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Implementation of Infrastructure Project Through Public-PrivatePartnership in the Southern Part of West Java Province

(Qualitative Study)

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Abstract

The objective of this research is to investigate how infrastructure projects are executed in government-business partnerships. The study aims to accomplish three objectives: (1) evaluate the implementation of these projects, (2) identify the obstacles encountered during project execution, and (3) analyze the strategies utilized in executing disruptive innovation in government-business partnership infrastructure projects. The research employs a qualitative descriptive approach, carried out for a period of one year, from July 2021 to June 2022. The study involves six experts from the Transportation Agency, two individuals from the Department of Public Works and Public Housing, one representative from Regional Planning and Development Agency (RDPA), and one academician, with structured in-person interviews used as the primary data source. The research indicates that executing infrastructure projects through disruptive innovation in construction firms involves several steps, such as preparing for disruption, developing internal and external innovation, using incremental innovations, and utilizing open innovation to explore new technologies and business models. Nonetheless, the study identifies several obstacles encountered during the execution of these projects, including inadequate infrastructure project risk analysis, poor coordination among stakeholders, limited funding allocation, and land availability issues. To mitigate these challenges, the study recommends the need for independent professional consultants, improved project planning, regulatory ease, fiscal incentives for investors, and legal guarantees for private investors to ensure equal rights as state-owned enterprises in executing feasible projects, and good coordination among stakeholders

Keywords*:implementation, constraints, infrastructure projects, public-private partnership*

Introduction

Gambatese and Hallowell found that the construction industry is not known for innovation, as evidenced by the low level of investment in Research and Development by construction companies. In fact, the level of innovation in the construction industry is only 30.8%, which is lower than other sectors.[1].However, despite this, in Indonesia, the construction industry is a significant contributor to the country's economy, making up 10.75% of its Gross Domestic Product (GDP) and experiencing a growth rate of 5.76% in 2019[2]. Typically, the construction industry relies on traditional methods in conducting its business, with innovation mainly occurring at the project level rather than the overall business level. There are several reasons why innovation is crucial in the construction industry, including improving work systems' efficiency and quality, enhancing competitiveness of construction products both regionally and globally,[3] adding value to the construction industry, and improving human resource competencies in the industry.[4]

One example of a new innovation that is beginning to be applied in the construction industry is 3D Printing. This technology has previously been adopted in the manufacturing industry for several decades. The 3D printing

process is an automated additive manufacturing process that produces a 3-dimensional solid object from a digital model (CAD). In other words, in the 3-dimensional printing process, the 3D CAD model will be sliced into a series of 2D layers, which will be saved by the printer to build the model[5]. This technology can have an impact on the construction industry in terms of increased customization, reduced construction time, decreased labor, and construction costs[6]. This technology also has an impact on the performance of the entire supply chain by providing significant performance improvement compared to existing technologies, enabling alternative manufacturing methods, and affecting the entire structure of the supply chain[7]. The production process can change due to the shortening of the supply chain, the possibility of de-specializing functions in the supply chain, integrating various value-adding steps into one highly complex function, and digitizing the production chain.[8] However, this technology is one of the innovations that have the potential to bring about disruption

According to[9], the construction industry is currently witnessing an increase in digitalization and automation, which could lead to disruptive innovation. Disruptive innovation refers to a new business process that has the potential to completely transform traditional practices, creating new value that is fundamentally different from existing technology. Although the initial performance of this technology may be lower than the old method, it has the potential to eventually surpass and replace previous technology.[10] While some new technologies only offer minor changes or replace old technologies, disruptive innovation has the potential to cause a complete overhaul of the industry.[11]

With the entry of innovation that tends to disrupt the construction industry sector, companies that begin to apply this innovation must change the business map and make changes to the business model, especially where the technology is applied. They must develop and survive in a dynamic market where stakeholders (customers, suppliers, regulatory authorities, and competitors) always have expectations that require continuous change[12]. And to face disruption, companies must also develop resources and there may be a need for a change in the business model.[13]

[14] state that companies need to master three distinct stages to achieve success in dealing with disruption: ideation, incubation, and scaling. In the ideation stage, potential new business ideas are generated. In the incubation stage, these ideas are validated in the market. In the scaling stage, the necessary assets and capabilities are reallocated to grow the business. According to O'Reilly's research, mastering only one or two of these stages is insufficient. Having new ideas that fail market testing, having market-tested ideas that cannot be improved, or scaling unvalidated ideas can result in failure. To successfully implement disruptive innovation, companies must master all three stages.[15]

Infrastructure plays a crucial role in supporting economic growth, as it can impact the quality and quantity of economic activities. For instance, well-developed transportation infrastructure can facilitate the smooth flow of people and goods, leading to more sustainable economic development [16]. The government has acknowledged the importance of infrastructure and has made it a national priority in the National Medium-Term Development Plan 2015-2019 to increase national competitiveness and productivity. However, the development of infrastructure requires substantial investment, with the required amount being IDR 4,796 trillion during 2015-2019, with about 40% coming from the PUPR sector.[17]The government was only able to provide about 41.25% of this through the State/Regional Revenue and Expenditure Budget (APBN/D), creating a significant challenge in meeting the high financing needs for infrastructure.[18] Furthermore, the availability of infrastructure in remote areas where investment is being made has been found to support high levels of FDI. Since infrastructure development cannot be solely carried out by the public sector, the government has partnered with private investors through public-private partnerships or PPPs. According to Government Regulation No. 38 of 2015, this partnership aims to expedite infrastructure development by sharing profits and potential risks, as well as receiving government support and incentives.[19]

These factors can lead to poor performance of PPP projects and consequently affect the payment process.[20] In this case, deductions from payments will be imposed on concessionaires for achieving low-level performance standards[21]. As reported, service failures and poor performance in maintenance work were frequently reported

in PPP projects in the UK and Australia.[22] These results lead to poor implementation of PPP projects and consequently failure to achieve VFM[23].

In order to obtain the measurement results of the Value for Money method, there are three main elements that are assessed, namely economy, efficiency, and effectiveness. Value for Money is the core of performance measurement in public sector organizations because government performance cannot be assessed in terms of the output produced alone,[24] but in an integrated manner must consider input, output and outcome together[25].

West Java Province has three areas that have the potential to be developed as growth centers for the southern part of West Java, namely the Pelabuhanratu growth center, the Pangandaran growth center, and the Rancabuaya growth center. Southern West Java has different characteristics from northern West Java where southern West Java is dominated by protected areas. Rancabuaya is one area that has the potential to be developed as a center of growth, so that it can develop small towns to boost the local economy and boost the economy. southern part of West Java.[26]In providing supporting infrastructure facilities and infrastructure, the government, in this case the West Java provincial government, has not been able to make it happen independently due to limited budgets, so the West Java provincial government feels the need to bring in investment from outside parties (PMA or PMDN), in infrastructure development in the growth center area. [27].

The aim of this study is to uncover the execution and difficulties of the government-business partnership infrastructure project in the southern region of West Java Province. To achieve this goal, the study has set three research objectives: (1) to scrutinize the implementation of the government-business partnership infrastructure project, (2) to depict the challenges linked to the implementation of the government-business partnership infrastructure project, and (3) to scrutinize the implementation strategies for disruptive innovation in the government-business partnership infrastructure project

Prior research has shown that technology plays a crucial role in development and innovation, but it is essential to have the appropriate strategy to effectively integrate technology into business processes. In order to identify where innovation can be applied and optimized to strengthen a company, a thorough analysis of the existing business strategies is required. This study will concentrate on investigating and assessing the application of disruptive innovation that has the potential to be implemented in a construction company, and examining how it can aid in business transformation, leading to innovation, competitiveness, and sustainability

Method

The qualitative approach was utilized for this research, which took place in Garut Regency. The researcher conducted the study at the location of the infrastructure project implementer's office and the home of the research subject, who was a related stakeholder. The research spanned a 12-month period, starting from July 2021 to June 2022, covering preliminary stages, instrument preparation, field observations, data collection, data analysis, and research result preparation. Purposive/judgmental sampling technique was employed in this study, meaning that the sampling process was carried out randomly and incidentally based on the considerations or research objectives of the sample.[28] The study subjects comprised six experts, including two individuals from the Department of Transportation, two from the Public Works and Public Housing Service, one from the Regional Development Planning Agency (RDPA), and one academician. The primary data used in this study were obtained through structured interviews or home interviews[29], and the experiences of experts from various technology and construction backgrounds were analyzed.[30]

Result and Discussion

The scope of the planning area refers to the Regional Regulation of West Java Province No. 12 of 2014, that what is meant by the Rancabuaya Growth Center Area consists of 5 (five) sub-districts namely Caringin District, Mekarmukti District, Cisewu District, and Bungbulang District in Garut Regency, and Cidaun District in Cianjur Regency. The Rancabuaya Growth Center area is part of the southern Garut Regency and the southern Cianjur Regency.

Based on Regional Regulation of West Java Province No.12 of 2014 concerning the Management and Development of the Metropolitan and Growth Centers of West Java, the Rancabuaya Growth Center area

consists of five sub-districts, namely four sub-districts in Garut Regency namely Caringin District, Cisewu District, Bungbulang District, and Mekarmukti District , and one sub-district in Cianjur Regency, namely Cidaun District, with a total area of 73,272.44 Ha. Geographically, this area is bordered to the north by Bandung Regency and Talegong District, to the east by Pakenjeng District, to the south by: the Indian Ocean, and to the west by Sindangbarang District, Cianjur Regency[26].

In fact, there is no single standard model for Public Private Partnership/PPP (Public Private Partnership) where there are various possibilities in application. In other words, PPP is as simple as involving the private sector which cannot always be linked to capital investment. The PPP mechanism functions to shift the majority of financing from the government to the private sector so as to minimize maintenance costs, improve service quality, improve efficiency against lagging technology, financial risks, as well as increase management capacity. While the private sector is seen as potentially able to provide efficient management through a more structured and measurable mechanism along with more flexible financing capabilities[31].

The origin of the Public-Private (Business Entity) partnership program in construction projects is the limited government budget (APBN) and the initial goal of the partnership between the government and the private sector is to increase the role of the private sector in infrastructure financing to reduce the burden of financing the APBN and BUMN (interview with Agus Rachmat, 2 July 2022). The government must provide everything in the government partnership program with business entities, namely guaranteeing the availability of project financing, and if the private sector can assist in financing to reduce the financing burden, the role of the government as a regulator is to prepare land and permits for construction or infrastructure projects (interview with Agus Rachmat, 2 July 2022)

One of the preparatory steps is to stipulate regulations (legislation) governing the implementation of the Public-Private Partnership (KPS)/PPP program, namely Presidential Regulation Number 38 of 2015, and Presidential Decree No. 38 of 2015 which is one of the regulations issued regarding cooperation between the government and private entities. business in the provision of infrastructure. And there are also several ministerial regulations regarding this matter (interview with Agus Rachmat, 2 July 2022).

The institutions involved in the government cooperation program with business entities in infrastructure projects are BAPPEBAS, the Ministry of Finance, and BUMN/BUMD. (interview with Agus Rachmat, 2 July 2022). There are several stakeholders who can be involved in the PPP/PPP program, namely those in charge of collaborative projects, equity sponsors, KPS companies, contractors, financial institutions and the public (interview with Dindin Solakhuddin, 30 June 2022).

The role of the parties involved in the construction project through the KPS/KPBU is in accordance with the Regulation of the Minister of PPN/BAPPENAS Number 2 of 2020) interview with Agus Rachmat, 2 July 2022).

“Each stakeholder has a different role. Some are in charge of preparing the land, some are related to financing, some are tasked with carrying out the work and also as users” (interview with Dindin Solakhuddin, 30 June 2022).

The technical implementation of the PPP/PPP program in Indonesia is regulated in the Government and Business Entity Cooperation Guidelines. There are several stages that must be carried out, such as selecting the project, then feasibility testing, examining market potential, then the auction process, contracts and how the financing process is. (interview with Dindin Solakhuddin, 30 June 2022).

To execute infrastructure projects through public-private partnerships, there are several obstacles that can arise, including inadequate infrastructure project risk analysis, insufficient coordination among stakeholders, limited funding allocation, and land availability (Agus Rachmat interview, July 2, 2022). To mitigate these challenges, it is recommended to involve independent professional consultants, improve coordination among stakeholders, enhance project planning, simplify regulatory processes, offer fiscal incentives for investors, and provide legal guarantees for private investors to ensure equal rights with state-owned enterprises in carrying out feasible projects (Dindin Solakhuddin interview, June 30, 2022)

The strategy implemented by the Director General of Highways in strengthening competitiveness is national

connectivity as one of the keys in strengthening competitiveness. Economic activity cannot be separated from the role of road infrastructure as infrastructure that serves the movement of people and the movement of goods. Increasing service coverage and quality of road services is one of the efforts to strengthen national competitiveness. [26]

In accordance with the 2015-2019 Strategic Plan Review Document, the target Performance Indicator Program Target Stability Level of National Roads in 2019 is 98.00%. In 2019, the level of stability of national roads achieved by the Directorate General of Highways was 92.81% with a performance achieved of 94.70% of the target where there was a less than 5.19% deviation. This is caused by:

1) There is an effective treatment that has not been maximized;

2) The existence of special assignments outside the authority, but still prioritizing aspects of transparency and special needs;

3) The handling of road maintenance has not been maximized, especially roads in moderate condition;

4) Incidents of natural disasters and landslides, which simultaneously result in a decrease in road stability;

5) Annual funding allocation that is not in accordance with the allocation plan stated in the Strategic Plan.

Based on the documentation (BinaMarga, 2019) it is known that the obstacles to implementing the performance of the Director General of Highways for the past 2 years are:

1) There is an effective treatment that has not been maximized

2) Land Acquisition Issues Several obstacles have resulted in obstacles to the implementation of land acquisition, including: Limited allocation of funds for land acquisition in the initial DIPA so that fulfillment must rely on remaining auction funds; Problems at the implementation stage of land acquisition in the field caused by weak coordination, changes in regulations, and high caution in the process of setting prices and paying compensation; Not all land owners accept the price that has been set, so it requires a longer process and must be resolved through the courts.

3) Auction Process: Unpreparedness for the completeness of the bidding documents, causing delays in the bidding process for several work packages resulting in low physical and budget realization because implementation could not meet the target by the end of 2019; The number of Pokja personnel in BP2JK is still very limited, so that some of the schedules for determining the winners that have been set are not fulfilled; Re-auction on several work packages causing delays in the execution of work.

4) Social and Security Factors: There is a condition of security threats caused by armed civilian criminal groups so that it is necessary to temporarily stop work, especially on road sections in the central mountainous area of Jayapura Province; The ban from a group of people demanding compensation for customary land rights has resulted in relatively large additional expenditures, especially for works that are located in the province.

5) Natural Disasters: The occurrence of natural disasters in the form of landslides, earthquakes, and flash floods in several areas caused delays in the implementation of work in the field

To overcome the obstacles faced, the Director General of Highways also takes the following steps:

1. Integrate spatial-based data on the Highways Geodatabase in preparing road and bridge handling programs, which consist of:

a. Collection and verification of road condition data (IRI, PCI, deflection, traffic, photos, videos) using the ArcGIS Web-based platform on the SMD Road application, so as to increase accountability for coordinate data and the length of roads in the field;

b. Simulating a road handling program based on spatial-based condition data using AgileAssets / IRMS V.3 which is connected to SMD Jalan through the GISPortal Bina Marga web service;

c. Conduct analysis and monitoring of mismatches in handling (based on POK coordinate data) with

condition data in the field (IRI data, PCI, photos and videos) using spatial-based analysis on the GIS Portal of Bina Marga;

2. Improving coordination with the Regional Government and other agencies related to land acquisition;

3. Formation of BP2JK.

a. Establishment of (Construction Service Selection Implementation Centers) in 34 provinces in Indonesia as a replacement for the Procurement Service Unit (ULP) within the Ministry of Public Works and Public Housing so that it is hoped that the process and results of the procurement of goods and services will be more effective, efficient, transparent, quality and accountable;

b. Improving design quality (DED) by ensuring that every DED used is valid, nothing is over-designed, handling output according to needs and preparation of Engineering Estimate (EE)/OwnerEstimate (OE)/Estimated Price (HPS) is prepared professionally/no mark- up;

4. Strive to continue to coordinate and collaborate with the Regional Government, TNI, POLRI, as well as social approaches with local residents, local traditional leaders, youth leaders, and religious leaders to minimize social conflicts and security risks that may occur;

5. Maximizing the role of job control especially controlling the existing execution time, quality control of implementation, management of resources and equipment;

6. Improving disaster risk mitigation through:

a. Compilation of Daily/monthly Rainfall Maps that are integrated with BMKG data as a basis for physical KDP preparedness in the field against the risks of extreme weather and landslides;

b. Management of the WhatsApp Center which is integrated with the website and social media accounts of the Directorate General of Highways to collect natural disaster information, and convey it to the PPK concerned in the field.

c. Use of mobile-based applications (ArcGIS Collector and ArcGISSurvey123) and web (GIS Portal Bina Marga) as tools for Balai/Satker/PPK in reporting disaster events, along with monitoring the progress of disaster impact management;

d. Cooperation between stakeholders in managing natural disasters

According to the results of interviews and documentation with the Director General of Highways[32], information was obtained that to overcome obstacles to implementing infrastructure projects during disruptive times is presented in the following table.

Table 1. Constraints and Solution Strategies

Number	Problem	Solution Strategy
1	The Covid-19 pandemic has caused limitations in direct interaction with stakeholders.	*Use of information technology facilities* *Via video conferencing; - Scheduled weekly meetings with the effective work team*
2	Limited number of human resources/staff; limited staff ability to conduct outreach, coordination and facilitation to stakeholders	Optimization of existing human resources; - Optimizing technical assistance personnel
3	Limited funds to carry out overall outreach, coordination and facilitation of stakeholders	Use of information technology facilities; - Optimizing the utilization of available funds
4	The consultant does not have licensed software/applications	Using the license provided by DPSI Sub-Directorate

5	Consultants as stakeholders are still hesitant to provide support due to the use of the new system	Communication is carried out persuasively with detailed explanations regarding the benefits of the change project for the public interest; - On the job training by experts

Source: Interview with Informant, 2022

Company Performance with Infrastructure Implementation Through Public-Private Cooperation

According to the statements of four research subjects, the innovation process results in increased operational performance for companies in terms of both quantity and quality of work.[33] With regards to quality, innovation leads to higher customer satisfaction levels (as measured by the customer satisfaction index) and faster completion times for construction projects. These benefits have been observed in the industry, as mentioned in an interview with R. Marpaung on March 11, 2022.

The comparison of the performance targets listed in the Director General of Bna Marga's strategic planning review with performance targets based on the 2019 Initial Work Agreement Document, revised targets for 2019 (June) and the last revised DIPA for 2019 is as follows:

Table 2. Comparison of the performance targets of the Director General of Highways

Output Performance Indicators	**Target Review Strategic Plan**	**Initial Target(Jan2019)**	**Revision Target(Jun2019)**	**DIPA Target (Des2019)**
Maintained path length (km)	46.914	46.867	46.931	47.564
Length of safe path Performance Indicator Output increased (km)	103	47	47	48
The length of the road built (km)	732	778	814	918
Length of freeway built (km)	42	8	13	21
Local road support (km)	414	3	3	3

Source: Director General of Highways Final Report, 2022

Table 2 shows a comparison of the performance targets of the Director General of Highways based on strategic planning, initial targets, revised targets, and DIPA targets which shows an increase in performance where the final DIPA targets have been achieved compared to when planning the strategy and initial targets.

This performance increase is supported by the application of BIM (Building Information Modeling), where BIM is proven to be able to speed up the technical planning stage,[34] so that the design process can run effectively, efficiently and in detail. There is a collaborative process within BIM during the design process. BIM can detect clashes or design discrepancies, so that they can be immediately followed up and reduce the potential for re-work.[35] In the implementation of the change project there are 6 (six) stages of activity, an effective work team is formed to carry out the change project and a technical design evaluation team to evaluate and provide recommendations on the design.[36]

Conclusion

Based on the results of research and discussion, it can be concluded that:

1) Disruptive innovation is a key strategy for construction companies to implement infrastructure projects, using a three-stage analysis of ideation, incubation, and scaling. This is achieved through (a) corporations

preparing themselves to either withstand or become part of disruption, (b) developing innovation both internally and externally, (c) primarily implementing incremental innovations through internal efforts (closed innovation), and (d) conducting open innovation with startups or other partners to explore new technologies and business models.

2) The implementation of disruptive innovation in government-business partnership infrastructure projects faces obstacles such as invalid risk analysis, coordination issues among stakeholders, insufficient funding, and land availability.

3) To address these obstacles in public-private partnerships, Bina Marga requires the assistance of independent professional consultants, improved coordination among stakeholders, better quality project planning, streamlined regulation and licensing processes, fiscal incentives for investors, and guaranteed orders for private sector investors to ensure they have the same rights as BUMN in implementing feasible projects

Credit Statements

Theauthorconfirmssoleresponsibilityforthefollowing:studyconception and design, data collection, analysis and interpretation ofresults,andmanuscriptpreparation.

Declarationsofinterest

The author declared no potential conflicts of interest with respect totheresearch,authorship,and/orpublicationofthisarticle

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