

Megaproject Organization and Performance: Myth and Political Realities

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EXECUTIVE SUMMARY

This report summarizes the insights of a three-year study on “megaprojects”—the project-based organizations purposely formed to develop capital-intensive, large-scale infrastructure systems. Our aim was to further our understanding of what form of organizing work a megaproject is and investigate the extent to which we could trace empirical regularities in the performance of megaprojects back to their organizational structure. Our central claim is that megaprojects are a meta-organization—a network of legally independent actors collaborating under an identifiable system-level goal. As with any meta-organization, megaprojects are guided by a “systems architect,” a designated leader who steers the organization in pursuit of a higher-order goal. In the case of megaprojects, the systems architect is the *project promoter*, the actor who had the grand idea and provides leadership. The promoter can be a solo actor, such as a public agency, a government, a private firm, or a coalition of actors.

In this study, we conceptualize the megaproject organization as formed by two constituent parts: core and periphery. The core members control the strategic choices that define the project output and the development process structure. The core is made up of the promoter and multiple autonomous actors who have direct access to the strategic decision-making process because they control critical resources, including finance, political influence, regulatory power, knowledge of needs, and land. In contrast, the periphery is formed by suppliers selected by the promoter to execute the strategy agreed by the core members.

Within the core structure, the project promoter cannot use authority vested in ownership stakes or regulation to get things done. The promoter and the core participants may be unified by the system-level goal. But the core participants are legally independent actors with heterogeneous interests, beliefs, and knowledge bases, and see themselves as “development partners”—as such, they are willing to commit their own resources to the system-goal insofar as the promoter shares with them rights to directly influence strategic choice. Diffused power over strategic choice creates a pluralistic structure at the core. In these settings, a “dominant coalition” rarely emerges with sufficient power to impose their preferences on others. Hence, strategic choices are the outcome of negotiation and deliberative processes. In marked contrast, the vertical relationships between the project promoter and the suppliers at the

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periphery are governed by buyer-supplier contracts that simulate an authority hierarchy.

Armed with this conceptualization of a megaproject as a form of organizing work, we tackle the issue of performance. Deep-seated social norms establish that a “successful” megaproject is a project in which the scope is frozen early on in the planning stage in order to deliver the project during the implementation stage on time and within budget. These norms are rooted in the professionalization of the project management practice in the 1950s. Since then, the world has become much more crowded and interconnected by technology, but the norms have yet to adapt. Thus, it is hard to see how megaprojects today, with their pluralistic structure at the core, cannot “fail” in the eyes of third parties. This is troubling because megaprojects are a source of value creation. It is also unfair to the leaders of these complex enterprises who deserve our sympathy, not blame. By revealing the organizational structure of a megaproject, it is our hope to contribute to debunk the megaproject performance myth.

The empirical database informing this study includes several large-scale, capital-intensive infrastructure development projects. Our initial theoretical insights are grounded in four contemporaneous megaprojects in the United Kingdom: Crossrail and High Speed 2 railways, London Olympic park, and the Heathrow Airport Terminal 2 (T2). These projects unfolded surrounded by the institutional context of an advanced economy with robust democratic institutions. We subsequently extend the validity of our claims to a developing economy context by studying large infrastructure development projects in Nigeria, India, and Uganda.

We organize this study in five chapters. Chapter 1 lays down the conceptual argument that is then exposed in detail in the next four chapters. Specifically, Chapter 2 asks: What form of organizing work is a megaproject? Chapter 3 traces regular slippages in the performance targets intrinsic to megaprojects back to their organizational structure. Chapter 4 investigates the governance and performance implications of the pluralism at the core of a megaproject organization. Finally, Chapter 5 moves us into developing economies, and we explore how this context affects the structure-performance relationship in a megaproject organization.

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Chapter 1: Introduction

What form of organizing work is a megaproject? Why do performance targets in megaprojects regularly slip over time? Can we trace regular slippages in the megaproject performance targets (cost, schedule, scope) back to their organizational structure? These are the central questions that motivate this study. Here, we claim that megaprojects are “meta-organizations”—networks of multiple actors, including individuals, communities, public bodies, and firms collaborating under an identifiable system-level goal (Gulati, Puranam, & Tushman, 2012). The defining attribute of meta-organizations is the absence of employment relationships, or ownership stakes, as sources of authority between its members. Meta-organizations are not, however, self-organizing systems. Rather they are guided by a central “systems architect”—a designated leader who leads the organization in pursuit of the higher-order goal. In the case of megaprojects, the leader is the project promoter. Here, we argue that megaprojects are a special class of meta-organization because of the fundamental structural differences between the two constituent organizational parts: the core and periphery.

The *core* of a megaproject is the organizational structure that controls strategic choice. In megaprojects, the core structure is porous and pluralistic. We trace the porosity of the megaproject core to the system-level goal. A megaproject promoter rarely has direct control over all the critical resources necessary to forge ahead, including finance, land, political support, regulatory consent, and knowledge of needs. Some resources may also not be up for sale. More likely, direct control of these resources will be distributed across multiple legally independent actors. These resource-rich actors will be directly impacted by the megaproject outcome and thus have a “stake” in the megaproject organization. Hence, resource-rich stakeholders want to be “development partners,” and propose to volunteer their resources in exchange for rights to access the strategic decision-making process. As a result, in a

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megaproject, multiple actors will share direct influence over the strategic design choices that define both the outcome and the development process. The sharing of decision-making power across autonomous actors with conflicting goals creates a pluralistic structure. Under pluralism, strategizing is inherently political and the outcome of negotiated processes.

In marked contrast, the periphery of a megaproject organization is a close, hierarchical structure. At the periphery, a vast supply chain of suppliers provides expert knowledge and labor for the organization, and carries out the engineering and implementation works in exchange for monetary rewards. Unlike the development partners, the supply chain has much less direct influence over the strategic design choices. Furthermore, suppliers can only enter into the megaproject organization if they are selected by the promoter or by the promoter's agent. Hence, the periphery is a closed organizational structure. The vertical relationship between the promoter and suppliers is governed by buyer-supplier contracts. Formal contracts enable the promoter to simulate an authority hierarchy in the relationship with the suppliers.

Armed with this conceptualization of a megaproject as a form of organizing work, we set off to shed light on why megaprojects perform the way they do. Various studies suggest, with statistical significance, that megaprojects struggle to keep the scope stable (Flyvbjerg, Bruzelius, & Rothengatter, 2003; Mellow, McDonwell, & Arguden, 1988). As a result, megaprojects grapple to achieve the system-level goal—the delivery of a functional, designed artifact—within the cost and schedule targets announced at the onset of the planning. And yet, megaprojects cannot do without premature commitments to performance targets. These commitments attenuate ambiguity in the value proposition and build the legitimacy necessary to convince other resource-rich actors to commit critical resources to the goal. But commitments to a performance baseline create normative expectations. Enterprises that fail to

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conform to norms established in the context lose their legitimacy to operate. Hence, a megaproject organization that fails to meet the initial pledges “fails” in the eyes of third parties and loses legitimacy for allocating the resources that the pledges allowed it to acquire.

Extraordinarily, the debate on megaproject performance has been stuck for almost 20 years between two views. One claims that the promoter frequently underestimates the performance targets. The reasons offered are varied, and include (1) optimism bias and deliberate strategic misrepresentation (Flyvbjerg et al., 2003; Wachs, 1989); (2) underinvestment in planning, leading to vague or poorly specified goals (Merrow et al., 1988; Morris, 1994); and (3) use of rigid buyer-supplier contracts that preclude the suppliers’ know-how to feed into planning and lead to late suppliers’ claims for compensation (Stinchcombe & Heimer, 1985). The second and more benign view is common, too—that megaprojects cannot be planned reliably because of external events and institutional self-interests that lay outside the promoter’s control. Promoters are thus hostage to project pathologies including scope creep or scope “shaping” (Miller & Lessard, 2000), inflationary consensus (Denis, Dompierre, Langley, & Rouleau, 2011), and escalation of commitment (Ross & Staw, 1986).

Reconciling less benign arguments that trace megaproject underperformance to agency problems with the more benign argument that traces megaproject underperformance to the environment has been a conundrum. Both views draw the boundaries separating the megaproject organization from the environment around the promoter organization. Hence, in both views, resource-rich actors are “external” stakeholders, not “development partners.” However, the two views are undergirded on different behavioral assumptions of the promoter. In the first view, slippages in the performance targets are traced to the promoter’s private decisions to set overly optimistic targets. These decisions are rooted in the promoter’s

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opportunism and incompetence. In contrast, in the second view, the megaproject promoter is well-intended and competent, but it is also hostage of the interests of powerful actors in the environment, the main cause of slippages in the performance targets.

In this study, we propose to reconcile these two research traditions by redrawing the megaproject organization boundary. We do so by bringing resource-rich stakeholders in the environment, the so-called “development partners,” into the megaproject organization. Hence, in our conceptualization, the environment around the megaproject organization is delineated to, first, the resource-poor stakeholders, that is, actors who may need to be consulted by regulation but lack the power to influence strategic choice directly, and two, to regulations and laws in the institutional environment. By delineating the organizational boundaries of a megaproject in this way, we reveal the pluralism at the megaproject’s organizational core.

Under pluralism, collective strategizing involves negotiation processes, and these processes invariably lead to slippages in the project performance targets. In addition, the political nature of many strategic choices leads to two other major performance risks. One risk is that of impasse, if the promoter and the resource-rich actors who mistrust one another keep disputing the evidence that the other party uses to back up his or her arguments—lack of cooperation leads to defections and the collapse of the pluralistic arena (Langley, 1995). This risk explains why megaprojects can take so many decades to get off the ground during the planning stage. A second risk is that the megaproject promoter makes concessions disproportional to what is at stake to carry the development partners along, undermining the collective value of the enterprise. This risk can explain why some megaproject organizations produce “white elephants”—sources of private value, but not collective value creation.

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The premise that strategic design choice in megaprojects is rooted in a pluralistic structure is also important for understanding discrepancies between the rhetoric used by promoters to describe performance and public perceptions. Under pluralism, strategic ambiguity and reification practices are critical devices to keep the pluralistic setting afloat (Denis et al., 2011; Jarzabkowski & Fenton, 2006). Strategic ambiguity creates space for incompatible goals and translates into vague goals, equivocal language, procrastination on difficult decisions, inflationary consensus, and the safeguarding of rights to reverse decisions. Reification practices add symbolic value to continued involvement and make it hard for participants in a pluralistic setting to withdraw without losing face; reification practices translate into: (1) enthusiastic language in public discourse implying prestige, process, and technological leadership; (2) signatures of nonbinding protocols and memorandums of understanding; and (3) ratification of documents. Both sets of practices are necessary to carry the participants in a pluralistic setting along, but they have a double edge in that they sow the seeds of discord. In a megaproject organization, the use of these rhetorical practices leads to a gap between what project promoters say about performance, and the cost overruns, delays, and scope creep observable to third parties. Here, we argue that, insofar as prevailing norms establish that “successful” megaprojects must freeze the scope early on to meet initial targets, it is hard to see how megaprojects cannot fail in the eyes of third parties. This is troubling, as many megaprojects are a source of value creation. It is also unfair to the megaproject leaders who deserve our sympathy and not blame. By revealing the organizational structure of a megaproject, we hope to move forward the debate on megaproject performance.

The database underpinning this study includes contemporaneous megaprojects unfolding in different parts of the world. It is, however, wholly focused on large, capital-intensive

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infrastructure development projects. Specifically, our insights are grounded in four multibillion-pound megaprojects in the United Kingdom: Crossrail and High Speed 2 (HS2) railways, the London Olympic park, and Heathrow Airport Terminal 2 (T2). Crossrail is a high-capacity train connecting the east and west ends of London, scheduled to fully open by September 2018. HS2 is a national high-speed railway network that aims to increase railway transportation capacity between London and the northern regions; it is planned to be delivered in two stages, and is not expected to be fully completed before 2033. The London 2012 Olympic park was a project to develop the infrastructure to host the 2012 Olympics and to catalyze urban regeneration in East London. And the Heathrow T2 was a project to develop a new terminal campus at Heathrow Airport to accommodate Star Alliance (Star), a global alliance of airlines.

In addition, we explore the validity of our claims to infrastructure projects in developing economies. Specifically, we studied the Dedicated Freight Railway Corridor, a megaproject that aims to connect first-tier cities in India with a railroad line dedicated to freight. This megaproject is promoted by a coalition that includes the Japan International Cooperation Agency (JICA), the government of India, and the World Bank. We have also studied three schemes in Africa: (1) the modernization of the transport network of Lagos, Nigeria (soon to be Africa's largest city by population); (2) the modernization of the road network of Kampala, Uganda's capital; and (3) and the Kampala-Entebbe Expressway, Uganda's first toll highway. All projects aim to deliver infrastructure critical to meet urgent societal needs.

Our study informed by megaprojects in developing economies reveals that the pluralism at the organization core is central to an understanding of megaproject performance in developing economies. It also shows that, in a developing economy, the propensity for

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slippage in megaproject performance is exacerbated by the lack of structures to resolve disputes and the scarcity of slack resources. In developing economies, our analysis focuses on two different ways to structure the megaproject development process: One approach overlaps the project planning and implementation stages in an effort to shorten the development life cycle. Another approach specifies that implementation should only start after planning is substantially done in order to attenuate uncertainty during execution. We find that the overlapped approach is attractive for the pledge of quick developments. This approach relies on opaque negotiations between the promoter and the suppliers, which are permissible because the institutions in the environment are weak. However, we show that the overlapped approach carries a high risk of the development derailing if improvisation, ingenuity, and flexibility fail to resolve late planning problems or suppliers engage in opportunistic behavior ex-post contract award. In contrast, a sequential approach relies on substantive investment in planning to acquire all the critical resources before letting the contracts to suppliers. This approach attenuates the risk of supplier opportunism ex-post contract award and the risk of overruns in implementation. But it pledges timescales that fail to respond to the urgency of the problems.

In sum, we believe that studying the phenomena of megaprojects from an organizational design lens brings a complementary perspective to megaproject literature. This perspective enables us to reconcile conflicting explanations for the regularity with which megaprojects miss performance targets. Guided by this perspective, we have assembled a vast database and sought to make sense of why megaproject organizations perform the way they perform.

We organized this monograph as follows. In the second chapter, we introduce our main cognitive lens—organization design theory. The second and third chapters are coauthored

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with Dr. Colm Lundrigan, and part of his doctoral research at the Manchester Business School. The second chapter asks the question: What form of organizing work is a megaproject? In seeking to address this question, this chapter explores the processes through which the structure of participation in a megaproject organization is created and grows.

In the third chapter, we trace the regular slippages in performance targets to the megaproject organizational structure. This chapter is coauthored with Colm Lundrigan and Professor Phanish Puranam. We show that as megaproject promoters seek to gain support for their system goal, powerful stakeholders in the environment enter the megaproject organization. But these so-called “development partners” are not altruistic: They contribute their resources in exchange for a stake in strategic choices. As the megaproject organizational structure changes, changes to performance targets ensue. We develop this argument by examining the conflict and the consequences to performance at the megaproject organization core. We show that the participants in the megaproject core are drawn from differing ideological and epistemic backgrounds, and thus have differing preferences for the final design. These differences spur the formation of coalitions between like-minded actors, which wage political battles over the strategic design choices—the losers can feel disenfranchised and see the megaproject as a poorly performing organization, while the winners will think that they did a great job. As a result, the megaproject performance is politically charged, with members crafting narratives that either support or attack the megaproject’s strategy.

The fourth chapter investigates the implications of pluralism at the megaproject’s core. This chapter was coauthored with Professor Jeff Pinto. We start by tracing pluralism back to the system-level goal. We use design structure matrices (DSM), a tool from design theory, to shed light on the diffusion of power. We show how the development partners directly

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influence the strategic design choices in exchange for committing to supply their resources. We thus argue that strategic design choices qualify as an Ostrom's "common-pool resource"—a resource shared by many nonexcludable claimants with rivalrous goals. We then show how pluralism affects governance, this is, the allocation of decision-making authority and resources. We show that megaproject governance is polycentric, consisting of a nested structure of decision-making centers with capacity for mutual adaptation and local variation. We also show that the context may presuppose that governance will fail to encourage sufficient cooperation to resolve emerging interorganizational disputes. Hence, the context can create a powerful external umpire to referee disputes. In some cases, promoters also have more slack resources (money, time) than in others to reconcile incompatible goals. We build upon these findings to offer a contingency model of megaproject performance that contains a relationship between slack availability and the presence of an umpiring structure.

Finally, Chapter 5 moves us outside the context of an advanced economy to a developing economy context. Although we know that context matters, we seek to further our understanding about why and how it matters. In this chapter, we examine megaprojects formed to develop new infrastructure in developing economies. In these settings, we trace pluralism to legal frameworks protecting property rights and the intervention of powerful funders. We show that slippages in megaproject performance targets are exacerbated by the scarcity of slack resources and mechanisms to resolve disputes. Furthermore, we also show that there are two alternative approaches to structure the development process: (1) the approach endorsed by constellations of Chinese actors, which relies on extreme overlap between planning and implementation stages, and (2) the sequential approach advocated by Japanese and Western development agencies, which limits the overlap between planning and

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implementation. We suggest that the Chinese approach is attractive for what it pledges, but can backfire if improvisation, problem-solving ingenuity, and flexibility cannot eliminate the system's bottlenecks. In turn, a sequential approach leads to development timescales that are inadequate to resolve urgent problems. We conclude with a discussion of the implications to literature and policy of this choice between unsatisfactory development structures.

We conclude this introduction with a discussion of our research methods. The methodology we adopted for this inductive study was a multiple case study research. The discourse surrounding megaprojects as a form of organizing work is still embryonic, leaving scope for exploratory inquiry. Comparative case studies have long proved a fruitful approach to building theory (Eisenhardt, 1989; Eisenhardt & Graebner, 2007). They are particularly appropriate for contextual research (Yin, 1984) and suit well studies of process and change (Pettigrew, 1990). Hence, to advance theory, we grounded our study on three megaprojects in London: (1) the 2012 Olympic park, (2) Heathrow Airport's Terminal 2 (T2), and (3) Crossrail. We then studied a fourth megaproject—the development of the United Kingdom's second High Speed railway line (HS2)—to probe deeper into the issues of front-end governance. Finally, in the last chapter, we extend our arguments to developing countries. We turn now to briefly explain the first three in-depth cases that informed the first two chapters. In Chapter 4, we include more details about the HS2 scheme, and in Chapter 5 we include details about the cases we conducted in India, Uganda, and Nigeria.

A duality characterized the goal of the publicly financed £7.1 billion¹ development of an Olympic park. It aimed to provide the sporting venues and athlete accommodation to host the 2012 Olympic Games, while catalyzing the urban regeneration of the area surrounding the

¹ All prices are in final outturn (cash) costs, that is, costs adjusted for inflation, unless indicated otherwise. For projects already completed, we use the final (cash) cost; for ongoing projects, we use anticipated costs.

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park. In contrast, the £2.6 billion Heathrow T2 development was financed by the airport's private owner and operator, BAA². The goal was to colocate into a new terminal all the airlines that were members of the Star Alliance, which accounted for approximately 25% of all traffic going through Heathrow Airport. Using a mix of public and private finance, the £15.8 billion Crossrail development aimed to deliver a high-capacity train to increase the capacity of London's railway network by 10%; it involved building a tunnel and eight stations in central London and upgrading over-ground commuter lines east and west of London.

We chose this sample to vary three key attributes of megaproject organizations and, thus, build a diverse and polarized sample as recommended for process-focused inductive studies (Siggelkow, 2007). First, the cases differ by the sources of finance. We considered finance an important differentiating factor because we expected more parties making claims on the design and development of the publicly funded megaprojects than on privately financed ones.

Second, the cases differ in terms of the potential for prior and future relationships among the members of the megaproject organizations. The Olympic park was a *sui generis* endeavor unlikely to be repeated for decades to come. In contrast, the key parties in Heathrow T2 had a long history of collaboration in both day-to-day business dealings and prior airport expansion schemes. On this dimension, the Crossrail meta-organization was a hybrid. It was the first major commuter line jointly promoted by the national government and the London government. But talks were ongoing to recreate a similar arrangement to promote a north-south commuter line, called Crossrail 2. The existence of prior and potential future relationships creates an environment more amenable for sustaining collaborations (Gibbons

² In late 2012, BAA (British Airports Authority) changed its name to Heathrow Ltd.; for simplicity, we use the BAA name in our account.

& Henderson, 2012; Gray, 1989). Thus, we expected less difficulty in resolving differences among members in a megaproject in which people had worked together in the past compared to one-off ventures. And third, the megaprojects in our sample varied in terms of the flexibility allowed in their schedules. While the Olympic park had an immovable completion date, the other two projects would (potentially) be able to negotiate additional time to complete their activities. This variation allowed us to observe differences in the collective dynamics under different levels of schedule constraints.

As mentioned, the research followed an inductive approach. Our core question (Eisenhardt, 1989) was: Can the performance of megaprojects be traced back to their structure? To address this, we sought answers to a set of subsidiary questions that included: What form of organizing is a megaproject? Which actors influence the system-level goal and the strategic design choices? And how does evolution in organizational structure affect performance? The meta-organization typology provided by Gulati et al. (2012) was our cognitive frame of reference (Van de Ven, 2007) and provided a set of high-level codes (Miles & Huberman, 1984). To allow for a more detailed level of inquiry (Yin, 1984), we embedded units of analysis that captured strategic design choices for key functional components. We define a *component* as a distinct element of the infrastructure that performs a well-defined function or set of functions (Ulrich, 1995). To triangulate interview data (Biernacki & Waldorf, 1981), we asked the first interviewees to introduce us to respondents who could provide complementary points of view. We also worked with interviewees to sample components that could illustrate the concomitant evolution of structure and strategy.

Following recommendations for inductive reasoning (Ketokivi & Mantere, 2010) and to guard against potential account bias (Miles & Huberman, 1984), we first developed detailed

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chronological accounts for each case.³ This was important for taking a process-oriented approach to theorization (Langley, 1999; Van de Ven & Poole, 2002) and for developing a reliable theory (Miller, Cardinal, & Glick, 1997). As we cycled between data and theory, a theory started to emerge that, first, the megaproject organizational structure could be differentiated into two constituting parts—a core and a periphery, and second, that the structure of participation in the megaproject was in flux throughout the development life cycle. As we refined our theory, we proceeded to fill gaps in our understanding through subsequent interviews. By mid-2013, we had reached theoretical saturation, as additional data were no longer leading to new conceptual insights.

Data Collection

We triangulated several data sources for this study, including semi-structured interviews with a range of actors, analysis of archival documents, and on-site visits. Triangulation was important to improve the accuracy of our data and the robustness of the insights (Jick, 1979; Miles & Huberman, 1984). Triangulation is particularly important in studies of organization performance since people's recollections are vulnerable to revisionism and self-aggrandizement (March & Sutton, 1997). To limit respondent bias (Eisenhardt, 1989), for each megaproject case, we interviewed executive and nonexecutive project directors, as well as senior management and technical staff of the public agencies (or corporate division, in BAA's case) established to plan and later execute the scheme. We also interviewed managers of the promoters and other public agencies and firms that directly influenced the goal and the plan to achieve it as well as the staff of the suppliers doing the design and construction works.

The two-year fieldwork began in the summer 2011 after we negotiated access to the

³ These detailed factual accounts were published with a presentation format similar to a Harvard-style teaching case study and were circulated for comments.

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executive team of the Olympic Delivery Authority (ODA), the public agency set up in January 2006 to deliver the Olympic park. Through its internal Learning Legacy project, the ODA had committed to share knowledge and lessons learned. The ODA executive felt our independent theory-building study fit nicely with their initiative, and agreed to contribute in kind. Armed with the ODA's letter of endorsement and a list of interviewees involved with the Olympic park, we then sought to line up comparable groups of interviewees at Crossrail and Heathrow T2. All in all, we conducted 75 formal interviews for the first three cases up to two hours long, which we transcribed and organized in a database. In addition, throughout the research, we regularly invited top managers to give talks to our graduate-standing students; these talks were followed by a question-and-answer period and lunch. In total, we organized eight events that created opportunities to ask complementary questions and take extra notes.

The interviews, presentations, and lunch discussions were complemented by numerous site visits, including a four-week on-site observation at Heathrow T2 carried out by one of the authors. We chose Heathrow T2 for a longer observation on site because it gave opportunities to garner documents that were not confidential but would be otherwise difficult to access. We organized our database of archival documents into seven broad categories (see Table 1.1). *Strategy and planning documents* include project feasibility studies, records of public consultations, outputs from planning bodies, and reports generated by central or local governments and regulatory investigations (for the publicly financed projects, we also studied parliamentary debates and documents released in response to requests made under the United Kingdom's Freedom of Information Act). Together with the interviews, PowerPoint presentations, and records of executive and high-level meetings (*meeting minutes*), this information was crucial for charting the evolution of the structure of participation of the

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megaproject organizations and commensurate evolution in performance targets. Other sources of data on the evolution of performance targets were *financial reports*, including annual company accounts and budgetary audits, and *news articles* in the national and trade press. To learn more about salient controversies that surfaced during the interviews, we examined *formal communications*, which included open letters exchanged between members of the megaprojects or sent by independent actors native to local communities affected by the megaproject organization. We also studied *newsletters and public relations (PR)* documents, including magazines, presentations, and multimedia created to inform the public about the works undertaken, and thus, providing an additional source of data on announcements of performance targets. Finally, *design documents* were useful to qualify the design structures of the infrastructures. These included architectural renderings, drawings, schematics, and project scope documents. To learn more about the design structures, we also studied detailed technical and managerial accounts and interviews with senior managers in the trade press.

We focused data collection on understanding the evolution of the meta-organization's membership and concomitant evolution of the strategic design choices and cost and schedule targets. The archival documents helped cross-check the informants' accounts. Our theoretical emphasis meant that we were not seeking to share commercially sensitive information, but we offered nonetheless to make the quotes anonymous to avoid any potential bias (Podsakoff, MacKenzie, & Podsakoff, 2003). Table 1.1 summarizes the overarching characteristics of each of the first three megaprojects in our sample, the documents in our database organized by the salient categories, and the official roles of the interviewees and their employers.

We turn now to discuss in Chapter 2 megaprojects as a complex form of organizing work.

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Table 1.1: Summary of characteristics of the case sample and interviewees.

Case	Goal	High-level framework for achieving the shared goal	Archival database	Actors interviewed	Description of the actor	Informants interviewed by official job roles
London Olympic park	Develop Olympic park to host the 2012 Olympic games and catalyze regeneration of East London	~£7.1bn final public investment (2013) ~8 years of planning talks (1995–2003) ~9 years to design and develop (2003–2012) Immovable completion date	Total number (except news articles): 469 Strategy and planning documents: 260 Financial reports: 6 Formal communication: 5 Newsletters and PR documents: 111 Design documents: 16 Meeting minutes: 71 News articles: 219	Olympic Delivery Authority (ODA)	Public agency created to lead the development and delivery of the Olympic park	Chairman; two chief executives; design managers (“sponsors”); directors of construction/ property/procurement; finance/ commercial/design and regeneration/transport/infrastructure; head of design; head of program assurance
				London2012 Ltd.	Agency that produced the bid	Regeneration advisor; transport advisor
				Games Organizer (LOCOG)	Private company created to deliver the games	Director of venues and infrastructure; head of venue development
				Olympic park operator (OPLC)	Public agency created to operate the park in legacy	Director of infrastructure
				Transport for London	Public agency in charge of London’s transport	Director of games transport
				CLM; Lend Lease	Private management and development firms	Supply chain manager; directors of infrastructure/program/ commercial; deputy head of procurement; assurance officer
Heathrow Terminal 2 (T2)	Develop new airport terminal to colocate the STAR Alliance	~£2.6bn final private investment (2014) ~4 years of planning talks (2002–2006) ~9 years to design and develop (2006–2014) Financial penalties if BAA unduly lets completion date and/or budget slip	Total number (except news articles): 114 Strategy and planning documents: 74 Financial reports: 6 Formal communication: 19 Newsletters, PR documents: 8 Design documents: 4 Meeting minutes: 3 News articles: 40	Star Alliance	Consortium of airlines	Project director
				Air Canada	Member of Star Alliance	General manager for commercial operations
				BAA	Private airport operator and owner	Planning and program director; capital director; project director; director of program control and performance; director of integration; director of operations; director of development
				HETCo; Balfour Beatty	Private design and build consortiums	Commercial director; construction director; project director
London Crossrail	Develop new cross-London high-capacity railway	~£15.8bn public-private investment (2014 estimate) ~6 years of planning talks (1995–2001) after two previous failed attempts ~18 years to design and develop (2001–2019) Flexible completion date	Total number (except news articles): 122 Strategy and planning documents: 74 Financial reports: 2 Formal communication: 6 Newsletters, PR documents: 23 Design documents: 9 Meeting minutes: 8 News articles: 274	Crossrail (CRL)	Public agency created to deliver scheme	Program supply chain manager; chairman; chief executive; executive directors of commercial/procurement/technical/central area/infrastructure/delivery/program/financial/operations; chief engineer; chief of staff; project manager; head of risk mgt
				Network Rail	Public railway owner	Director of infrastructure; chief executive
				Transport for London (TfL)	Public agency in charge of London’s transportation	Director of operations
				Canary Wharf	Private funder of a station	Executive director
				Cross London Rail Links (CLRL)	Public agency created to promote the scheme	Executive chairman; acting chief executive/managing director; financial director

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