Business Model Innovation for Inclusive Development: Case Studies of Infrastructure Development in India

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Accepted for publication in International Journal of Business Innovation and Research.

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Abstract

There has been growing recognition of the challenges of inclusive development in developing economies. However, very few studies have looked at the business model innovation of domestic companies under different resource constraints. In this study, we examined the business model innovation of private firms engaged in the inclusive development of public infrastructure development facilitates. By analysing two case studies on public infrastructure in India as the empirical context of this study, we highlight areas where private firms can introduce innovation into their business models. We extend the current business value creation and exploitation model in private firms to include an active interface between private firms and public organisations. Thus, we expand the literature on business model innovation in developing countries. While these innovations generate profits for private firms, they do not undermine the overall benefit generated in the country due to the adoption of world-class public infrastructure for inclusive development.

Keywords: business model innovation, inclusive development, public infrastructure, innovation

1 Introduction

The role of innovation in inclusive development is well documented (George et al., 2012; Rao-Nicholson et al., 2017), especially in the context of public infrastructure ranging from health services to transportation (Rao-Nicholson et al., 2017). However, the ability of public organisations in developing countries to effectively and efficiently deliver these public goods is doubtful (Patel and Bhattacharya, 2010; Rao-Nicholson et al., 2017). Studies have also noted the steady growth of the transfer of such provisions from government operations to that of private firms. Nevertheless, this transition of public infrastructure from government ownership to private companies has not been a smooth process; for example, in India, telecommunication companies have benefitted from privatisation, whereas the electricity sector has not benefited from privatisation gains (Patel and Bhattacharya, 2010). To further refine the delivery of public services, the public-private partnership has also been mooted in the developing country context. In this case, public organisations would continue to license and subsidise services from private firms, which would, in fact, deliver the end product (national highways) or provide services to the end customer (i.e., transportation, electricity; Patel and Bhattacharya, 2010).

Recently, scholars have called for business model innovation for inclusive development (George et al., 2012; Mongelli and Rullani, 2017; Leone and Belingheri, 2017; Pansera and Owen, 2018) as well as undertaking comparative look between various types of innovators and their application technologies (Wu et al., 2010). Despite the growing recognition of inclusive development challenges in developing economies, research on promoting innovation and inclusive development in terms of private firms is still an under-researched field in the context of public infrastructure development. Much of the extant research focuses on the role of multinational companies and foreign investment in inclusive development (Seelos and Mair, 2007; Halme et al., 2012; Onsongo, 2019; Peerally et al., 2019); however, very few studies have looked at the business model development of domestic companies in the bottom of the pyramid (BOP) markets (Yunus et al., 2010; Angeli and Jaiswal, 2016; Lashitew et al., 2020). This paper followed the call for the better conceptualisation of business model innovation for the BOP market (Angeli and Jaiswal, 2016), focusing on local private firms. We emphasise the changes introduced within the private firms and how they can contribute to public infrastructure development via business model innovation. Thus, this research aims to address the following question, how private firms develop innovations through changes to their business model in developing countries. By answering this question, we hope to contribute the literature on business model innovation for inclusive development in developing economies based on our empirical evidence of infrastructure development projects in India.

We find that business model innovation in developing countries requires an active interface between private firms and public organisations. The study results highlight the role of internal organisation reforms in private firms and public organisations as these are a precursor for institutionalising business model innovation in this context. We also discover that private firms engaged in public infrastructure development can greatly benefit from actively engaging with the end customer. The research results indicate that this involvement with the end consumer can generate greater interest in public infrastructure and lead to the broad adoption of public infrastructure. Thus, we suggest a refinement to the business model literature, developing a suitable framework for private firms involved in public infrastructure development projects with public organisations. Following the perspective article by Karnani (2010) on the discussion on the libertarian approach to reducing poverty, we emphasise both the endogenous business model innovation of the firm and the importance of engagement in public infrastructure projects.

The rest of the paper is organised as follows: first, we present the theoretical background of our study. Next, we discuss the research methodology, cases and case analysis to derive the observations relevant to innovation in the business model. Lastly, we present the discussion on our results and conclude with limitations and managerial and policy implications.

2 Theoretical Background

2.1 The notion of business model

Business model innovation is a type of organisational innovation in which firms identify and adopt new opportunity portfolios (Teece, 2010). A business model describes how a firm creates value through the exploitation of business opportunities (Zott and Amit, 2010; Baden-Fuller and Morgan, 2010; Climent and Haftor, 2021) and works as the architecture of the firm´s value creation, delivery and capture (Teece, 2010; Foss and Saebi, 2018). Extant research has highlighted the importance and usefulness of the business model in various research areas, e.g., strategy, technology management and e-business (Zott et al., 2011). The business model concept has been conceptualised according to different focuses; for example, three principal streams in the business model literature are identified by Boons and Lüdeke-Freund (2013), namely, the technology-focused stream, strategic management stream and strategy-oriented stream. The three streams of research examine business models from different perspectives, namely, emphasise the business model concepts for technology companies, view business models as tools for improving a company's value chain, and enhance the market competition and efficiency focus of the business model. Similarly, after reviewing 681 articles mentioning the

business model, Wirtz et al. (2016) identified three groups of business model components: strategic, customer and market, and value creation.

Several definitions of the business model have been provided in various literature; among them, the definition based on the work of Teece (2010) has been widely applied. Teece (2010) stated that a business model is 'how the enterprise creates and delivers value to customers, and then coverts payments received to profits' (Teece, 2010). More specifically, a business concept concerns how to create value for customers, entice payments and convert payments to profits. We adopted the notion that a business model is the 'design or architecture of the value creation, delivery and capture mechanisms' (Teece, 2010). It influences firm performance (Afuah, 2004), technological innovation (Chesbrough, 2010), and competitive advantage (Zott and Amit, 2008).

2.2 Inclusive development in developing economies

The term inclusive development, which has been widely used in the developing economies setting (George et al., 2012; Halme et al., 2012; Pouw and De Bruijne, 2015), refers to the 'development that includes marginalised people, sectors, and countries in social, political and economic processes for increased human well-being, social and environmental sustainability, and empowerment' (Gupta et al., 2015). Inclusive development aims to achieve high and sustainable growth that reduces poverty and provides equal opportunity in the market (Ianchovichina and Lundström, 2009).

Inclusive development concerns two main dimensions: income inequality reduction and non-income well-being improvement. Regarding the first dimension, inclusive development aims to achieve growth that is accompanied by declining income inequality (Rauniyar and Kanbur, 2010), similar to the concept of pro-poor growth (Klasen, 2008; Grosse et al., 2008), as policymakers and organisations in developing countries have become increasingly aware that rapid economic growth has been unevenly distributed among the population and regions, which is raising income inequality. These kinds of disparities could threaten the fragile political consensus for economic reforms or even political stability (ADB, 2008). Therefore, inclusive development considers declining income inequality between the poor and the non-poor as vital to economic growth. The second dimension of inclusive development focuses on growth that promotes equal opportunities and increases access to these opportunities (Ali and Zhuang, 2007). One way of providing equal opportunities for inclusive development is by providing financial support to small entrepreneurs in encouraging social ventures (Karnani, 2007; Sonne, 2012). Entrepreneurship with external help from the government or charitable institutions and

internal processes such as entrepreneurs' social networks can facilitate inclusive development (Bruton et al., 2013; Wu and Si, 2018). Moreover, inclusive knowledge-sharing and learning are considered significant determinants of sustainable, inclusive development, aiming to provide long-lasting opportunity equality for developing countries (Conceição et al., 2001).

Inclusive development is often difficult to realise due to various constraints in the developing economies (Karnani, 2007; Ianchovichina and Lundström, 2009). Inclusive development needs to overcome constraints such as poor access to domestic and international markets, inputs, services, information (Ianchovichina and Lundström, 2009). Also, limited infrastructure development, including energy, transport, telecommunication, water (Ianchovichina and Lundström, 2009), and weak government functions, including public safety and security, primary education, public health education and public health (Karnani, 2007; Ianchovichina and Lundström, 2009). Furthermore, there are, among others, issues like the lack of skilled human resources (Hausmann et al., 2005; Ianchovichina and Lundström, 2008), high financial, monetary and fiscal instability (Ianchovichina and Lundström, 2008; Sonne, 2012).

2.3 Public infrastructure and inclusive development

Investing in public infrastructures, such as transportation, electricity, water and sanitation, and security, can be an effective policy instrument for inclusive development, as it can improve the well-being of individuals and communities living at the base of the pyramid (BoP; George et al., 2012; Gupta et al., 2015). However, in developing countries, very often, various constraints exist for the development of public infrastructure. To summarise the issues in the developing economy context, we use Porter's diamond of national competitive advantage to outline the challenges in public infrastructure development.

Insert A here

Inadequate infrastructure and deficient quality, as well as expensive essential services, are perceived as significant constraints on inclusive growth in developing countries (Ianchovichina and Lundström, 2008). On the other hand, public infrastructure development plays a vital role in the potential to generate desired capabilities, such as physical assets, human capital and technical structure (Veloso and Soto, 2001), which could facilitate inclusive development in developing economies. Large infrastructure development can also create spillover and learning potential for local economic players by sourcing technology and knowledge, creating job opportunities,

and involving private sectors in the development. The learning among organisations that engaged in the large infrastructure development can also stimulate innovation (Rezaei et al., 2018; Lehtimäki et al., 2018). The technological regime embedded in large infrastructure projects guide the direction of technological change and the adoption and diffusion of new technologies (Markard and Truffer, 2006). However, large infrastructure projects cannot purely be regulated by marketing mechanisms because of the need for a significant amount of financial investment and coordination capability, which is difficult for firms to implement in such projects. Therefore, a certain level of government intervention is needed (Veloso and Soto, 2001). Government and large public-sector firms can be effective coordinators working with private firms on public infrastructure development and implemented activities to ensure inclusive development for local people (Sharma, 2012).

Therefore, we consider large infrastructure projects as platforms for firms to adopt new technologies and knowledge, develop their competitive advantage and deal with different types of constraints in developing economies. We study the inclusive business model innovation for those firms, as they are facing some unique opportunities and challenges, which, to our knowledge, has not been investigated in the extant literature. As we will later see, we develop an understanding of the inclusive business model and highlight the difference in the business model pursued by the firms involved in public infrastructure development. In this paper, we study how a firm can achieve inclusive development through involvement in public infrastructure development while adapting its business model to best leverage its capabilities and overcome the institutional challenges present in this context.

2.4 Inclusive business model innovation

With the rise of emerging markets, such as India and China, there is growing research interest in exploring the business potential of resource-constrained customers and markets in these areas. Since the customer needs and market segment differ from the Western economies, the application of current business model theories needs to be adjusted accordingly (George et al., 2012; Sonne, 2012; Vicente et al., 2018). When studying inclusive development in developing economies, we focus on firms with less competitive technological competence, possess insufficient strategic management capabilities, and operate in a market where customers are highly price-sensitive and have low purchasing power. Therefore, we need to further study business models for inclusive development for firms operating in developing economies.

Business models for inclusive development, namely, inclusive business models, aim to achieve both financial and social development that benefits not only the individual customer but also the community of low-

income people (Kistruck and Beamish, 2010; Klugman, 2010; Pansera and Owen, 2018; Van Wijk et al., 2019). The inclusive business model could reflect actions with multiple meanings: "supporting sustainable growth and at the same time tackling social, cultural and ecological problems" (Gasparin et al., 2021). Such a goal may not be easy to achieve as the social transformation influenced by the business model can be either positive or negative (or both; Martí, 2018). Recent research has highlighted the need to put the business model concept in the centre stage to understand better the "world of work" (Baden-Fuller and Morgan, 2010; Fulgencio and Fever, 2016). It is especially true for understanding the value proposition development and value capture in firms primarily operating in developing markets. Inclusive business models need to engage with various constraints in developing economies, such as deficient market information, limited regulatory environments, lacking physical infrastructure, or lacking access to financial services (Ianchovichina and Lundström, 2008; Ianchovichina and Lundström, 2009). To overcome these constraints, Sanchez and Ricart (2010) suggested that firms may collaborate with local partners, such as NGOs or governmental agencies, to increase the capacities for identifying opportunities and integrating various resources. This type of 'interactive' instead of 'isolated' business model could combine, integrate and leverage firms' internal resources with the ecosystem's capabilities to create new business opportunities and realise value creation in developing economies (Sanchez and Ricart, 2010). As suggested by Peerally et al. (2019), social business can contribute to the inclusive growth of local communities by first creates operational capabilities and then, over time, builds innovative capabilities to fulfil a social need, be self-sustainable and achieve inclusive innovation. Ausrød et al. (2017) identify four business model elements for the BoP market: value proposition, supply chain, customer interface and finance. They suggest that firms need to design a business model that can enhance their native capability to integrate into local routines and further absorb local knowledge in order to 'adapt' to the context in the developing countries and, equally importantly, to 'shape' the context for inclusive development (Ausrød et al., 2017). In addition, Gebauer et al. (2017) identify various barriers for firms that enter the BoP market, including low-income levels, the poverty penalty, low-payment rates, heterogeneous needs, little profitability, the image of being 'only' for the poor, risks inherent in the BoP initiative, limited growth and slow scaling processes. They suggest five types of business model innovation as a response to these barriers, namely (a) design, (b) renewal, (c) expansion, (d) diversification and (e) replication.

We suggest that there has been growing attention to the inclusive business model of firms operating in developing economies. Firms operating in these countries often find themselves under too many constraints to develop their sustainable competitive advantage; they may occupy a unique position by engaging in public

infrastructure development. By studying how firms can develop a competitive advantage in the business model, which supports inclusive development, we hope to advance knowledge in this area of business model innovation and inclusive development.

2.5 Inclusive business model innovation for infrastructure development

Most studies focused on the private firm's strife to generate value and build a market for their products (Baden-Fuller and Morgan, 2010). The ´Business Model Ontology´ by Osterwalder and Pigneur (2004) provides a framework to ´better formulate, understand, analyse and share a company's business model´ so the alignment between ´business strategy, business organisation and information systems´ can be better understood. We thereby use the framework from prior work (Osterwalder and Pigneur, 2004) along with Porter's diamond framework to include the potential avenues for innovation in private firms involved in public infrastructure development. This theoretical model provides the fundament for the analysis of the case data we gathered.

Table A presents the five factors from Porter's diamond and limitations in the contextual environment. For this study, we combined firms, competition and supporting industries into one factor relating to the firm's business environment and label it as "Firm and supporting industries." In table A, we listed the potential constraints in public infrastructure development in a developing economy.

Insert Table A here

The work of (Osterwalder and Pigneur, 2004) identified pillars which form part of the business innovation, namely, innovations that relate to products, customers, resource management, financial management and institutional interface. Each of these pillars has further defined avenues for innovation. For example, in the case of a product, the value proposition has been seen as one of the ways to introduce business innovation. In public infrastructure development, this innovation can materialise in the form of innovations in metro services, primary health care, emergency medical services, fire agencies, highways, road works and so on, which address effectively, efficiently and economically the needs of the citizens.

We map these five pillars emerging from Osterwalder and Pigneur (2004) into three factors: market, firm and supporting industries, and institutions. The market factor is linked to products and customers; using information from Table A, which identifies the gaps in the infrastructure, we can further identify how innovations can be generated. Similarly, we map firms and supporting industries to resource and financial management. In the case of resource and financial management, we identify, based on (Osterwalder and Pigneur, 2004), five avenues for innovations along with value configuration, core competencies, partner network, cost structure and revenue model. Furthermore, we indicate innovations in public infrastructure projects relating to these five avenues. Lastly, we link institutions to the institutional interface and discuss liaising and partnering with government organisations.

Insert Table B here

However, very few studies have investigated how firms could develop an innovation strategy by actively engaging in public infrastructure development and through business model innovation. In this paper, we use two case studies to illustrate the process that private firms overcome local resource constraints and achieve innovation.

3 Research Methodology

3.1 Data Collection

In order to examine the process of business model innovation in public infrastructure development, we chose two large infrastructure projects in India (Project A, Project B) and began this research work in 2008. Moreover, to arrive at these two sample projects, we adopted an approach suitable for identifying unique and significant projects that will have an enormous impact on the local community and generate inclusive development. We referenced the local news media and national newspapers to identify the most notable projects in India. Through this method, we initially identified 50 Indian public infrastructure development projects. Similarly, we also considered which of these projects had global links and media visibility, in order to identify the wider global influence and acceptance of these projects and provide us with ample secondary information sources. Following these criteria, at this stage, the number of projects was reduced from 50 to 20. Also, the cases needed to

demonstrate a novel business model for this context and demonstrate engagement with the issues in the local business environment, which prevented previous infrastructure development or led to inadequate infrastructure development. At this stage, suitable projects reduced by 10–20 projects. We also interview two nationally reputed Indian academics who worked in this area to inculcate their feedback into the identification of projects suitable for this study. Based on this intensive process, two novel infrastructure projects were identified for this research project. The investigated cases demonstrated a few exceptional qualities that made them logical candidates for detailed empirical investigation (Eisenhardt and Graebner, 2007).

Project A is a transport development project in the northern state of India. We began our study when this project was partially complete and parts of this project were still under development. This allowed us to track the progress of this project and conduct observational visits to project sites. Also, this project has performed better than other similar projects in India. The state had not provided subsidies for the metro operations for the Kolkata metro because it was a central government project that made the project expensive (Das, 2020). However, the state government provided a subsidy for electric power to the tram service (Bandyopadhyay, 2012). Thus, Kolkata metro faced low ridership as it was expensive to travel by metro instead of subsidised trams. The Kolkata metro took more than 20 years to construct and faced severe cost overruns and ridership issues; in contrast, Project A was constructed on schedule and within budgeted costs. Similarly, issues were experienced in another metro operation, Gurugram's Metro Rail, a fully privately-developed project. In this case, the ridership was low, and only 39% of the revenue was derived from the commuters (Bhatt, 2019). Also, the operating costs of the financing were around 65%; in contrast, other metro operations in India were between 4–13%, but as a private construction, the financing for the Gurugam metro project was borrowed at commercial rates of 12–14%.

Project B provides emergency services in the southern state of India. The emergency healthcare organisation was in the initial stages of development when we approached it to access its activities related to its infrastructure development. Similar to Project A, as this project was still under development, we had the opportunity to follow its lifecycle and visit project sites. Both of these projects were developed about 20 years ago, and as of now, have been in operations for more than a decade. Due to confidentiality agreements and the need for anonymity, we do not provide detailed information on these case projects. Choosing case studies from different regions of this vast country helped us to, firstly, generate a rich dataset for analysis of our research question, and secondly, generate some generalisable results from this research.

Insert Figure A here

A multi-stage process was used to collect information on these two projects. In the first stage, secondary information about these two projects was collected by following intra- and inter-organisational developments over time. This secondary information covered the earlier stages of these project, which transpired before the inception of our research work, as well as some contemporary secondary information sources that were collected during this study period. Parts of both these projects were under development at the start of our research work, and some sections were operational during the data collection phase. Thus, giving us an excellent opportunity to collect data on these projects. Given the public nature of these projects and their impact on the local community, both of these projects enjoyed wide-ranging media coverage, providing numerous secondary data sources (e.g., reports and newspaper articles and interviews) that helped triangulate our findings. In our case, secondary data sources included organisations' internal reports and presentations, government reports, media reports, medical journals, newspapers and trade press articles. These were several independent English and Hindi-language newspapers and websites of TV news stations, such as The Times of India, The New Indian Express, Hindustan Times, New Delhi Television Limited (NDTV), Telegraph, Businessweek, and Zee News. We also located information on the financiers and external contractors. We used the Google search engine to locate articles related to these two projects.

In the second stage, we conducted fieldwork; as it was performed during the "live development," it allowed us to interact with the contractors and visit construction sites to avail real data on decisions and practices. The interview questions are presented in Appendix A. We were also allowed frequent access to senior managers in the private firms and government officials involved in this project. We used a purposive sampling technique to generate an interviewee list for this research, and 55 interviews were conducted between 2008–2011 with employees and key stakeholders of Project A and B. The information on the respondents is provided in Table C. Interviews, lasting between 30 to 60 minutes, were conducted with various stakeholders to capture the perspectives of these stakeholders. Some of these interviews were recorded, and where the interviewees refused to grant permission to record the interviews, we made detailed notes during these interviews. The interviewees were drawn from different levels of the organisational hierarchy and various functional areas. Interviews with top-level managers focused on the corporate strategies and strategic intent of these business innovations. In contrast, frontline employees and end-users were interviewed to understand the implications of these business

model innovations. The interview included questions about fundamental concepts such as organisational background, capability development within public organisations, and across the network and specific change initiatives. Additionally, in 2010, one of the authors carried out three observational visits to the project sites to observe the project management and operational issues being managed on a day-to-day basis.

Insert Table C here

3.2 Data Analysis Methodology

First, we conducted a detailed investigation and analysis of official promotional materials and over 300 articles about Project A and B. Some of this work was carried out before the interviews to provide us with the overall information about the projects and helped us derive our interviewee questions. Following the second stage of our project, we used interviews, secondary sources and literature to triangulate the information. During this process of triangulation, we obtained a generic set of codes. The data examination process entailed three stages—data reduction, data display, conclusion drawing and confirmation—to simplify and make sense of the complex data (Pettigrew, 1990). We could identify the adopted processes and innovations in these two projects. This process was defined as the latent analysis, where one of the authors interpreted the data using what (s)he knew about the topic, country context and situation within which the data was gathered.

Next, to audit this coding process, we recruited two Indian researchers who had a good understanding of the infrastructure projects themselves but not our research questions. These researchers had sound knowledge of the business model innovation literature. Researchers were then asked to identify business model innovations in these projects. The author and two researchers could independently arrive at a similar set of codes. In cases of divergence, it was observed that much of the issues arose from idiosyncratic differences in coding rather than any disagreement in the underlying theoretical grounding (Fetterman, 2009). The findings were written up in two 20+ page in-depth case study reports. These case studies were provided to five interviewees to generate feedback on our findings.

4 Cases

4.1 Case Analysis

4.1.1 Market: Product/Service

Both projects were designed and developed to provide public services to the local community. These were developed under the public-private partnership model; as such, though the government was the primary stakeholder with which the firms engaged and contracted to provide this service, the end-users were the local society. Project A was geared to provide rapid transportation services in a city plagued by congested traffic, pollution, and rapid urban growth. This infrastructure was developed as an alternative to road transportation and provided environmentally friendly transportation for a developing country with evolving travel needs. These services were positioned to be a cheaper mode of travel and were affordable to weaker sections of society. The one critical private firm, in this case, was contracted with the government to provide these services on a profit-sharing basis as well as other private firms were involved in this project on the contractual basis who delivered infrastructure or equipment required for this project.

As one of the customers noted, "*The metro is cheaper to travel than taxis, and has the same level of timeliness and is clean and comfortable. The bus is slightly cheaper, but it is very crowded and uncomfortable to travel over long journeys.*"

With regards to the partnership, the government official noted that "*Project A is a win-win situation for the government as we can get the best talent on the market to undertake this project rather than relying on the old system of internal procurement and project development. This new method offers us flexibility and value for money. This way, we were able to provide the best service, best trains, best transportation.*"

Project B was an emergency service provider in an urban area and was started by a private firm to leverage its competencies and capabilities in a different industry. The main service delivered by Project B was the provision of free access to emergency healthcare services to urban and rural poor. The private firm, in this case, was involved in the project on a subsidies basis, with the government providing some of the operational costs; however, the private firm had to locate other sources of funding.

The uniqueness and value of this project were indicated by one of the end-users, *"In the past, we did not have a single way to contact the emergency service, and we contacted local hospitals for emergency care. Sometimes they had a bed available, sometimes they did not, and most times, we were asked to take the patient ourselves to the hospital. Now we can use the emergency number to request a service."* The top manager in the private organisation noted the value that government and independent funding added to this project. "*The government funding assured the operational aspect of this project, whereas having access to outside funding, including international funding, both in grants and in-kind, helps us access the best technology and medicine for*

this project. In the past, projects which were reliant only on the government fundings failed as this limited investment and innovation."

4.1.2 Market: Customer

Project A's target customers were the urban masses or individual transportation users who had been using road transportation services like taxis, bikes and buses. In this particular context, bikes were risky as they were more likely to be involved in road accidents. Alternatively, taxis were expensive and highly likely to increase pollution in this city as it rapidly urbanised. The buses provided a cheaper alternative, as mentioned by one of the customers noted before. There are also numerous incidences of mistreatment of female users, and several scandals and issues highlighted the personal safety issues faced by the female passengers. Thus, one of the primary goals of Project A was to provide a cheaper and safer travel option to all its users, including female passengers. As one of the managers from the private firm noted, "We created a separate compartment for women to travel in, and during the evening hours provided security officers on the sites as well as on the trains to protect women passengers."

Throughout the duration construction phase of this project, the advantages of this project were widely advertised to generate a positive relationship with the future customers of this service. Several localised advertisement practices were introduced to make this project viable to end-user; for example, street plays were conducted in several parts of the city to advertise the benefits of these services. Customers were also engaged in providing feedback on the operational issues, and these issues were promptly addressed by the project managers as well as the private firm managing the project. The private firm used this feedback process to develop several useful processes and services, such as having toilets at stations, providing information on travel and metro card usage, and having metro cards with low-value and high-value tickets for certain services more likely to be used by tourists and foreigners. The spaces around the train station were used to plant shrubs and flowering plants, which improved the aesthetic feel and greenery in the area. One manager from the private firm mentioned the open nature of the feedback between the firm and the customers, *"We asked the customers to provide information on things that they thought would be important or essential to make their journeys comfortable. Someone suggested that having secure bicycle stands would be useful. We provide these for our customers."*

Project B focused on individuals who required access to emergency healthcare but did not have the financial means to access higher-quality medical services typically accessible to persons who can attend private hospitals. The people from the lower-income segment disproportionately accessed the government hospitals and

emergency services. Thus, Project B aimed to provide excellent, free emergency healthcare comparable to the best medical care in the country and compatible with the global standards in emergency care. Additionally, in this case, users were asked to provide feedback on the services, and improvements were made following this information. For example, following feedback that patients typically expect family members to accompany them on the ambulances, the private firm worked with ambulance manufacturers to create extra space in the ambulance for the relative accompanying the patient. One of the frontline staff noted this responsiveness, "*We included local people in planning our emergency contact persons in these poor areas as we were told that many people did not have phones or mobile phones to get in touch with the emergency services. We also trained interested women and men in basic first aid using our resources.*"

In both cases, the amenities provided by the private firms were done so through channels best suited for delivering the services to average customers who were not necessarily discerning in terms of quality but very price-sensitive. Thus, the transportation services provided through Project A needed to implement pricing strategies which made the travel by their transportation systems cheaper than the conventional transportation system. Also, in the case of Project B, since the average customer was price-sensitive, the private firm decided to focus on other mechanisms to raise capital to support the customer's need for free access to emergency healthcare.

Both projects aimed to actively engage with the end-users and provide structures and processes within the organisations and in interfaces between the organisation and the end-users; this facilitated active engagement between the private firms and the end-users. For example, in the case of Project A, the private firm created formalised suggestion points within its transportation network, which was regularly monitored, and any major issue swiftly addressed. Also, several engagement activities involving local stakeholders—council members, village elders and teachers—were organised in the transportation services area to advertise the services and increase interaction between private firms and the end-users. In the area where transportation links were reduced in the past, local outreach programs were established to improve visibility and information on the new transportation services. In the case of Project B, the private firm worked to create communities of practices within the local society that worked as advocates for the use of emergency healthcare facilities. These individuals were also trained to provide some basic emergency healthcare, which also improved the legitimacy of the services as people trusted the service providers who were known to them rather than strangers visiting their communities. These uses of the gatekeeper model helped the private firm establish the uptake and increase of these projects' viability.

4.1.3 Firm and Supporting Industries: Resource Management

Resource management involves, among other things, the transfer of project experience from the private sector to the public sector or partners with lesser capability and experience irrespective of their network position. The resource management also considers that typically high human capital can be found in private firms, especially those who are industry leaders in their sector, and these private firms have higher flexibility in their organisational structures. Similarly, resource management involves service standardisation in sub-contracts and effective use of capabilities and resources via contracting mechanisms between the public and private partners.

We observe the difference in our cases when it comes to resource management. In the case of Project A, the innovations were public organisation led and private firms were the recipient of some of the major changes in this sector, whereas, in the case of Project B, the innovations were private firm driven and public organisations were suitably changed to engage with the new form of private firm's business model.

The key objective of Project A's central public organisation with regards to organisational structuring and network linkages was to improve efficiency. Thus, the private firm was primarily interested in improving efficiency via its resource management strategy. Public organisations were keen to leverage the high human capital in private firms on the one hand, and at the same time, transfer knowledge on human capital management to partners with lower capabilities in the supply chain like their sub-contractors. As one manager suggested, the reason for improved efficiency was their ability to recruit top talent, unlike government organisations involved in the public infrastructure development – "*We can offer a market salary to our employees and other incentives like a scholarship to study abroad."*

The public organisation leading Project A was keen to introduce formal managerial processes within the ambit of this project, which was driven by its managers' experience working in private and foreign organisations. Thus, the main work of this public organisation to introduce networkwide changes was to organise the contracts between them and the sub-contractors in such a way that formal management procedures and financial incentives were embedded in the contractual agreements. The value was derived by public organisations through their interactions with private firms in terms of better management structures and ownership of responsibilities and rewards; additionally, these changes observed in public organisations were also transmitted via formal and informal mechanisms to their network partners with limited previous experience working with private firms.

In the case of Project B, the private firm leading the project was the key player in deriving the value configuration for this project. The private firm developed the project to leverage its previous experience and successful business model from the information technology industry into the public service sector. The private firm developed contracts and partnerships to transfer their skills and competencies to both private firms and public organisations that lacked these capabilities. Thus, the resource was ably managed by private firms to meet public infrastructure development needs. The private firm manager noted that "*We could adapt our knowledge to the challenges in developing public infrastructure."*

4.1.4 Firm and Supporting Industries: Financial Management

In order to provide services that were context-appropriate, both private firms engaged in several organisational configurations and coordination development, which were novel to their sectors. In order to develop appropriate financing, the private firm in Project A developed its cost model on subsidies from the government as well as soft loans and grants from international financing organisations. This capital generation and financing model aimed to avoid transferring the higher cost of running the transportation services in the initial stage to the end-user. Once the transportation services were fully operational and working to capacity, the private firm was less reliant on external financing. One of the top managers indicated how the subsidy model was developed such that there would not be overt reliance on the government funding, *"We observe that other projects in transport which depend on the government subsidy fail over time as they do not learn to be self-reliant; hence, we developed the financial model to be independent as soon as possible."*

In the case of Project B, the private firm initially worked on subsidies from the state government and later developed a sophisticated model, where much of the cost of the operations was accounted for by the revenue generated by the private firm from providing services to private hospitals. In return for access to hospital beds, equipment and medicines were provided by the pharmaceutical and medical manufacturing companies under various agreements which supported their corporate social responsibility agendas. The supplementary finances for this project were also generated by providing know-how and training to various institutions in the local community and training medical professionals for established private sector hospitals. The top manager noted that "*We could not take money from the people who were actually using our service, so we had to think different. We began the revenue sharing model with hospitals and pharmaceutical companies to provide the service for free to poor people needing emergency care."*

4.1.5 Institutions: Institutional Interface

The private firms in Project A were involved with governmental organisations to get access to various licenses and permission to buy public land to construct the transportation system. The main private firm was the key player in organising various signed, multiparty contractual agreements between private firms and public organisations. Project A's central private firm was also involved with several public organisations in developing rules and regulations that governed the transportation system's operations. As one of the top managers noted, *"The different government departments might have regulations which are divergent to each other or some departments are slower than others, we had to first agree on the project process to avoid delays later in the project."*

Project B required the private firm to work with the government to establish various platforms to provide services during various emergencies. For example, the private firm wanted to provide support in emergencies like fire-related accidents, food-poisoning, terror attacks, maternal illnesses, road accident victims, flood and typhoon-related accidents, and each of these emergencies required the private firm to work with a different set of the governmental organisation to establish their operational plan. Since the governments served fixed terms, private firms kept this in mind with the objective of stabilising their operations and wanted each contractual agreement with the government department to last at least one and a half to two fixed terms. In the Indian context, this meant that agreements were between 7.5 to 10 years. The top manager noted that "*Given the unstable nature of the politics, we wanted to have contracts that made it possible for these projects to continue even if the government changes*."

4.1.6 Cross-Case Analysis

There are some similarities and differences between how the private and public organisations interacted over the two projects. The differences between Projects A and B were mostly due to their nature and given that they were targeting consumers in different service sectors. By focusing on the similarities, the analysis shows that, in the case of both projects, customers were crucial for the strategic development of widely accepted services. We observed that private firms developed a process that gathered valuable information from the customers on service suitability, performance and issues. This broader engagement with the community also led to broader adoption of the services. We also observed that both private firms established various sophisticated resource management strategies and were involved in an internal organisational restructuring, which helped align their

resources with those of their network partners and public organisations. These internal changes are a precursor for institutionalising innovation. Table D summarises the findings of this study.

Insert Table D here

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5 Findings and Discussion

Based on the above results, our findings refine and extend the conventional business models by Osterwalder and Pigneur (2004) in the context of inclusive development of public infrastructure projects by articulating three key findings. One, this study develops a model to understand business model innovation under resource constraints. This model focuses on capability building undertaken by organisations involved in developing economies and extends existing findings on business model innovations in developing countries. Two, internal organisational reforms are a precursor for institutionalising innovation. We observed that efficient resource management and financial management using innovations were appropriate for the country context and mitigated the issues arising from resource constraints. Meanwhile, our study highlights the role of the efficient partner network with both private firms and public organisations. Finally, our study emphasises the importance of the customer, private firm and government interface in the innovation process. We find that resource constraints can be mitigated by actively engaging in building these interfaces. Firms that engaged with the end customer significantly gained from these interactions by either creating legitimacy for their actions or improving services, which improved uptake of services by the end-user.

This section also summarises the findings from the two case studies and identifies three propositions in business model innovation. The internal organisation reforms in public organisations and private firms are a crucial step in business model innovation (Osterwalder and Pigneur, 2004). The changes in the managerial and operational processes help the organisations to align their capabilities and resources to meet the needs of the infrastructure development in the developing country context (Conceição et al., 2001; George et al., 2012; Boons and Lüdeke-Freund, 2013). These reforms are essential to develop new internal organisational talent and resources and locate talent and resources from outside the organisations.

Proposition 1: Internal organisational reforms in private firms and public organisations are an important facet of business model innovation.

The second key factor towards wider dissemination of business model innovation, especially outside the private firm or public organisation where the innovation was initiated, is to have an active interface between private firms and public organisations so that innovations in the business model can easily be transmitted between organisations (Conceição et al., 2001; Seelos and Mair, 2007; Patel and Bhattacharya, 2010; George et al., 2012; Halme et al., 2012; Gupta et al., 2015). In order to achieve sustainable, inclusive business model development in the BOP market, the private firms need to have an active interface with multiple players, including local government, non-governmental organisations, local communities, financial institutions (Prahalad and Hart, 2002; George et al., 2015). Similarly, there is enough literature on customer orientation, customer co-creation, and community participation in sustainable business model development in the BOP markets. In order to achieve wider dissemination of innovations developed within one organisation, it is crucial to have links between the organisation and its industry players to initiate a transfer of best practices and generate sector-wide innovations.

Proposition 2: Generating an active interface between private firms and public organisations promotes the business model innovation.

Lastly, we posit that working with customers to understand their needs from the infrastructure development as well as creating opportunities for positive engagement and feedback with customers is an essential part of business model innovation (Osterwalder and Pigneur, 2004; Karnani, 2007; Seelos and Mair, 2007; Klasen, 2008; George et al., 2012). By actively engaging and achieving co-creation with local communities and consumers, private firms can boost their corporate legitimacy and gain access to social networks, build new business models and ecosystems at the BOP, secure social and environmental value for low-income communities, and empower poor communities by reducing poverty (Nahi, 2016). In this context of infrastructure development, customers are not seen as passive consumers of infrastructure; instead, they seem to be a crucial part of value configuration for the company. Our finding is aligned with the findings from Angeli and Jaiswal (2016) that, in the setting of health care delivery at the bottom of the pyramid, the co-creation process between patient and the organisation to identify the health care need, namely value discovery, is a critical part of business model innovation for inclusive development. In our cases, we observe that the broader engagement with the community also led to broader adoption of the services. Especially in the case of Project B, local communities that worked as gatekeepers improved the legitimacy of the services and established trust from people, which also increase the viability of these projects.

Proposition 3: Generating an active feedback loop back from the customer to the organisation further embeds business model innovation.

6 Contribution and Implications

6.1 Contribution

This paper contributes to the literature on promoting business model innovation and inclusive development with engagement with private firms in the context of public infrastructure development. As the conventional business model of value-proposition-value creation-value appropriation in the existing literature (Osterwalder and Pigneur, 2004; Yunus et al., 2010) only partially covers the conceptualisation of business model innovation for inclusive development, our findings suggest some key elements of inclusive business model innovation that refine and extend the current business models in the context of inclusive development of public infrastructure projects. This study develops a model to understand inclusive business model innovation under resource constraints with three focuses: (1) capability building and internal organisational reforms undertaken by private firms and public organisations, (2) the role of the efficient partner network between private firms and public organisation and (3) the importance of engaging customer and local communities to embed the business model innovation. By emphasising those focuses, we argued the necessity to refine and adapt the conventional business models into the setting of inclusive development.

6.2 Managerial and Policy Implications

Both private firms and public organisations in the developing economies experience challenges to their current business models, and innovation to their business model is crucial for inclusive development. One of the most significant challenges of these developing economies is their limited investment in public infrastructure. Allied with this challenge is the lack of governance and presence of bureaucratic structures in public organisations. The private sector can greatly mitigate the issues observed in the public governance of infrastructure by introducing advanced technology and skill in public infrastructure development and management. At the same time, private sector organisations can enhance their legitimacy by providing inclusive development through their participation in public infrastructure development.

Also, our results draw attention to the importance of suitably adapting organisational interfaces and introducing appropriate business model innovations to engage in public infrastructure development for inclusive development. For example, private firms that enter into public infrastructure development can gain by closely

engaging with their end customers just like they would while providing products or services in the commercial or competitive markets. Creating valuable feedback processes and close alignment of products and services meeting the local needs can create a higher demand for public services.

Lastly, there is an opportunity for managers from developing economies to transfer these skills from one developing economy context to another. There is potential for knowledge transfer between the developing countries, especially in how business model innovations can be engendered and how these innovations can be fine-tuned to the local context.

6.3 Limitations and future research

The principal limitations of this study relate to the sampling technique and location of this research work. We chose to focus on two diverse case studies to exemplify similarities as well as differences between them. Nevertheless, the choice of case studies might impact the findings and subsequent derivations of learning from these case studies. Also, we focus on successful projects; future studies can conduct comparative work on the projects that have engaged in business model innovation but have not yet successfully implemented infrastructure projects. Knowledge of drivers of failures in large infrastructure projects is as crucial as those that drive successful projects to understand how developing economies can implement large projects for inclusive development.

The case studies are from a single country. Though several developing economies are similar in institutional factors; however, there might be other challenges that might drive business model innovation in these countries. We chose to focus on two sectors to derive generalisable results for our study. With that said, we acknowledge that underpinnings for business model innovation under resource constraints might be different in other areas. Also, the drivers of change and implications of resource constraints might be different in other industries. Thus, detailed studies in other sectors and other developing economies will undoubtedly aid in providing a much broader picture for managers, academics and policymakers regarding business model innovation. Future studies can also examine whether certain PPP model has been better able to alter operations in response to COVID19. For instance, which types of service providers (metro or hospital) were able to adapt their business model quickly to respond to new demands and government guidance on social distancing, sanitising, etc.

We argue that our study provides a preliminary insight into the business model innovation in organisations that deliver in large infrastructure projects in India.

7 Conclusion

This study examined two large infrastructure projects in the developing economy context, namely India, to elucidate how firms engage in business model innovations to overcome local resource constraints. Projects like these are relevant for the development of infrastructure in these developing economies; what is more, these infrastructures are vital for inclusive development. Our study showed how firms and governmental organisations could create and implement interfaces between themselves and their service provisions and end-users for improving the services. These practices of developing systematic interfaces between public organisations and private firms can further enhance the inclusive development aspect of these projects.

Table A: Resource-Constraint in public infrastructure development in a developing economy*

	Limitations
Market	Lack of customer education. The absence of basic amenities leads to customer disenchantment with the government's policies and makes citizens sceptical of new products introduced by the government, especially when the citizen does not adequately recognise the need due to lack of information on the product.
Competition	Few firms can provide expertise to build world-class public infrastructure. High barriers of entry due to the high investments required in public infrastructure development projects. Competition is limited.
Institutions	Limited financial institutions. Undeveloped financial markets. Inexperienced judiciary and legal policies in case of project delay and litigations.
Firm	Lack of funds to invest in large infrastructure projects. Limited access to finance.

	Inadequate government support.
Supporting Industries	Lack of human resources essential for public infrastructure projects. No standardisation in the services provided by sub-contractors for public infrastructure projects. Sub-contracting companies lack experience in large project development. Limited heavy machinery/equipment manufacturing in the home country.

* Adapted from Porter's Diamond of Competitive Advantage. In public infrastructure, the government is the primary stakeholder, but the primary consumers of the product are ordinary citizens.

Table B: Business Innovation Building Block in Private Firms engaged in Public Infrastructure Projects derived from 'business model' literature

	Pillar	Definition	In public infrastructure projects
Market	**Product**	**Value proposition**	Metro services, primary health care, emergency medical services, fire agencies, highways, road works, etc.
	Customer	**Target customer**	Customers can be generated from Technology push (faster trains) Demand-pull for certain services (emergency medical services, quick transportation) can generate customers.
		Channels	Customer Education, government policies, NGO's disseminating information in target customer segments.
		Relationship	Generate user communities, create a feedback network.
Firm and Supporting industries	**Resource Management**	**Value configuration**	Transmit project experience from the private sector to the public sector.
		Core competencies	High human capital in private firms, flexibility in the organisational structure.
		Partner network	Project experience in world-class developments, service standardisation in sub-contracts, developed partnership models in sub-contracting, high human capital in supporting industries.
	Financial Management	**Cost structure**	Borne either by the government in the procurement model or split between the government and private partner in the Public-Private Partnership model.
		Revenue model	

			Providing low fees to end customers will generate higher demand for the product, nominal usage fee, stratified subscription fees - Product feature dependent or Customer segment dependent.
Institutions	**Institutional Interface**	**Liaising with government organisations** **Partnering with government organisations**	Generate grants, tenders, licenses for projects. Infrastructure development projects, Public-Private Partnerships.

** We have adapted and extended the original Osterwalder and Pigneur (2003) business model to highlight the difference in business model pursued by the companies involved in public infrastructure development as compared to private firms focused on final products, intermediate products or services markets

Table C. Details of interviewees

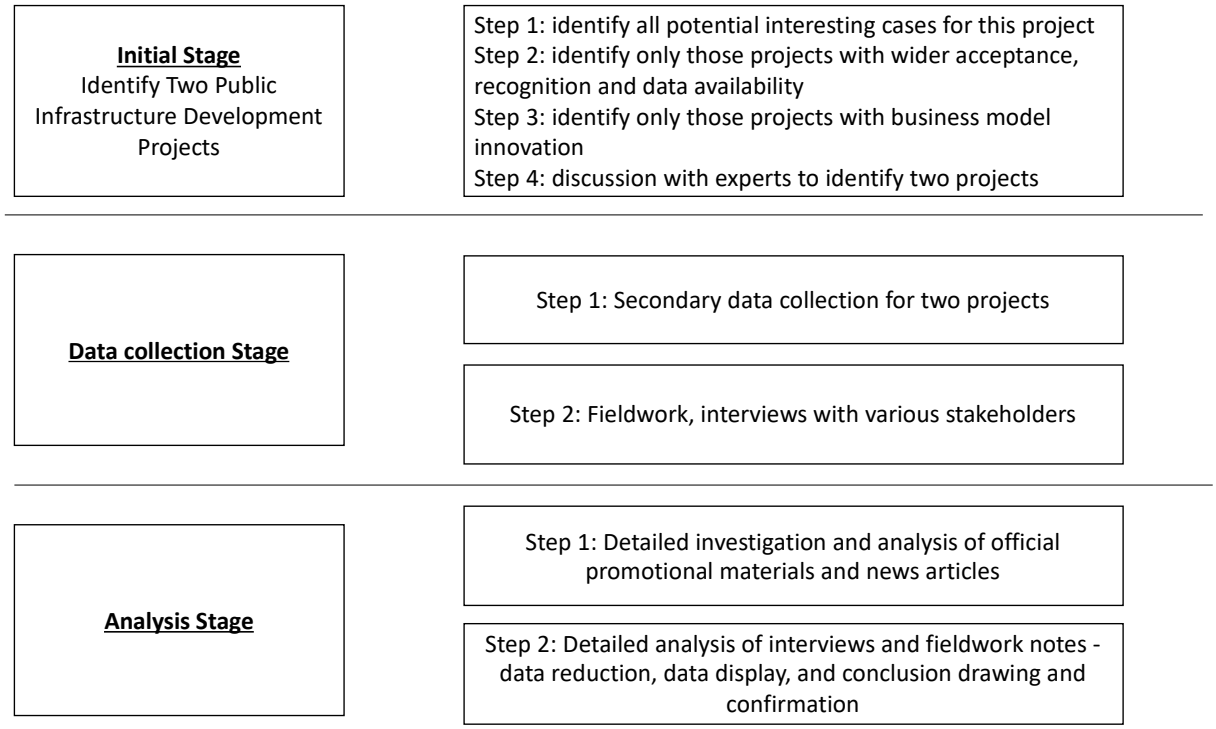
Respondent	**Private firm**	**Government officials**	**Financiers**	**External contractors**	**Customers**
Top management	2		1		
Middle managers	9	4	1	7	
Frontline employees	14			8	
End-users					9
Total	25	4	2	15	9

Table D: Analysis of Business Innovation Building Block in Private Firms engaged in Public Infrastructure Projects

	Pillar	In public infrastructure projects
Market	**Product**	Both projects were designed and developed to provide public services to the local community. Contractual agreements that foster engagement with state and other private firms for service delivery in this infrastructure project.
	Customer	Customers were engaged in providing feedback, and the feedback is adopted by the developers. In the case of transport projects, provide a cheaper and safer travel option to all its users, including female passengers. In the case of emergency health services, they provide excellent and free emergency healthcare to their customers. Delivering the services to average customers who were not necessarily discerning in terms of quality but very much price sensitive
Firm and Supporting industries	**Resource Management**	Resource management involves the transfer of project experience from the private sector to the public sector or partners with lesser capability and experience irrespective of their network position. Service standardisation in sub-contracts and effective use of capabilities and resources via contracting mechanism between the public and private partners. In the transport project, innovations in resource management driven by the public organisation, and in healthcare projects, innovations in resource management driven by the private firm.
	Financial Management	In the transport project, their cost model was based on subsidies from the government as well as soft loans and grants from international financing organisations. In the healthcare project, much of the cost of the operations were accounted for by the

		revenue generated by the private firm from providing services to private hospitals in the quid pro quo model.
Institutions	**Institutional Interface**	In both projects, private firms and public organisations worked together to grant tenders and licenses for projects.

Figure A: Research process chart



Appendix A. Interview Questions

A. Name of interviewee

B. What were your main actions/ responsibilities on this project?

C. General questions on Infrastructure projects in India:

1. What, according to you, are the challenges in financing large infrastructure projects in India?
2. How do you think these challenges can be mitigated?
3. What organisational and project-level factors influence the allocation of risk in multiparty projects?

D. Questions on the project:

General:

4. Did you have any specific approach to this project?
5. What motivated the organisation to enter this project?
6. How big was the core decision-making team in your organisation?
7. Who were the key decision-makers on this project?
8. How did you manage your resources across this project?
9. How did you identify the key customers and the uptake of this service?
10. Who (person) greatly influenced the success of this project?
11. What were the three main drivers of the success of this project?

Financing model:

12. Can you tell me something about the financing model?
13. Did you face any hurdles in this project? Please elaborate.
14. How is the follow-up evaluation done? How do you generate feedback mechanisms?
15. What was unique about your relationship with DMRC that made this project successful?

External Partners:

16. Did you engage with external contractors working on this project? If yes, any comments on how the interaction was designed and contracted between various partners?

17. Describe and detail your partnership with the state and the federal government. What was unique in your contracts with the state partners?

18. What lessons did you take away from this project?
19. Ex – post: Can you tell me what you would have changed in the implementation of this project?

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