory framework for infrastructural megaprojects (Dewick et al., 2019; Esposito et al., 2021; Ochieng et al. 2016; Winch & Cha, 2020) by adding a performative perspective. This perspective identifies the ground for enabling megaproject success in the incompleteness of the framing and the capacity to react to surprises generated by overflows.

Thirdly, echoing recent contributions in project management research that focus on precarious narratives of success (Winch & Sergeeva, 2022), and adding to more holistic perspectives of megaproject success (Winch & Cha, 2020; Gil, 2023), this paper proposes a reconceptualization of success by developing a processual perspective that envisions success as the illusion of completeness.

## 2. Theoretical resources

### 2.1. Megaproject management and regulatory environments

Regulations play a critical role in managing the risks and challenges associated with megaprojects by establishing standards for project planning, design, construction, and operations (Winch, 2010). Prescriptive regulatory requirements are also barriers for project financing (Sainati et al., 2019). However, uncertainties linked to regulatory changes can increase project risks and costs, leading to budget overruns and affecting project outcomes such as project scope, quality, and schedule, which can further increase project costs (Jaafari, 2007). The challenge of regulatory uncertainty can also be attributed to the questionable interpretation of norms. The sociology of formality (Bittner, 1965; Dingwall & Strong, 1985; Stinchcombe, 1997, 2001), which explores the role of norms in organizing collective life and guiding individual action, observes how the level of abstraction of the law (Stinchcombe, 2001) can lead to degrees of freedom in interpretation (Misztal, 2000).

The interpretive uncertainty is sometimes linked to the multiple and overlapping levels of legality, as is the case with the Dakota Access Pipeline (DAPL), a 1172-mile-long pipeline intended to transport crude oil from North Dakota to Illinois. The pipeline crosses under the Missouri and Mississippi Rivers and Lake Oahe, and runs within a half-mile of the boundaries of the Sioux's ancestral lands. The Sioux Tribe used multiple levels of legality, including federal law, treaties, and the international human rights of self-determination and free, prior, and informed consent, to oppose the megaproject (Young, 2017).

Regulative institutions have been recognized as essential for the success of megaprojects (Michaud & Lessard, 2000). Walz (2007) investigated the role of regulations in sustainable infrastructure projects and argued that they play a critical role in shaping the design and implementation of such projects. The project management literature also acknowledges the significant impact that regulatory changes can have on a project's timeline, budget, and scope (Merrow, 2011, pp. 66–67).

Esposito et al. (2021) suggest that a misalignment between the regulatory framework and project goals can result in significant budget overruns and may even trigger changes in the institutional context, as megaprojects have the potential to act as catalysts for altering regulatory structures.

Project management literature has proposed different approaches to managing the intervention of regulators in megaprojects. For instance, Locatelli et al. (2017) suggest that early engagement with regulators can help to identify potential issues and risks and facilitate the development of effective regulatory strategies. Similarly, Pinto and Winch (2016) propose a collaborative approach to managing projects which involves also working with regulators to align regulatory requirements with project goals and objectives. To mitigate the impact of regulatory changes and reduce the risk of cost overruns and delays, anticipating potential regulatory changes and building contingency plans into the

project schedule and budget is essential (Morris & Galdi, 2011). Ochieng et al. (2016), who explored the project delivery in the energy sector and the connected “continuous regulatory, legislative and judicial adjustments” (p. 243), emphasize the need for project managers to closely monitor regulatory changes and build flexibility into their planning to account for potential delays and increased costs. Other research approaches, that rely on institutional work, study how actors aspire to influence the institutional context of megaprojects, including regulations (Biesenthal et al., 2018; Esposito et al., 2021; Esposito & Terlizzi 2023).

Engaging with stakeholders early and often throughout the project lifecycle is a valuable strategy for mitigating risks by identifying potential regulatory issues early and working to address them before they become major obstacles. This strategy involves holding public meetings, conducting regular briefings with regulators, and consulting with experts in the relevant regulatory fields (Flyvbjerg, 2014).

Despite efforts to manage the intervention of regulators in megaprojects, there are still significant challenges and risks associated with regulatory intervention. Regulatory requirements and processes can be complex and difficult to navigate (Winch, 2010). The lack of transparency and predictability in regulatory decisions can make it difficult to plan and manage project activities. Additionally, in very complex regulatory environments, the high level of normative production and the interweaving of norms can make their interpretation difficult and uncertain. Yet, political instability (Venkataraman & Pinto, 2023; p. 216), which provokes a rapid alternation of political parties at government level, with the legislatures lasting even a few months, creates further uncertainty because even parties who make the laws cannot envisage how changes could develop when different political forces will get the power. It follows that rather than giving certainty to megaprojects, regulations can produce overflows.

### 2.2. Success and megaprojects

Studies have shown that megaproject management narratives are dominated more by cases of failure than success (Currie & Guah, 2007; Currie, 2012). It is difficult to determine whether failure is due to inefficient project management, an incorrect understanding of success, or if it is related to project planning at all (Kreiner, 2014).

The literature on success in megaprojects is extensive, and several criteria have been proposed in addition to the traditional and widely used iron triangle framework to evaluate megaproject success (Khan & Fu, 2020). Morris and Hough (1987) suggest that success can be evaluated based on project management, project product, and business success criteria. These success criteria are closely related to the project goals and objectives and should be identified and agreed upon by all stakeholders before the project is initiated. However, they acknowledge a lack of consensus on the most appropriate criteria to evaluate success in megaprojects.

Scholars have considered the importance of stakeholder satisfaction (Turner & Xue; 2018), which requires an understanding of stakeholder interests, expectations, and needs (Gil, 2023). This is important to build trust, mitigate risks (Hillson & Murray-Webster, 2007), improve communication, and enhance project outcomes (Unterhitzberger et al., 2021). Leadership and project governance have also been found to be critical success factors in megaprojects (Joslin & Muller, 2016; Tezel et al., 2018). Another critical factor in achieving success in megaprojects that has been identified in recent studies is the importance of sustainability and innovation (Cantarelli, 2022; He et al. 2019; Zhao et al. 2022).

In recent years, the trend in project management literature to overcome the iron triangle model has led to the adoption of a more holistic view of project success (Winch & Cha, 2020). Rather than simply focusing on traditional measures of success such as meeting budget and schedule targets (which remain crucial reference points), this approach recognizes the importance of considering a range of factors that

contribute to a project's overall success. Projects do not exist in isolation but are situated within larger systems and contexts. Therefore, success should be assessed not only in terms of project outputs but also in terms of the project's outcomes and impact on broader societal and environmental goals (Winch & Cha, 2020). By considering these broader factors, project managers can better understand the true impact of their projects and make more informed decisions about how to allocate resources and prioritize competing demands.

This more holistic approach to project success is also reflected in recent changes to project management standards and guidelines. For example, the Project Management Institute's (PMI) Guide to the Project Management Body of Knowledge (PMBOK) has recently been updated to include a broader range of success criteria, including measures related to stakeholder satisfaction, benefits realization, and sustainability (Project Management Institute, 2017).

Influential studies, pointing out the role of politics (Feldman, 1985; Flyvbjerg, 2005, 2007; Szyliowicz & Goetz, 1995), propose alternative approaches to evaluating success in megaprojects that take into account the ambiguity of the concept of success. Flyvbjerg (2014) argues that the success of megaprojects is strongly influenced by the political, social, and institutional environment in which they are situated.

Therefore, success in megaprojects can be evaluated based on various indicators, including technical, economic, social, and environmental dimensions (Shenhar & Holzmann, 2017). Similarly, He et al. (2021) propose a multidimensional framework for success that includes project-level, organization-level, and societal-level criteria. However, although notable, all these efforts to address the ambiguity of success in megaprojects have not produced a consensus on the most appropriate approach to evaluating success. This is because the ambiguity of success is not a problem that can be solved, but rather a challenge that needs to be managed (Shenhar et al., 2001; Shenhar & Holzmann, 2017), as it is caused by diverse stakeholder expectations, interests, needs and knowledge (Gann & Salter, 2000) that can change over time. Yet, this ambiguous concept (Belassi & Tukel, 1996) is sometimes ascribable to persuasive rhetoric used for legitimizing particular courses of action (Finchman, 2002).

A stream of research highlights the importance of expert knowledge for project management definition and success (Bresnen et al., 2004; Cha et al., 2018; Lampel et al., 2008; Morris & Hough, 1987; Sydow et al., 2004). Turner (1999, p. 329) proposes focusing on a corpus of knowledge to deliver projects successfully and identifies time, cost, and quality as constraints to realizing that knowledge. A parallel stance, which recognizes the significance of knowledge as a critical resource for success, has been developed in strategic management literature (Nag & Gioia, 2012), while organizational learning research emphasized the crucial role of human resources, their cognition, motivations, and capability to learn from previous experiences in organizational success and failure (Argote & Greve, 2007; Carroll et al., 1996; Coff, 1999; Gavetti, 2005; Gottschalg & Zollo, 2007; Phillips, 2002).

Despite its importance for effective project management implementation, it has been observed that the notion of success remains a "complex and often illusory construct" (Pinto, 1988, p. 71); an evanescent thing based on one's perceptions and expectations (Baker et al., 1974) and whose evaluative narrative can be unstable over time (Winch & Sergeeva, 2022).

Beyond the ambiguity surrounding the notion of success in megaprojects, a common stance in the above studies is to consider success as an outcome, an organizational performance in opposition to failure. The aspirational level of performance that is considered acceptable by decision-makers is the criterion used for such dichotomization (Cyert & March 1963; Greve, 2003; Madsen & Desai, 2010; March & Simon, 1958).

In the next section we adopt the Michel Callon (1998) analytical framework of framing and overflows for providing insights into the inherent complexities, ambiguities, and contradictions of the dialectic of megaproject success.

### 2.3. The notions of framing and overflow

Framing and overflow are ways of dealing with the practical entanglement between uncertainty, risk, and organizing. Framing involves making something understandable and defining it. Callon (1998a, p. 249), recalling Goffman (1971), defines framing as the establishment of

*"a boundary within which interactions... [are assumed to] take place more or less independently of their surrounding context... framing puts the outside world in brackets, as it were, but does not actually abolish all links with it... This 'bracketing', which assumes that boundaries are drawn between the actors interacting with one another on the one hand and the rest of the world on the other, does not imply a total absence of relationships". (Callon 1998a, p. 249)*

Callon's concept of framing involves the definition and establishment of boundaries, the drawing of distinctions, and the creation of a framework within which an action or project is situated. For example, in the context of megaprojects, framing is crucial for delineating the project scope, identifying key stakeholders, and establishing the overall vision. The framing process involves not only technical considerations but also social, political, and economic dimensions due to the large-scale and often public nature of megaprojects. Understanding how different actors contribute to framing, and how competing frames may emerge is the way for project managers to navigate the complex landscape of stakeholder interests and expectations.

However, as Callon observes, putting the outside world in brackets does not abolish all links with it, meaning that any frame is permeable, and it can never encompass all project impacts due to the complex interconnectedness inside and outside the project's space. Framing helps to remember that nothing comes without its world, and life beyond the frame ultimately has an influence.

Therefore, framing

*"...presupposes the existence of courts of law, as well as the existence of a body of legal texts defining, for example, the content and scope of property rights, as well as the existence of solicitors entrusted with recording the state of knowledge held by each of the contracting parties before the contract comes into force, and so on... The actions within the frame are prepared and structured by the equipment, the theoretical statements, the skilled persons of the researchers and technicians, the procedures and reports; all these elements ensure that they are not scattered or dispersed. But-and here we come to the crux of the argument-each of these elements, at the very same time as it is helping to structure and frame the interaction of which it more or less forms the substance, is simultaneously a potential conduit for overflows. (Callon, 1998a, p. 254)*

Then, legal infrastructures (regulations, Courts of Justice, etc.) and organized framing elements for the successful execution of contracts or projects (project management plans, chronoprograms, engineering standards and protocols) are potential conduits for overflows.

Each of these framing elements, while contributing to the structure and organization of interactions, simultaneously serves as a potential conduit for overflows. This dual role highlights the inherent complexity and unpredictability within framing. While these elements contribute to cohesion and prevent dispersion, they also introduce the potential for unexpected events, uncertainties, or deviations -what Callon terms as "overflows"- which create the possibility for "events that might refute, or even happen independently of, what humans believe or think" (Callon, 2007, p. 323).

Overflows represent the connections to the outside world that the frame is unable to prevent. As Callon (1998a, p. 253) explains, "overflows have multiple sources and can flow in many directions" as they originate from framing and enact relationships between frames and their world. They are elements for describing and understanding interactions as they recall that no project is an island, but it is linked to a context (Engwall, 2003).

Consequently, framing, e.g., in cost, time, and quality, cannot exclude the world, but it faces the problem of negotiating the difference between the frame and the world as it emerges during construction. Overflows are sources of uncertainty, leading to surprises that can challenge the assumptions and beliefs of project stakeholders.

This recognition emphasizes the need for adaptability and contingency planning. Effective project management involves not only meticulous planning and coordination but also an awareness of the dynamic nature of interactions and the potential for unforeseen developments.

Therefore, as Callon observes:

*...a framing process, in addition to requiring expensive physical and symbolic devices, is always incomplete and ...without this incompleteness would in fact be wholly ineffectual. (Callon, 1998; p. 252)*

Framing involves substantial investments of both tangible resources, such as physical infrastructure, and intangible resources, like symbolic devices that shape perceptions and meanings. In the case of megaprojects, the deployment of enormous resources and organizational endeavors subsumes the relevance of the framing within the broader context of project management.

However, as Callon (1988) observes, framing is characterized by incompleteness, which signifies that no framing process can fully encapsulate or predict every facet of a complex situation since inherent uncertainties, dynamics, and unforeseen elements permeate real-world scenarios. The acknowledgment of incompleteness challenges any notion of achieving absolute control or exhaustive planning in framing processes.

Callon introduces a paradoxical idea – that the very incompleteness, which might seem like a limitation, is fundamental to the effectiveness of the framing process. The term "wholly ineffectual" suggests that attempting to create a perfectly complete framing would render the entire process futile or counterproductive. This challenges conventional views that perceive completeness and precision as the epitome of effectiveness.

Callon's statement has implications for project management and organizational practices. It encourages a critical reflection on assumptions about planning and control in project management by challenging the notion that exhaustive planning and control leads to optimal outcomes. It proposes instead that the ability to navigate and adapt to the incomplete aspects of framing is a source of effectiveness and suggests that a certain degree of flexibility, adaptability, and openness to the unforeseen is integral to effective framing. Rather than aiming for exhaustive control, organizations and project managers might benefit from embracing the inherent incompleteness of their framing processes. This because

*... the heterogeneous elements, that are linked together in order to frame the contract and its performance, in reality take part in its overflowing: and it is precisely because they are sources of overflows that they make the contract productive. This can be expressed in terms of a paradox: a totally successful frame would condemn the contract to the sterile reiteration of existing knowledge. (Callon, 1998; p. 255)*

The very potential for overflows infuses vitality into a project, or a contract, enabling it to go beyond mere repetition and engage with novel ideas and solutions. The paradox is that a totally successful frame would condemn the contract to a sterile reiteration of existing knowledge. This challenges the conventional notion that success in framing a project, or a contract, equates to the elimination of uncertainties and deviations. Callon argues that if a frame were entirely successful in eliminating overflows, it would stifle the contract's ability to evolve, adapt, and generate new insights. The completeness that may seem desirable at first glance could, in fact, lead to a lack of innovation and creative problem-solving. Transposing this reasoning in project management arena, we could say that the essence of a successful project management is to deal with the incompleteness of the framing process. Succeeding in this

endeavor does not exclude misfiring, falls and project redirections. Dealing with framing and overflows is a way of transposing the focus more on the unexpected consequences that megaproject plans might produce, rather than on their regularities. This involves embracing a perspective of success intended as the ability to react and adapt to surprises.

#### 2.4. The implication of the Callon theoretical framework on the performativity of success

In a subsequent work, Michel Callon (2010) encourages a more comprehensive view of framing and overflows that goes beyond immediate success or failure and considers the ongoing and evolving impact of communicative acts. In this performativity perspective, engaging with Judith Butler (2010)'s critique of James Austin (1962) speech act theory, he explains framing and overflows in terms of the distinction between illocutionary and perlocutionary performativity.

Illocution and perlocution refer to different aspects of speech acts and communication. In essence, illocution is about what the speaker is trying to do or convey, while perlocution is about how the listener interprets or responds to what the speaker said. Illocution is the intended meaning, and perlocution is the actual impact or result which diverges from the original intended meaning.

Callon (2010), aligning with Butler (2010), asserts that perlocution is more fundamental and general than illocution. This view implies that the impact and consequences of communicative acts (speech, texts, narratives, designs, pictures, visual, calculations) extend beyond the act itself, encompassing a broader array of effects even unintended and unexpected. This implies that what may seem like a successful illocution (communication) might reveal its true perlocutionary consequences over an extended period.

*A successful illocution, like a successful performance, implies the active presence of appropriate socio-technical agencements. As such an adjustment is always fragile and rare, the general rule is a misfire. We can choose to call this misfire overflowing, when we equate perlocutionary performativity (i.e. performance) with a framing that, like any other, produces or, rather, ends up producing, its own overflows. Illocutionary performativity is a successful performance because it is able to make inactive and invisible the overflows or misfires that comprise any illocution but that will (perhaps) be discovered only later. One simply has to broaden the timeframe to transform illocution into perlocution. (Callon, 2010; p. 164)*

Callon, here, introduces the concept of "performation", as a parallel to Butler's emphasis on perlocution, in order to highlighting how successful communicative acts involve not just illocutionary acts but the active presence of socio-technical arrangements or agencements. A socio-technical agencement is a way of describing how people along with the tools or technologies they use, are dynamically interconnected and collaborate to achieve a common outcome. This concept emphasizes the integration of social and technical factors in understanding how activities are organized and accomplished within a particular context.

In megaproject management, a socio-technical agencement would refer to the collaborative arrangement of various elements, including human resources (project managers, engineers, contractors, etc.), cutting-edge technologies (i.e., project plans), processes, and organizational structures, all interconnected working together to plan, execute, and complete a large infrastructural project like a motorway. The dynamic nature of megaprojects, coupled with external factors like regulatory changes or economic shifts, introduces unpredictability. Adjustments may be necessary, but predicting their precise impact is challenging. An "adjustment" refers to the process of making changes or fine-tuning various elements within a socio-technical agencement (collaborative arrangement involving social and technical components). Adjustments are made to ensure that these elements work together effectively to achieve a specific outcome. Adjustments are fragile

because of the intricate nature of socio-technical systems and the sensitivity of these systems to changes. Callon's perspective underscores the difficulty in achieving and maintaining effective adjustments within complex socio-technical arrangements.

Callon here subsumes that by broadening the timeframe, it is possible to experience a temporal transformation from illocution to perlocution. The complex interplay between illocutionary and perlocutionary effects can explain the performativity of a megaproject, despite its failure to meet time, cost, and quality objectives. For example, the Sydney Opera House was a success despite missing its scope and going over budget and time. On the other hand, it is possible for projects to meet the criteria of time, cost, and scope but result in significant failures. The famous collapse of the Tacoma Narrows suspension bridge in the US state of Washington, just four months after it was opened in 1940, is one of the best-known examples of a tremendous disaster following successful correspondence with all project design parameters and implementation objectives. However, that disaster opened up learning processes leading to a "reassessment of bridge building techniques and the role that aerodynamics must play in bridge design" (Pinto, 1997, p. 29).

The Callon theoretical framework helps to explain the inherently complex and contradictory nature of success and suggests that success, especially when it is exceptional, involves the integration of many elements, even inconsistencies and oppositions. Success is a condition that is problematic and subsumes various challenges along the way. The combination of felicitous and infelicitous conditions creates exceptional grounds for making exceptional success rare on the one hand, and offers the premises for its destruction on the other. This provides a picture of the fragility and precariousness of success, which is not just a destination, but an ongoing journey that involves multiple unpredictable scenarios that can change over time. The notions of framing and overflow open up a view on megaproject success from a knowledge perspective, where uncertainty and ambiguity are constantly renegotiated, and settlements are temporary until new obstacles arise. This requires framing new compromises and developing new knowledge resources to address emerging challenges. The dynamics and controversies around framing and overflowing have been studied in a number of different settings. These include public sector performance reporting, which may diverge from officially stated aims (Christensen & Skærbæk, 2007); the role of accounting in shaping corporate strategy (Skærbæk & Tryggestad, 2010); practices in risk and performance management (Mouritsen et al., 2022); management control and the influence of pressure groups (Jolands et al., 2018); and processes involved in organizing and managing digital platform renewal (Clausen et al., 2024). More specifically, within the field of project studies, this theoretical framework has been applied in a project testing Intelligent Transport Systems (ITS) in the arctic northern region of Norway (Haugland et al., 2023); in the design phase of a green construction project (Georg & Justesen, 2017) and, notably, in navigating the complex and politically charged process of planning a wind farm project (Jolivet & Heiskanen, 2010).

### 3. Research methodology

This study employed a research design involving a single case (Yin, 1984; Eisenhardt, 1989). By focusing on a particular case, it is possible to delve deeply into a specific phenomenon, providing detailed descriptions and insights (Abbott, 2004). This richness enables a comprehensive understanding of the processes, temporal dynamics and context involved in the case. Such context is critical for understanding the unique factors that influence outcomes and behaviors (Stake, 2005).

The empirical site for the research that offers a scene for such reflections was Autostrade, a company that manages and builds the main Italian motorway network under the Italian State control. Autostrade

can be classified as an owner and operator of motorway networks. However, this domain of project organizing is only temporary because the Italian government delegates the construction and management of the motorway infrastructures to the company for a certain period of time. The government grants and regulates a concession (Campagnac & Winch, 1997), which gives the licensee monopoly rights to use and appropriate income from the motorway assets for a defined period of time. Autostrade uses public property (the motorway network) and exercises rights and powers belonging to the Italian government on its behalf. In return, it pays a public duty and accepts the constraints which are settled in the concession agreement. When the concession agreement expires, in case of no renewal, the motorway infrastructures, including all the annexed pertinences (such as the optical fibre network), have to be transferred for free to the Italian state.

#### 3.1. Data collection

The data presented in this paper are from the field study conducted by the first author in Autostrade, which involved different departments within the company. Data collection was part of a broad research program aimed at exploring the plural and ubiquitous nature of politics in managing major infrastructure projects (Revellino & Mouritsen, 2017b). The initial contacts with the empirical field date back to 2005, a period when the first author of this paper was pursuing her Ph.D. and visited the company, having a dedicated workspace and accessing the company's intranet via a personal computer provided by the management. Meaningful aspects of that reality were captured by observing daily work routines and during informal conversations and social networking in the company's canteen at lunchtime and at the coffee machines. Other sources of information included website articles, newspaper articles, reports, organizational charts, Excel spreadsheets, and PowerPoint presentations.

Primary sources of data collection included on-site interviews with senior managers, project managers, and employees from the Legal Unit and the New Work Division.

As Paolo Fabbri (2017) states, a good interviewer is an "open Opera planner" who understands that perhaps what is most interesting is not the answer the interviewee gives to the question, but what the interviewer did not expect. For this reason, the techniques of semi-structured and unstructured interviews were chosen in this research. This method of data collection demonstrates its utility through the richness of information it is able to extract from reality, as it leaves a greater degree of freedom in answering to the people interviewed who have the opportunity to delve into the topics, they find significant (Wengraf, 2001). The flexibility of semi-structured interviews and the degree of interaction between the interviewer and the interviewees allow for an in-depth exploration of the reasons underlying the answers given by the respondents (Rubin & Rubin, 2005).

In conducting interviews to identify and recruit participants, a snowball approach was used (Biernacki & Waldorf, 1981; Gil & Pinto, 2018). This approach involved starting with a small number of initial participants and then asking them to refer or introduce the researcher to other potential participants. The process continued to "snowball" until the researcher reached a point of data saturation, where new participants provided little additional insight.

Most of the interviews were conducted in 2005. Further examinations in the field took place from 2006 to 2010 to extend interviews with relevant respondents and broaden their range and number. In these subsequent examinations, some respondents replaced previous interviewees who had left Autostrade due to retirement or turnover. In 2011, further interviews were conducted with key respondents to corroborate and explore issues that had emerged during previous visits.

The interviews were conducted with 61 participants. Given the open-ended nature of this approach, both the topics of the dialogue and the time allocated to different subjects varied during the interviews. The duration of each interview ranged from a minimum of 30 min to a maximum of 4 h. The specific strategy employed in conducting the interviews can be summarized as follows:

First, during the interviews, respondents were prompted to elaborate on their answers by describing behaviors, discussing problems, and providing examples. They were also asked to clarify how they acquired their knowledge, ensuring a comprehensive understanding of their responses. Questions that encouraged articulation of the reasoning behind their answers, such as "what leads you to believe this?" were utilized.

Second, informants were presented with open-ended questions (Bougon, 1983). The objective was to comprehend how they interpreted the questions and, consequently, the value and significance they attributed to individual concepts or relationships observed within the organization. This approach proved valuable in extracting insights into how success, failure, the regulatory system, and concepts like power, delegation, and influence were conceptualized.

Third, each interview focused on understanding "what happens?" within the organization in question, delving into the reasons behind occurrences, and uncovering the values and meanings mobilized in the process.

The specific aim was to understand how construction processes for motorway megaprojects occurred; which networks of collaborative agreements covered the design and construction of a new piece of motorway; which actors and resources, participating in a network of ties, were mobilized and concurred in shaping the strategy of those capital investment expenditure decisions. Interviewees were asked to comment on actions oriented towards framing the management of megaprojects; managerial implications in terms of coordination activities to be undertaken, and the main constraints, challenges, and problems to be addressed.

An interesting element emerged from the dialogues with respondents in the field: Although the researcher had always considered regulations as resources for structuring and framing the world, and then providing stability to social life (Scott, 2014) she had never considered that they could also be sources of surprises and overflows.

While data collection has been conducted on the topic of megaproject management processes, this paper has a success focus that emerged as a post hoc reflection based on the stories people within Autostrade shared during the researcher's fieldwork. Using data collected for a different purpose than the current focus may limit the insights that it is possible to extract from data since some important elements may be missing from the analysis. For example, we missed the possibility to interview other relevant stakeholders in the making of the megaproject because the success theme became a point of interest later, after the megaproject was "completed", when initial acclaim was followed by significant criticism. At that time, re-reading the collected interview data revealed the shakiness and precariousness of the project's perceived success. It is known that the value-relevant perspectives of the same investigator can change over time (Hammersley, 1997), leading to new insights. This underscores the importance of secondary analysis of existing data. The value of a researcher's re-examination of their own data through supplementary analysis, retrospective interpretation, or analytic expansion of previously gathered data is well recognized in social science research (Heaton, 2004, 2008; Thorne, 1994). Secondary analysis of existing data allows for wide-ranging comparative analysis and can foster emotional detachment from the data, potentially resulting in less subjective interpretations (Mauthner et al., 1998).

### 3.2. Data analysis method

To gather and interpret data we took into account the roles that both human actors and non-human agents (such as regulations, regulators, governmental, and non-governmental bodies) played in performing motorway construction megaprojects.

De-centering human agency permits to consider both human and non-human entities (such as regulations, i.e., texts) as active agents in shaping social phenomena. This fitted the specific requirements of our research context, while maintaining a reflexive and iterative approach to data collection and analysis. Embracing this methodological perspective, the researcher followed actors, via interviews and ethnographic research, in the making of megaprojects construction strategies and investigated the network within which actors performed decisions. In addition to this, she also considered inscriptions, including normative texts. The aim was to make sense of what was going on under the metaphorical bridge that separates the plan of a motorway megaproject and its realization, and the role of the different actors engaged in the network and their diverse competitive visions of reality.

Megaprojects are notorious for being characterized by power dynamics effects (Newell et al., 2008) and controversies among different government bodies and dominant knowledge regimes. The empirical analysis led the researcher to understand how power was distributed in the space of that megaproject where several strong actors (including different bodies of the same central government), across intersecting social worlds, produced obligatory passage points (OPPs) and cooperated and conflicted with each other (Star & Griesemer, 1989). An Obligatory Passage Point (OPP) is a place or moment where people or things must go through in order to complete a process or accomplish a goal. It is a point in a network which catches the attention and the interest of other actors (Callon, 1986a, 1986b; Law & Callon, 1994) and where something must pass through in order to reach its destination. In the next empirical section, we will provide an illustration of the constellation of the main actors producing OPPs in a motorway construction megaproject. We will map their contrasting interests and the power which permits them to build an OPP. This power often derives from and is regulated by regulations and their modifications.

## 4. Framing and overflows in motorway megaprojects

### 4.1. Constellation of power and obligatory passage points in motorway construction megaprojects

In the process of a motorway construction megaproject, regulatory power is an example of Obligatory Passage Point (OPP). When the construction process is underway, a regulatory change or a municipality that opposes the motorway works through a power of veto, as well as the authority for catchment basins that poses a veto due to the rising risk of contamination or deviation of the underlying aquifers, are all examples of OPPs that must be navigated. Without passing through these points, the project cannot move forward. Understanding OPPs can help us better grasp how power and control are exerted in the megaproject arena and how they are also shaped by regulations and their changes over time. For example, when a regulation for the disposal of the digging materials changes, this could rise an occasion for a municipality, or a region, to rise a veto power (endowed by the law) which opposes and creates obstacles to the advancement of the megaproject.

Fig. 1 illustrates the power dynamics at play among the key stakeholders involved in the process of making a motorway megaproject in Italy. These elements, represented by the green circles, sometime cooperate, other times craft and articulate OPPs, spaces or moments where a power, endowed by the law or by the ontology of the entity

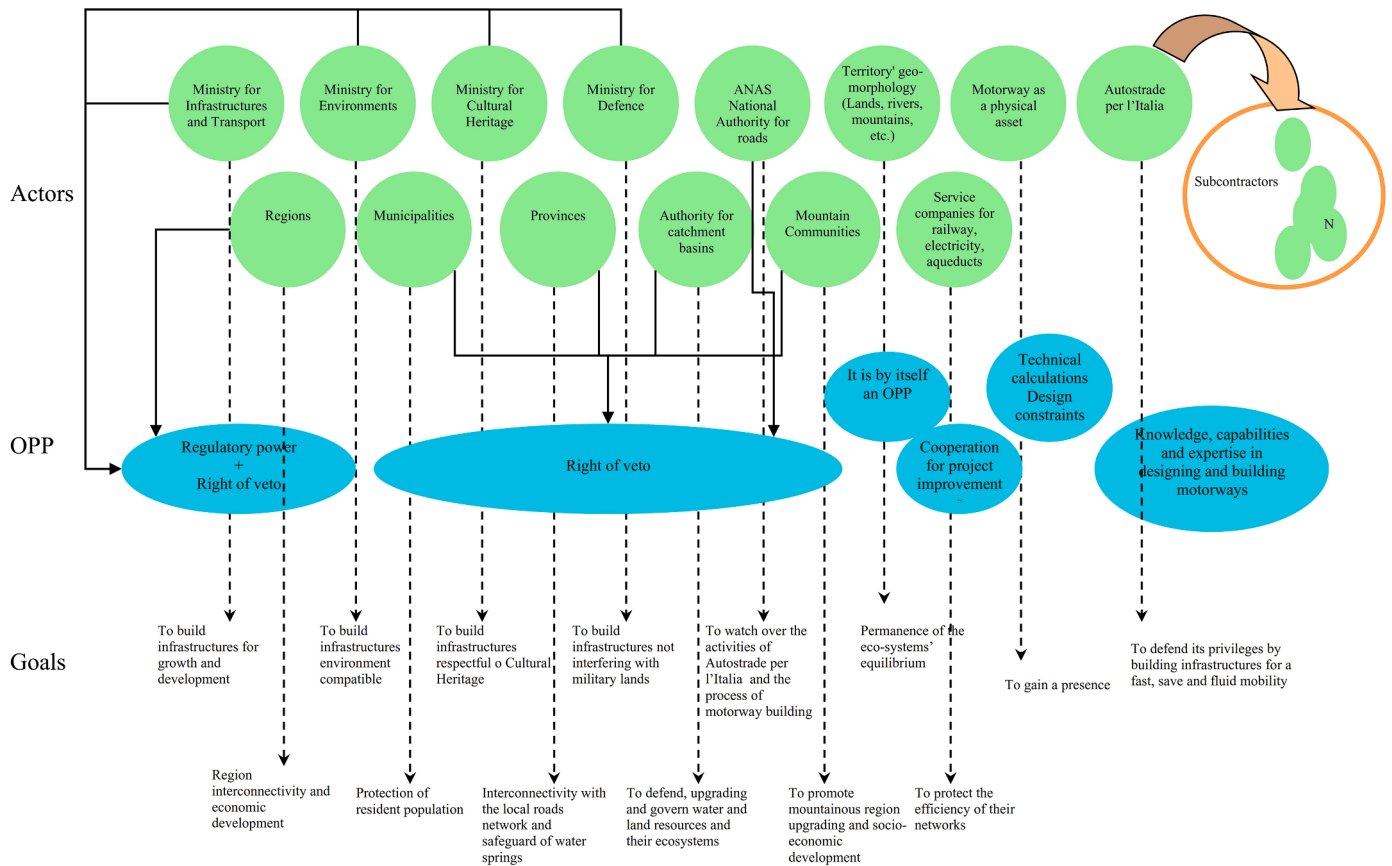


Fig. 1. A visualization of the constellation of power and obligatory passage points in motorway construction megaprojects.

itself, places the megaproject under scrutiny and criticism. The geomorphology of the territory is by itself an OPP in the motorway construction project, with the goal of preserving the equilibrium of its ecosystem. The motorway, as a future physical asset, is also an element whose goal is to establish its presence in the world, and the engineering and technical calculations and design construction parameters are the OPPs for making the project real.

This power enacted through the OPPs often produces counter-narratives (Winch & Sergeeva, 2022) to the project narrative proposed by project's makers. In this interacting space where different entities come into conflict with each other, due to their contrasting interests and conflicting goals, the fate of a motorway construction megaproject comes to be realized.

Upon examining the goals and OPPs of the main entities represented in Fig. 1, there are five branches that are expressions of the central government. These include four ministries and one road supervision authority (ANAS), which represent the powerful and conflicting agencies interacting in the Italian infrastructural megaproject arena and are expressions of the same central government. Institutional conflicts and contradictions are frequent among these distinct branches of the central government. For instance, the Ministry of Infrastructure and Transport, which promotes motorway construction for economic growth and development, may clash with the Ministry of Environment, which must evaluate the project in terms of pollution, noise, water-bearing strata, landscape, or the materials produced by excavation. The Ministry of Cultural Heritage, which is responsible for ensuring that the project does not conflict with pre-existing cultural heritage elements, has the authority to halt motorway works when archaeological sites are discovered during tunnel excavation or motorway layout. The Ministry

of Defense is concerned that the motorway's route does not interfere with military installations.

ANAS, the National Authority for Roads, supervises the execution of licensed road construction works and their management. It develops laws and regulations to safeguard roads, motorways, and traffic. However, laws and regulations are also developed by the various ministries and, on a smaller scale, by the different regions. Through the regulatory power, these entities can influence the strategies of other organizations (Frooman, 1999) and transform future courses of action.

Other organizations, such as the Authority for Catchment Basins and Mountain Communities, oversee lands, mountains, water resources, and related environmental systems. Municipalities and provinces, as organizations that represent various levels of aggregation of local communities, protect their territories and citizens. These organizations even if do not have regulatory power, have the power of veto, which means that they can obstruct or block the motorway project. In addition to their veto power, their role in motorway construction projects is mediated by "operative roundtables" between them, Autostrade, and the companies responsible for the works. These roundtables provide spaces for developing compromises and building commitments. There are also other entities, such as service companies, which offer services such as electricity, water, gas, railway transport, and telephone communications. Although these companies do not have veto power, they have some influence on the motorway construction process, as the motorway works may interfere with service installations.

Regulatory complexity in this arena arises from the fact that different actors with regulative power can produce norms that contrast with each other, or even different entities can interpret norms in different ways resulting in institutional clashes and contradictions. In the following



paragraph, we will present an example of such divergences, and it will become even clearer why regulations can sometimes lead to overflows instead of bringing certainty to megaprojects.

4.2. Regulatory changes as overflows

“Modifications of regulations are our daily bread, and they affect the realization of our infrastructure projects. Changes in rules bring about surprises or at least situations of uncertainty that provoke the slowing down or even the interruption of works on construction sites. The management of major infrastructure projects is difficult for various reasons. Very often, the construction of motorway infrastructure is not seen as a public asset but rather as a problem and an environmental hazard. Regulations that continually change often constrain us to critically re-examine projects, and this implies additional costs and time.” (A Project Manager from the New Work Division - Int. 41 Appendix 3)

Through these words, a project manager of Autostrade emphasizes the role that regulations play in generating overflows that need to be managed to reframe motorway construction megaprojects. But, to what degree can regulations be a surprise? Even if most of them may be discussed well in advance before they happen, their interpretation can lead to different conceptions and subsequent behaviors. This is what happened with the so-called Variante di Valico (a 60 km stretch of motorway through the Apennines in central Italy between Emilia Romagna and Tuscany), the most important and contested megaproject that composed the Autostrade’s investment plan. It can be compared to the Gotthard Tunnel and the Channel Tunnel if we consider its scale, the financial resources involved, and the volume of excavation. At the time of the researcher’s visit, the works on the Variante di Valico were still underway and would have been completed only ten years later. The construction of this strategic infrastructure was of such significance that it consistently filled the pages of the leading national media. On the day of its inauguration, the story of this megaproject was summarized by the pages of the National Daily as follows:

“The history of the Variante di Valico traverses and narrates the history of Italy. The initial idea dates back to 1982, with inclusion in the convention occurring in 1997. The construction of this imposing infrastructure was completed in 9 years, but it took 24 years to go

from the initial project idea to the final authorization in 2006. Consequently, the cost of the project increased from the initially estimated 2.5 billion euros in 1997 to 4.1 billion euros at the end, due to increases in raw material costs, regulatory changes, approval processes, and project refinements.” (Extracted from the newspaper “Quotidiano Nazionale” 23rd December 2015” –<https://www.quotidiano.net/economia/variante-valico-e6d0c188> Our translation)

The Variante di Valico was opened to traffic on 23rd December 2015, thirty-three years after its initial design. As the excerpt of the above newspaper reminds, the planning procedure of the Variante di Valico megaproject started in 1982 when the first design was proposed. The agreement between Autostrade and Anas, which included a commitment to improve the motorway route between Florence and Bologna, by building a new, more modern and efficient motorway, the Variante di Valico, was signed in 1997. After two and a half decades of planning and hurdles, the project received its final authorization, regarding the Tuscan section of the infrastructure, in 2006. Then, the implementation phase could proceed. However, this phase was not without its problems, and it further hindered the project’s completion.

Regulatory changes are reported as one of the main reasons of cost overruns. The Italian regulatory context is complex and frames infrastructural megaprojects. This means that it provides a framework within which the megaproject has to be realized. However, when regulatory approval is obtained because the project conforms to norms and codes, changes in norms start to generate overflows which require the megaproject to be reframed again and again. Regulatory bodies change regulations because they learn about issues and concerns that have to be regulated, such as work environment, technical norms, and natural protection. It is therefore difficult to imagine framing as a “future perfect strategy” (Pitsis et al., 2003) designed ex-ante that permits envisaging project outcomes and realizing them through stepwise adjustments (see also: Clegg et al., 2002, 2006).

As the project manager above pointed out, modifications of regulations often require a critical re-examination of megaprojects. This implies the problematization of previously accepted plans because overflows happen, and knowledge about construction generally has to be developed. Such problematization asks new questions about the time, cost, and quality of the object under construction. It also requires questioning the compatibility of the solutions previously adopted and

**Table 1**  
Effects produced by the new regulations. Source: Autostrade New Works Division.

Motorway design	Safety barriers	Tunnels	Earth dumping	Environment	Hydraulics	Expropriations	Seismicity
DM n. 6792/5.11.01 DL n. 151/27.6.03 DM n. 67-S/22.4.04	DM n. 2367/5.8.04	EU DIRECTIVE 2004/54/ 29.4.04	Law 443/21.12.01 Law 306/31.10.03	DPR 142/30.3.04 on acoustics	Regional Law Emilia Romagna n. 7/14.4.04	DPR 327/8.6.01 Regional Law Emilia Romagna n.37/19.12.02	Presidential Decree n. 3274/20.3.03
Greater dimensions of the motorway (traffic dividers and wider lateral margins to guarantee greater fields of vision, continuous hard shoulders also in galleries) Modifications of the tract	Greater dimensions of the motorway and new installation requirements	Greater dimensions of the excavation site to guarantee the operative safety interventions (bypasses, emergency exits etc.) Greater engineering plan preparations	Greater difficulties in the identification of dumping sites Onerous procedures for the characterisation of materials Difficulty in the interpretation of provisions by Institutional Bodies and more participation from the Watchdog authorities (ARPA)	Planning revision and a consistent increase in the dimensions of the acoustic barriers and the relative foundation works	Increase in the time limits for the issue of hydraulic authorisations and deferment to the executive project phase	Greater performances both in quantitative terms as well as qualitative terms (anticipation of the communication of indemnities, communication procedures of the start of proceedings)	Greater dimensions of the structures and foundations, even in works located in previously classified non seismic areas
Costs ✓ Time ✓	✓	✓	✓ ✓	✓	✓ ✓	✓	✓

**Table 2**

The impact of new regulations on the investment plan. Source: Autostrade New Works Division.

Regulations		Road design			Tunnels	Safety barriers	Dig materials	Environment	Hydraulics	Expropriations		Seismic
	<b>Interventions</b>	DM N° 6792 of. 5.11.01 Rules for the construction of roads	D.L. n° 151–27.6.03 Changes and additions to C. d.S. (Exceptions to DM 6792 also for new roads)	DM n° 67-S 22.4.04 - Modifications of DM 6792/ 5.11.01* Transitional period for existing roads	DIRECTIVE 2004/54/CE 29.4.04** Minimum safety requirements for tunnels on the trans-European road network	DM 2367 5.8.04 on Safety barriers design	Law 21.12.01 n° 443 (Framework Law for dig materials) and Law 31.10.03 n. 306	DPR 142/2004 Provisions for the containment of vehicular noise pollution	Regional Law on Emilia Romagna n. 7 14.4.04 (Release of state water concessions)	Law 327–2001 on Expropriations and s.m. entered into force on 1.7.03	Regional Law Emilia Romagna 19.12.02 n. 37 Regional provisions on expropriations	Order of the President of the Council of Ministers n. 3274 20.3.2003 and s.m.i.
<b>F.P. 1997</b>	A1 4th Lane Modena-Bologna					X	X		X			
	A14 3rd Lane Bologna ring road							X	X	X	X	X
	A1 3rd Lane Casalecchio-Sasso M.					X			X	X	X	X
	A1 Variante di Valico				X	X	X	X	X	X	X	
	A1 3rd Lane Barberino-North Florence	X		X	X	X	X	X		X		X
	A1 3rd Lane North Florence- S. Florence				X		X			X		
	A1 3rd Lane S. Florence-Incisa	X		X	X	X	X	X		X		X
<b>F.P. 2002</b>	A1 3rd Lane Orte-Fiano											
A4 4th Lane Milano-Bergamo	X		X			X	X	X		X		X
A1 3rd Lane Fiano-GRA	X		X			X	X	X		X		X
A9 3rd Lane Lainate-Como	X		X			X	X	X		X		X
A14 3rd Lane Rimini-Pedaso	X		X	X	X	X	X	X	X		X	X
A10 Genoa passerbay	X	X	X	X	X	X	X	X		X		X

\* This provision also considers the effects of Circ. LL.PP. N° 3699/8.6.01 - Guidelines for the analysis of road safety.

\*\* This provision also considers the effects of DM LLPP 5.6.01 - On tunnel safety.

the development of new analytical models and calculations, as well as greater efforts to align the megaprojects' parameters that were developed in different time periods. These translations produce further technical and economic commitments for the solutions that have to be realized.

The manager provided two documents, which are presented in their original versions in [Appendix 1](#) and 2, while an English translation of these documents is made available in the following [Tables 1 and 2](#). The two documents outline the primary changes in regulations affecting motorway construction standards during a three-year period (between 2001 and 2004), which preceded the researcher's visit to the empirical site. Over those three years, the changes in regulations were so significant that they profoundly altered the construction parameters. [Table 1](#) summarizes the main modifications in regulations that impacted costs and/or time of motorway construction megaprojects.

Additionally, [Table 1](#) gives an overview of the primary knowledge areas affected by these changes in regulation, which produced overruns in costs and/or time. The knowledge invested in these modifications was related to the geometry of the road (see first column "motorway design"); the dimension and the mode of installation of securities barriers (second column); the structure of the tunnels (third column); the storage, disposal and reuse of excavation materials in the absence of quarries and dumps (fourth column); the procedures for expropriation of lands (fifth column) and the construction parameters under seismic safety.

As an example, if we want to delve into just one of these regulatory changes, let's focus on the fourth column of [Table 1](#), which indicates that the enactment of two laws (Law 443/21.12.01 and Law 306/31.10.03) altered the management of excavation rocks, making it more difficult to identify disposal areas; more burdensome the procedures for characterizing extracted materials; more challenging the interpretation of regulations; and more intense and pervasive the involvement of institutions (such as ARPA - the regional environmental protection agency) responsible for conducting checks, supervising the correctness of behaviors by construction companies, and implementing corrective actions and sanctions where necessary.

Law 443/21.12.01 and Law 306/31.10.03 heavily impacted motorway construction costs and time because the provisions regarding waste management and reuse of extracted materials at other sites, for other uses, or for the motorway works themselves, closing material cycles and avoiding sending waste to landfills, must be defined via new project planning in agreement with the different stakeholders. The eventual disposal of the excavation materials can only take place once the impossibility to recover and reuse them has been demonstrated. In the absence of an arrangement for the disposal of the materials, the progression of the megaproject is interrupted.

[Table 2](#) illustrates the impact of changes in regulations for the various megaprojects included in the Autostrade's financial plans for the years 1997 and 2002 (first column). The names identifying the different motorway construction megaprojects, are listed in the second and third columns. The table shows, for the different knowledge areas interested by the changes in regulations, if these changes affected the construction of specific megaprojects.

When parameters set in the design phase are altered in the execution phase of the megaproject, these changes inexorably come to have an impact on costs and time.

In October 2014, the Italian newspaper "Repubblica" observed:

"...the design of infrastructural works is continually evolving. Since 2001, 31 regulatory changes have occurred, resulting in an enormous expansion of the time required for authorizations' approval. While technological innovations allow larger works to be completed in less time, the regulatory stratification causes delays in infrastructural works' completion times." (4th October 2014)

The new regulations required additional activities, including new environmental impact assessments (EIA) and conferences of services involving over 100 regulatory bodies. The stratification of all these regulations had a significant impact on the megaprojects' realization times and costs. The Head of the New Work Development Division explains:

"The regulatory complexity has increased exponentially since the 1950s when the first Italian motorway linking Milan to Naples was built, covering an 800 km stretch. This growth in complexity has resulted in a significant increase in the number of regulatory requirements that must be fulfilled". (Head of the New Work Division-Int. 48 Appendix 3)

The top manager provided two slides (see [Fig. 2](#)) that visualize the increased regulatory complexity between 1956 and 2011. The complexity can be gauged by the difference in the number of project plans produced. In 2011, constructing a 17.5 km motorway tract required 4362 project plans, while in 1956, a more extensive and complex 62 km motorway project required only 100 project plans.

Regulations can generate overflows that require continual re-evaluation, meaning that the original framing of cost, time, and quality is merely a starting point, rarely an end. Regulations can also make megaprojects surprising due to the ambiguity surrounding their interpretation. For example, one episode that caused the Variante di Valico, to be delayed was the change in laws governing the treatment of materials resulting from excavations. The different interpretations of the regulation for extracted materials by the two regions, Tuscany and Emilia Romagna, who were involved in the project caused diametrically

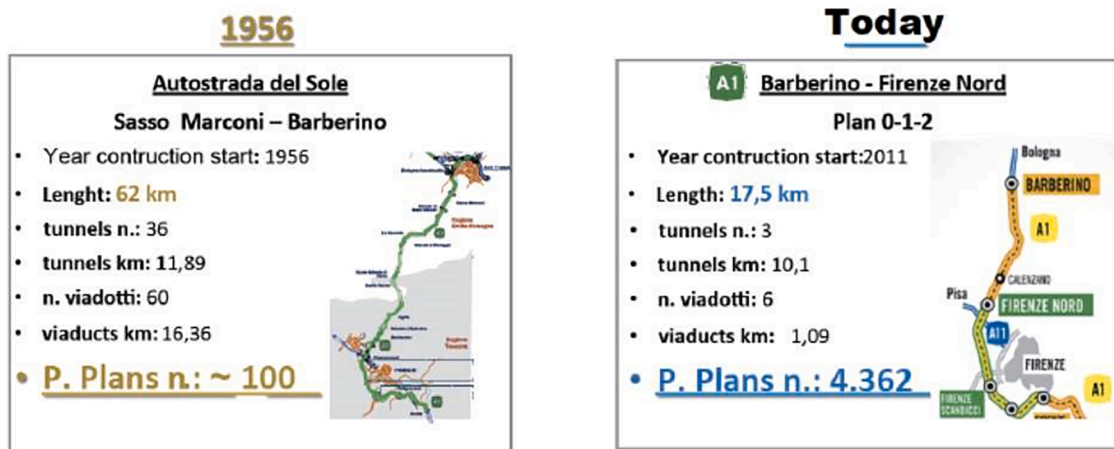


Fig. 2. The growing regulatory complexity. Source: Autostrade New Works Division.

opposed considerations to arise regarding the nature of the extracted digging material from the tunnels. Tuscany considered it waste to be disposed of, while Emilia Romagna evaluated it as a reusable material. As a result, construction work on the Variante di Valico advanced on the Emilia Romagna side while remaining at a standstill on the Tuscany side. A senior manager from the Legal Unit commented on this issue, saying,

“In Emilia, nobody has ever had to complain about the destination of the excavation materials. However, in Tuscany, the investigation into the classification of the excavation materials started in 2010. Subsequent regulations did not resolve the issue, as it required those who dug to submit plans regarding the use of the extracted materials, based on which the supervising authorities could give or withhold authorizations. In fact, no clear environmental standard was ever proposed that defined the criteria for separating reusable extracted materials from waste materials.” (A senior manager from the Legal Unit – Int. 22 Appendix 3).

Focusing on this specific overflow created by changes in regulations, a project manager provided a picture (see Figure n. 3) which displays some criticalities which still in June 2005 blocked the advancement of the works of the Variante di Valico on the Tuscany side.

The project manager reported to the Head of the New Works Division on the obstacles created by the new regulations on the tract n. 13 between Aglio and Barberino (see Fig. 3) as follows:

“On the Aglio-Barberino route - Lot 13 - we do not have the final approval from the Province and Municipality for the executive projects of the storage areas. The Council of Ministers, based on the indications of the Tuscany Region and Barberino Municipality, has not approved the planned storage areas in the project, hoping that the Region will take the lead in searching for other sites. More than three years have passed without reaching the conclusion of the

approval process. Despite the lack of guidance, we have proceeded to identify and design two other storage areas, for the approval of which we have requested a specific Services Conference. Even these areas, in the first meeting of the Services Conference three years ago, were not accepted, forcing us to identify and design further storage sites that obtained approval last year but with additional requirements to be verified in the executive design phase. The executive projects had been shared with the Province of Florence and the Municipality of Barberino and proposed for formal and final approval... approval that has not yet occurred. This critical situation does not allow for the issuance of the ANAS administrative device and the consequent start of work. Furthermore, the Municipality of Barberino, in the Deliberation of December 22, expressed the hope "... that the possibility of allocating excavation materials destined for the Fienile storage area to the Bellosguardo site will be verified ..." effectively modifying its opinion expressed on the aforementioned area in the Services Conference of last year's March. ...However, the Ministry of Infrastructure and Transport - Department for the Coordination of Territorial Development - has committed to promptly urging, especially the Province of Florence and the Municipality of Barberino, to issue the final authorization. In the meantime, at ANAS headquarters, we had an informal meeting with the Mayor of Barberino to discuss the matter. At the moment, even though we do not have certainty about the authorization, we can discern signs of a favorable evolution. Last May, in a meeting at the Tuscany Region, the mayor and the councilor confirmed their intention to approve the storage areas, but emphasized the need to verify the actual environmental enhancement of the areas in question.”

The above project manager's report describes the impact of the overflows produced by the change of the regulations concerning the earth dumping. These overflows resulted in prolonged bureaucratic

Map of Criticalities connected to the authorization processes

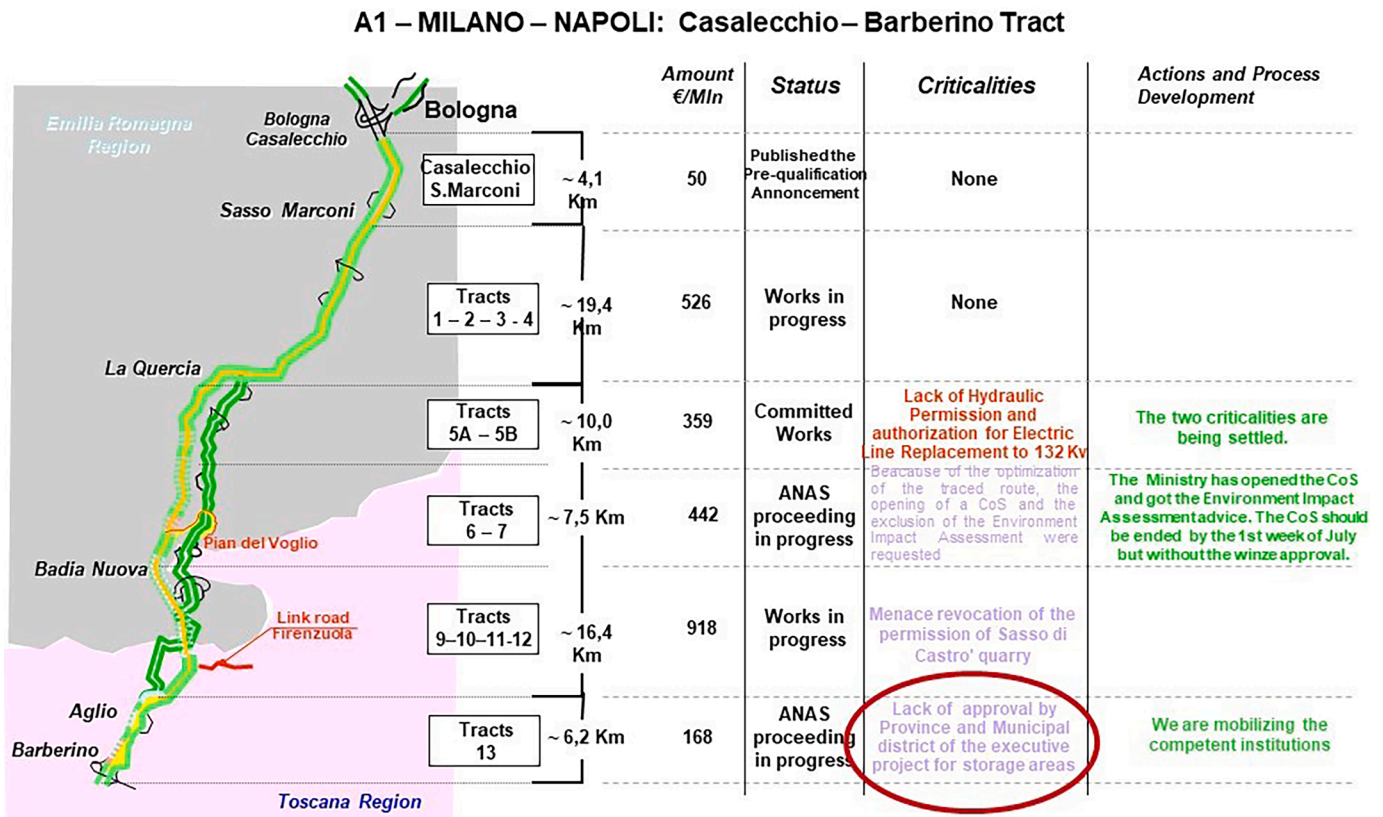


Fig. 3. Variante di Valico: Map of criticalities related to the authorization processes (Source: Autostrade New Works Division).

process concerning the approval of storage areas for the Aglio-Barberino route project (see Fig. 3). Despite efforts to identify suitable sites and engage with relevant authorities, in June 2005 the final approval for the storage area had not been obtained yet due to changes in requirements and different roles of the stakeholders. Despite these obstacles, there were signs of progress, with commitments from the Ministry of Infrastructure and Transport and indications of potential approval from local authorities. However, uncertainties remained regarding the timeline for authorization and the fulfillment of environmental considerations.

Variante di Valico was finally inaugurated the 23rd of December 2015, thirty-three years after its initial design. To use a familiar expression, this megaproject was realized "over time, over budget, over and over again." It failed to achieve several objectives set out in the original plans, but despite all the problems and overflows, it was "completed". Once finished, the project emerged amidst acclaim from political forces, the press, and travellers as the most significant megaproject to emerge since the Second World War. It was seen as a symbol of Italy's rebirth. Despite the obstacles it had managed to overcome, including those related to the geomorphology of the territories, it was considered a successful endeavor.

However, the winds of success, following the inauguration of the megaproject were temporary and fragile. Numerous critical voices and several concerns from the territories it crosses suggest that it may have been the wrong project: the excavation of the tunnels that make up the Variante di Valico's blueprint triggered latent landslides that put entire inhabited centres, such as the village of Ripoli, at risk. The noise pollution caused by the joints of the viaducts, when crossed by trucks, the possible negative health effects of prolonged exposure to fumes and dust emitted by the ventilation systems of the main tunnels, and some missed connecting link with ordinary roads, also provoked the discontent of the inhabitants of the surrounding territories and their representative institutions.

The illusion of successfully completing the project, even over budget, over time, over and over again, led the company to rejoice prematurely and overlook how the mistake of perceiving a project as completed may hide other factors, problems, and concerns that put the megaproject at stake again and again, obscuring previous alleged or temporary successes.

## 5. Discussion

The story outlined in the previous section prompts reflections on the significance of success in infrastructural megaprojects, as well as its polysemic value and temporality. Coming back to the research question: How do regulatory changes intervene in affecting megaproject success and shaping the way in which megaprojects affect their realization?

The possible answer to this question, based on the case empirical material, is that regulatory changes affect megaproject success by influencing the power dynamics within the network of interests and stakes surrounding the realization of these major projects. However, they also contribute to making the notion of success even more unstable, ephemeral and precarious. This view of success differs from what the dominant management and project management literature suggests. The dialectic of success for megaprojects, which are entrenched with the production of common goods effects (Bornstein, 2010), such as motorway construction megaprojects, seems to be a more complex affair than merely achieving goals (Carrol & Tosi, 1970; Chua et al. 2018; Hayter, 2011; Tosi & Carrol, 1970); meeting the project owner's desired benefits (Cha et al., 2018; Winch & Leiringer, 2016) or exceeding the acceptable aspiration level (Greve, 2003; Madsen & Desai, 2010).

The dialectic of success for these major projects also differs from the iron triangle accomplishment (Atkinson, 1999; De Witt, 1988; Munns & Bjeirmi, 1996; Olsen, 1971) traditionally referred to in project management literature, which involves managing the project through agreed time, cost, and quality constraints while respecting the investment budget envisaged upfront.

Other research on managing the front-end of megaprojects (Morgan, 1987; Morris, 2013, 2019; Williams et al., 2009) emphasizes the need for a more careful identification of the knowledge in the project definition phase. They assume that the inability to identify the appropriate knowledge in the planning phase leads to budget and schedule escalation. Traditional research on the management of major infrastructural projects takes an approach based on the idea that successful project management requires planning to unfold according to a scheduled time and that plans' execution relies on pre-packaged knowledge. In the absence of these conditions, there is failure or misrepresentation.

Recent project management literature addresses the problem of managing knowledge in complex projects as a governance problem (Pensel et al., 2014) or as a specification problem (Abern et al., 2014a; 2014b). In the first case, the focus is more on the organizational coordination of knowledge processes. In the second case, the impossibility of completely specifying in advance all knowledge creates the necessity for project management to focus on the practices that facilitate the formation of the missing knowledge through learning.

This paper addresses the incompleteness of knowledge by introducing a performative view of megaproject success, intended as the ability to deal with surprises and it contributes to the debate on megaproject success through a regulatory context angle. The case of Autostrade's infrastructural megaprojects shows that regulatory modifications generate surprises, and they require project managers to be flexible enough to enact new knowledge, which often presents itself in the form of overflows. The original framing cannot take into account all the problems that the project is exposed to. These conditions, which are not addressed by framing and become overflows, are things that project managers have to learn about during the course of the realization of the megaproject. Megaproject management is then a process of learning about new conditions that were not, and perhaps could not, be taken into account in the front-end stage. It is a process of learning about new knowledge objects that were not contemplated in the original frame.

While a knowledge-based perspective of project management does not exclude politics, it is important not to view politics as inherently deceptive. Instead, politics can be viewed as a skill that can be learned. In the context of this paper, learning involves understanding how to construct a motorway by responding to a dynamic and complex regulatory framework that presents various challenges that require reflection. Regulatory changes can create unexpected problems, and even the government that creates the laws cannot predict all the issues that may arise. The designers of the motorway acknowledge that the learning process is ongoing, as they continually encounter new problems and scenarios that require them to adapt and improve their knowledge and skills.

Returning to the question of success, this case study shows that framing creates project management tasks and continuously pushes the project in new directions. Regulatory changes could hardly be foreseen, as even those who create regulations did not know how they would be changed. When regulations create overflows, managers must develop new activities. They have to start a kind of "voyage of discovery" but not in the sense described by Hirschman (1967, p. 70) in his Hiding Hand theory, which comes into play when initial planners, motivated by optimism and a sense of possibility, underestimate the difficulties of their undertaking. This underestimation is beneficial because it allows them to take the initial leap into the unknown. As they encounter challenges along the way, the mystery and the benevolence of a "Hiding Hand" comes to rescue. The hiding hand seems more governed by abstract forces which create success by serendipity. The duality of framing and overflows as described by the case of regulative changes does not necessarily include an underestimation, here project managers may not underestimate because they relate to an established frame. However, it is the frame itself that originate overflows when regulations change and/or become ambiguous in their interpretation.

Indeed, the emergence of overflows makes keeping original promises

a tenuous idea. Success is also about managing all the new conditions that emerge. Sometimes, this implies disregarding the budget and overrunning it. However, overrunning time and costs also offers some opportunities. It opens up learning processes and offers certain qualities. As Callon (2007, p. 320) says, overflows create a dynamic view by which a process becomes "a long sequence of trial and error, reconfigurations and reformulations". Therefore, megaproject management requires extra efforts and investments of time, money, and/or attention.

Megaproject management begins when the original project plan has been established because then the plan meets the world which, expectedly, will be different from the plan. Project managers just do not know which new world will emerge. This is also in line with Hällgren and Söderholm's (2010) observation that projects are often loosely coupled objects where project managers again and again face the problem of having to decide whether surprise requires efforts to move it back to the original plan or whether new options should be developed and considered. In this view, successful megaproject management becomes an activity of re-orienting (Normann, 1971) or reframing the project. This reframing may overrun time, cost, and/or quality, but it may also indicate that, at the time of planning, the framing activity is intended to create an overview. However, an overview omits things that are confusing and have been removed by framing but which may return when construction begins. Then success is not a movement towards a clear and fixed destination. Studying success involves mattering and revisiting previously established targets and ambitions. Yet, even when the megaproject seems to have reached its completeness and the attribute of success may be associated with it, this state of things is never absolute. It has the character of impermanence as overflows can undermine the presumed and supposed success.

The Callon's theoretical lens on framing and overflows we have adopted in this paper offers an opportunity to explain the extent to which success, as a form of enactment, rather than description, can help us understand megaproject realization and unfolding across time and space. The problem that this paper come to address using this perspective is that any attempt to frame the knowledge necessary to manage a project successfully is incomplete and leaves room for new learning processes and overflows. However, it is because of this incompleteness that innovative course of action can emerge. Project management is then the process and the outcome of dealing with the incompleteness of framing.

## 6. Conclusion

This paper contributes to the notion of megaproject success in changing regulatory environments. Changes in regulations, through the lens of Callon's framing and overflow dynamics (1998a; 1998b), provides management with a task to manage disorder and deal with a continuous definition of the megaproject's parameters. In the presence of overflows that question the original megaproject's frame, any attempt to define the project is always partial and incomplete. Quattrone and Hopper (2006) aptly explain how closure can be a failing undertaking in any definition process:

"'To define' comes from the Latin *definire*, which consists of the prefix '*de-*' ('to be about' but also 'to do the opposite' – 'to deprive') and the verb *finire* (to limit – from *finis* – a boundary or end). This etymology illustrates the rich and conflicting nature of any definition: on the one hand, 'to define' establishes boundaries but on the other it demolishes them (Merriam-Webster English Dictionary). Every *de-finition* (a closure) is also a *de-finition* (an incomplete order)." (Quattrone & Hopper, 2006; p. 234)

Every tentative of *de-finition* (every limit, every boundary) is also a *de-finition* (an opening of a topic to speak, a being about) because every attempt of making order (a closure) is always incomplete. Any definition of megaproject success presupposes a specific conception of knowledge, action, and rationality which has the character of temporariness. The

recalling of Quattrone and Hopper's provisional nature of any definition, which underpins the impossibility of a complete knowledge, finds its explanation in the twin notions of framing and overflow we have highlighted in this paper. At stake is the question of how to allow adaptations through learning and then mobilize a capacity to move outside the original design because of its *de-finition*.

The dialectic of success is much more complex than it seems. It can be happy or unhappy in different ways, and it is not a movement towards a fixed destination. Exploring success involves revisiting previously established targets and ambitions. In other words, assessing success requires flexibility and the ability to put previously established frames at stake. Although megaprojects often fail to deliver the planned links between costs, time, and quality, they can still succeed. However, this success is an impermanent state and a fleeting concept that should not be intended as a goal attainment, an accomplishment, or the achievement of a desired outcome. Instead, it should be seen as the ability to respond to surprises and new courses of action. Engaging with this processual view of success implies recovering the Latin origin of the English word "success": from '*succedo*', meaning "to happen" or "to succeed". The mattering remains whether the complex and elusive character of this succeeding will make all interested actors (regulators, construction companies, users, populations, etc.) 'happy' or leave spaces that have to be fulfilled.

Based on this case story, the paper advances the notion of success in project management as an illusion of completeness. This wholeness has not been contemplated in project management literature so far. Based on this neglected view, a project is considered successful not because it reaches its fulfillment, but because one no longer realizes that it is still unfinished. The impossibility of perceiving their incompleteness could not only be the inevitable fate of megaprojects but also the essence of success as succeeding.

## 7. Limitations and areas for further research

The results of this study have potential significance for major infrastructural projects facing regulatory changes and open-ended implications for project management practices and future research. Managerial implications relate to the managers' opportunity in gaining attention and orientation in dealing with surprises and stimulating learning processes. This attitude can inspire practical applications in several ways. Firstly, it can help project managers to identify the underlying mechanisms and processes that contribute to success, allowing practitioners to develop more effective and targeted interventions by incorporating strategies that take into account the precarious and unstable notion of success. Secondly, this attitude may inspire the development of new decision-making tools or training programs based on a deeper understanding of the factors that contribute to success or failure.

Megaproject management is related to the management of overflows. This requires project managers to take into consideration when and how overflows call for transformation of the megaproject parameters and when new regulations can be accumulated within the existing parameters of the megaproject. Overflows work in a way that project managers have to be able to manage surprises, i.e., to have an attitude towards learning and face new conditions that could not be forecasted in the front-end face of the project. When regulations move through the mechanisms that impact the existence of a project, the role of project management, as part of the planning horizons and framing devices that create the common goods, is to establish a framework for reasoning and reflection, a framework for learning how change happens, and also a framework for reinventing the megaproject's parameters.

Future project management research could benefit from embracing the performative direction suggested by this study. In particular, future research may investigate more closely how learning processes develop when different kinds of surprises, which are most likely to influence major infrastructural projects, emerge.

While our research is a useful first step that can guide and spur future

research, we have to acknowledge some limitations in our study. Firstly, interview data that is almost 20 years old may require contextualization, they may contain unique insights that could not be captured in more recent research. Participants may have provided perspectives, experiences, or narratives that are no longer prevalent or accessible in the present context. However, the older data remain valuable for understanding historical contexts, developmental trajectories and the impact of interventions or policies over time.

Secondly, as this study was conducted exclusively in Italy, a country that adheres to a Roman law system. This legal framework, combined with multiple and overlapping levels of legality, often creates an intricate web of regulations, leading to ambiguities in their application and interpretation. Furthermore, the frequent turnover of Italian governments, some lasting only a few months, exacerbates this issue. The rapid alternation of different political forces in power has been particularly prominent in recent decades, considering that over the 33-year span of the Variante di Valico megaproject (from 1982 to 2015), there were 25 different governments that have succeeded each other in power.

Thus, countries that follow a common law approach and enjoy relative political stability may face different situations than those depicted in our study. Therefore, we propose that future research should aim to replicate the study in various cultural settings. This would present

an exciting avenue for further investigation.

**CRedit authorship contribution statement**

**Silvana Revellino:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Supervision, Visualization, Writing – original draft, Writing – review & editing. **Lino Cinquini:** Supervision. **Raffaele D'Alessio:** Funding acquisition, Resources. **Valerio Antonelli:** Resources.


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**Supplementary materials**

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.ijproman.2024.102615](https://doi.org/10.1016/j.ijproman.2024.102615).

**Appendix 1. Sintesi Degli Impatti Prodotti Dalle Normative (Dal 2001)**

		10/06/2005					
SINTESI DEGLI IMPATTI PRODOTTI DALLE NORMATIVE (DAL 2001)							
Progettazione stradale	Barriere di Sicurezza	Gallerie	Depositi Terre	Ambiente	Idraulica	Espropri	Sismica
<ul style="list-style-type: none"> <li>DM n° 6792 del [5.11.01]</li> <li>DL n° 151 del [27.6.03]</li> <li>DM n° 67-S del [22.4.04]</li> </ul>	<ul style="list-style-type: none"> <li>DM n°2367 del [5.8.04]</li> </ul>	<ul style="list-style-type: none"> <li>DIRETTIVA 2004/54/CE del [29.4.04]</li> </ul>	<ul style="list-style-type: none"> <li>Legge 443 del [21.12.01]</li> <li>Legge 306 del [31.10.03]</li> </ul>	<ul style="list-style-type: none"> <li>DPR 142 del [30.3.04] sull'acustica</li> </ul>	<ul style="list-style-type: none"> <li>Legge Reg. Emilia-Romagna n° 7 del [14.4.04]</li> </ul>	<ul style="list-style-type: none"> <li>DPR 327 dell' [8.6.01]</li> <li>Legge Regionale Emilia Romagna n° 37 del [19.12.02]</li> </ul>	<ul style="list-style-type: none"> <li>Ordinanza Presid. Cons. Min. n° 3274 del [20.3.03] e s.m.i.</li> </ul>
<ul style="list-style-type: none"> <li>Maggiori dimensioni della sede autostradale (spartitraffico e margine laterale più ampi anche per garantire le visuali libere, corsia di emergenza continua anche in galleria)</li> <li>Modifiche di tracciato</li> </ul>	<ul style="list-style-type: none"> <li>Maggiori dimensioni della sede autostradale e nuovi requisiti di installazione</li> </ul>	<ul style="list-style-type: none"> <li>Maggiori dimensioni delle sezioni di scavo per garantire gli interventi operativi di sicurezza (bypass, vie di fuga, ecc.)</li> <li>Maggiori apprestamenti impiantistici</li> </ul>	<ul style="list-style-type: none"> <li>Maggiori difficoltà nel reperimento dei siti di deposito</li> <li>Onerose procedure per la caratterizzazione dei materiali</li> <li>Difficoltà di interpretazione della normativa da parte degli Enti istituzionali e più coinvolgimento degli Enti di tutela (ARPA)</li> </ul>	<ul style="list-style-type: none"> <li>Revisione delle progettazioni e consistente incremento delle dimensioni delle barriere acustiche e delle relative opere di fondazione</li> </ul>	<ul style="list-style-type: none"> <li>Aumento dei tempi per il rilascio delle autorizz. idrauliche e rinvio delle stesse alla fase di progetto esecutivo</li> </ul>	<ul style="list-style-type: none"> <li>Maggiori adempimenti sia in termini quantitativi che qualitativi (anticipazione della comunicazione degli indennizzi, procedure di comunicazione di avvio del procedimento)</li> </ul>	<ul style="list-style-type: none"> <li>Maggiori dimensioni di strutture e fondazioni, anche per opere ubicate in zone precedentemente classificate non sismiche</li> </ul>
Costi	✓	✓	✓	✓	✓	✓	✓
Tempi/CdS Approvaz.	✓		✓	✓	✓	✓	

Appendix 2. Quadro Degli Impatti Indotti Dalle Normative (Dal 2001) Sugli Interventi Di Adeguamento Della Sede Autostradale



10/06/2005

QUADRO DEGLI IMPATTI INDOTTI DALLE NORMATIVE (DAL 2001) SUGLI INTERVENTI DI ADEGUAMENTO DELLA SEDE AUTOSTRADALE

INTERVENTI			NORMATIVE		Progettazione Stradale	Gallerie	Barriere Sicurezza	Depositi Terre	Ambiente	Idraulica	Espropri	Sismica
			DM n° 6792 del 5.11.01 Norme per la costruzione delle strade	D.L. n. 151 - 27.6.03 Modifiche e integr. al C.c.d.S. (Deroghe al DM 6792 anche per strade nuove)								
P.F. 1997	A1	4ª corsia Modena - Bologna					X	X		X		
	A14	3ª corsia Tangenziale di Bologna							X	X	X	X
	A1	3ª corsia Casalecchio - Sasso M.					X			X	X	X
	A1	Variante di Valico			X	X	X	X	X	X	X	
	A1	3ª corsia Barberino - Firenze Nord	X		X	X	X	X	X		X	X
	A1	3ª corsia Firenze Nord - Firenze Sud			X		X				X	
	A1	3ª corsia Firenze Sud - Incisa	X		X	X	X	X	X		X	X
P.F. 2002	A4	4ª corsia Milano-Bergamo	X		X		X	X	X		X	X
	A1	3ª corsia Fiano-GR	X		X		X	X	X		X	X
	A9	3ª corsia Lainate-Corno	X		X		X	X	X		X	X
	A14	3ª corsia Rimini-Pedaso	X		X	X	X	X	X	X	X	X
	A10	Passante di Genova	X	X	X	X	X	X	X		X	X

(\*) Con questa norma si considerano inclusi anche gli effetti della Circ. LLPP n° 3699/8.6.01 - Linee guida per l'analisi di sicurezza delle strade

(\*\*) Con questa norma si considerano inclusi anche gli effetti del DM LLPP 5.6.01 sulla sicurezza delle gallerie

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