

THE STATUE OF UNITY: A BOOST FOR TOURISM- A CASE STUDY FROM INDIA

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ABSTRACT

The Statue of Unity, the Tallest Statue in the world, is a tribute to Sardar Vallabhbhai Patel's life, a role model of unity and statesmanship in India. The Statue was to accelerate tourism within the region and the surrounding 2,200-acre preserve along the Narmada River, where it is located. In addition to the Statue, which stands on an island in the river, there is an exhibit hall and memorial garden at the base. The project includes a canopied bridge to the island, a visitor's center, a hotel with a conference center, a transit center, and a 3.5 km road from the nearby town of Kevadia. This project was launched in 2010 as a public-private partnership model and was completed in 2019. This paper studies the life cycle of this project and explores how it would boost India's tourism sector.

Keywords: Statue, Public-Private-Partnership, Tourism Industry, Project Management, Comparative Analysis.

INTRODUCTION

Standing at 182 meters, which is twice the height of the Statue of Liberty, the Statue of Unity in Gujarat rises on India's western shore as the pride of the nation built on a budget of Rs. 2,989 Crore (USD 450 Million), it is a tribute to Sardar Vallabhbhai Patel, a freedom fighter and India's first Deputy Prime Minister. Constructed by Larsen and Toubro (L&T), the Statue of Unity is located on Sadhu Hill on the banks of the Narmada in Gujarat. The statue towers over another engineering marvel, the Sardar Sarovar Dam, and has already become a draw for tourists from across the country. The project was the winner of PMI India's Project of the Year in the large category in 2019.

Construction of a statute of this magnitude was one of India's unique projects in recent times. The project is grand in terms of the size of the Statue and the challenges it posed for the engineers, government, local community, and the environment. Not only it is now a pride of the nation, but it has also now become a source of employment and income generation for the local community through the boost the Statue has provided in the region. In this article, the authors have highlighted the life cycle of the projects and the various challenges the project faced at different stages, and how those were met through successful implementation of the innovative technology, managerial efficiency, division of labor, and partnership between public and private organization. The project management lessons of this Public-Private Partnership (PPP) model could be worth emulating in taking other such mega projects, especially the low to medium-income nations that often need to deal with budgetary constraints and managerial challenges in completion of them.

LITERATURE REVIEW

Construction of The Statue of Unity could fit into a typical project that requires efficient management for completion within the timeline and not exceeding the budgetary provisions. Project management revolves around three aspects, i.e., cost, time, and scope Keren (2012); Rozenes et al., (2006). But this scope can be defined to achieve the strategic objectives of the organization. Freeman & Beale (1992) measured the project's success; thus, completing the project would attain the strategic goals. Also, Shenhar, et al., (1997) proposed mapping the project's dimensions. The strategic importance of the project is typically obtained only after the project is done. For example, even if the project outputs have been delivered efficiently, the project can still be ineffective to the funding organization. Examples are the Sydney cross-city tunnel as highlighted by Zwikael & Smyrk (2011) and the Los Angeles Metro as shown by Shenhar & Dvir (2007).

Another well-known example is the famous Sydney opera building, far from being on time and on a budget but is a great success in the long run. A wider view on the management of projects has recently emerged, which also discusses the delivery of strategic goals by projects as described by Gareis & Stummer, (2008), Morris & Jamieson (2008); Cleland (1994) have emphasized strategic design and implementation in project management. Project management emphasizes the strategic roles of projects in organizations (Kolltveit et al., 2007) and defines the management process's value Breese (2012). Consequently, benefits management is becoming an important research area Gareis & Huemann (2000) have stressed the project-oriented organization's project management competencies. Project benefits are "*the flows of value that arise from a project*" Zwikael & Smyrk, (2012). A project owner is accountable to the project funder/founder for the realization of these target benefits. The Statue of Unity is one of the unique projects undertaken in independent India. However, in terms of its project assessment, completion challenges, and benefits evaluation, the available literature is somewhat scanty. Singh (2019), in his paper, investigates the environmental issues associated with this mega project as no public consultation has been conducted regarding environmental Impact assessment (Maheshwari et al., 2019) in their case study, highlighted '*Statue of Unity*' design and sustainability. Rough quantitative results of life cycle energy analysis and life cost analysis. This paper lays a conceptual framework for the interface between a project of this magnitude and its strategic considerations. This study emphasizes the use of project management to achieve the organization's mission and vision. In this case, the world's tallest statue is a source of national pride, inspiration to the future generation, and the same point in time, a source of economic welfare in terms of revenue generation through the promotion of tourism and employment creation.

METHODOLOGY

The article is written based on sources that are secondary in nature. The primary source of information has been various news articles that are available in the public domain. The news articles have been supplemented by literature made available to the general public by the government of Gujarat and the Central Government. Various data, facts, and descriptions related to projects have been scouted from web resources as well.

The basic framework of project management, especially the project life cycle, has been utilized to construct the paper's descriptions and arguments.

Discussion

In this section of the article, the authors have highlighted some of the critical aspects of this enormous project. From its scope to the budget to executions and risk management to potential welfare impact after completing the project. This section essentially highlights the life cycle of the project and how innovations and the use of cutting-edge technology help a complete project in time and mitigate the risks inherent in it.

Project Scope

The Statue of Unity is the tallest statue in the world and is dedicated to the life and work of Sardar Vallabhbhai Patel. The scope of the project also included a hotel, convention centre, memorial garden, visitor centre building and a 3.5 km (2.2 mile) highway connecting the statue site to the town of Kevadia in the state of Gujarat.

The project envisages that the iconic statue will become a catalyst for accelerated development in the project area benefitting a large number of the local tribal population. It was anticipated that development will be based on several stimuli such as tourism infrastructure, entertainment and educational infrastructure, research activity in facets of bio-technology, clean energy, water resources, environmental management and tribal development. The overall area surrounding the project site was expected to grow and support all of the above activities and more.

The Statue rises above a geometric star-shaped platform built on Sadhu Island in the Narmada River. Visitors to the Statue of Unity arrive at a riverside visitor center and then proceed across a footbridge to the Statue's base where an exhibition hall provides accounts of the life and accomplishments of Patel and the history of modern India. Draped over the roof of the exhibition hall is a contemplative Memorial Garden. Within the Statue's chest, a 200-person gallery provides visitors with a view of the surrounding countryside and the nearby Sardar Sarovar Dam in Table 1.

Project Features

Height of the Statue	182 meters
Project Cost	Rs. 2,989 Core (USD 450 Million)
Project Duration	33 months
Employment Generation	4500 direct and 3500 indirect
Project management Effort	1, 058 (person-month)
Amount of reinforced Steel Used	18,500 Mt. Tons
Amount of Structured Steel Used	6.500 Mt. Ton
Amount of Bronze Used	1,700 Mt. Ton + 1,800 Mt. Ton for cladding

Sponsors

The Statue of Unity was built through a Public Private Partnership model, with most of the money raised by the Government of Gujarat. The Gujarat state government had allotted Rs.500 crore (equivalent to Rs.607 crore or USD 85 million in 2019) for the project in its budget from 2012 to 2015. In the 2014–15 Union Budget, Rs.200 crore (equivalent to Rs.257 crore or USD36 million in 2019) was allocated for the construction of the Statue. Funds were also contributed by Public Sector Undertakings under the Corporate Social Responsibility scheme.

Construction of the Project

Consortium comprising Turner construction, Michael Graves and Associates and the Meinhardt Group supervise the project. It took 56 months to complete; 15 months for planning 40 months for construction and two months for handing over the consortium. The total cost of the project was estimated to be about Rs.20.63 billion by the government.

An Indian infrastructure company, Larsen and Toubro (L&T) won the contract on 27 October 2014 for its lowest bit of USD 420 million for design, construction and maintenance. They commenced the construction on 31st October 2014. In the first phase of the project, Rs.13.47 billion for the main statue, Rs.2.35 billion for the exhibition hall and convention centre, Rs.830 million for the bridge connecting the memorial to the mainland and Rs. 6.57 billion for the maintenance of the structure for 15 years after its completion were allocated.

The Sadhu bet hillock was flattened from 70m to 55m to lay the foundation. L&T employed over 3000 workers and 250 engineers in the statues construction. The core of the statue utilised 210000 cubic metres of cement concrete, 6500 turns of structural steel and tonnes of bronze plates and 1850 tonnes of reinforced Steel. The outer facet is made up of 1700 tonnes of bronze plates and 1850 tonnes of bronze cladding bronze cladding which in turn comprise 565 macro and 6000 micro panels. The bronze panels work was cast by Jiangxi Tongqing Metal Handicrafts Company Limited in China as suitable facilities were unavailable in India. The bronze panels were transported over sea and then by road to the workshop near the construction site where they were assembled.

Local tribal population, belonging to the Tadvi tribe, opposed land acquisition for the development of tourism infrastructure around the statue. They were offered cash and land compensation and were provided with jobs. People of Kevadia, Kothi, Waghodia, Limbdi, Navagam and Gora villagers opposed the construction of the Statue and demanded the restitution of the land rights over 375 factors of land acquired earlier for the dam as well as the formation of new Garudeshwar sub district. They also opposed formation of Kevadia area development authority (KADA) and construction of Garudeshwar weir-cum-causeway project. The government of Gujarat accepted their demands.

Construction of the monument was completed in mid-October 2018 and the inaugural ceremony was held on 31st October 2018, and was presided over by Prime Minister Narendra Modi. The Statue has been described as a tribute to Indian engineering skills.

Budget

Built at a cost of Rs 2,989 crore (USD 450 million), the Statue of Unity project, barring bronze cladding which is a fragment of the mammoth work, has been done indigenously.

Project Milestones

Timeline	Task
21st August 2012	Project signing with PMC Turner Project Management & JV
28th December 2013	Began the 'Loha Campaign'
1st November 2013	Sadhu Bet hillock land investigation
28th May 2013	Potential Bidders meet
28th October 2013	Website Launch by Governor of Gujarat
31st October 2013	Ground Breaking
27th October 2014	Issuance of work order to L&T
31st October 2014	Ground Breaking ceremony of Shrestha Bharat Bhavan
27th December 2014	Consultation on statue features
5th January 2015	Showcasing the statue at vibrant Gujarat Summit
2nd May 2015	Consultation Workshop at bardoli
26th May 2015	Consultation workshop at Ahmedabad
21st July 2015	Consultation workshop at Noida
31st October 2015	Replica of the statue installed at Swarnim Park, Gandhinagar
17th June 2016	Review of the project by Hon'ble Prime Minister
29th September 2016	Ground breaking of Memorial & Visitation Centre
31st October 2016	Oath of Unity at Swarnim Park
4th January 2017	Launch of Archival Book
Jan-17	Showcasing the statue at Vibrant
May-17	Launch of Coffee Table Book
17th September 2017	Visit of Hon'able Prime Minister
31st October 2018	Construction Completed

Project Execution

Due to the sheer grit of the project team and sophisticated engineering and project management skills, the target of constructing the statue, memorial centre, service building, and a 5-km-long, 4-lane approach road with one major and two minor bridges, was completed within 33 months and finished within the budget.

The entire process was based on ISO 9001-2015 framework of risk assessment and mitigation. The project management team fixed responsibility and accountability at the individual, group, and project levels for smooth delivery of the project.

For effective project planning, L&T conducted a workshop in which it analysed sequential and parallel activities from the point of view of time and resource optimization. The project management team worked like a federal structure where different teams worked independently with their fixed areas of responsibility, but each worked toward a common goal.

In this work structure, the project management team closely monitored the intersecting activities of the different teams, but left the micro management of each activity to the department in-charge. Since time was of the essence, the team looked for incremental innovation in design and engineering at every stage to reduce time.

The project gave employment to over 8,000 people, including over 2,000 local residents during the duration of the project construction. The Statue of Unity has attracted over 1.5 million tourists since its inauguration on 31 October 2018. It has boosted the local economy by providing direct and indirect employment.

“It is a tremendous achievement by our building and factories business vertical. Right from the concept through the entire process of developing the design, the features and characteristics of the statue, the engineering, project planning, logistic, and cost controls, were all managed extremely efficiently and reflected a triumph of teamwork. We are proud to have built a monument that makes the country proud,” says M.V. Satish, whole-time director and senior executive vice president, Buildings, Minerals & Metals, L&T.

Risk Management

The engineering and construction team, along with the architects, the sculptor, and a reputable global consultant have completed the project in record time. The commitment to the scale, speed, and quality of their engineering has yielded a desirable outcome, which is not only structurally superior but aesthetically appealing as well.

Since it was a highly publicized project of national significance, the teams had to work closely with the government authorities on design approvals. Verification of design documents resulted in an increase in approval time from the contractual 21 days to 45 days. This adversely affected the project schedule and required the engineering contractor to deploy additional resources to mitigate the delays. L&T also battled high attrition of workers at the beginning of the project. This was due to the remote location of the project site in a tribal area that lacks good infrastructure and amenities.

Wind and Earthquake

Natural factors such as earthquakes and wind posed stiff challenges in the construction of the statue of unity. Since the statue of unity was located right in the middle of the river Narmada, it was exposed to the tunnel effect of winds blowing down the river. After analysing the wind pattern data over the years, researchers identified that the wind speeds of 130 kilometres per hour (roughly translated into 39 meters per second) could topple the statue in a worst-case scenario. To address this, issue the Statue of Unity has been engineered to withstand the wind speeds of around 180 kilometres per hour.

The challenge in the construction of unity was not just about the wind blowing against the statue but also about the succession effect created at the back of the statue. This aspect was also considered in the structural design of the statue of unity. The Statue of Unity could easily survive an earthquake measuring around 6.5 on the Richter scale within a radius of 12 kilometres and at a depth of 10 kilometres.

Walking Pose of the Sardar

The Statue's final posture, in which one leg is ahead of the other, mimicking a walking stance, also posted significant challenge. It meant that the Statue couldn't have one strong, broad base, which is the norm in tall statues for protection against wind speed. After several rounds of discussions, the design engineers opted for two giant columns to pass through both the legs of the Statue to make it stable without compromising on the aesthetic aspect.

Due to the walking pose of the Statue, its base is slenderest. In comparison to other taller states of the world, this is something unique. Due to the Statue's walking posture, a gap of 6.4 meters had to be created between two feet. This gap was also tested to withstand wind velocity.

Movement of Men and Material

As the Statue location is amidst mountainous terrain, it leads to enormous difficulties for the construction team in delivering material. For the purpose of transportation of men and material, a temporary baileys bridge connecting the hill to the mainland was used. Specialists conducted a detailed hydrological study and examined the flood level records of over 100 years of the nearby Narmada dam. It helped them ascertain the river level and flow during various conditions, and accordingly, the statue base was erected above the highest flood level. Use of Design Innovation, Cutting-edge Technology Design innovation, advanced technology, and lateral thinking were applied at every stage as the prestigious project had no room for error or delays. The statue required 6,500 bronze panels of different sizes, shapes, and textures to be assembled. Bronze of minimum thickness was used in the panels to keep the total weight in check. With the help of radio frequency identification (RFID) technology, the team tagged each bronze panel with details such as casting date, inspection status, and location and fed that data into a master database. This enabled engineers to quickly retrieve data on each panel with the help of an RFID detector gun and an android phone. Two 200-tonne tuned mass dampers, which are devices used to reduce the impact of vibrations during an earthquake, were installed. That makes the statue earthquake resistant. L&T had used special concrete to strengthen the core of the statue comprising the two legs. Indigenous technology was used to generate self-compacting cold concrete, which measured less than 15 degrees Celsius. This was accomplished using chilled water and ice flakes. This concrete was then poured at high speed, which was faster than that used during the Burj Khalifa construction in Dubai. The statue has an outer acrylic-based weather-resistant protective coating that will last 100 years. There was a great deal of pressure on the project managers to build the Statue in record time and to accommodate late additions, such as exhibits for the exhibition hall and projection mapping facilities for a light and sound show, including developing the content for it. L&T imported equipment and worked closely with the government authorities and assigned specialists to meet these requirements.

RESULTS

A project's success and evaluation of the efficacy of its management often lie on the benefit the project generates and the cost implications of the project undertaken. Keeping those in mind, the authors have highlighted those two different dimensions in assessing the project results in the following paragraphs.

Development of Local Economy

As per tourism details shared by Gujarat Tourism Department, 2.6 million tourist footfalls at the State of Unity have generated an earning of Rs.570 million through selling tickets from 1st November 2018 to 12th September 2019. The daily average from the first year increased by 74 percent, 15,036 footfalls registered in the first month of the second year, which further rises to 22,430 on weekends. Tourist can many other attractions visiting the Statue of Unity like exhibition hall, the wall of unity, sound and laser light show, museum, a tour of Sardar Sarovar Dam, a tour of the valley of flowers, boating, sight-seeing of historical shoolpaneshwar sanctuary, helicopter ride, trekking in Zarvani Eco-tourism area, bird watching and lot more.

A Brief Comparison with Similar Projects

Statue of Unity is the tallest of all other comparable statues in the world. One can compare them in more parameters as well. The parameters could Cost, Year of completion, Height, Daily Tourist Average, and the time taken to complete the project. Below is a brief comparison of the Statue of Unity with three other renowned statues – The Spring Temple Buddha, The Statue of Liberty, and Christ the Redeemer in Table 3.

Parameters	Statue of Unity	Statue of Liberty	Spring Temple Buddha	Christ The Redeemer
Cost	\$450 Million	\$250,000	\$18 Million	\$250,000
Year of Completion	2018	1886	2008	1931
Time Taken	5 years	11 years	11 years	9 years
Daily Tourist Average (2019)	15,036	10,000	2,800	5,500
Height	182 meters	93 meters	153 meters	39 meters

The cost of construction for The Statue of Liberty and Christ the Redeemer would be a lot higher if we consider it in today's inflated values.

CONCLUSION AND FUTURE ORIENTATION

Completing a 182 meters' tall statute within five years and within a budget of USD 450 million is a success story of project management. It also throws light on the various risks associated with these kinds of projects and how these risks can be mitigated through engineering innovation, successful division of labor, and collaboration of the private and public sector. It does a comparative analysis of the similar projects done by the other countries and found that with the advancement of technology and proper utilization of project management techniques, this project has achieved its targets with less cost and time. This study also reveals its impact on the development of the area and its future prospects.

The project's description and the challenges that were overcome in completing it could be a useful reference for future studies on projects of this magnitude. Especially in low to medium-income nations that may have the ambition to undertake such a grand project, this paper could be a useful reference to anticipate the potential social and ecological challenges and potential benefits in terms of employment and revenue generation through the promotion of tourism.

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