Responsible project management: beyond the triple constraints

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In this theoretical paper, we propose the concept of Responsible Project Management drawing upon perspectives from responsible innovation, accountability and sustainability in project environments, especially those of megaprojects, addressing their long-term impact, far beyond the traditional notion of project success on the triple constraints of time, cost and adherence to specifications. Megaprojects as multibillion dollar projects (e.g., the Channel Tunnel, organisation of London Olympics 2012 and the construction of Heathrow Airport Terminal 5) are very important parts of infrastructure in developed and developing countries, where traditional project management analysis focuses on the implementation or execution process (i.e. planning and control) usually incurring delays, cost overrun and financial risk. However, this analysis requires further understanding regarding their complexity and their effects on environment and society as a whole. Furthermore, management of megaprojects as a professional practice lacks a framework to provide lessons to support the improvement of decision-making process for the future generation of infrastructure for development, which increasingly needs to be built up under sustainability and accountability premises. This paper proposes an integrative framework based on four dimensions of responsible innovation, four instruments of accountability and six principles addressing sustainability that help to define and implement megaprojects, aiming at an inclusive approach – to better inform practitioners, policy makers, academics, and the wider society - when decisions about building megaprojects are taken. This framework might help also to analyse megaprojects in order to extract lessons that might be useful in the controversial arena of infrastructure development.

1. Introduction

Multibillion dollar investments in mega-infrastructure projects in developed and developing countries are central to the politics in countries which have them and, in recent decades, these projects have been enabled by a mixture of public and private capital, development banks and national and supranational governments (recent examples in the UK include the Channel Tunnel, London Olympics 2012 and the construction of Heathrow Airport Terminal 5). Moreover, these projects face political, environmental, social and economic supporters and detractors. However, most of these projects have strikingly poor performance in terms of economic, environmental, public and social issues (e.g., the Athens Olympic Games 2004 is an obvious example whilst the Brazilian World Cup of 2014 is also considered by many to have been a failure).

The recurrent problem of overestimation of benefits and underestimation of costs in project management has been the persistent performance paradox that managers of private and public megaprojects have faced for decades without being able to address with the aid of planning and control tools (Flyvbjerg et al., 2013). The paradox is about the increasing number of megaprojects implemented despite their performance being deemed as ‘poor’ (overestimation of benefits and underestimation of costs). However, the paradox is artificially created because we tend to separate the content of the project (i.e. the specific purpose of and sector/industry where the project is embedded) from the function of the project (i.e. the general processes used to manage the project). Focusing on the function of the project whilst neglecting its content makes for a fragmentary approach which, in turn, makes the evaluation of project success elusive (or confusing). One recent example is the World Cup 2014 in Brazil. Before the World Cup, it was deemed as a failure due to cost overrun, delays, and not delivering according to the specifications required. But after its completion, it is not generally considered a failure. Future use of the stadium and of the event’s legacy remain issues of concern.

The paradox of the performance of megaprojects needs to be addressed beyond the classical triple constraints of time, cost and adherence to specification. For instance, (Shenhav and Dvir, 2007) extend the dimensions of project success beyond the triple constraints to a consideration of the impact on customer, impact on team, business and direct success, and preparation for the future, which refers to new technology, new market, new product line, new core competency, and new organizational capability, that is, the future competitiveness of the firm. Megaprojects, due to their inherently complex nature, require a stronger emphasis on the aspects related to preparation for the future. However, we argue that this concern should include other criteria such as responsibility, accountability and sustainability. For example, for megaprojects such as the London Olympics 2012, an important aspect of project success is the legacy of the event in terms of infrastructure and the promotion of sport in the UK. Thus legacy, as part of the sustainability criteria, is an important aspect of megaproject success that is not adequately addressed by current frameworks which could use responsibility as an overarching concept to embrace accountability and sustainability.

Current literature in project and megaproject management addresses accountability and sustainability in a somewhat fragmented way. Bruzelius et al. (1990) and Flyvbjerg et al. (2013) provide some suggestions for improving accountability in megaprojects, while Romzek and Dubnick (1987) analyze the Challenger tragedy as a case of accountability in the public sector. Other authors focus on the social and environmental impacts of megaprojects (e.g., Charest, 1995, Gellert and Lynch, 2003, Molle and Flock, 2008, Scudder, 1973). Gaafar and Perry (1998) discuss the limitation of design liability for contractors in the construction industry. The project owner is singled out by Zwikael and Smyrk (2015) as the main driver of accountability for the realization of project benefits. Mueller et al. (2014) identifies some organizational enablers for governance and governmentality of projects such as the development of self-responsible and self-organizing people. Self-responsible people are important for the delivery of sustainable outcomes in projects, but the notion of responsibility is supposed to transcend people and to consider wider environmental and contextual issues.
In the sustainability domain, Klakegg (2009) suggests strategies for improving the relevance and sustainability in the front-end for major public projects. Deng and Poon (2013) suggest ways to improve practices at the early stage of mega-events flagships in order to meet sustainability challenges for catalyzing the regeneration of urban areas. Silvius et al. (2012) address the various aspects of sustainability in projects (e.g., nuclear plants, space projects, refineries, etc.), as well as in developing countries (e.g., water and sewage systems, energy dams, underground lines, etc.). The framers propose to rethink the dimensions of responsible innovation (Silvius et al., 2013), the instruments of accountability for megaprojects (Flyvbjerg et al., 2013), and the principles of sustainability (Silvius et al., 2013, Silvius et al., 2012) as a starting point to flesh out in practice the areas of concern when the conception of a project emerges and evolves towards an outcome (e.g., new industrial facilities and infrastructure for transportation and water supply). This requires an inclusive approach and increasing participation of all stakeholders involved in the process (i.e., members of society and their representatives, investors, project developers and integrators, government organisations, etc.). They are of social, economic, and political importance for the success and the legacy of developmental megaprojects and the avoidance of unintended consequences.

This paper explains the concept of RPM in four sections. In this first introductory section, we articulate the various aspects (accountability, liability, sustainability, etc.) in which the issue of responsibility is discussed in the literature of megaprojects. We propose that these various aspects can be articulated into an integrated framework through the concept of ‘Responsible Innovation’. In Section 2, we present the four dimensions of RI (Silvius et al., 2013), the four instruments for accountability in megaprojects (Flyvbjerg et al., 2013) and the six principles of sustainability (Silvius et al., 2013, Silvius et al., 2012), which are the starting point for developing the integrated framework for RPM. In Section 3 we develop the framework for ‘Responsible Project Management’, organizing the dimensions, instruments and principles in a more comprehensive way for better understanding and visualizing of the various aspects put into play. Section 4 draws some conclusions regarding the integrated framework to improve megaproject performance, and invites further research in order to address the limitations of the framework and to refine it.

2. In search of a framework for responsible project management

The sustainability challenges that we face every day have changed dramatically what we do and what we are expected to do in order to guarantee access to goods and services to the current and future generations. It has changed the perspective from just a few people in charge of sustaining any economic and environmental system to a more inclusive approach. This means that the present model of economic growth of countries may not be socially and environmentally sustainable in the long term. This raises the problem of the need for a more holistic understanding of megaprojects as projects (e.g., nuclear plants, space projects, refineries, etc.). This understanding will be made more apparent in terms of the degree of fitness with their environment and society at large. Projects (especially the large scale, megaprojects) can be seen as socio-technical systems, beyond the techno-economic paradigm which is the pervasive approach predominant in the development of megaprojects. Issues such as the public and private actors that megaprojects tend to involve are valued and insufficiently addressed in the early stages of the front-end and planning of megaprojects, sometimes resulting in ‘white elephants’ that only raise suspicion before the public eye.

The main purpose of this section is to review critically three interrelated bodies of literature to explore sustainability as the main aim of any economic and social system and to obtain in-depth understanding as to why we need a Responsible Project Management concept and a framework for its practical realization.

The section explores three propositions in order to obtain a better understanding of the meaning of sustainability of project management and to address the agents and processes that influence accountability and responsibility therein. These propositions focus on:

- Responsibility regarding the activities and processes and their intended and unintended consequences when searching, defining and carrying out new projects (Who’s responsible? Who benefits? Who decides? What are the risks? Who’s in control? What if we are wrong? What are the alternatives?) (Silvius, 2013).

- The sustainability of the project per se. That means projects that guarantee to a certain extent the protection of the planet’s natural resources and increasing welfare for more people (Silvius et al., 2012).

- Redrawing and rethinking some instruments of accountability of private and public sectors and increasingly society’s participation in the development of major infrastructure and megaprojects (Flyvbjerg et al., 2013).

The concept of RPM is novel as it is evidenced by the fact that it has been developed in the literature. The contributions of this paper are in two aspects: (i) to introduce the RPM concept in regard to megaprojects; and (ii) to provide a framework which might help improve the performance of project management.

2.1 Responsible Innovation Approach

The Responsible Innovation approach started in academic and policy studies of science, technology, and society in the past 20 years. However, as it is addressed by Siligoe et al. (2013), responsible innovation is an idea that is both old and new, and it is an operational practice, which is framed in different time and place. Science, Technology, and Innovation (STI) have allowed society to have important achievements. In turn, society is also influenced their direction. However, the key question for scientists, technologists, innovators, firms, and policy makers is the extent to which STI can maximize economic and public values that match the demands of society. This is an important concern in developed countries and increasingly in developing countries (Murakami et al., 2013), since sustainability is a local-global process, which involves individual, organisational and societal responsibility.

RI is a recent and emerging powerful policy discourse in Europe and North America (Owen et al., 2013a, Owen et al., 2013b) and increasingly in cross-cultural perspectives from North South governance of controversial areas of research, technologies and innovation (Macnaghten et al., 2014) and responsible global leaders in management (Mafig, 2013).

The RI framework proposes that research and innovation processes must be responsive to societal challenges, the technical, economic, and social uncer- tainties, ambiguities and questions that research and innovation create (Owen et al., 2013a). Stilgoe et al. (2013, p 1570) reframe responsibility aiming at opening up and cataracting the democratic autonomy, which constitutes the relevant foundations for responsible innovation and expands to ‘responsible research and innovation’. Although the framework lacks conceptual weight, it appears in academic and policy literature and debates around nanotechnology and other emerging contested areas of science and technology (e.g. geengineering projects, GMOS, etc.) (Owen et al., 2013a, Parkhill et al., 2013, Stilgoe, 2013, Silvius et al., 2013). RI is seen as a platform for making sense of the move from the governance of innovation to the governance of innovation as it is conceptualised by the European Commission. However, RI is and will be an evolving framework that addresses different factors of responsibility, accountability, sustainability and regarding science, technology, and innovation, which affect economies and eventually societies in different ways.

von Schomberg (2013, p 63) defines Responsible Research and Innovation as ‘A transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability,
the shaping of agendas for socially-risky research and innovation. Improved anticipation in governance comes from several sources: political and environmental concerns about the pace of social and technical change; from scholarly critiques of the limitations of top-down risk-based models of governance, which entail the social, ethical, and political stakes associated with technological and scientific progress. The negative outcomes of megaprojects are often unforeseen and risk-based estimates of harm have failed to provide early warning. Then anticipation calls for stakeholders to ask specific questions about what it... to consider contingency, what is known, what is likely, what is plausible and what is possible; any process of anticipation faces a tension between prediction, which tends to see particular futures, and participation, what is possible; any process of anticipation faces a tension between... the shaping of agendas for socially-robust risk research and innovation. Multi-stakeholders’ inclusion is also an ongoing process in the execution of a megaproject when deliverables are presented and assessed to avoid overruns in time and cost; and to avoid unintended consequences for society (i.e. financial breakdowns, vulnerability to natural disasters, changes in technology, environmental degradation, tax increases, etc.), which emerge in the process of project implementation and its legacy. Responsiveness is the coupling of reflection and deliberation to action that has a material influence on the direction and trajectory of innovation itself (Owen et al., 2013, p 29). It requires a capacity to change shape or direction in response to stakeholder concerns and interests arising through the changing circumstances (Stilgoe et al., 2013, p 1572). In a much broader sense, responsible innovation calls for embedding policy measures and regulatory frameworks into the coupling of anticipation, reflexivity and deliberation to action. Then, agents can resolve conflicts and move beyond their traditional roles. For instance, where companies highlight benefits and NGOs risks, co-responsibility implies that agents have to become mutually responsive. It means firms have to go beyond the short-term benefits and NGOs have to reflect on the constructive role of new technologies and innovations. In other words, responsiveness implies responding to changes as they arise. It requires sufficient discussion among stakeholders on the possible positive and negative consequences of STI and/or projects. Moreover, these consequences need to be visibilized and accountable to the society as a whole (Owen et al., 2013, p 44, 70, 210, 235). 2.2 Sustainability in Project Management Sustainability in project management has become a very important idea among practitioners and academics from different perspectives (i.e. normative, logical or moral point of view). However, it is still an emerging field of study in project management, which requires empirical evidence on how sustainability is implemented in practice (Silvius et al., 2013). Sustainability is not just relevant to projects and project management; it is increasingly necessary to support society’s development and this implies the full deployment of a project, from its inception to its disposal. Since project management standards fail to address sustainability, (Silvius et al., 2013, p 14) propose to include it. From this point of view, the necessity of a new dimension: the question should change from ‘doing things right’ to ‘doing the right things’ (Silvius and van den Brink, 2011, p 235). Not only, in order to ‘DO things, we need to change the way we VIEW things’ (Nelmana Arzba, Global Reporting Initiative Director in Planko and Silvius, 2012, p 19). (Silvius et al., 2013, p 11) reported that in 56 case studies an overall level of sustainability consideration in the Actual Situation (that is, giving consideration to sustainability of the project) was 25.9%. For the Desired Situation (having an ambition about sustainability of the project), the score is 10% higher (35%). The results show that sustainability is most of all considered on the level of business resources, accordingly with a traditional project management view and not at the level of the product or service, which would correspond to a broader project view and not a project management view. The authors conclude that sustainability is an emerging trend moving from reputation management strategy to true strategic integration. It should be argued that sustainability must be a way of working, doing, and living in a way firms and any other organisations improve the welfare of the society and prevent the exhaustion of natural resources. Sustainability in projects and project management is the development, delivery and management of project-organised change in policies, processes, resources, assets or organizations with considerations of the six principles of sustainability: in the project, its results and its effects’ (Silvius and Schipper, 2012, p 46). This includes the internal, which focuses on the delivery and management processes of the project, the project resources, approach and team; and the external scope, which focuses on the deliverables and benefits of the project, in other words, the project results and their effects. All the innovations emerging about both short term and long term orientation, another principle of sustainability, which links these two scopes together. Although one could argue that the responsibility of the project manager is restricted to the internal scope, the project delivery and management processes, considering sustainability in project management inevitably includes sustainability aspects of the project deliverables and their effects. This
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Economic
- Economics
- Returns on investment
- Direct financial benefits
- Net present value
- Strategic value
- Risk analysis

Business and organisational model
- Flexibility
- Optionality in the project business model
- Organisational arrangements

Environmental
- Transport
  - Local procurement
  - Supplier selection
  - Digital communication
  - Travelling
  - Transport
- Energy
  - Energy production and use
  - Emission/CO2
- Water
  - Water supply and usage
  - Recycling
- Waste
  - Production
  - Recycling and disposal

Ecosystem
- Land use
- Affected landscape
- Use and erosion of resources
- Biodiversity
- Pollution sources
- Noise
- Community and social impacts

Use of materials and resources
- Reusability
- Incorporation energy
- Sustainability of suppliers

Social
- Labour practices
  - Fair employment
  - Labour-management relations
  - Fair wages and salaries
  - Health and safety
  - Training and education
  - Organisational and systems learning

Human rights
- Non-discrimination
- Diversity and equal opportunities
- Freedom association
- Opposing child labour, forced and compulsory labour

Society and customers
- Community support and development
  - Public policy/compliance
  - Customer health and safety
  - Product and services labelling
  - Market communication and advertising
- Customer privacy

Ethical behaviour
- Investment and procurement practices
- Anti-bribery and corruption measures
- Anti-competitor behaviour

TABLE 1. Context and Variables for the Main Dimensions to achieve Sustainability for Project and Project Management
Source: Authors’ modification of (Silvious, 2010, cited by Silvious and Schipper, 2012, p.4)

external scope may not be the primary and direct responsibility of the project manager, but project managers are the best positioned to bring sustainability aspects to project management, which goes beyond corporate social responsibility narrowly defined (Russell, 2008, cited in Schipper and Silvious, 2013). Therefore, the project manager has an influence not just on the project process, but also on project deliverables (Schipper and Silvious, 2013).

The proposed principles of sustainability (Silvious and Silvious, 2013; Silvious et al., 2010; Silvious et al., 2013; Silvious et al., 2012; Silvious and van den Brink, 2013) act as a guidance to address sustainability in project and project management. They are based on reflections of multiple propositions (Gareis et al., 2011; Gilbert et al., 1996; Martens, 2006; Robinson, 2004; Wil- lad, 2003) including the ISO 26000.

These principles are:
- Sustainability to balance and harmonise social, environmental and economic interests. It requires a proactive approach and is not just about compensating harmful consequences but creating new opportunities.
- Sustainability addresses both short-term and long-term consequences of firms, organisations, and government and stakeholders’ actions. It is, therefore, not only focused on short-term gains. This is a very important principle for publically financed projects, for which firms in many cases have overemphasised the short-term performance and thereby lost sight of the possible negative social impacts or environmental degradation, which may occur over the long-term.
- Sustainability focusing on local and global orientation for which international stakeholders’ behaviours (i.e. government agencies, competitors, suppliers or potential customers) and their institutions must coordinate efforts across several levels, ranging from the local to the regional and the global.
- Sustainability based on consuming income, ensuring the natural capital remains intact and the environment is not degraded. Therefore, the extraction of renewable resources should not exceed the rate at which they are renewed. Whereas this principle is clear for financial managers, from a social or environmental perspective, however, the impact may not be visible in the short-term, causing degradation of resources in the future. Therefore, for firms to be sustainable, managers have to manage not only economic capital, but social and environmental capital.
- Sustainability, with its focus on transparency and accountability means that organisations are open about their policies, decisions and actions, including the environmental and social effects of their activities. This implies that they provide timely, clear and relevant information to their stakeholders so that the latter can evaluate the former’s actions and can issue decisions of concern. The principle of accountability is logically connected to this and implies that an organisation is responsible for its policies, decisions and actions and the effect of these on environment and society – and which it accepts.
- Sustainability is also about personal values and ethics. Sustainable development is inevitably a normative concept, reflecting values and ethical considerations of a society. Accordingly, a change in behaviour is required on the part of professionals, business, and consumers so that they are congruent with this normative stance. These principles represent consideration and dilemmas from different perspectives on the project. However, in order to integrate these principles in the project and project management, they have to be specific to the project under consideration for which specific context and variables have to be analysed (e.g., see Table 1).

These principles eventually have direct effects on the societal and organisational context of the project, the increasing responsibility of stakehold- ers in the short and long term as well as in both local and global environments. Therefore, they will influence the content of the project, which will influence objectives, results and success factors, when environmental and social concerns are included. These principles will also affect the business case in order to expand non-financial factors (e.g. societal perception of the project, ethical behaviour on the selection of suppliers, etc.) (Schipper and Silvious, 2013; Schipper et al., 2012) to redefine and define the success of the project in a wider and more sensitive way to benefit not just firms and government organisations, but the welfare of future generations.

2.3 Accountability in megaprojects
Accountability in megaprojects comes up from Flyvbjerg et al.’s (2013) discussion of the five most important factors that explain the megaproject paradox: a) cost overruns, b) inaccuracy in the demand forecasts, c) environmental impacts and risks, d) regional and economic growth effects, and e) optimistic risk analysis.

Cost overruns in major transport infrastruc-ture projects is widespread – often by 50-100%. A main cause of overruns is a lack of realism in initial cost estimates because many factors influencing the cost are ignored (e.g., geological risk, environmental risk), or underestimated (e.g., duration of activities, changes in specifications, changes in exchange rate, etc.). Many projects have predictive and important technological innovations with high risk (e.g., delays in technological development, uncertainty of the outputs and unexpected conse-quence), which is translated into cost increases.

Also in the transport sector, demand forecasts (e.g., covering traffic volumes, spatial traffic dis-tribution and transport modes, etc.) are the basis for socio-economic and environmental appraisal but are usually wrong by 20-70%. Therefore, the financial viability, which relies heavily on these forecasts, is often poor. If the actual viability had been known for a given project, the decision might have been: a) not to implement the project, b) to implement it in a different way, or c) to develop an alternative project. Clearly, the uncertainty is invariably high. However, the lack of further use of tools to understand the sources of uncertainty and the risk of the project (except the economic risk assessment) leads to an inef- ficient use of resources.

The extent and magnitude of the actual environmental impacts of projects are often very different from forecast impacts. The Environ-mental Impact Assessment (EIA), which is the main methodology used to predict environmental effects of megaprojects, is rarely used to trigger learning. The reason for lack of learning is that in most cases, post-auditing of projects is neglect- ed. Furthermore, although many environmental studies have been done, there are important deficiencies of these assessments such as a) a lack of accuracy in impact predictions, b) the narrow scope of the impacts in their time horizon, and c) an inadequate organisation, scheduling and institutional integration of the EIA process in the overall decision making process.

The regional, national and sometimes inter- national development and growth claimed by promoters of projects typically does not mater- ialise, or they are so diffuse that researchers cannot detect and measure them. Studies of the effects of economic growth of firms affected by the megaprojects are marginal. The main reason why is this so, the transport cost is relatively small component of the final price of goods and servic-
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es (1-7%) that firms produce (ibid., p 71). However, the combination of the investment in both infrastructure and social capital in proactive regional development has proved to attract new business and leisure activities.

The appraisal optimism of risk analysis refers to the actual project viability, which does not correspond with forecast viability, especially market forecasts, which are in most cases brazenly over-optimistic (ibid., p 136).

(Flyvbjerg et al., 2013) conclude that rent seeking behaviour and the appraisal optimism are not in the interest of those whose money is put in risk, i.e. taxpayers or private investors. Nor are they in the interest of those concerned with environment, safety, democracy and the social interest. For those stakeholders, (Flyvbjerg et al., 2013) propose four instruments to improve accountability in megaproject decision making.

1. **Transparency** is the main instrument to enforcing accountability. Transparency refers to a higher degree of openness and of public participation, which requires a high involvement of stakeholders, explicitly civil society. In other words, it demands inclusion of wider groups of stakeholders, and the engagement of the public that might be affected.

2. **Performance specifications** imply a goal-driven approach to megaproject decision making. This is the opposite of the conventional technical-solution approach. Performance specifications force stakeholders to focus on the end rather than the means. This requires a constructive, reflexive and responsive dialogue with different stakeholders, which play an active role regarding environmental, safety, economic, and social interests to construct credibility for the project and their supporters. This instrument is clearly related to anticipation and reflexivity dimensions of responsible innovation, which aim at recognising and systematically reflecting upon social and ethical issues of decision making. These processes might eventually contribute to balancing and harmonising the interest of the economic, social and environmental stakeholders.

3. **The regulatory regime** refers to the set of political, economic, and financial rules regulating the construction and operations of a specific megaproject, which influence the cost and risk of the project. It has to be set up front when the project is conceptualised and implemented — meaning that the regulatory regime is central to any feasibility study and appraisal. This instrument is becoming increasingly important since most megaprojects are funded by private and public investment. Furthermore, the political nature of projects requires a regulatory regime which identifies all risks before the decision regarding the project is made and supports and anticipates possible responses to stakeholders’ demands.

4. **Risk capital**, in economic terms, is the most important issue from an accountability point of view. It leads to the decision on whether to proceed with a project. Governments are not sufficiently effective in enforcing accountability on decisions made on mega infrastructures. A more effective way of achieving accountability is to authorise a project — assuming the project satisfies agreed public interest objectives — but without a sovereign guarantee. Hence at least part of the capital is genuine risk capital. In other words, only if this capital is mobilised will the project be undertaken. Thus, tax payers bear limited risk and investors will share the costs of wrong decisions. This inevitably necessitates a high degree of involvement by investors during the design, construction and operation phases of the project. As a consequence, better cost control can be expected and better control against construction delays. (Flyvbjerg et al., 2013) propose two alternative models to improve accountability in megaprojects decision making: one based on the state-owned enterprise (SOE) approach to project development, and the other on the build-operate-transfer (BOT) approach. Both alternatives require careful consideration of the four instruments; moreover, they are very useful in supporting some of the sustainability principles. For instance, it is clear that the issue of sustainability is important for firms and organisations since infrastructure megaprojects are always subject to public scrutiny. For firms, the short term is crucially important (especially on cash flows and profitability) as it often determines long term survival. In the case of government organisations, since mega infrastructures are assessed by society in terms of perceived costs and benefits, short term success or failure of the projects might affect and influence the political environment in the long term.

3. **An Integrative Framework: Responsible Project Management**

The idea of an integrated framework is to present and reflect on the four dimensions of responsible innovation proposed by (Stiglitz et al., 2013) (i.e. anticipation, reflexivity, inclusion, and responsiveness), which are the preconditions for responsible project management achieving sustainable projects. These dimensions embed and extend the instruments of transparency, performance specifications, regulatory regime and risk capital in order to improve megaprojects accountability as proposed by (Flyvbjerg et al., 2013).

**TABLE 2.** An overview of the dimensions of responsible project management

**FIGURE 1.** An integrated framework for responsible project management (RPM)
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et al., 2013), which eventually aim at supporting the principles for sustainability in project management proposed by (Silvis et al., 2012) (i.e. balancing and harmonizing social, environmental and economic interests; long and short term orientation; local and global orientation; consuming income, not capital; transparency and accountability; values and ethics). Principles of sustainability on the top layer, dimensions of responsible innovation and instruments for accountability as preconditions for responsible project management are represented as nested circles or progressive layers in Figure 1. The nested circles and progressive layers give a sense (but not a necessity of hierarchy). This means that the principles of sustainability, dimensions of responsible innovation and instruments for accountability in megaprojects may be seen ‘blended’ in a way that better suit the megaproject under consideration.

RPM goes beyond time cost and quality constraints, which are firm–customer centred. RPM is a process carried out by responsible and accountable firms, government agencies, society representatives and in general multiple stakeholders. Their systematic and systematic participation in the identification, selection and implementation of megaprojects by highlighting some of the 48 areas of analysis and influence of RPM (see Table 2) is crucial to enhance sustainability. The ultimate aim is preventing and/or avoiding unintended consequences as a result of implementing a megaproject.

RPM framework entails cross disciplinary views and activities, of multiple combinations of the various areas of analysis and influence of RPM throughout the preconditions (i.e. dimensions of responsible innovation and instruments for accountability).

Table 3 shows an instance of the ‘customised variables for operationalising and practicing RPM’. Each project can take different and specific combinations of variables depending on a) the type of project based on novelty (derivative, platform, breakthrough); technology (low, medium, high and super high); scope (assembly, system, array or meta system), and expected legacy, that is, the degree of uncertainty and complexity of a project (Shenhar and Dvir, 1996, Shenhar and Dvir, 2007); and their systems (Davies and Hoody, 2005, Hoody, 1996) (e.g. research projects, industrial projects, infrastructure projects and mega projects); and b) the economic, environmental and social impacts of the project (Flyvbjerg et al., 2013, Silvis et al., 2013, Silvis et al., 2012, Proctor and van den Brink, 2013, Stiglo et al., 2013).

These areas of analysis and influence to operationalise RPM are the starting questions for each of the projects and the customised variables are left open as they are defined in the project in consideration such as research projects and mega projects, industrial, infrastructure and complex projects. Customised variables could be analysed and defined according to the circumstances of the project by several authors depending on the stakeholders’ views, interest and responsibilities of a specific project (see examples in Table 1). These indicators are included in Table 3, that the framework informs the analysis of the customised variables. Moreover, the elaboration of the customised variables, as indicated in the Framework would also be informed by a project categorisation and typology, which can highlight some aspects such as the extent of the geographical impact of the project - from local, to regional, to national, to international, to global.

3.1 Responsible Project Management as a cross disciplinary approach

Responsible project management is a cross disciplinary management process in which stakeholders either feel responsible, or can be made responsible for a project (i.e. the product and/or the service) and its consequences on a sustainable basis. RPM refers to whatever invites, accommodates, stimulates, enhances, fosters, implies, or incentivises responsible action from stakeholders who have participated in the conception and definition of a megaproject as well as its design, execution, implementation, control during its life cycle (including maintenance) and eventually its disposal. It implies that those who initiated it and were involved in its functioning be accommodated as ethical and responsible agents. They have to be capable of:

- obtaining as much as possible the relevant knowledge on the consequences of the inputs and outcomes of their activities; and on the range of options to commission a megaproject;
- evaluating options effectively in terms of relevant values (e.g. wellbeing, equality, justice, privacy, safety, security, sustainability, democracy, and efficiency). In other words, RPM is a capability procedure for ethical stakeholders and agents involved in the conception, development and disposal of megaprojects.

RPM as a tool might be a process to improve the performance of firms and organisations and to prevent the collapse of firms and governments by avoiding unintended consequences for societies and their ecosystems (Flyvbjerg et al., 2013, van der Hoven, 2013, Silvis et al., 2013).

The RPM framework helps to address project sustain-ability at three different levels: a) the macro-level, which focusses on the socio-political and economic environ-ment of the project, i.e. the context in which the project is conceptualised and defined; b) the meso level, which articulates the institutional processes which affect the macro level, and supports the firms and organisations ac-tivities to conceptualise and implement the project, and c) the micro level, which connecting responsi-bility when no one actor/stakeholder/public is in con-trol, but many are tasked with specific project activities (Flyvbjerg et al., 2013, Macnaghten et al., 2014, Stiglo et al., 2013).

3.2 Limitations of the concept and framework of Responsible Project Management

The main constraint on RPM is the limited reflexion of the implications and consequences of past projects in the use of resources to avoid further degradation of the environment and society. The main problem is the lack of systemic and systematic assessment of the costs and benefits of existing projects. Most of the existing assess-ments address the consequences of disasters such as the Chernobyl disaster, Chlorophenol explosion in 1986, and Fukushima explosion in 2011. Moreover, the debate on climate change and environmental sustainability is a hot spot on the agenda, but these indicators show the out-puts of some of the consequences of the extraction and exploitation of resources versus the rate at which they are renewed. Whereas economic considerations are usually clear, from a social and/or environmental perspective, considerable progress still needs to be made.

RPM requires a proactive approach as to how or-ganisations influence each other. Recognising the complexities and uncertainties of projects, which could be improved by anticipatory discussions carried out by including and engaging a broader audience than just traditional stakeholders to visualise short and long term futures at different levels, that is, economic, social and environmental ranging from the global to the regional and the local. Moreover, they would help to shape, coor-dinate and organise efforts towards them and eventually creating benefits instead of compensating unintended consequences, which may not occur before the long term.

RPM is logically connected to this and implies that an organisation is responsible for its policies, decisions and actions and the effect of these on environment and soci-ety. Responsible project management is, therefore, inevi-tably a normative concept and process, which reflects on values and ethical considerations of organisations, their individuals and of society. It needs to have implicit or explicit set of values that professionals, business leaders, government representatives and citizens can influence and which lead to collective behaviour for conceptualisation and implementation of new projects new projects.

RPM also implies a system of learning and knowl-edge, which underlies the evolution of complex systems, regardless of the nature and composition of the projects and their systems (Latzlo 1991). These learning systems might be the foundation for responsible leaders/stake-holders decision making process aimed at improving performance and commitment to society and environ-mental sustainability.

4. Conclusions And Policy implications

By linking the idea of RPM to the accountability and sustainability of megaprojects, we aim at broadening and amplifying the scope and scale of the traditional project management approach when conceptualising, designing, planning, implementing and assessing megaprojects. The integrated framework presented in Figure 4 reflects on the four dimensions of responsible innovation (i.e. anticipa-tion, reflexivity, inclusion, and responsiveness), which are the preconditions for responsible project manage-ment for the achievement of sustainable projects. These dimensions might be used to extend the role of trans-parency, performance specifications, regulatory regime and risk capital in order to improve the accountability of megaprojects, which eventually aim at supporting the principles of sustainability in project management (that is, balancing and harmonizing social, environmental and economic interests; long and short term orientation; local and global orientation; consuming income, not capital; transparency and accountability; and personal values and ethics).

This paper has developed an approach to attract the attention of project management practitioners, academ-ics, policy makers and members of the society, which are eventually the main participants in the development of the projects and/or those who benefit from or suffer from mega projects. Since these megaprojects are becoming increasingly high profile public and intensely political endeavours, which have generated stronger involvement of multiple stakeholder groups, they deserve special atten-tion for the future of the project management profession and practice in the decision making process.

The implementation of this framework requires further analyses of cases and their variables in order to refine and expand the RPM framework and/or to propose new/different instruments and dimensions to improve the performance of megaprojects, which may benefit society as a whole.
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