Risks and Strategies for a Build-Own-Operate International Airport Project in India

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ABSTRACT

This is a retrospective case study of applying risk management in a well-known successful build-own-operate (BOO) mega-project. The participants were the project team of the Cochin International Airport facility which was developed in India. This project is a world class monument of strategic vision and exemplary risk management, orchestrated as a public-private-partnership (PPP). The novelty is that this is the first time a large risky international airport BOO mega-project has been successful and then published in the literature. The project was delivered at a total cost of about Indian National Rupees (INR) 283,00,00,000 (with all phases included), while other airports built later on the same PPP model, namely those at Bangalore and Hyderabad, cost over INR 2000,00,00,000 (almost 10 times more).

Keywords: Build Own Operate (BOO), India, International Airport, Mega-Project Management, Risk Management

INTRODUCTION

In the large facilities construction industry, build-own-operate (BOO) projects have a high risk of failure because of the inability for organizations to control uncertainty (Kerzner, 2011). In a BOO mega-project organizations use their internal resources since funding is usually limited for outsourcing all phases of designing, building, and operating a large facility. Generally the organizational project sponsors are also trying to expedite the project by integrating or fast-tracking the design-build-operate phases using the same resources to avoid losing momentum during knowledge transfer (Strang, 2012a).

In a build-operate-transfer (BOT) approach, the project sponsors transfer the risk to a private company to operate once the facilities are completed. However, in a BOT project the company still integrates all phases up until the facility is ready for business, to speed up the construction (Kerzner, 2011).

Other methods such as construction management, design-build, or design-bid-build are used when specialized resources are needed, but
this is usually at the expense of a longer duration, or higher costs if external resources are needed (Yoon & Han, 2006; Strang, 2012a). These approaches are conceptually illustrated in Figure 1, showing that using more internal resources will usually increase risks and managing more of the design-build phases internally typically reduces the time-to-market (project duration).

**Problem Statement**

BOT is very common with governments who require new large facility infrastructure such as airports that are funded with tax revenues (Strang, 2012b). The purpose of constructing new facilities is to provide infrastructure to stimulate a stagnant financial climate or improve a developing economy. It is rare that a BOO approach would be used with a large risky public mega-project because governments rarely have the requisite in-house engineering expertise for managing all phases nor would a government or the public wish to assume the ongoing risks (Villmo, Torvatn & Karlsen, 2012). In the outlying cities of India, there is a lack of engineering expertise. Therefore using a BOO approach would be risky. Nonetheless, municipal governments outside the New Delhi capital region in India generally do not have funds to pay for engineer expertise or to outsource all required infrastructure projects (India tries to be the choice for software technology and call center outsourcing but not construction management). This is a paradox - municipal governments do not have the expertise or the funds to outsource or assume the long term risks, yet they need to construct more infrastructures to stimulate the economy. A typical solution would be to change to a BOT strategy, and then initiate user fees or tax revenue to pay for operating the facility (Strang, 2010). Unfortunately, in this case there was insufficient funding to outsource any aspect of this high risk project.

Furthermore there are many macro-environmental risks associated with building an international airport in a developing nation with the second highest population in the world (next to China), amidst neighboring countries noted for terrorism, and being located on the Indian Ocean where cyclones are more likely to occur. As noted above, it is also rare that a state government in a developing nation would have all the expert resources to manage such a high-risk mega-project.

Finally, most developing nations are unable to develop or acquire the risk management knowledge for managing uncertainty in mega-projects in the first instance (Morcos, 2008). Once a developing nation has completed several mega-projects, they will have developed basic

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**Figure 1. Risk vs. time for construction project strategies**

- **Risky**
  - Construction-Management
  - Design-Construct

- **Very risky**
  - Design-Build-Operate
  - Build-Own-Operate (less costly in-house resources)

- **Traditional**
  - Design-Bid-Build

- **Slower**
  - Combined delivery

- **Fast to market**
  - High uncertainty
  - Low uncertainty

- **Segmented delivery**
  - Design-Build-Operate-Transfer
  - BOT, BOOT (contracted experts)
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