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## **Part 1: Beijing Daxing International Airport, China**

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# 1. Part 1: Introduction

## 1.1 Background

Most project management infrastructures consist of rules, standards, methods, and regulations that govern project management activity. Modern civilizations are rapidly expanding massive infrastructure projects (MIPs), with a forecasted market of USD 6–9 trillion per year (Flyvbjerg, 2014). As "big solutions", MIPs increase economic growth, generate employment, reduce social conflict, and address natural resources, energy, the environment, and public emergencies (Jia et al., 2011). Critics also point to MIPs' environmental damage, immigration relocation, and biodiversity loss (Thounaojam and Laishram, 2021). MIPs now prioritise sustainability (Sturup and Low, 2019). The future Beijing Daxing International Airport (BDIA) will be 30 miles south of Beijing (Hou et al., 2022).

Beijing Capital International Airport (PEK), the second-busiest airport in the world by passenger volume, will have less congestion and growth (Li and Ryerson, 2017). As the key shareholder of value generation in MIPs (Fuentes, Smyth and Davies, 2019), the project client is usually an infrastructure operating firm like Heathrow Airport Limited (previously the British Airports Authority) (Winch, 2014). The project client's main business is customer service, not MIP development, hence MIPs are only useful when they support or enhance it (Xu et al., 2022). When creating MIPs, the customer owns and operates them.

## 1.2 Rationale and Significance

Valuation, or the maximisation of project values while minimization of negative consequences, should be addressed while evaluating MIP methods, rather than product development, or the achievement of the iron-triangle aims (Winter et al., 2006). Despite falling short of the iron triangle goals of time, money, and scope, Goldsmith and Boeuf claimed that due to the significant value it provided and its role as a change agent, including urban and regional redevelopment (Goldsmith and Boeuf, 2019). Massive investment projects (MIPs) are temporary because of their length, complexity, length of time, strategic importance, and the impact on society, the environment, and the economy they have (Abu Aisheh, 2021).

## 1.3 Aims and Objectives

The study aims to analyse the elements of project management in contemporary programmes.

The objectives of the study are:

- To analyse elements of the management of the project
- To evaluate the management and programs at Beijing Daxing International Airport
- To observe the critical implementation of project management

## 1.4 PESTLE Analysis

When studying the external marketing environment and its effects on a business or sector, marketers often utilise a framework or instrument called a PESTEL analysis. Examining the external environment from a political, economic, social, technological, environmental, and legal perspective is what it contains (Chutipongdech, 2022). Government strategies, leadership, and changes; policies regarding international commerce; trends and problems inside the government; tax policies; and trends regarding regulation and deregulation are all examples of political influences. Economic variables include a wide range of topics, such as the state of the economy, expectations for the future etc. Demographics and consumer sentiment, and purchasing habits; economic and population growth rates; socio-cultural shifts; religious and ethnic tendencies; and living conditions are all examples of social elements. New methods of production, distribution, and communication with target audiences are three ways in which technological considerations impact marketing. Supply and demand shortages, pollution goals, ethical and sustainable corporate practices, and carbon footprint objectives all highlight the importance of environmental considerations. Health and safety, fairness, advertising requirements, consumer rights and legislation, product labelling, and safety are all aspects of the law that must be considered (Rantesalu, 2022).

*Table 1: PESTLE Analysis of Airport (BDIA) in China*

PESTLE Analysis	Description
Political Factors	The geo-political crisis and political unrest have negatively impacted the airline industry, leading to reduced services and reduced

	<p>passenger numbers. Political stability is crucial for the industry's growth, with countries like China building and expanding airports like Daxing International Airport to handle more travellers (Sorvi, 2023).</p>
<p>Economic Factors</p>	<p>The airline industry, a vital component of the global aviation sector, is significantly impacted by fluctuations in interest rates and exchange rates (Merkert and Swidan, 2019). These fluctuations can significantly impact the cost of financing new aircraft, infrastructure, fuel, labour, and other inputs, thereby affecting the competitiveness of domestic airlines in the aviation industry.</p>
<p>Social Factors</p>	<p>The PESTEL analysis of the aviation industry considers social factors, consumer preferences, and sustainability. The global airline industry supports various industries and generates profits. Consumers seek personalized experiences and eco-friendly options, driving airlines to invest in innovative solutions and communicate their environmental efforts to customers (Hwang and Lyu, 2019).</p>
<p>Technological Factors</p>	<p>The aviation industry relies heavily on technology for its operations, but its use is limited to airline development and operations. Innovations are needed in ticketing, front office, and customer-facing functions. Social</p>

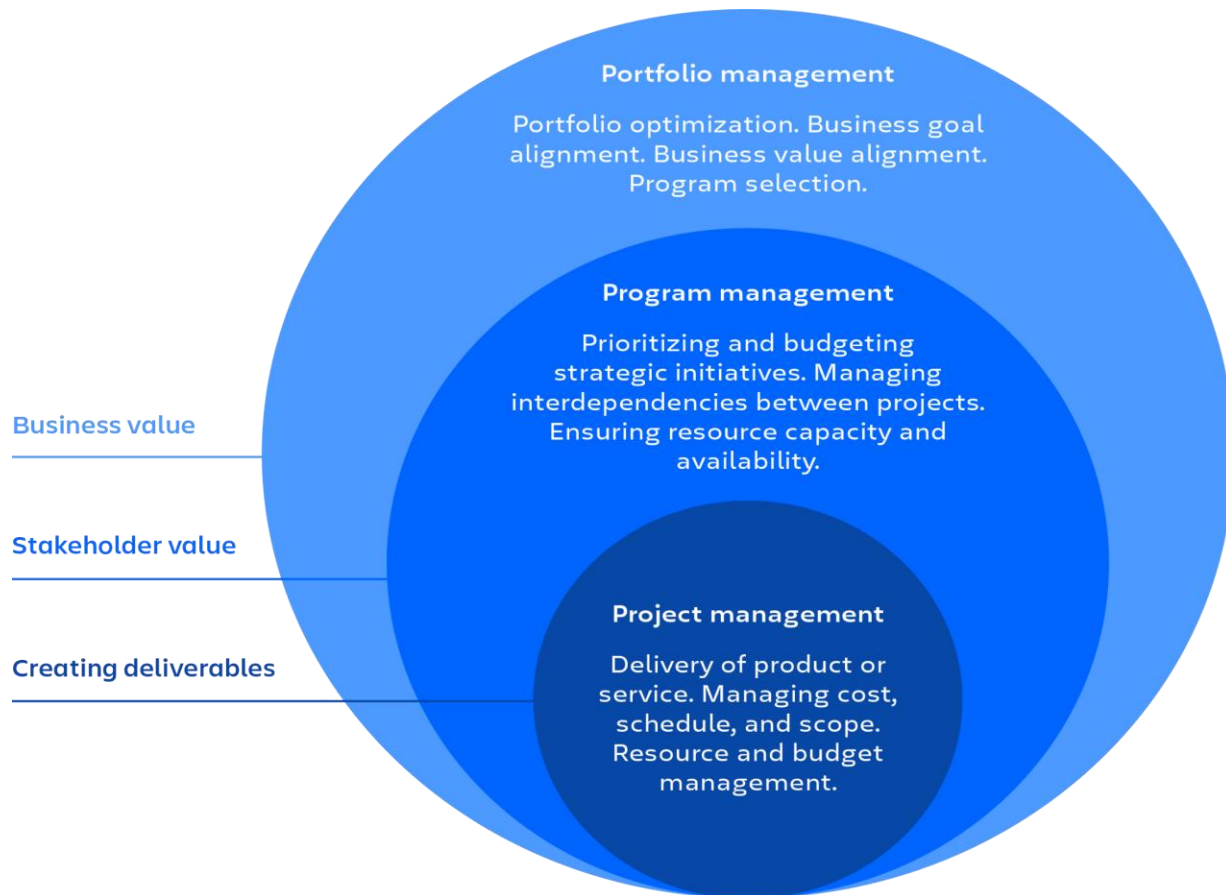
	<p>media has been effective in reaching target audiences and making the industry safer, efficient, and eco-friendly (Zhang, Chintagunta and Kalwani, 2021). However, technology may reduce demand in the future, with fuel-efficient aircraft, autonomous aircraft, and data and machine learning capabilities enhancing efficiency and cost reduction.</p>
<p>Environmental Factors</p>	<p>The aviation industry, responsible for 5% of global warming, is exploring environmentally friendly options like solar-powered, electric, and zero-emission planes (Hasan et al., 2021). Noise pollution is a concern, with aircraft manufacturers developing noise-reducing designs and airports implementing noise abatement procedures and land-use planning to minimize impacts.</p>
<p>Legal Factors</p>	<p>The aviation industry in China faces challenges in land management, especially in developing countries, to accommodate urbanization and promote economic growth. China, one of the fastest urbanizing countries, is projected to have 335 million new urban residents annually, primarily from rural migrants. Observing these changes and their short- and long-term impacts will provide valuable insights (Peng, 2011).</p>



## 2. Analysis of the Management of the Project

### 2.1 Elements of Programme and Project Management Analysis

"Program management" refers to the steps taken to manage initiatives with predetermined goals to improve an organization's efficiency and effectiveness (Miterev, Engwall and Jerbrant, 2016). The function of a portfolio manager is mostly strategic, however they are responsible for overseeing the project management process and may need to investigate specific projects to determine their efficiency and compliance. As seen in Figure 1, program managers are responsible for directing and coordinating an organization's many projects and other strategic endeavours. A project is an isolated, purpose-built endeavour with well-defined goals and parameters for completion. The core goal of a project remains the same even if it runs for many years. The deliverables that contribute to the program's main goals are the best indicators of a project's success (Shao, 2018).



*Figure 1: Critical elements of program and project management (Source: Internet)*

The fundamentals of program management also include the program's general governance, details on its initiatives and projects, how those components will contribute to the program's success, management strategies and procedures, a schedule, and methods for keeping tabs on everything (Franken, Edwards and Lambert, 2009). Figure 2 shows that the BDIA, China project was delayed in completion and delivery due to a lack of protocols and an emphasis on interrelationships among various government bodies.

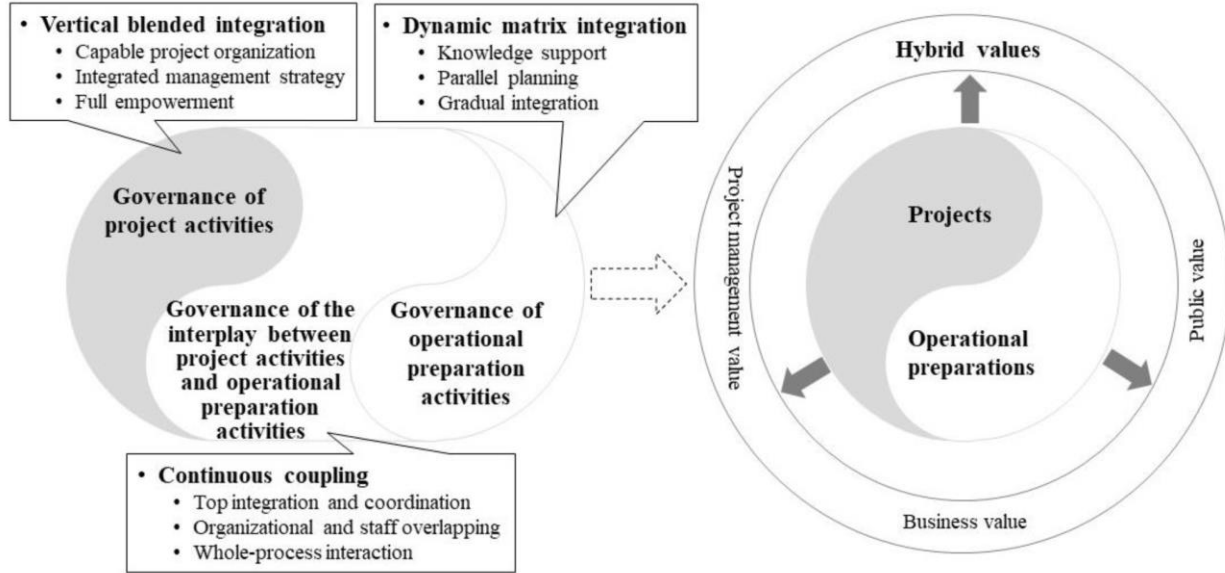


Figure 2: Project integration at Beijing Daxing International Airport (Source: Internet)

The goal of project management is to advance a program step-by-step via the delivery of value. There may be more of a focus on outputs in modern project management, but strategy and planning are still integral parts of the process (Kiani Mavi and Standing, 2018). Figure 3 shows the many tasks that a project manager does after a project has begun, including monitoring progress, allocating resources, managing risks, communicating, and more. According to Tereso et al. (2019), project management consists of the following steps: initiation, planning, execution, monitoring, and completion. With BDIA, not a single one of these elements was missing. However, the use of extensive external stakeholder collaboration above the minimum can lead to negative outcomes instead of positive ones.



Figure 3: Program manager role in project management (Source:Internet)

Many diverse parties were engaged in BDIA, a complicated initiative with many interrelated projects. Capital Airports Holdings Limited (CAH) implemented an integrated management strategy that created the Headquarters (HQ) the sole project organization within CAH responsible for project activities to tackle the challenge of dealing with complicated project interfaces and interactions with stakeholders (Xu et al., 2022). In particular, the airport project expected the corporate office to coordinate with external stakeholders and integrate all project activities as shown in Figure 4. Other projects that needed coordination included aviation fuel, air traffic control, airline base, subway, highway, and high-speed railway. However, according to the researcher, there is no connection between the traits of senior management teams and the success of megaprojects (Zhang et al., 2023).

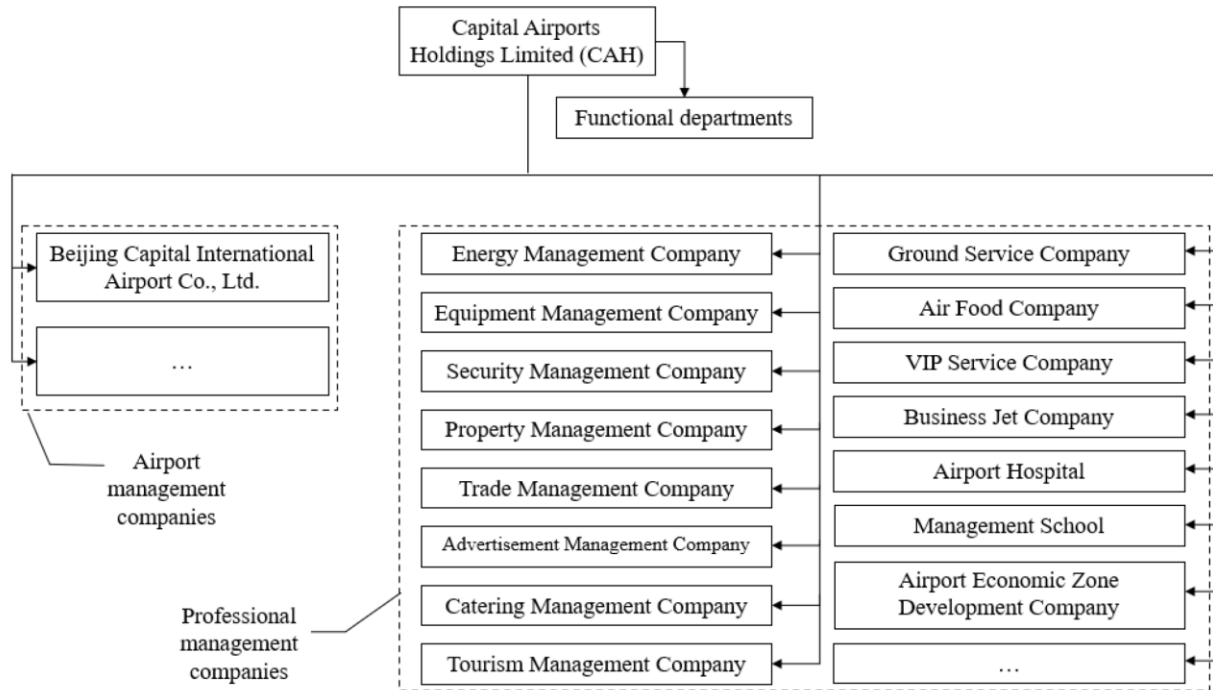


Figure 4: Diverse stakeholder engagement in BDIA (Source:Internet)

## 2.2 Program and Project Management Application

### 2.2.1 PRINCE2 Methodology-Project Management

PRINCE2 is a technique for managing projects with an emphasis on control and structure. The abbreviation PRINCE means "Projects IN Controlled Environments." One of the most famous project management frameworks is Prince2 (Esteki, Javdani Gandomani and Khosravi Farsani, 2020). Experts, consultants, and managers in the area of project management came up with Prince2. Prince 2 is an effective approach to project management that contains four interconnected parts: principles, themes, procedures, and the project environment (Mousaei & Javdani, 2018). The Prince2 framework for project management is structured into two halves, the themes and processes, with seven sub-issues in both halves and seven guiding principles for the whole project (Islam and Evans, 2020). One method in project management that is built on processes is Prince2. The seven processes that make up Prince2 include the steps needed to manage, control, and complete projects (Hughes, 2010). Project management based on Prince2 principles demonstrates transparency and compliance with the standards. (Roudias, 2015)

Prince2 lays forth seven principles. The project must make consistent and simultaneous use of themes that describe the components of project management. According to Zajdel and Michalcewicz-Kaniowska (2017), the Prince2 architecture lends itself well to customization for projects of any size or nature. In Prince2, people learn to break down large projects into smaller, more manageable ones.

### **2.2.2 PRINCE 2 Methodology: Key Phases and Principles**

According to Simonaitis, Daukšys, and Mockienė (2023), this project management framework is characterized by being process-based and linear, with an emphasis on advancing projects through predetermined phases. As a beginner-friendly approach, PRINCE2 incorporates fundamental project management concepts such as defining the project scope and budget. To help teams navigate projects from start to finish, PRINCE2 contains seven stages in addition to its seven principles (Esteki, Javdani Gandomani and Khosravi Farsani, 2020). It entails launching a project, leading it, initiating it, controlling it, monitoring product delivery, defining stages, and finally, closing it. A project mandate is an initial description of the project's scope and objectives used to submit a project plan. According to JĖDRUSIK (2021), the project board is responsible for overseeing the evaluation of project briefs and determining the necessary steps for the team to proceed. To provide room for time or resources, it may be necessary to modify the project brief.

As a first step in developing a comprehensive strategy, the project board selects a manager to head the effort. Each of these categories has its baseline: time, money, scope, risk, and rewards. After the project board gives its final approval to the manager's plan, the project may formally start (Kang and Kim, 2016). Part of controlling is the project manager making smaller, more manageable chunks of the project. They divide the task into smaller sections and assign each team member a specific task to perform. The project manager is responsible for keeping everything on track and making sure the final product is up to par with the quality standards outlined in the project register (Drob, 2013). After that, the project board looks over the deliverables and decides whether to approve, ask for revisions, or add to the project. After each phase, the project board meets to discuss the next steps and make a decision on whether or not to proceed with the project. Before this project's lifetime comes to a full stop, the project manager finishes the results and reporting.

## **3. Critical Evaluation of the Management of the Project**

### **3.1 Case Study-Beijing Daxing International Airport (BDIA)**

The Beijing Daxing International Airport (BDIA), a major Chinese airport serving international flights, is the subject of this study. The BDIA is an iconic infrastructure project and a model of Multi-Infrastructure Projects (MIPs), and it was named one of the world's new seven wonders by the Guardian newspaper. It spans 27 square kilometres, costs more than CNY 450 billion, and has great wealth generation potential (Xu et al., 2022). BDIA is a brand-new airport that has many similarities with the Capital Airport, including its size and the way it will eventually function. The typical MIP, BDIA, has enormous internal and external complications, and CAH, being an operation-based firm, had significant difficulties in guaranteeing its smooth delivery. In addition, BDIA's operational schemes had to be established and refined during development and implementation to direct project planning, design, and execution. It was also necessary to progressively develop BDIA's operational structure to guarantee its effective functioning after opening. Project and operational preparatory tasks were so intricate and interdependent, and CAH encountered them all while building BDIA (Mao, 2021).

### **3.2 Analysis of Contemporary Programme and Project Management**

Many diverse parties were engaged in BDIA, a complicated initiative with many interrelated projects. Brombal, Moriggi, and Marcomini (2017) state that CAH implemented an integrated management strategy to make the HQ only project organization within CAH responsible for the project's operations to tackle the challenge of managing complicated project interfaces and stakeholder relationships. In particular, the airport project expected the HQ to coordinate with external stakeholders and integrate all project activities.

#### **3.2.1 Strategic Stakeholder Coordination in Contemporary Organizational Boundaries**

Starting with CAH as the organizational boundary, the HQ had to coordinate with a plethora of external parties. As the project's implementer, the HQ took part in nearly all formal coordination

meetings and maintained frequent informal communications with related organizations. This was in addition to the government-established multi-level committees of steering that helped integrate the project's operations and the critical support provided by CAH (the Group). To facilitate coordination among external stakeholders, the HQ specifically set up channels for communication and cooperation with the outside world (Zhang et al., 2023b).

### **3.2.2 Inter-Organizational Collaboration for Project Planning and Design**

To facilitate project planning, design, and execution, the HQ had to work with several CAH internal operational organizations. Various operational groups within CAH developed operational schemes that were intimately tied to the planning, design, and implementation operations of the various interconnected subprojects that made up the BDIA airport project. For instance, CAH established a Cargo Business Development Office in February 2017 to investigate BDIA's cargo operating mode and CAH's cargo development strategy. The cargo facilities' planning and design had to be in sync with the needs of future operations, thus the HQ had to work with the Cargo Business Development Office. Project finance models have an impact on project activity as well. As an example, CAH set up an Investment Promotion Office in November 2012 to alleviate financial strain by luring social investment. Airport communication systems, parking structures, air meal facilities, and aircraft repair facilities were among the several subprojects that the Investment Promotion Office sought to solicit social investment for in a series of repeated efforts. In June 2015, the HQ formed a special team to work with the Investment Promotion Office to develop the investment promotion scheme. Additionally, Xu et al. (2022) state that the HQ was required to consult with the bid winner on the planning and design scheme of related facilities.

### **3.2.3 Strategic Expansion and Integrated Management**

Several commercial user companies, including retail, catering, and advertising businesses, as well as government user organizations, like Customs, and Border Inspections, came to the site during the close-out phase to carry out project activities like secondary decoration and special equipment installation for BDIA. During the implementation stage, CAH (the Group) decided to add new projects to promote and support the overall development of the business, such as the education park project. The HQ was also in charge of integrating and overseeing those project operations. In addition to reducing organizational interface difficulties and coordination obstacles, the integrated management method enabled the HQ to adopt a systematic viewpoint in integrating



the planning, design, and implementation activities of all (sub)projects. According to Zhou et al. (2020), an integrated management system's (IMS) main goal is to unify all of a business's current systems.

## **4. Observations, Lessons Learned and Conclusions**

### **4.1 Application for the Student's Experience-Lessons Learnt**

The application of PRINCE2 methodology provides a systematic approach to project management. Furthermore, the students can apply this methodology in managing complex tasks. As the PRINCE 2 methodology involves 7 key stages, it can help students in summarising and carrying out the tasks in an efficient way. Furthermore, another lesson a student can learn from this assignment is the need for effective communication. It is also evident in the study that effective communication will lead to delegation of tasks and optimisation of work. However, the delay in tasks can lead to inefficient output of the work. Furthermore, this essay also highlights another lesson as risk register in the management of qualities and maintaining high standard outcomes. Integrated management of students can pull together maximizing output from all perspectives for his work.

### **4.2 Recommendations**

Practically, key stakeholders should encourage project management consultants and contractors which when adhered to, will lead to project success which is contrary to what this study found. The assignment suggests the incorporation of enhanced collaboration among stakeholders and local governments. Furthermore, the study also highlighted the establishment of clear communication goals and strategic decision-making skills leading to the efficient delivery of tasks. The research also suggests continuous training and development of workers for smooth project delivery and program management.

## 5. Part 2: Critical Analysis and Evaluation of Challenges

### 5.1 Introduction

Two separate stages, known as "project" and "operations," are involved in the construction and management of large-scale infrastructure systems (Ramasesh and Browning, 2014). According to Zhang et al. (2023), there is a fundamental difference between the project phase and the operations phase of these big inter-organizational initiatives. Plans, designs, and constructions of new systems or renovations of old ones are the unique, one-time operations that makeup projects. Providing infrastructure services to consumers involves repeated and continuing tasks, (Yun et al., 2020). More than ten project customers make up the complicated Beijing Daxing International Airport (BDIA) programme (Zhang et al., 2023b). These clients include the airport, the metro, and the high-speed railway projects. The essay aims to analyse the critical issues of BDIA as a complex case study.

### 5.2 Complex Case Study Challenges

#### 5.2.1 Departmental and Employee Overlap

Daxing Airport Management Company, a newly formed major player in BDIA's integrated management, spent a lot of time growing up and maintaining tight ties with HQ (Chen, 2020). Rather than existing as a separate entity, its predecessor, the Operational Readiness Office, was "one organisation with two titles" under Headquarters. Headquarters externally oversaw operational readiness exercises under the auspices of the Operational Readiness Office (ORO). The managers created a department to the current organisational structure of the HQ to handle specialised operational preparedness operations. So, there was a lot of duplication between the two organisations, the HQ and the ORO.

Formerly known as the ORO, the Daxing Airport Management Company (DAMC) became an autonomous entity in July 2018 after separating from the headquarters (Mao, 2021). The manager

of the HQ also served as the general manager of the DAMC. Other senior leaders and department heads worked for both organisations. Additionally, some staff members from the HQ were transferred to the DAMC to manage airport operations. Despite this, there was still some overlap in staff between the two organisations. The HQ and the DAMC were the two main organisations that supervised BDIA's projects and operational preparations, respectively. There was a lot of personnel and organisational overlap, which helped with a couple of things: first, it reduced interface and communication issues, and second, it promoted the coupling of project and operational preparatory operations. It only took BDIA 87 days to complete the shift from projects to operations, due to part to organisational and personnel intersection and overlap (Xu et al., 2022).

### 5.2.2 Whole Process Interaction

In addition to facilitating the adaptation and coupling of project and operational preparation tasks, whole-process interaction enabled project teams and operational organisations to work together and innovate on the project and operational plans, which ultimately led to value creation. In addition, top-down incorporation and collaboration, organisational and personnel overlap, and the potential for negative effects from whole-process interaction influenced the interaction between project activities and operational preparedness activities (Lu and Yan, 2007). Capital Airports Holdings Limited (CAH) proposed a strategic initiative to ensure the high-quality opening of BDIA, and these three systems of governance brought together all levels and types of organisations within CAH to couple all aspects of the project with active planning activities.

### 5.2.3 Gradual Integration

When it came to operational readiness, some tasks, like those in the aviation industry, were too complex for professional management firms to handle, therefore the responsibility fell on the Operational Readiness Office (ORO). In addition, it began to include some divisions of professional management firms, such as four of them's non-aviation divisions (Liu, 2016). Relationships between OROs and professional management firms were more comparable to parallel partnerships, and the level and extent of integration were modest. There was a constant change in the process of governing operational preparedness operations. During the planning and building stages, CAH coordinated with professional management firms and the Capital Airport

Management Company to offer expertise in areas such as knowledge support, operational scheme formulation, operational management organisation establishment, institutional development, and talent reservation (Pi et al., 2021). The official establishment of DAMC to combine all enterprises and operational preparedness operations occurred during the close-out period. The integrated management company and the specialised management businesses of airport operation formed a matrix integration, which was the ultimate governance style of operational preparatory operations from CAH's standpoint.

#### **5.2.4 Major Issues**

The Group (CAH) delegated complete authority to the Headquarters (HQ) to oversee the project's operations. At first look, it was necessary to notify the Group (CAH) only of significant matters, such as the airport's yearly investment plans, bids for baggage management and terminal development, modifications of significant magnitude, and problems with exceeding the budget. However, when it came to consultation, design, building, supervision, and equipment, the HQ had considerable discretion in the bidding and procurement processes (Zhang et al., 2021). It was up to the discretion of the HQ to establish several institutions for project management, including those for bidding, pricing, risk, quality, time, and safety. To oversee the construction of the airport, headquarters opted for the design-bid-build (DBB) approach. To be more precise, the HQ used competitive bidding, invited tendering, or direct confiding to choose market providers for the equipment, advisory services, development, building, supervision, and equipment. According to Pi et al. (2021), the headquarters oversaw around 700 contracts in total. To address the issue of contract interfaces brought about by the DBB model, the headquarters used a mixed approach that included local integrated management, professional integrated management, and functional assistance as shown in Figure 5.

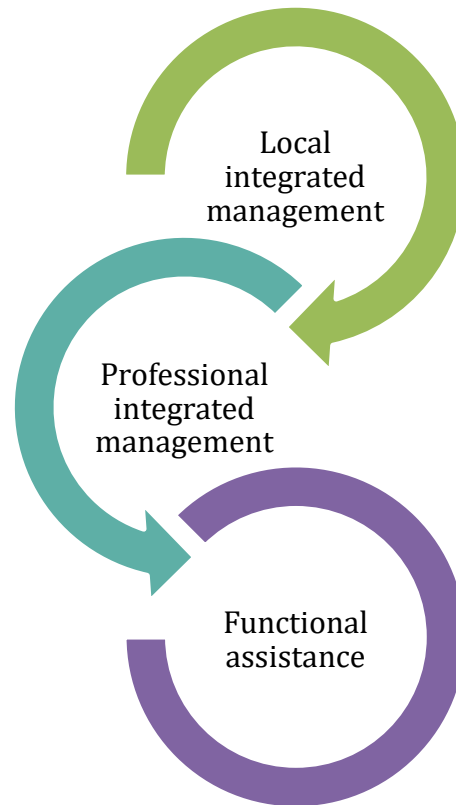


Figure 5: DBB model components used by Headquarters (Source:Self)

## 6. Conclusion

In conclusion, Beijing Daxing International Airport project management study shows megaproject infrastructure management issues. PRINCE2 with external stakeholder and internal cooperation may produce BDIA. The findings from this study promote project management flexibility and continual development. BDIA lessons may assist stakeholders and policymakers identify and minimise important concerns and obstacles. Demand for internal cooperation between project managers and organisations may boost project success. The DBA case study shows how integrated project management satisfies stakeholders. The multi-agency Beijing Daxing International Airport (BDIA) project builds and manages massive infrastructure. Case study problems for HQ and DAMC managing the project included personnel and departmental overlap, interaction, and progressive integration. HQ and DAMC coordinated BDIA's programming and operations. This improved project and operational coordination and creativity, adding value. The headquarters managed airport development using design-bid-build (DBB) and

had extensive procurement and bidding authority. The Beijing Daxing International Airport project presented departmental and personnel overlap, complete process communication, and conflict interfaces for the HQ and DAMC.

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