

Lessons From History Case Studies - The Giza Pyramid Project

About the elearning course in Project Management

The Giza Pyramid project case study has rarely been associated with project management and this is what makes this course so unique. More often this project case study is associated with other disciplines like engineering and architecture this course highlights the importance of project management which has been often overlooked and undervalued. Yet the core principles of project management were used extensively in this project, and without them the project could not have been delivered. The course allows you the learner to take on the role of project manager and deliver the most notable early mega project in history.

As the project manager you will examine the human side of the project and the significance of organization, team work, welfare, healthy competition and creating a conducive work environment. You will also see the importance of innovation and how it was used to manage the project scope by developing unique solutions. This project was about managing the available project resources and making intelligent decisions about their deployment, and where investments needed to be made in quality to achieve the high levels required. The course summarizes all this into a set of best practices that you can carry forward into your current projects.

Why is the Great Pyramid of Giza important?

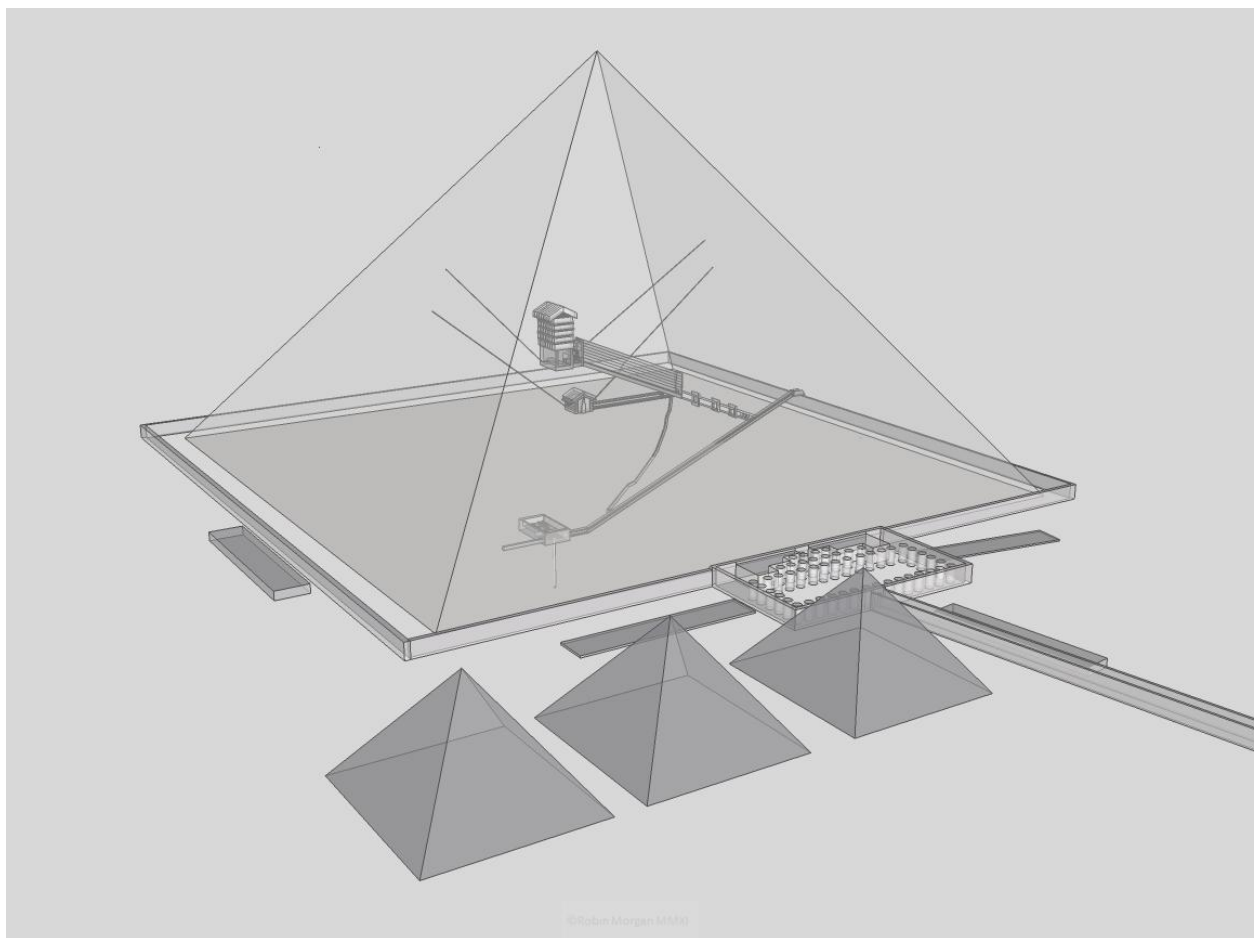
The Great Pyramid of Giza is an iconic structure, one of the seven wonders of the ancient world and the only one still remaining to this day. Remarkably it was built in a timeframe of 20 years. Not only is this a very tall and wide structure that dwarfed anything in its heyday but it has survived intact for 4,500 years despite being hit by earthquakes. It even had the legacy of being the tallest structure for 4,400 years (till the completion of the Eiffel Tower in 1879).

What makes the Great Pyramid of Giza so iconic?

The precision, accuracy, and complexity of the structure that still astounds engineers and architects today. At 148 metres (454 feet) high, the equivalent to a modern 48-story building, with 203 layers to its summit the volume of the structure is made up of an estimated 2.3 million limestone blocks. That is two-thirds of the size of Hoover Dam, or you could build 30 Empire State buildings with its masonry. The joints between the adjacent blocks fit together with optical precision. The complexity of the interior includes chambers and galleries that are assembled from 130 granite blocks weighing between 12 to 70 tons (with 43 over 60 tons) that tower to a height of 43 metres (150 feet).

What were the Technical Challenges in the Project?

The project pushed the limits of technologies, materials, and resources with the heights and stability of the structure, and the complexity and integrity required for the internal chambers. The technical challenges still baffle engineers and experts today, considering the primitive tools and equipment (no wheel or pack animals) available to the project. For example, the pyramid needed to be precisely centred and aligned to a true north-south axis, and required a perfectly level base where inaccuracies of centimetres at the bottom would translate into metres at the top. Throughout the construction the builders had to deliver the limestone blocks weighing 1.5 tons each, up to a height of 148 metres and a precise position in the structure. The builders had to measure and calculate the position of the corners to the centre, the angle of inclination of the ridges and lateral surfaces. If the centre shifted then the overall pyramid shape would be distorted. The internal chambers required relief from the full weight of the pyramid above. Finally, creating perfectly straight passages with one to the bedrock chamber running over 120 m (394 ft) long.



Why is the Project (Case Study) Important to Project Managers?

For centuries the Giza Pyramid has not only been a testament to engineering and architecture but, to build a structure of this magnitude requires a truly sophisticated approach to project management. It wasn't just the technical but the organizational challenges of the project that were on an unprecedented scale and complexity. The project can be better understood by highlighting these challenges. For example, the procurement and transportation of vast amounts of building materials and equipment that were pouring into the project from all over the Eastern Mediterranean. This included 130 granite blocks that were quarried and transported over 900 kilometres, and approximately 350 limestone blocks that were quarried and transported daily. There was also a massive supply chain of food, provisions and supplies constantly flowing into the project which engaged a large population of Egypt across villages and farms.

The project required a large workforce that needed to be fed, clothed, housed, and the welfare of thousands of workers had to be considered. The project manager had to organize these complex, massive and elongated supply chains and integrate them into the complex work schedule whilst keeping an eye on the health of the Pharaoh and the timely completion of the project.

How has our Understanding of the Project Recently Changed

Many contemporary views of the Giza pyramid project are out of date and many misperceptions need to be reset. Over the last two decades our understanding of the case study has been rapidly changing and this course taps into this latest research. The wide variety of disciplines (like Egyptology, archaeology, anthropology, archaeobotany) is providing a broad set of specialist evidence which is forcing Egyptologists to re-examine long held and accepted theories. It is helping to fill the gaps in our knowledge and understanding of the project. For example, the workers' village (Heit el-Ghurabor or "the Lost City of the Pyramid Builders") and cemetery are providing new insights into the organizational side of the project.

In this course we take an inter-disciplinary approach and piece together this knowledge to provide a more rounded and complete view of the case study. The knowledge accumulated about the project is constantly increasing. A seemingly impossible project is put into achievable perspective by this research.

Uniqueness of Course

The course is unique because it examines the case study through a project management lens rather than the traditional engineering or architectural lens. Knowledge areas and practices specific to project management are carefully examined.

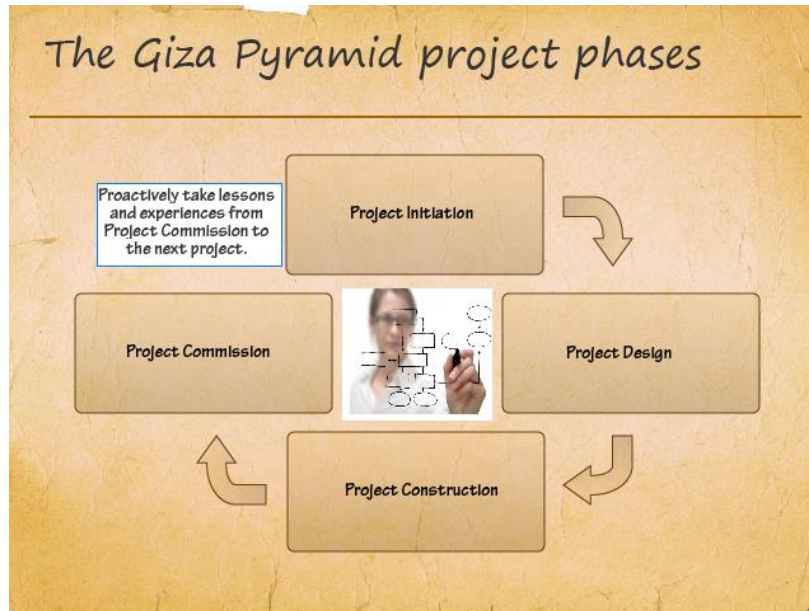
As the project manager you have a mission to complete the project and deliver the Giza Pyramid. You will be presented the ancient Egyptian experience in pyramid projects that spanned 200 years. This experience delivered evolving structures that reached perfect symmetry. As you play this role you will be presented scenarios, situations, and exercises based on actual events, and you will be faced with decisions to make. Of course this previous pyramid project experience will be of great help to you.



How do you Deliver this Project?

The course steps through each project phase from initiation, design, construction to commission, and this allows you to:

- Explore the motivating factors and drivers behind the project.
- Determine the economic model capable of supporting such a major public works project.
- Determine the stakeholders who you will need to actively support the project.
- Piece together solutions to the complex technical and organizational challenges that arise in the project.
- Manage down the excessive scope with innovations and engineering breakthroughs like the Internal Spiral Ramp and the Grand Gallery counter-weight system.
- Set up a schedule that is agile enough to deliver in a somewhat unpredictable project timeframe based on the Pharaoh's life expectancy.
- Work around the limitations of knowledge (basic math) and primitive tools (copper based).
- Create the supporting infrastructure like a harbor and canal (for landing materials, equipment, supplies, provisions, and workers), trackways, worker's village, quarries (limestone & granite), building yard and ramps.



Benefits of the Course

Reviewing this iconic case study through a project management lens highlights the fundamentals of project management in a very unique way. From this review you will be able to relate this project to your contemporary projects. For example, the need for:

- having a comprehensive grasp of the whole project, its work breakdown structure and schedule, and critical paths,
- understanding how certain complex features would significantly impact the project scope and then carefully managing these through innovation and developing unique solutions,
- determining where to exactly invest in quality and precision so that it makes a difference,
- investing in the project workforce and welfare, through teamwork and a healthy level of competition, and creating a harmonious and conducive working and living environment to get the best from them.

One of the most important findings in the course is the relevance and impact of the 200 years of experience in pyramid building, and the “reflexivity” of the project team.

Finally, the course addresses the missing dimensions of project management - the political, social, ethical and economic, and environmental. Their representation provides a much richer case study.