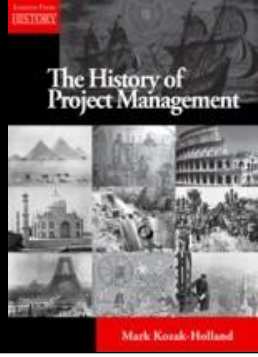


What can we learn from the Ancient Project Managers

Building the Case for Historical Project Management

Presentation to CMIT
Charlottesville, VA
September 16, 2011

Mark Kozak-Holland

"Lessons From the Past that Assist the Projects of Today to Shape the World of Tomorrow"

www.lessons-from-history.com

Project management research has paid limited interest in the research of the past

- **In June 2011 IRNOP (The International Research Network on Organizing by Projects) 10th conference in Montreal. Founded in 1993 IRNOP - vibrant worldwide research network.**
- **One track based on the history of projects, and project management. The key objective of the workshop was to:**
  - "provide a face-to-face forum for discussion and recollection of our common past and how that helps us construct the future of projects management in academia and in practice."

What this presentation addresses is paper presented

- **Common misperceptions about historical projects and project management, these projects had:**
  - unlimited budget
  - predominant slave workforce
  - unlimited time lines
- **It infers modern project management is**
  - unique,
  - unconnected to past,
  - started 20th century.

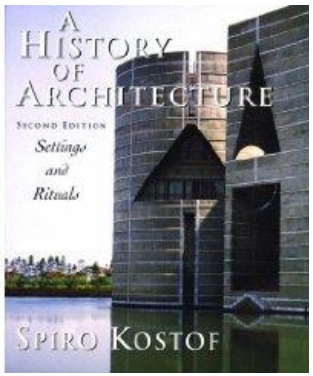
- **Project selection critera:**
  - truly influential,
  - definitive examples of success,
  - firsts in use of particular technology (material or tool), or process,
  - good ethno-history,
  - on-going archaeological research.

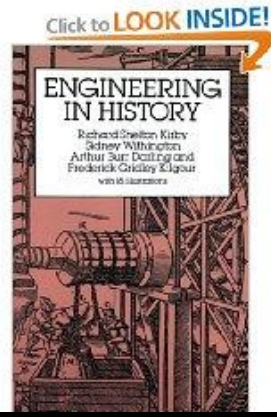
This presentation will describe

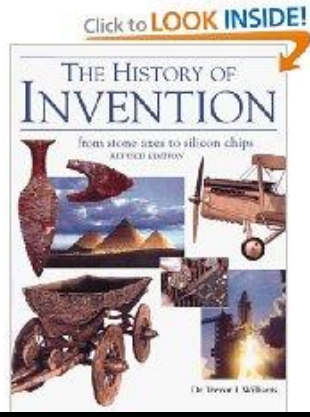
- **Why this paper was written?**
  - Misperceptions - Historical Projects
- **All had**
  - Project Sponsorship, Project Manager Team
  - Project initiating, planning, executing, controlling and closing
  - Nine knowledge areas of PMBoK®
- **Questions**

Why this paper?

- **Mis-perception that project management was initiated and evolved in the 20th century**
  - PM is modern and started with Gantt
  - Scope wasn't recognized till 18th Century
- **Interest from many PMs and PM community**
- **Books - History of inventions, engineering, architecture exist**
- **History of PM is unique**





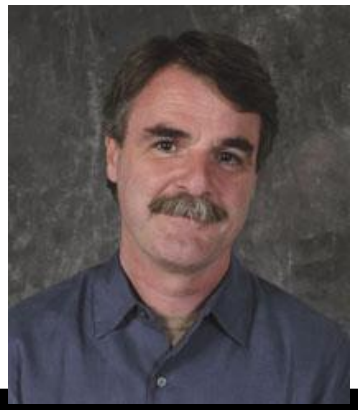


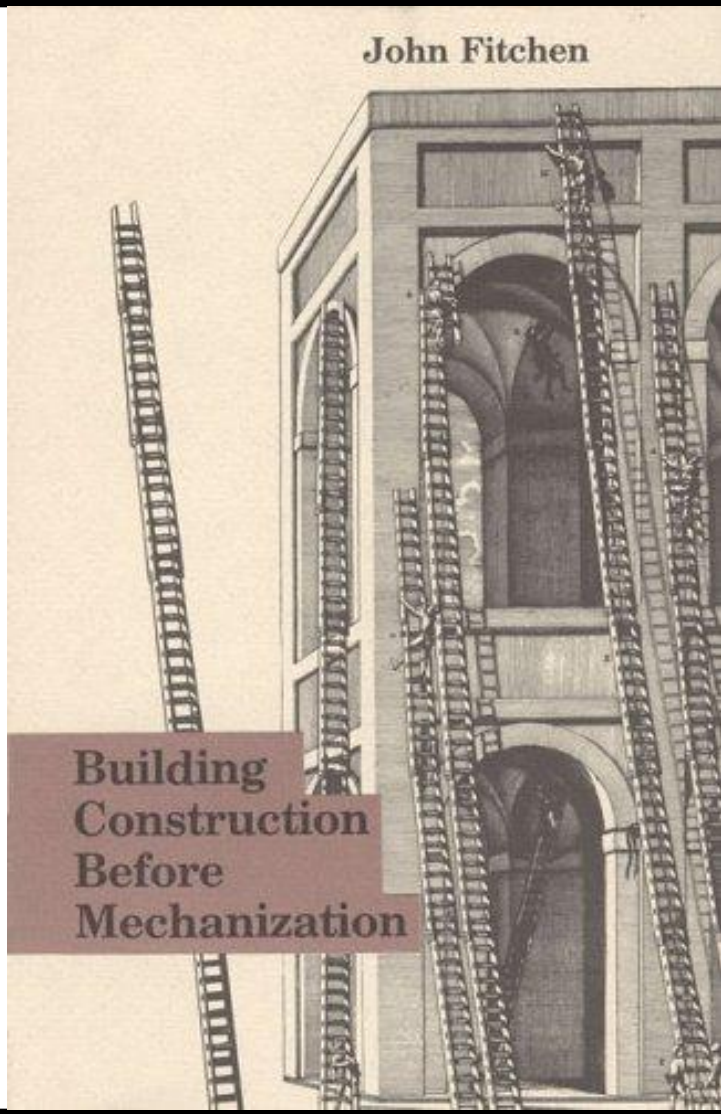
Latest research in archaeology points to how projects were planned and executed

- **Egyptologists Mark Lehner**
  - Workers village
- **Jean-Pierre Houdin**
  - Giza internal ramp theory
- **Professor Ahmet Çakmak**
  - (professor emeritus in earthquake engineering at Princeton University) work on the construction of Hagia Sophia

Latest research in archaeology points to how projects were planned and executed

- **Associate Professor of architecture Manolis Korres**
  - (at the National Technical University of Athens) and a leading Parthenon scholar, work on the Parthenon restoration project
- **Architectural detectives**
  - John Fitchen,
  - David Macaulay





Background Information about the Five Historical Projects

- **The Giza Pyramid Project (2550-2530 BCE) – had enormous technical challenges, from the creation of perfectly level base, to building burial chambers, to completing last third and mounting cap stone. It remained the tallest structure till the completion of the Eifel Tower.**

- **The Greek Parthenon Project (447-438 BCE) – public works project to keep the unemployed off the streets, and stimulate the economy. Completed in 9 years, remarkable when considering quality of finished deliverable. It set notion that it was possible to deliver esthetically pleasing buildings within the scope of a project. It was widely copied.**

- **The Roman Colosseum Project (69-79) – built in swamp, used new technologies and materials, like concrete to create extensive arches, barrel vaults, and domes. Completed in 10 years project shored up emperor's shaky regime and delivered by 4 contractors.**

- **The Hagia Sophia Project (532-537) – was successfully delivered in only 5 years. Built in an earthquake zone it has withstood multiple earthquakes because of its intelligent design and use of flexible materials. It was widely copied in the Muslim world.**

- **The Chartres Cathedral Project (1145-1220) – was built in a race to complete tallest cathedral were the world record was broken 5 times within 62 years. Built beyond financial means of town, the challenge to sustain project over several generations.**

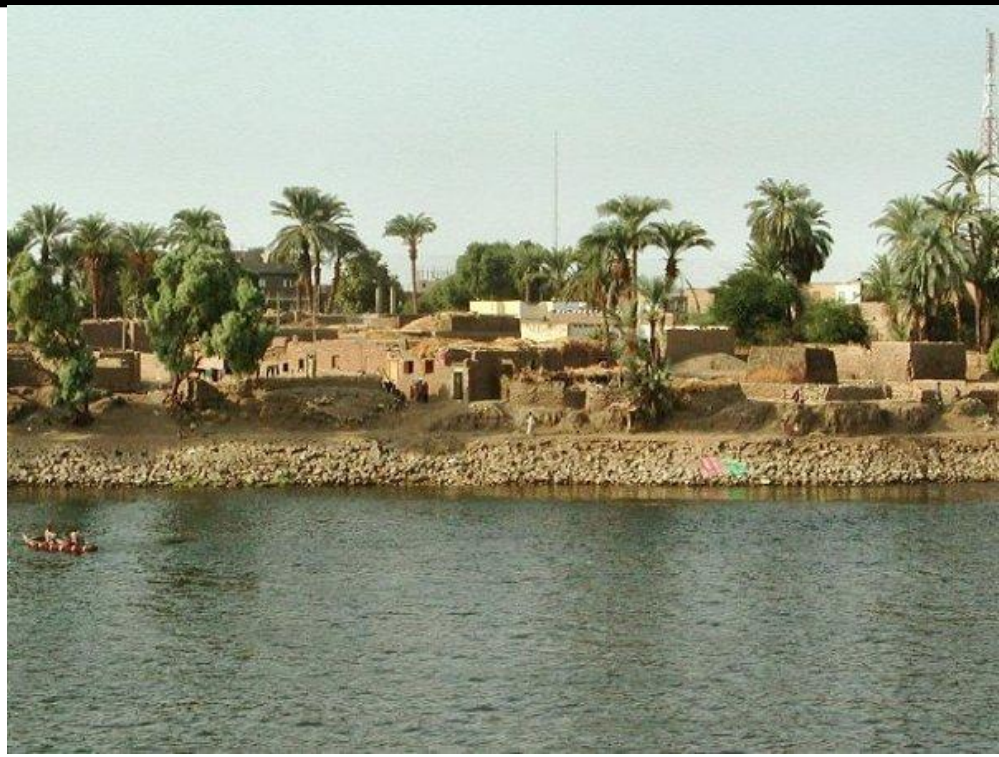
Misperception #1 Historical projects had unlimited budgets without an economic return

- **Project had unlimited resources poured in, little accountability, no expenses spared, at cost of everything outside of project which caused societal deterioration.**
  - There was no real economic return to majority with exception of few benefits for project sponsor.

- **The counter argument - projects in the past as today needed a budget to get started with, but had to have some sort of a return on investment for the project stakeholders.**
  - Otherwise it would have been very difficult to initiate the project.

The Giza Pyramid Project (2550-2530 BCE)

- **Financing project - Not an issue, Pharoah is a Sun God**
  - But return expected and required
- **Massive economic stimulus to different sectors and industries, and increase in trade**
- **Public works project**

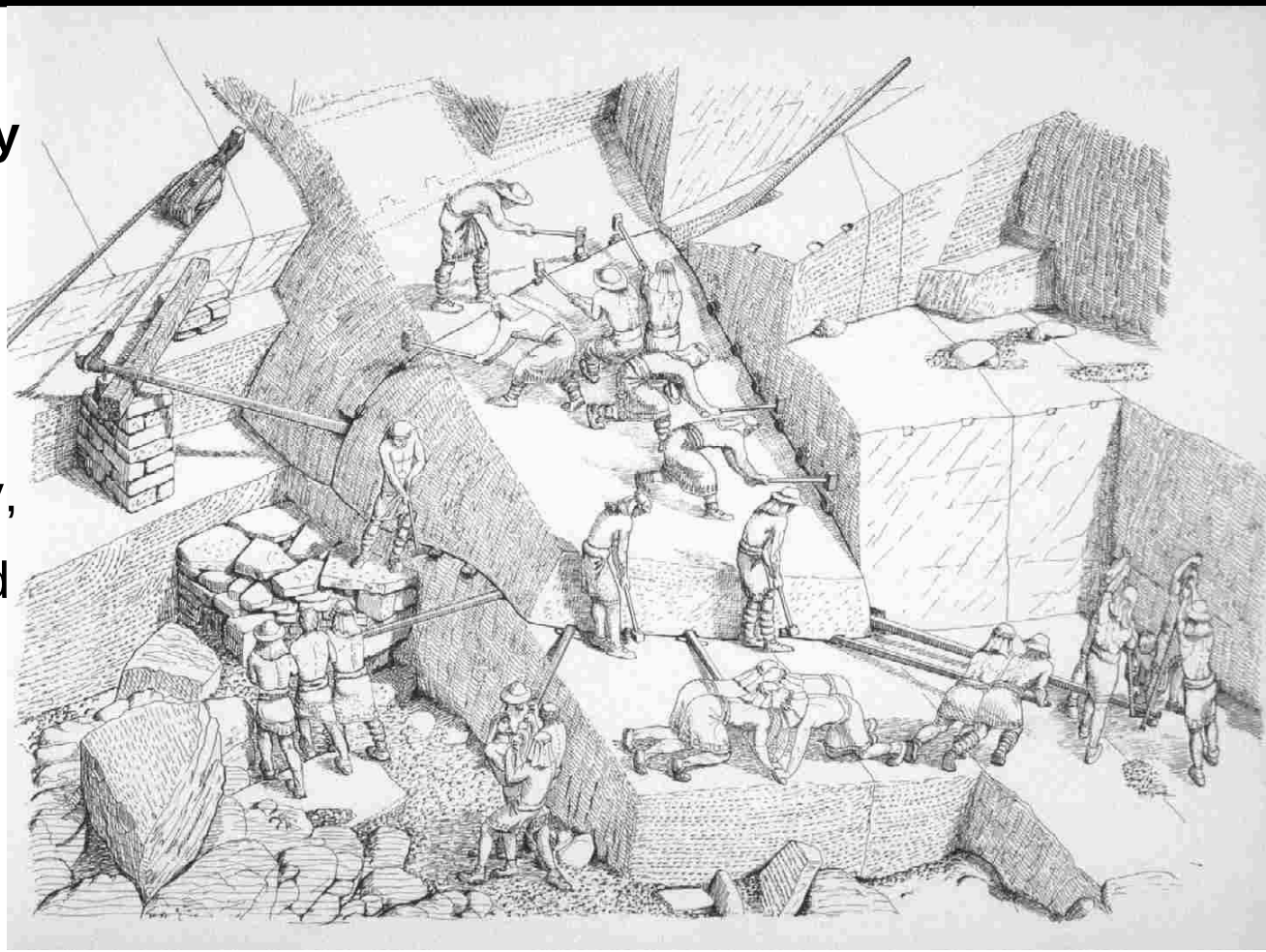


The scale of massive project kept nation busy, and unified to common purpose

- **The extensive supply chain and logistics of feeding a large work force touched almost everyone in Egypt's population**

The Greek Parthenon Project (447-438 BCE)

- **Economic returns**
- **Stimulate economy by**
  - creating number of important feeder industries,
  - putting much of Athens into state-pay,
  - keeping unemployed workers off the streets.
- **The Athenians were very conscious of accountability.**



The Roman Colosseum Project (69-79)

- **Vespasian under pressure to restore confidence**
  - Wipe memory of Emperor Nero
  - Save his tottering regime
- **Rome swelled by immigrants**
  - state policy of civic control
  - through free benefits (bread) and entertainment (circuses)
- **Economic returns**
  - create a vast and permanent place of entertainment which would appeal to the masses
  - workforce (20,000 to 30,000) solved many unemployment problems in Rome.

The Hagia Sophia Project (532-537)

- **Emperor Justinian**
- **Ambitions were to re-establish the Roman Empire, but from east**
- **Showcase**
  - capability of Eastern Roman Empire,
  - establish Constantinople and himself as successor to might of Rome.
- **Economic returns**
  - attract visitors and pilgrims to city

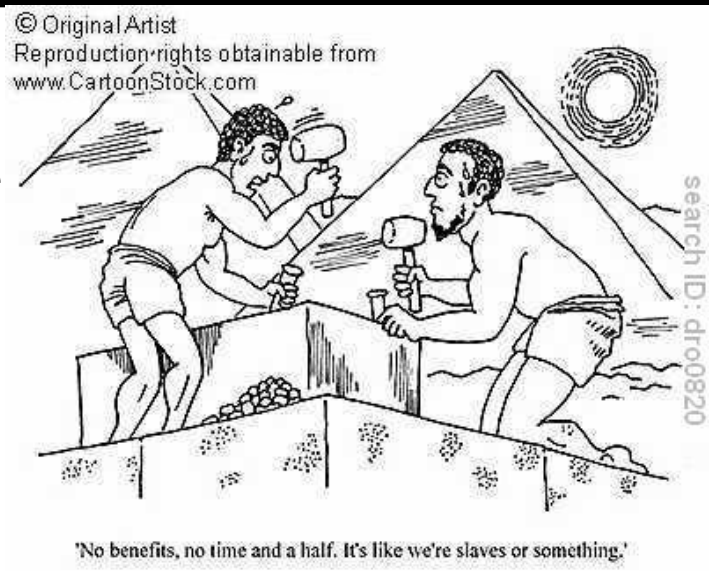
The Chartres Cathedral Project (1145-1220)

- **Cathedrals had major impact on prosperity & importance of city**
  - attracted thousands of pilgrims.
- **City merchants recognized economic return of project**
  - were principal sponsors
  - along with church.
- **In this period world record fever gripped cities as they resourced their cathedral projects.**
- **It was broken 5 times within 62 years.**

Misperception #2 Historical projects had a predominant slave workforce

- **Great Pyramid at Giza project conjures up images of thousands of slaves serving a merciless pharaoh and toiling in inhospitable conditions.**

- **The counter argument is that in the projects of the past labor was not an inexhaustible supply, but came at a higher price.**
  - One of the most challenging areas of project management is Human Resource management, and creating a conducive environment to get the best out of people.



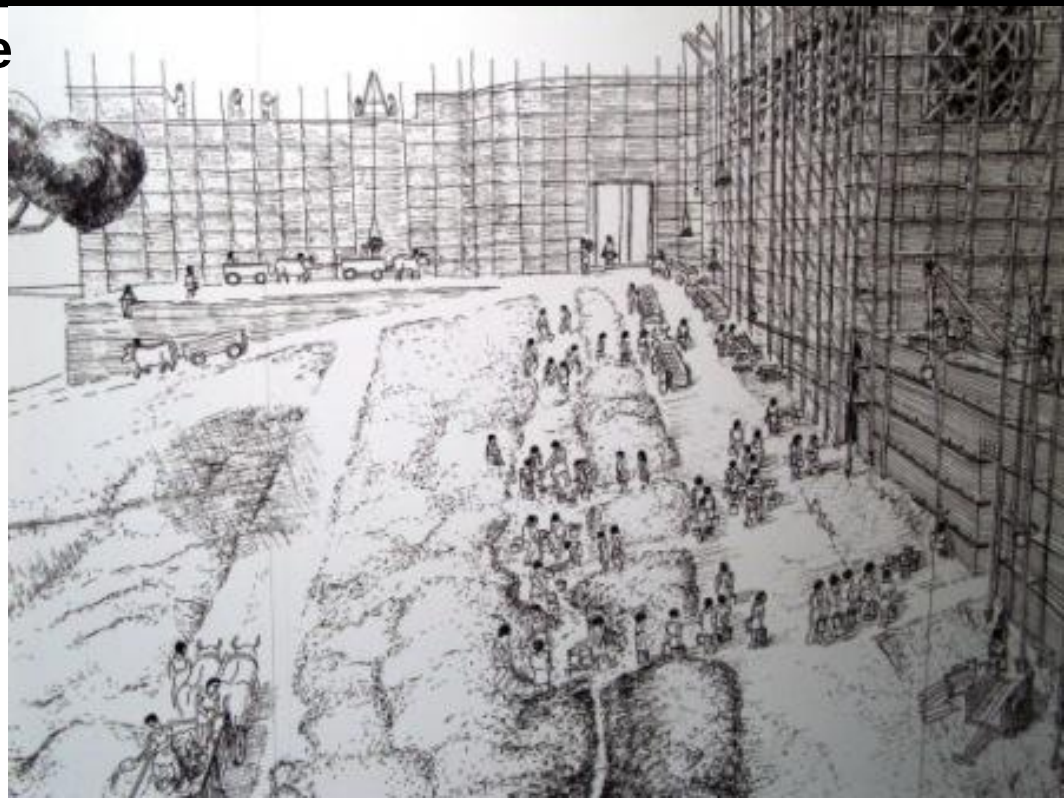
LESSONS FROM HISTORY

The Giza Pyramid Project (2550-2530 BCE)

- NOT slaves mostly farmers
- Nile flooding stopped farming
- Lived in workers village
- Industrial sized bakeries, breweries, abundance of meat

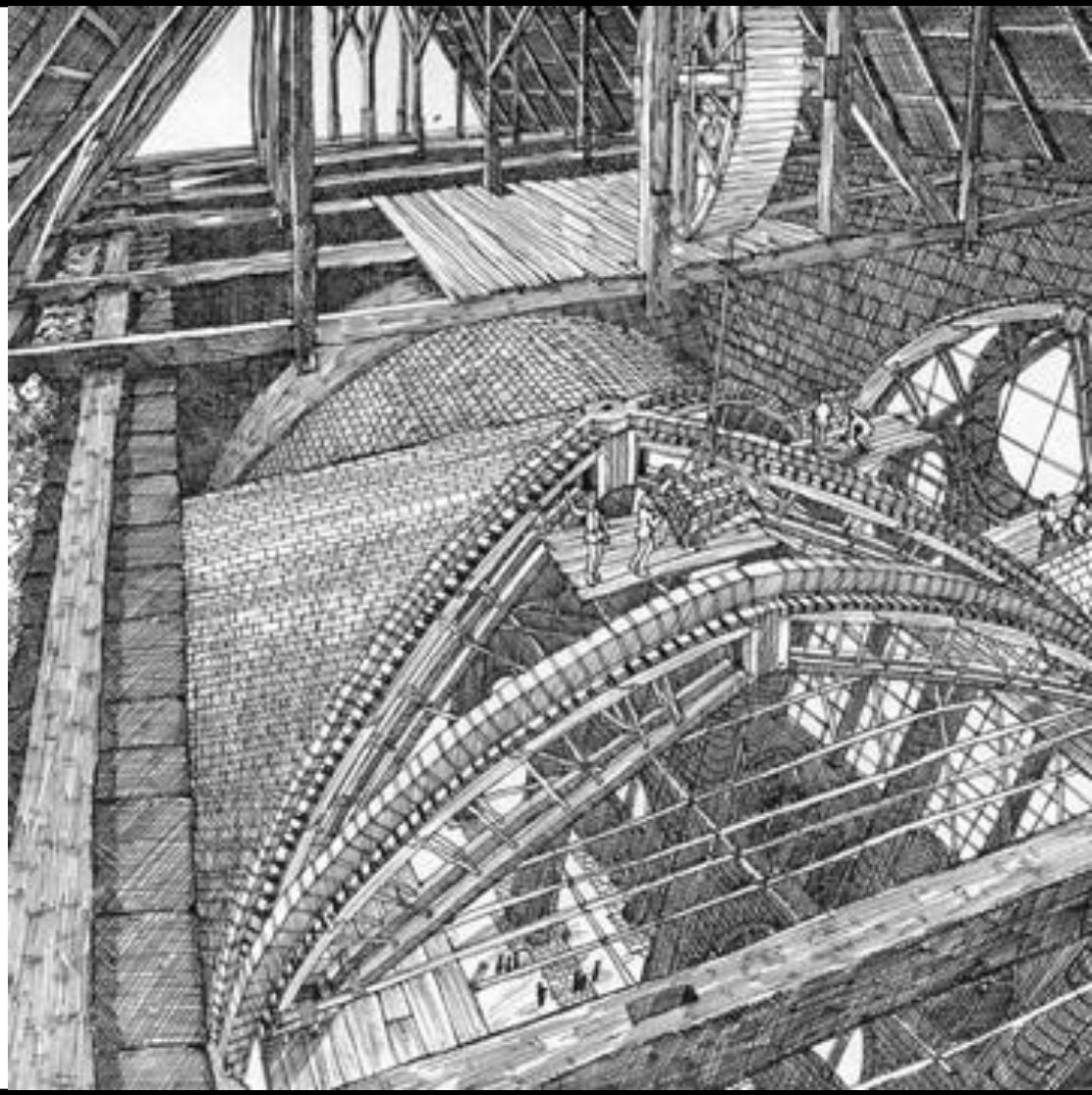
The Roman Colosseum Project (69-79)

- **Slaves mainly owned by private families and individuals**
  - used as household servants or concubines.
- **These slaves ill suited for project.**
- **Major projects contracted companies**
  - Used local workers (citizens) rather than slave labor.
- **Large scale government projects main construction force made up of contractors**
  - (Colosseum project had 4), who used the guilds for their workforce.



Medieval Guilds

- **Specialized workers,**
  - stonecutters and masons, blacksmiths and carpenter.
- **Laborers, called servants or assistants**
  - no particular trade or skill
- **Bottom of medieval ladder,**
  - but had the opportunity to better themselves.
  - Become a specialized craftsman
  - or save money and set up as a contractor.



Misperception #3 Historical projects had unlimited timelines

- **Historical projects which extended for decades or even centuries. Yes there were projects such as this, notably some of the Gothic Cathedral projects, which were planned with extended timeframe.**

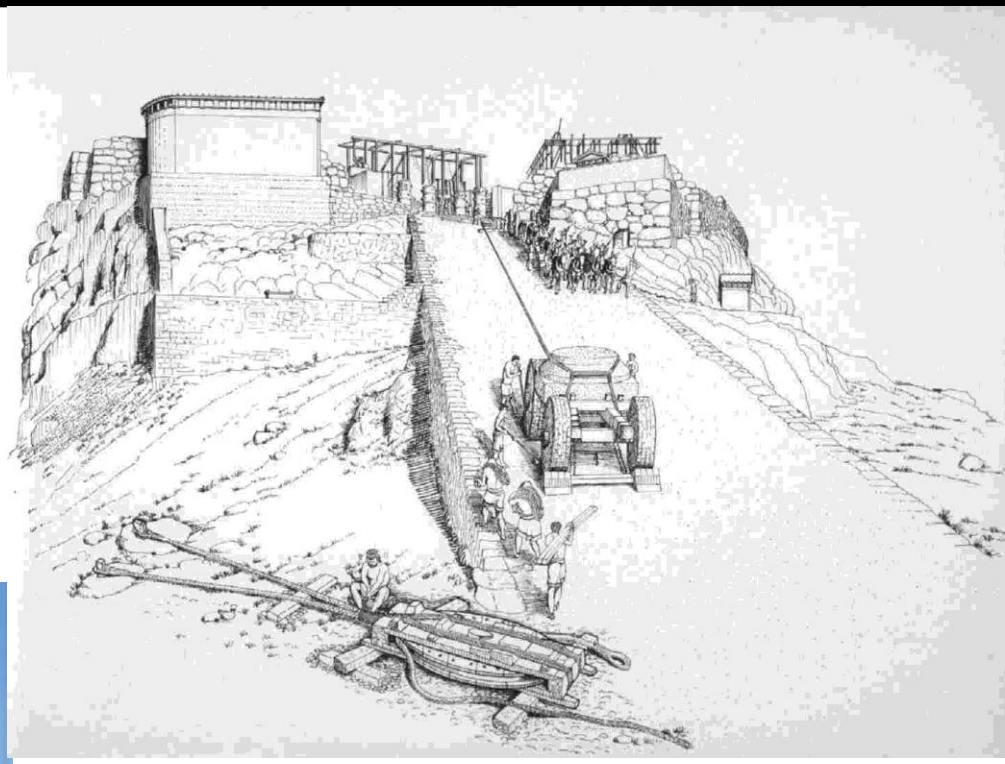
- **The counter argument is that projects of the past were initiated by project sponsors looking for project benefits to be delivered within timeframe when they were still in power, so to reap the benefits and glory of the project.**
  - Typically, 5 to 15 years.

The Giza Pyramid Project (2550-2530 BCE)

- **Pharoah Khufu was 40 years old and expected to live to 60 to 70**
- **Clear deadline deliver project before Pharaoh dies (~20 years)**
- **Project Manager Hemieniu, Khufu's younger brother could monitor health**
- **Most recent evidence from Giza site suggests project scope was smaller**
  - Foundation was built inside a quarry,
  - Internal ramp would have shortened the size of the external ramp

The Greek Parthenon Project (447-438 BCE)

- **Accelerated by:**
  - Use of naval technology, ropes, pulleys and wooden cranes for hauling lifting of marble blocks.
  - Created sharper and more durable chisels and axes
  - Carve marble at more than double rate of today's craftsmen



The Roman Colosseum Project (69-79)

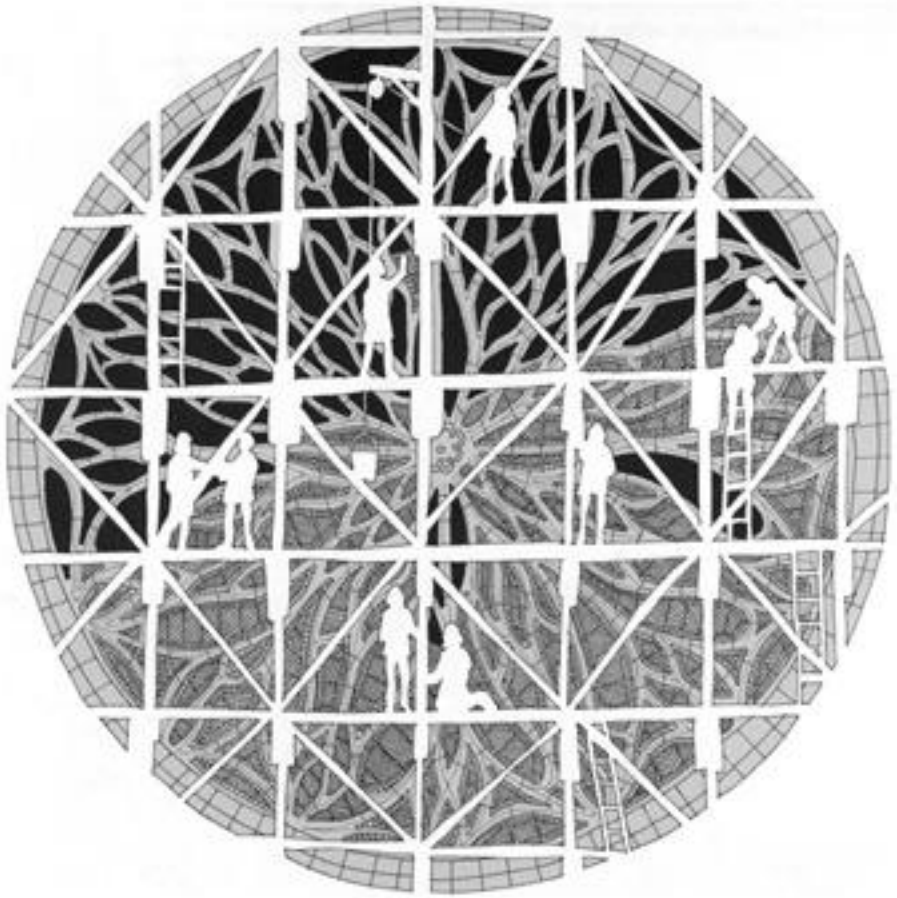
- Project shored up the emperor's shaky regime as Empire was close to ruin, following Nero's reign, and held back revolt in Empire.
- According to records project completed in 10 years.

The Hagia Sophia Project (532-537)

- **Vast project workforce of 10,000**
- **Divided into two teams of 5,000, each under 50 master-builders.**
- **Healthy competition.**
- **Project hierarchy run on lines of guilds.**
- **Time sensitive project, run in a confined environment with little space.**
- **Pace of project delivery was dependent on guilds and use of skilled labourers.**
  - Slave workforce would have inhibited pace.
- **Project completed in 5 years, compared to cathedral projects of Europe**
  - (much smaller workforce 20th of size).

The Chartres Cathedral Project (1145-1220) - world record fever gripped cities to build tallest cathedral. In France record broken 5 times in 62 years.

- **Often complete cathedral structure finalized over decades or even centuries.**
- **Great competition for pilgrims,**
- **To make cathedrals viable built in sections**
  - Completed sections put into use right away.
    - for church services, or indoor markets to provide an economic return.
  - This encouraged further collections and with more project funding available remaining sections were completed.
  - This overall project approach was planned for from the outset.



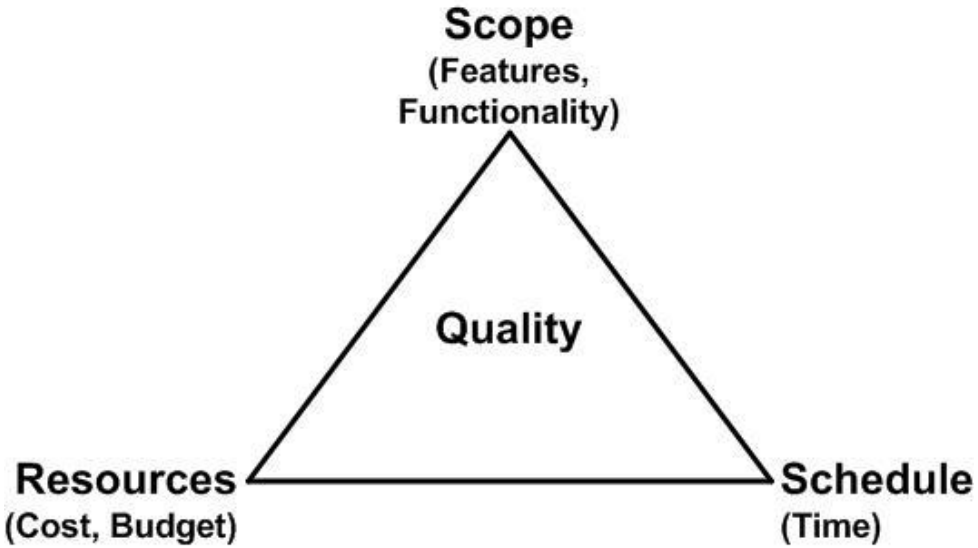
Project integrated complex structure of glass, stone and concrete that were stunning in appearance

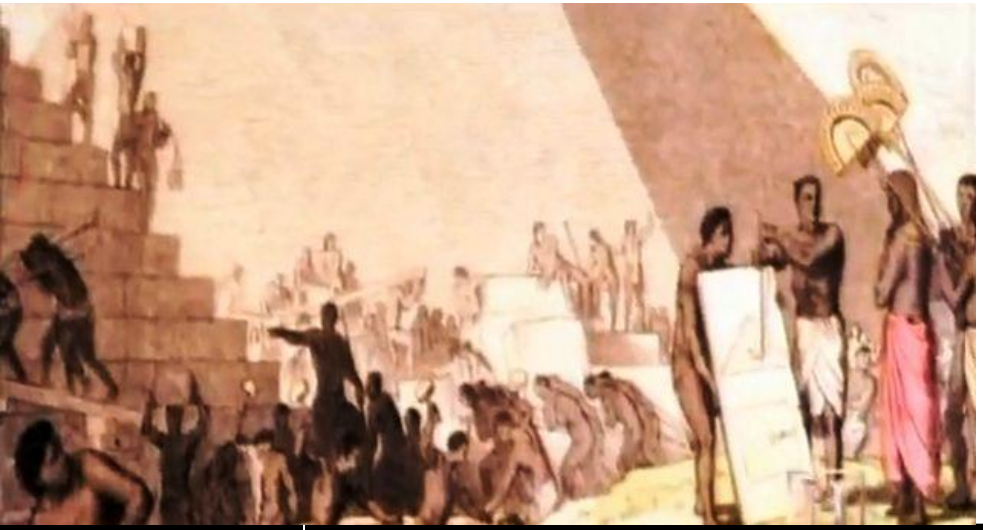
Misperception #4 Historical projects had used concepts not associated with modern project management

- **The use of management concepts (or knowledge areas)**
  - integration, scope, time, cost, quality, human resources, communication, risk, and procurement. These concepts not formalized or documented, and too advanced and complex for use.
- **Projects in the past, as today, without comprehensive project management could not have been delivered with the constraints of relatively short timeframes, limited budgets, limited workforce, and predefined quality levels.**
- **The engineering complexity of end deliverable for all the landmark historical projects would even be a challenge for today's projects.**
  - They were pushing the technology of the time to its limits (especially the structural height and stability), materials management and supply chains, and the ability to organize a vast workforce.

Mis-perceptions - used concepts not associated with modern project management

- **Iron triangle at core of project**
  - Fixed scope
  - Fixed time (may have to accelerate)
  - Limited resource, some flexibility
  - Quality standards





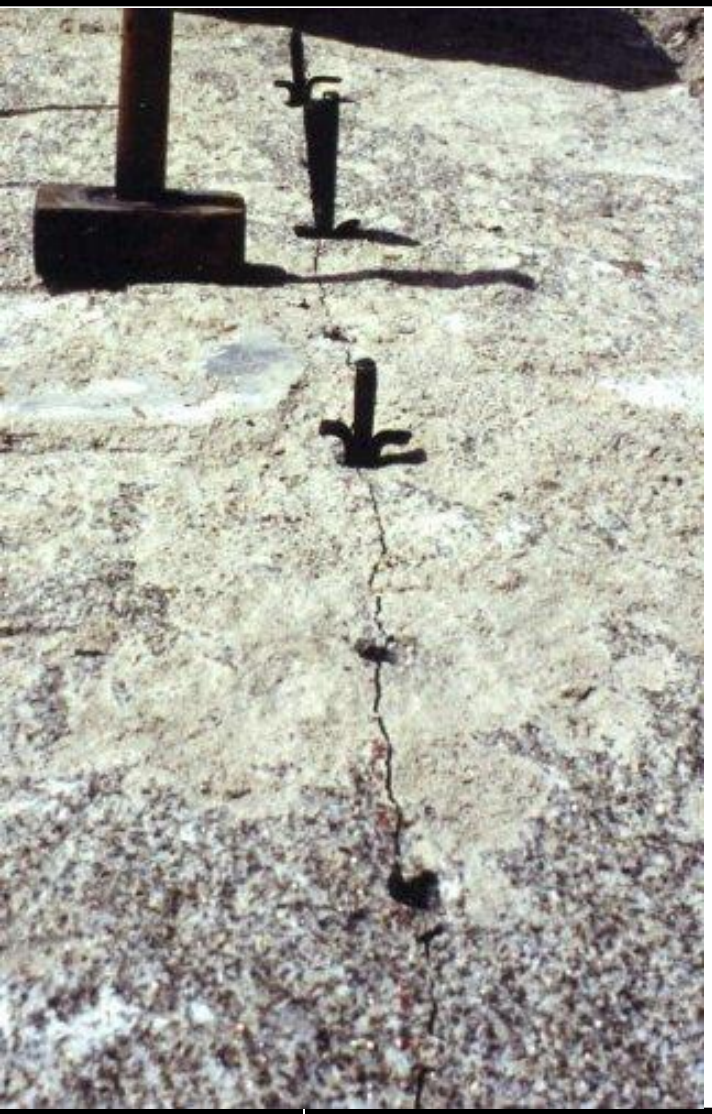
Integration Management

- **4 of 5 projects targeted specific project end date for political reasons**
- **To deliver in short time frame required clear project objective and project charter**
- **Change control, in hands of overseer of works to monitor the project and control budget.**
  - Project overruns, and overspends were problematic then as today.
  - Need for strong leadership through project sponsor
    - Emperor Vespasian - Colosseum project, or Emperor Justinian - Hagia Sophia project.

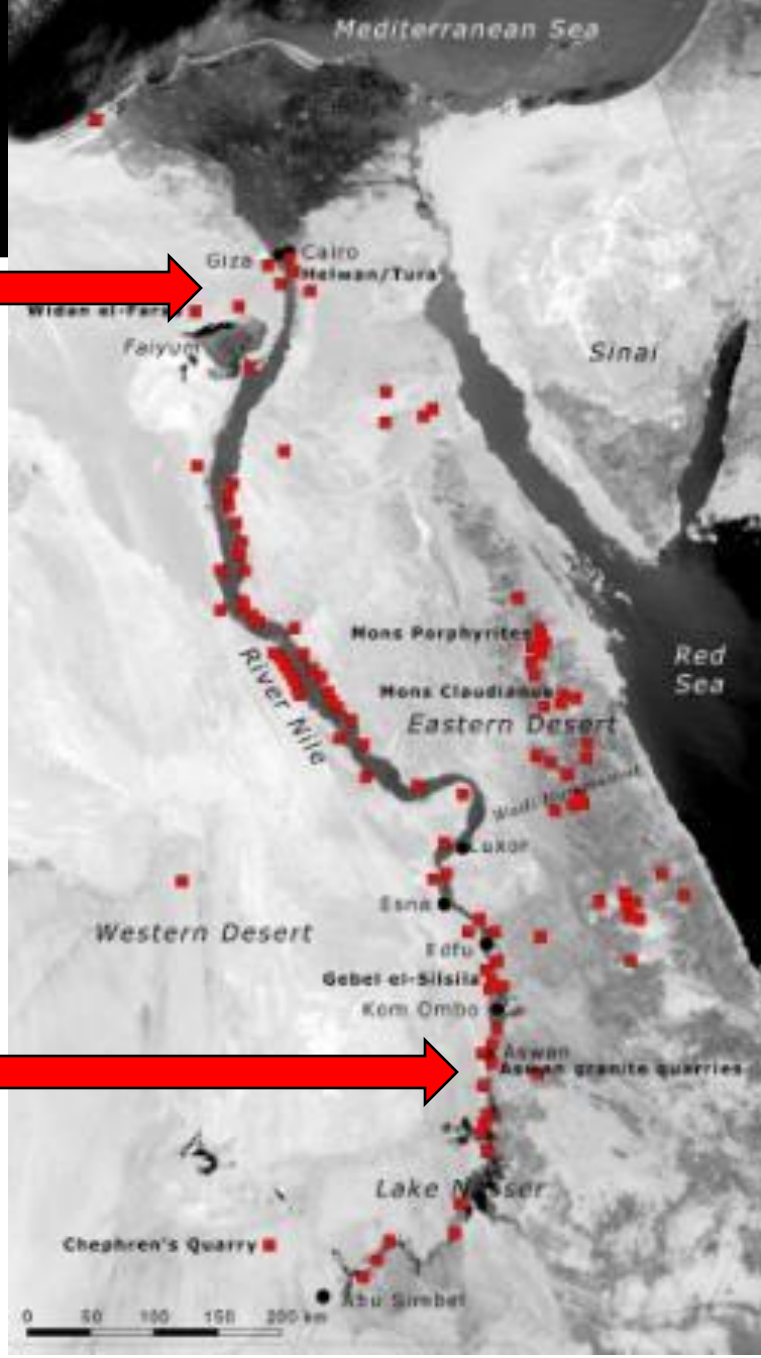
Scope Management – Work Breakdown Structure

- **Master-builders on ALL historical projects had comprehensive and intuitive grasp of totality of projects, entire building operation, all the major activities, and concept of a WBS (e.g., Giza)**
  - Site preparation (2 to 3 years)
    - Levelling, solid base, determination of true north, creation of a perfect square of limestone blocks
  - Construction (up to 15 years)
    - Creation of harbor and canal on Nile
    - Creation of workers village
    - Construction of ramps
    - Quarry operations
    - Transportation of finished stone
    - Performance of the finished work
  - Removal and ramp demolition (2 years)
    - Incorporated as rubble in top part

Time Management
At project start teams sent 500 miles to Aswan to quarry granite

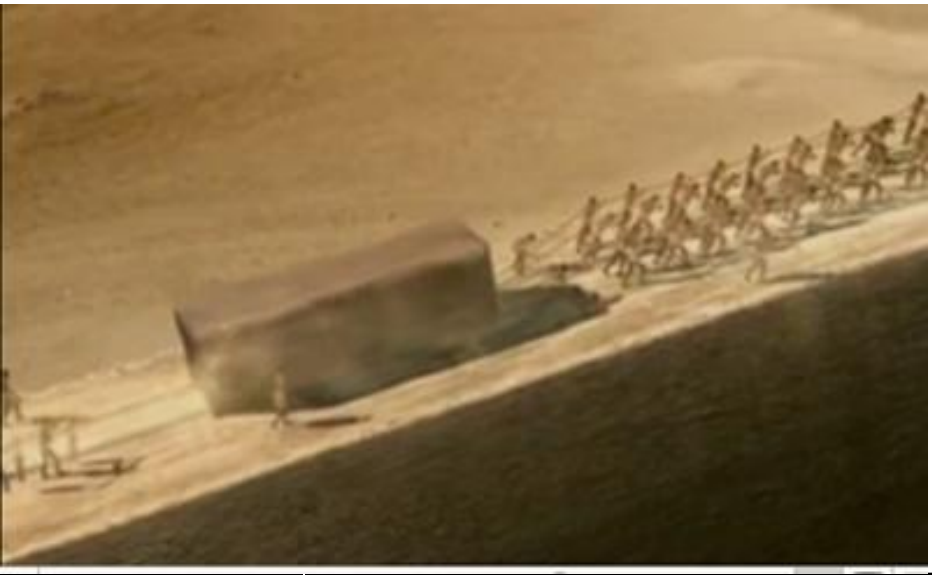


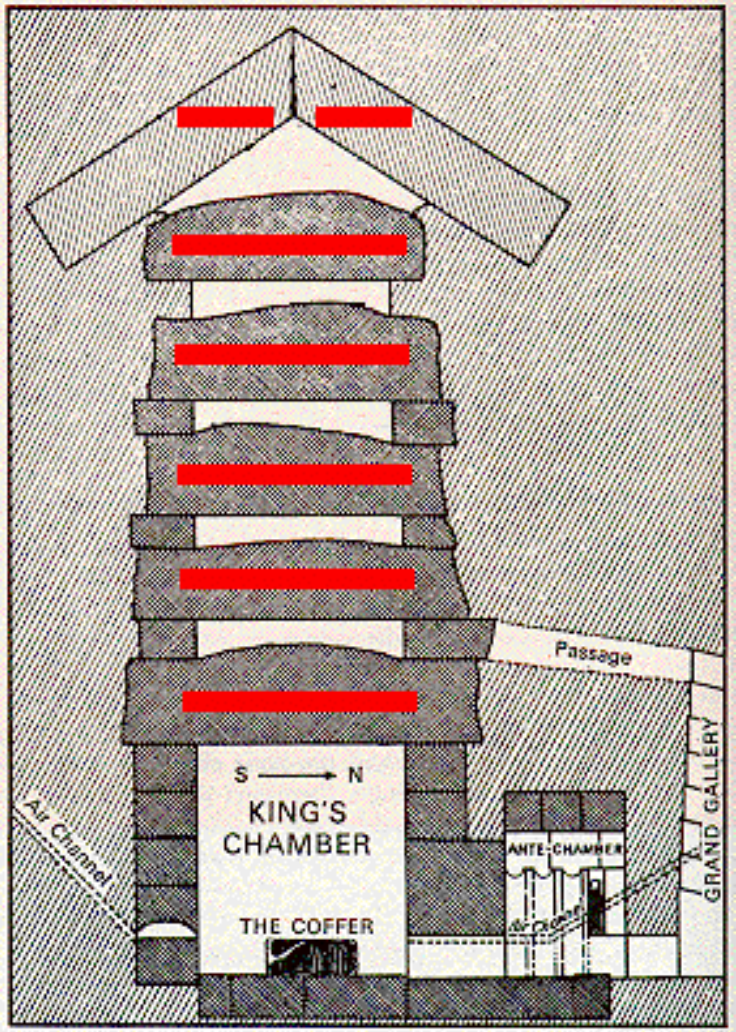
1. Giza plateau
2. Tura (17 kms)
3. Aswan (800 kms)



Time Management

- They calculated 10 years to hack out granite for king's burial chamber roof
- At 10 year mark pyramid would be 150 feet high & ready for pharaoh's burial chamber
- First of 43 granite blocks arrived

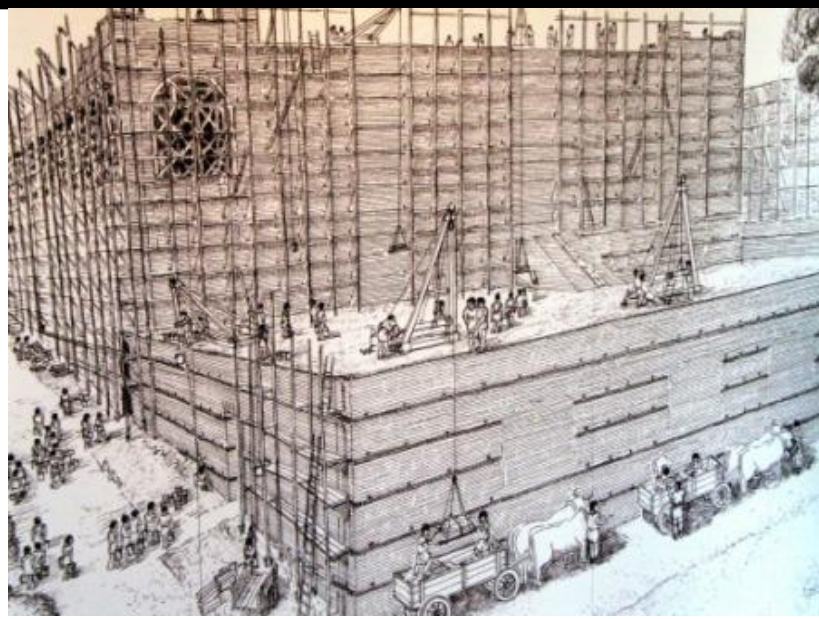




Vertical section of King's Chamber Complex (looking west). Crossed lines indicate granite; single lines limestone.

Cost Management

- **Projects relied on investments and loans**
- **Basic need to pay workforce regularly**
- **Julius Caesar's initiative for funding massive construction projects,**
  - took back from money changers power to coin money, created plentiful money supply.
- **Romans aware of impact of costs on projects effectively managed costs with different strategies.**
  - Exploited local materials (tufa, bricks, stones), used concrete for core, with veneer of marble
  - Low cost way of constructing buildings of high quality
  - Incorporation of labor saving devices (cranes), or material saving techniques such as the arch

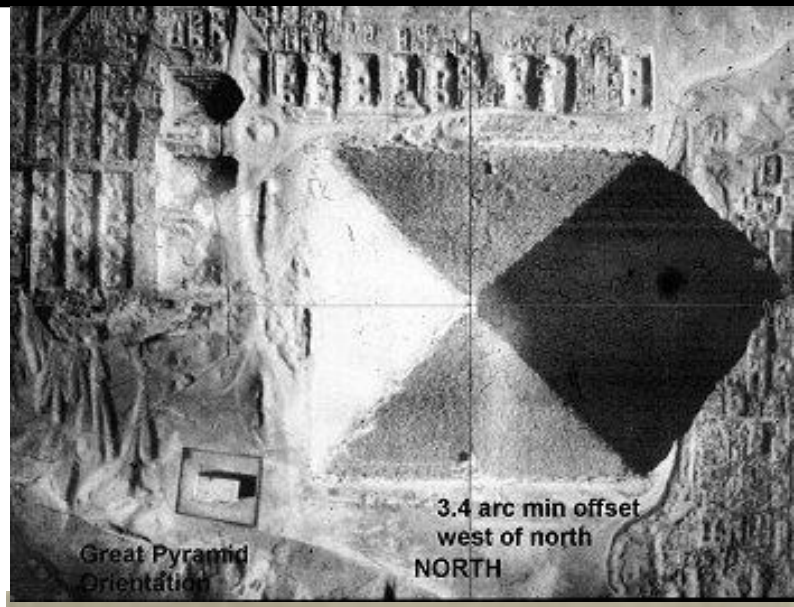


Quality Management - ability to accurately measure was catalyst for project

- Each side is 230 meters (767 ft) in length and almost perfectly level (to within 15 millimeters).

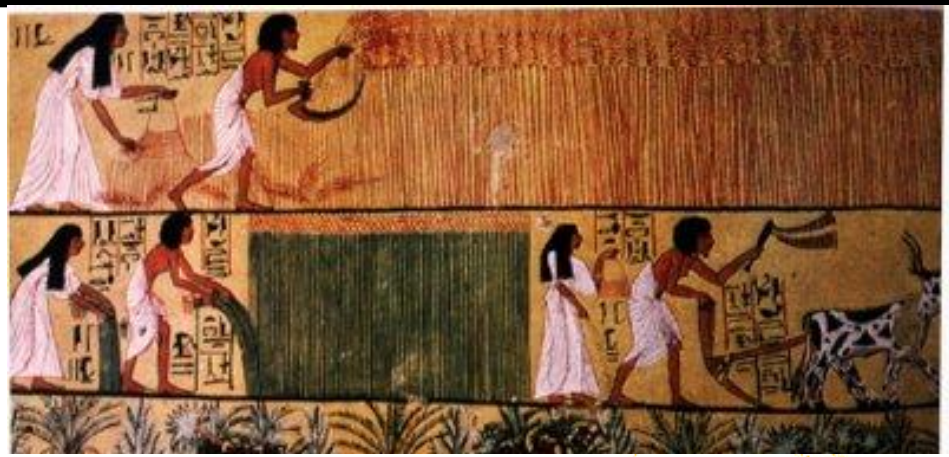
According to Daniel, Mann, Johnson & Mendenhall (DMJM) - 2007

- ***…the dimensions of the pyramid are extremely accurate and the site was leveled within a fraction of an inch over the entire 13.1-acre (5.3 hectares) base.***
- ***This is comparable to the accuracy possible with modern construction methods and laser leveling.***
- ***That's astounding. With their rudimentary tools, the pyramid builders of ancient Egypt were about as accurate as we are today with 20th century technology!***



Human Resource Management

- **For Giza 20% of adult male population was available for project**
- **200 years of pyramid experience identified size/mix of trades/skills**
  - Skilled and unskilled
- **Workers were well looked after,**
  - Excavated bones were mineralized indicating meat diet
  - (Egyptian middle class)
  - Records show that each day 21 buffalo and 23 sheep were sent to the plateau to feed the workers

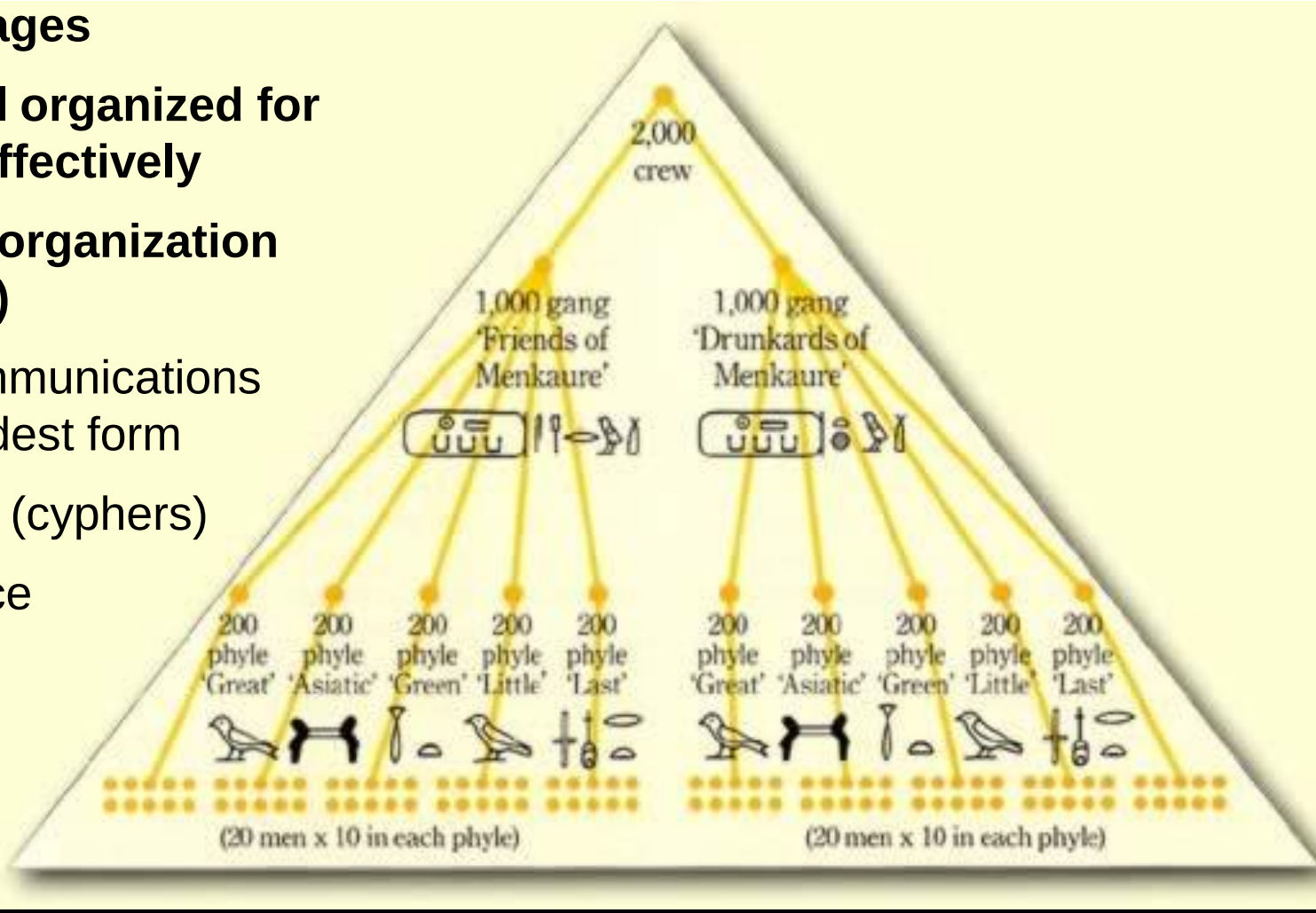


Human Resource Management

- **Workforce extended beyond site with extensive supply chain**
  - Workers organized into gangs encouraged competition between them
  - Workers owned by community and sourced from
  - Communities provided a steady worker supply on a rotational basis.
  - Were paid in lieu of village taxes

Communications Management

- **Large stakeholder number in towns and villages**
- **Workforce well organized for it to function effectively**
- **A hierarchical organization (quasi-military)**
  - top down communications oral/audio, oldest form
  - Mason marks (cyphers)
  - Courier service

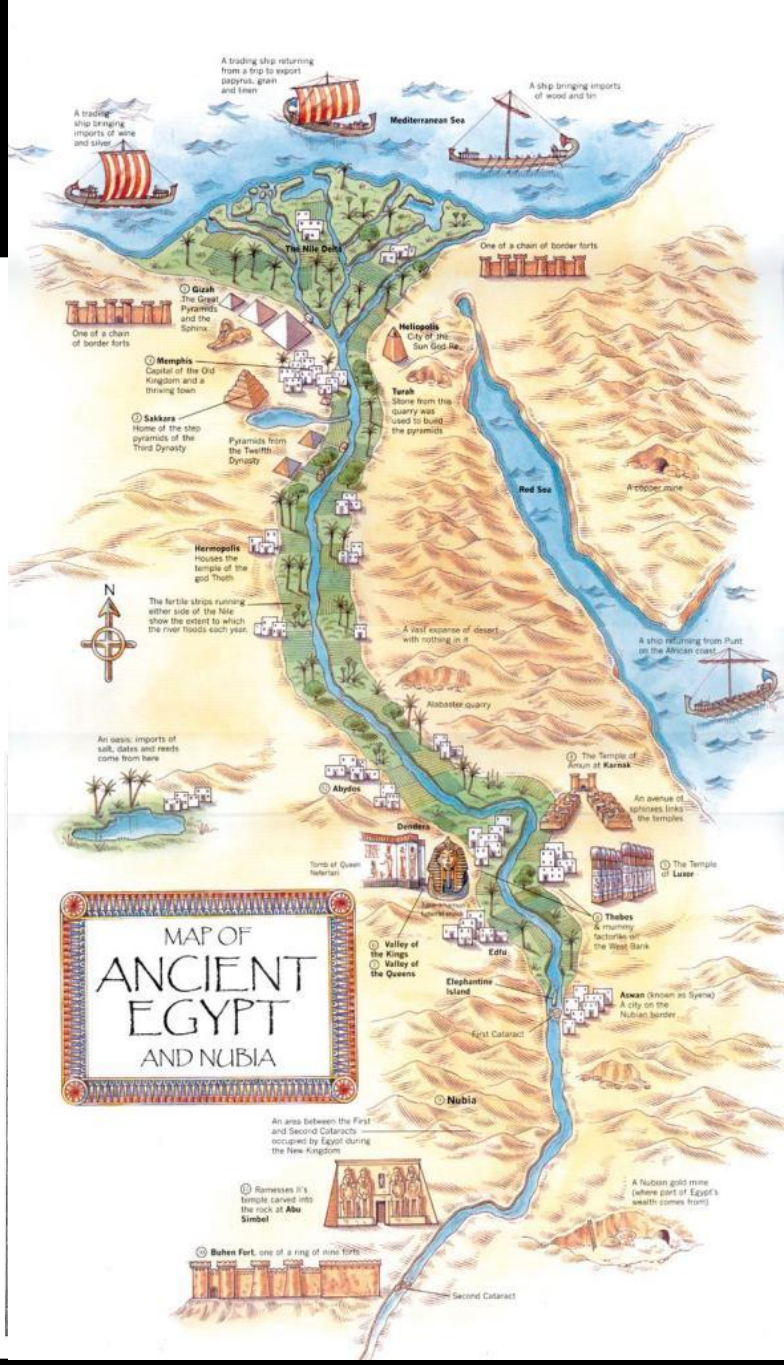


Risk Management - the extensive supply chain and site were fraught with dangers

- **The risk to workers was high**
  - Quantities of materials being moved with relatively simple equipment (sleds, ropes, levers)
- **Huge blocks pulled out of quarries and up ramps into and raised onto the pyramid position**
  - Cramped space little room for maneuver
- **Injuries and death very BAD for project morale**
  - One skeletal remain several fractures healed well and straight, evidence of good medical care (surgeons)

Procurement Management - Extensive supply chain required

- **Moved millions of tons of procured materials, food, provisions to project site**
  - Copper (250 tons) - Red Sea (9 day journey)
  - Rock gypsum (Half million tons) mined Red Sea coast
  - Large quantities of timber (cedar) - Syria
  - Dolerite pounders - Eastern Desert
  - Wine, silver and tin
  - – Exports
  - Papyrus, grain and linen, gold
- **Colosseum delivered by 4 contractors.**
  - Contracts detailed specifications of work, requirements for guarantees, and methods of payment and time. Roman Governments mandated that public works projects went through procurement process.



Conclusion

- **Misperceptions stem from generalized view of ancient regimes as being autocratic and authoritarian**
- **Driving factors to create public works projects**
  - to unify society or nation,
  - get the unemployed off streets,
  - placate society, give something of value back.
- **Success based on creating conducive environment, to support and allow project to proceed without getting caught in red-tape or morale sapping politics**
- **All elements of the 9 knowledge areas of PMBoK® were intuitively practiced**
- **We need to reinterpret historical project management so that we can connect & equate it to modern project management, and see it as a natural evolution.**





IRNOP conference conclusions – summary by track organizers

- **Lack of historical knowledge on project management raises several problems.**
  - Existing literature on project history is biased toward large, US, military and space projects.
  - Need to broaden the perspective to other industrial sectors and national contexts.
  - The history of projects and project management is accordingly a global phenomenon and variations exist across the globe,
  - We know very little, about the most influential projects in World history and their impact on management capabilities, management practice, and subsequent projects.
- **In June 2011 IJPM (International Journal of Project Management) called for papers on subject**

Questions

Presentation available on-line

Mark available to work with you and your organization (PMs and Executives), speak or run workshops.

Format	Length	Audience	Description
Presentation	1 hour	up to 500	Standard
Presentation	2 hour	up to 500	Extended Q&A
Workshop	4 hour	up to 50	Half day
Workshop	8 hour	up to 50	Full day

Please contact me at mark.kozak-holl@sympatico.ca

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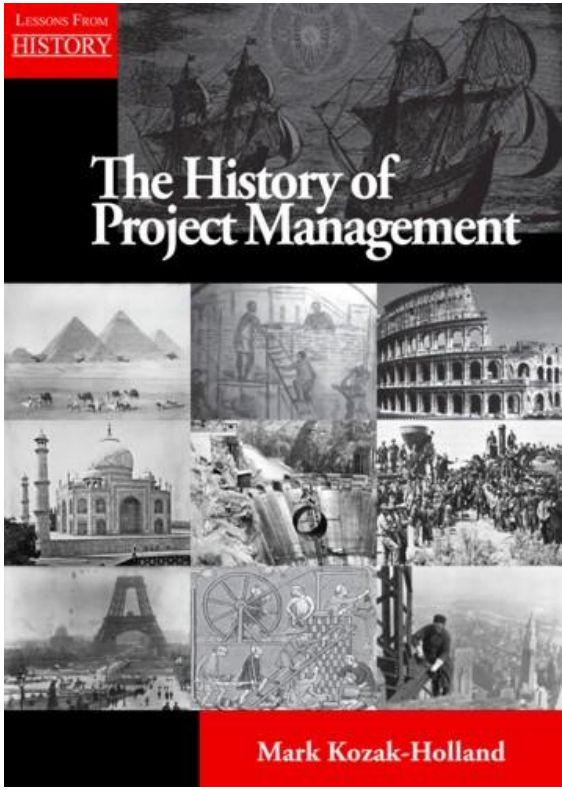
The History of Project Management

- ***"A book on the History of Project Management is long overdue especially one that looks at the history from a modern Project Management perspective."***
- ***Ron Taylor PMP, Past President of the Washington D.C. Chapter of the Project Management Institute.***
- ***"Mark comes from 'stage left' with 'The history of project management'. He presents a very fresh and for me, an inspirational perspective – quite an achievement in a lesson from history! He helps us to recognise, in his examination of the deciding features of a project, that little has changed over the last four thousand years. Mark's book spells out the message; that to succeed, a project organisation must find the tenacity and capability to deliver a job well-done."***
- ***Martin Price, Past Director of PMI UK, Founder of EngagementWorks.***



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