Book review

Megaproject Risk Analysis and Simulation

By *Prince Boateng, Zhen Chen and Stephen Ogunlana*
Emerald Publishing
2018
334 p.
£70.00
Hardback
ISBN: 978-1-78635-831-8, eISBN: 978-1-78635-830-1
Review DOI 10.1108/F-08-2017-0080

Huge transport infrastructure projects are a global phenomenon: from the London Crossrail to the Hong Kong–Zhuhai–Macau Bridge and the California High Speed Rail, they are the present-day means for providing solutions to our infrastructure and transport needs. In their provocative book, *Megaprojects and Risk: An Anatomy of Ambition* 14 years ago, Flyvbjerg *et al.*[1] had called megaprojects "a new political and economic animal" and had rightly pointed out that megaprojects posed additional risks because of their sheer size, novelty and complexity. Megaprojects today continue to face several of the same old challenges pointed out all those years ago: inadequate consideration of environmental disruption, optimistic scheduling and costs, misrepresentation of the project's viability to those taking decisions and the general history of cost overruns and lower performance. What has positively changed since then, however, has been the shift in the perception of risk: from risk being estimated variance to becoming a project attribute.

Currently, there appears to be a general consensus that the world of megaproject preparation and implementation is a highly risky one – where things happen only with a certain probability and rarely turn out as originally intended. Some contend that given the complexity of megaprojects, the only way forward is to focus more on "in-practice" risk management. The book in question aims to do the same and focuses on construction risk during megaprojects and contends that better modelling and assessment of construction risk are essential if learnings from previous projects are to be incorporated and risks are to be better anticipated. The text combines dynamic systems approach (SD) and analytic network processes (ANP) to show their effectiveness using the recently completed Edinburgh Tram Network (ETN) Project in Scotland as a case study.

Those who lived in and around Edinburgh during the time of the project's planning and execution are witness to the kind of challenges it faced: concrete laid of incorrect specifications, contractual and financial disputes, safety issues voiced by the city's cyclists and of course cost that escalated from the approved £545m to the final £776m, with the project being delivered three years late. The ANP models presented in the book identify the risks from this very interesting case quantitatively, while SD carries out risk simulation over time so that emerging risks and their interdependencies are mapped and risk responses are developed appropriately. Given the importance of megaproject control, this book offers a framework that can allow project managers to respond quickly to changes in environment.

Facilities
Vol. 36 No. 3/4, 2018
pp. 227-228

0263-2772

The process (termed SDANP) goes beyond the traditional focus on analytical parameters and brings to focus the dynamic nature of factors contributing towards risk.

What I liked most about the text was its structure: the simplicity of moving from the need to manage risks more effectively on megaprojects to the detailed description of the ETN project to the introduction of the SDANP framework itself. Starting from risk quantification, the text went on to explain how the process of both (SD simulation and ANP quantification) can be done in the ETN project. For those interested in the management of inter-relatedness of risks, the causal loop diagrams developed through the SDANP framework and the sub-systems (social risk system and technical risk system, for example) generated will be interesting and useful.

Megaproject Risk Analysis and Simulation is a decent contribution to the literature on megaproject risk management in terms of practical risk frameworks and is relevant for academics and practitioners working in the area of megaproject risk management. However, given that it covered the construction phase of the project, one felt that it lacked contractual and technical details of the ETN itself that one would have expected from a book covering a high-profile case such as ETN. While the authors acknowledge this as a limitation in the final chapter, the lack of identifiable details of the project construction phase left a bit to be desired, as the data felt embedded in a context that was not described richly enough. In providing the means to generate new insights into the future using a non-deterministic systems approach, however, one must appreciate that the framework is an effort to counter the long-standing assumption that all project risks *can* be identified prior to the start of a project and that their "management" is not rooted in the dynamic present.

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Note

1. Flyvbjerg, B., Bruzelius, N. and Rothengatter, W. (2003) *Megaprojects and Risk: An Anatomy of Ambition*. Cambridge University Press.