



## Bibliographic and comparative analyses to explore emerging classic texts in megaproject management

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### Abstract

Megaproject management (MPM) is a highly complex emerging research field with fragmental and diversified traits. Understanding the work on MPM and its classic texts can help advance the current body of knowledge significantly. However, to date, few quantitative methods exist that can determine the classic texts in MPM. This study aims to investigate the potential emergence of studies on MPM on the basis of bibliometric techniques. We conducted a bibliographic meta-network analysis for the most cited classic texts in five selected management theories as a reference group. By comparing the results from the reference group and from MPM, we identified and discussed several key features in the current MPM studies. This study bridges the gap in the quantitative identification and evaluation of classic texts in MPM theory, and lays out a road map for the future development of MPM theory.

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### 1. Introduction

Theories of management and organization have often originated from solving a practical question and its “tension,” which refers to “a wide variety of dichotomies, dualities, conflicts, inconsistencies and contradictory pulls or demands experienced by those in a particular setting that appear to represent different and contradictory poles and, as such, seem to require a choice of one or the other” (Bartunek and Rynes, 2014, p. 1183). In recent years, the emergence of megaprojects has gradually become a critical factor in strategies for social development, economic growth, technological innovation, and urbanization. A conservative estimate of the global megaprojects

market is between six and nine trillion U.S. dollars per year, accounting for approximately 8% of the total global gross domestic product (Flyvbjerg, 2014a).

Megaprojects encounter a number of challenges and dilemmas, such as decision-making risks, cost overruns, performance shortfalls, and environmental impact (Altshuler and Luberoff, 2003a; Flyvbjerg, 2014a; Flyvbjerg et al., 2003; Flyvbjerg and Stewart, 2012). Both academics and practitioners have argued that many of these issues actually appear when conventional theories of project management are applied to the management of megaprojects. This suggests we have arrived at a “tension point” for megaproject management (MPM) and calls for a systematic rethinking of the practical and theoretical issues that occur in MPM to facilitate the exploration and generation of new theoretical foundations that can address the complex challenges faced in MPM (Flyvbjerg et al., 2016). A recent study explored three texts in the megaproject management field and employed four criteria for a structured analysis to study their potential to

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E-mail addresses: [lyk@tongji.edu.cn](mailto:lyk@tongji.edu.cn) (Y. Li), [luy@nus.edu.sg](mailto:luy@nus.edu.sg) (Y. Lu), [jett@gatech.edu](mailto:jett@gatech.edu) (J.E. Taylor), [yilong.han@nus.edu.sg](mailto:yilong.han@nus.edu.sg) (Y. Han).

become classic (Pollack et al., 2017). Siemistycki used one case study to demonstrate that classic texts can have a significant impact on megaproject planning theory and practice and presented key ingredients that could make a classic text (Siemiatycki, 2016). Ma et al. introduced a conceptual governance framework to understand the characteristics of megaproject social responsibility. They concluded that an integrative mechanism of different organizations is critically important to facilitate and maintain efficient and effective social governance (Ma et al., 2017). From a different and a more holistic perspective of megaproject social responsibility, Zhou and Mi implemented a systematic approach to understand classification of megaproject social responsibility research and identified four research gaps and the corresponding research agenda for future work (Zhou and Mi, 2017).

A number of internationally recognized journals have also published special issues focusing to improve our understanding of megaprojects, including “Megaprojects - Symbolic and Sublime: an organizational theory perspective” (2015) from the *Project Management Journal*; “Social responsibilities for the management of megaprojects” (2015), “Classics in Megaproject Management” (2015), and “Complexities in managing mega construction projects” (2011) from the *International Journal of Project Management*; “Supply Chain Management in Megaprojects” (2015) from the *Journal of Management in Engineering*; “Megaprojects, Settlement Dynamics and the Sustainability Challenge in Metropolitan Cities” (2015) from *Habitat International*; and “Construction Economics and Building, Incorporating a Special Section on Megaprojects” (2015) from the *Australasian Journal of Construction Economics and Building*. In addition, the number of international conferences and workshops focused on MPM has similarly increased. Experts and scholars from governments, industries, and academia have had interdisciplinary and cross-cultural dialogue on MPM-related issues from different perspectives to search for possible solutions and/or best practices.

However, the establishment of a new theory is a long and rigorous process. The form of a management theory is subject to at least three conditions: differentiation, mobilization of resources, and legitimacy establishment (Hambrick and Chen, 2008). During the evolution of a new theory, classic texts are normally to be recognized as reference points to show the progress and advancement of the theory building (Flyvbjerg, 2014b; Kuhn, 2012). Currently, we lack consensus on a theory of MPM. Therefore, the need to identify the possible existence of classic texts in MPM has emerged as a critical and fundamental subject for the theoretical development of MPM.

This study empirically investigates the milestones and achievements of existing research on MPM theory through a bibliometric analysis. It first refers to the classic texts in five classical management theories by analyzing the functions, characteristics, and evolution of these texts both qualitatively and quantitatively. Similar bibliometric analyses and indicators are used again in MPM literature to evaluate its potential for classic texts. Then, we summarize the latest theoretical achievements of MPM and also shed light on the trajectory of MPM development. The findings of this study enrich the theoretical foundation of MPM as well as position it in relation to general management theories.

This study is organized as follows. In the following section, we review key literature and identify research gaps in existing MPM studies. We then describe the theoretical foundations and research framework. In Sections 4 and 5, we detail the data collection, bibliometrical calculation and analysis, and discuss the analytical results. The last section summarizes this study and proposes directions for future research in MPM.

## 2. Literature review

### 2.1. Definition of megaprojects

The term “megaproject” has not been explicitly defined in the literature. In layman’s terms, “mega” means great, large, vast, big, high, tall, mighty, or important. As a scientific and technical unit of measurement, one million is defined as “mega” (Flyvbjerg, 2014a). If such a unit of measurement in economic terms was used, then, strictly speaking, megaprojects would be million-dollar (or -euro, -pound, etc.) projects, while use of the terms “giga” and “tera” would indicate larger projects (Flyvbjerg, 2014a). In the construction field, Hu et al. define construction megaprojects from two different perspectives: the level of investment and the level of complexity (Hu et al., 2013). The former was usually adopted by governments and industries to characterize construction megaprojects; however, different criteria exist in different countries. As for academia, megaprojects have been characterized mainly by their complexity. Academics believed that construction megaprojects intrinsically exhibit highly complex characteristics and have endeavored to explain and propose solutions using complexity theory.

Additionally, many other terms have been used in the existing literature to describe megaprojects. These include “major project” (Morris and Hough, 1987), “complex project” (Miller and Hobbs, 2005), “(very) large/grand-scale project” (Charette, 1996), “large project” (Assaf and Al-Hejji, 2006; Cooper, 2005), “large engineering project” (Miller et al., 2001), “global project” (Mahalingam and Levitt, 2007; Orr and Scott, 2008), “macro-engineering project” (Saeed and Brooke, 1996), and “public works project” (Flyvbjerg et al., 2002). In case studies, megaprojects have been described as “transportation infrastructure project” (Flyvbjerg et al., 2004), “high-rise project” (Kaming et al., 1997), and “tera, giga, giant project and program” (Flyvbjerg, 2014a; Grün, 2004; Hu et al., 2013). Synthesizing insights from several key studies (Altshuler and Luberoff, 2003a; del Cerro Santamaría, 2013; Flyvbjerg, 2014a; Priemus et al., 2008), megaprojects can be framed as follows:

- Very expensive or very large, where the cost or investment exceeds USD 250 million, USD 500 million, USD 1 billion, or 0.01% of GDP;
- Attract a lot of public attention, carry strong symbolic significance, or are closely linked to society, environment, the economy, and politics;
- Are extremely complex in terms of technology, organization, environment, culture, and finance (and may include

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