

Decision support models (demands)

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Construction/Project Management

Projekt definíció

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graph TD; Scope ---|quality| Budget; Scope ---|quality| Scheduling; Budget ---|quality| Scheduling;
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SCOPE : Plans

- *Scope Planning
- *Scope Definition
- *Scope Verification
- *Scope Change Control

BUDGET: project cost

- *(in cash or in labor hour)
- *Resource Planning
- *Cost Estimating
- *Cost Budgeting
- *Cost Control

SCHEDULE: Time management

- *Activity Definition
- *Activity Sequencing
- *Activity Duration Estimating
- *Schedule Development
- *Schedule Control

QUALITY

*Quality is “the totality of characteristics of an entity that bear on its ability to satisfy stated or implied needs”

Definition of a project

*Performed by people. Constrained by limited resources.
Planned, executed, and controlled.

Project management

*“Project management is the application of knowledge, skills, tools, and techniques to project activities to meet project requirements. Project management is accomplished through the use of the processes such as: initiating, planning, executing, controlling, and closing. „

Brief history of construction project management

Seven wonders of ancient world

"I have set eyes on the wall of lofty Babylon on which is a road for chariots, and the statue of Zeus by the Alpheus, and the hanging gardens, and the Colossus of the Sun, and the huge labour of the high pyramids, and the vast tomb of Mausolus; but when I saw the house of Artemis that mounted to the clouds, those other marvels lost their brilliancy, and I said, 'Lo, apart from Olympus, the Sun never looked on aught so grand.'"

*Antipatros

Seven wonders of ancient world

- *Pyramid of Khufu 2500 BC
- *The hanging gardens of Babylon: c.580 BC, II. Nabúkadurri-uszur king of Babylon
- *The statue of Zeus at Olympia: c.430 BC
- *The temple of Artemis at Ephesus: c.550 BC

Seven wonders of ancient world

- *The mausoleum at Halicarnassus: c.350
- *The colossus of Rhodes: 292 BC
- *The pharos at Alexandria: c.280 BC

Seven wonders of ancient world



Pyramids (Kheops)

- *Built near to Cairo 2551-2528 BC
- *Herodotus 450 BC: 100.000? workers during 20 years
- *Domestic houses of adobe, dried bricks (clay + lime + sand)
- *147 meter high,
- *Experiment of Thor Heyerdahl in 1986
 - *(10t stone, 180 workers move on tree trunk)

Pyramid of Kheops



Hanging garden of Semiramis

It was built 90 kilometers from Baghdad in Babylon
(German archaeologist Robert Koldewey 1898)
Cantilever design
Herodotos: 3-4-storey houses, straight streets
Other buildings in Babylon
Palaces from stone
Domestic houses burnt bricks

Hanging garden of Semiramis



Hanging garden of Semiramis



Artemis Temple

Built in 560-570 BC. In Ephesus site of the old church
Designer, Developer: Kheirokratesz architect, in Ephesus
65m wide and 125m long, 18m high marble columns 127 pieces
The church also was used for business, functioned as a bank
AC. 262 was destroyed by the Goths

Artemis Temple



25m

Pheidias statue of Zeus at Olympia

Built in BC. 457 Olympia inner chamber of the temple and placed
The 64m x 27m based church 34db high of 10,5 columns
The statue is 12m tall
Earthquake destroyed or damaged by fire

Pheidias statue of Zeus



12m

Mausoleum at Halikarnassos

Builder: Mausolos

Built in 353 BC, selected through tenders Greek architects (Szatüros and Phütheos) in Bodrum
49m high, 11m high pillar inner chamber of 39 pieces
12.sz was destroyed by earthquake

Mausoleum at Halikarnassos



49m

Colossus at Rhodes

It was built in BC. 302 Rhodes
Built by: Kharezsz
36 m high (originally 18m tall, modified on the fly) and 12t of bronze in boulders formed
ie. 224 collapsed in an earthquake, and lay in 900 years


Colossus at Rhodes



Pharos at Alexandria

- *Épült a Nílus deltájában Pharosz szigetén
- *Építető: Nagy Sándor
- *Épült halála után több mint 20 évvel, ie. 300
- *130m magas 30x30m alapú
- *800 talentumba került (21000 kg ezüst)
- *Isz. 796-ban földrengés rombolta le

Pharos at Alexandria



130m

Tower of Babel

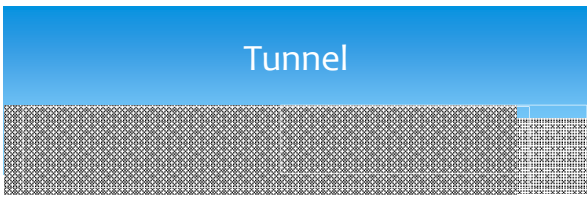
It was built in 505-502 BC, 90 km from Baghdad
90m high and 90x90 m² based
Building materials: Mud and straw

Tower of Babel



90m

Tunnel



Built in 530 BC. Samos island
1km long, 1.5-2 x 1.5-2 high sometimes narrower,
sometimes wider

Tunnel at Samos

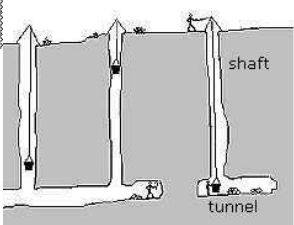

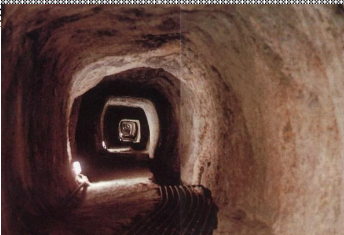
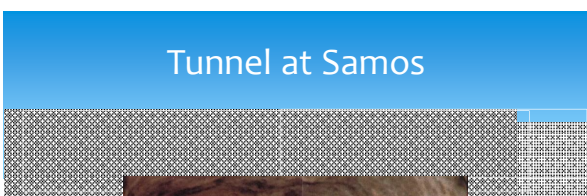


Fig.4:
The
ancient
qanat
method for
digging
tunnels

Tunnel at Samos



Roads and bridges

Darius BC. 500-250km long

Babylon 123m long bridge parts under water with bitumen

Management

El Whitney In 1886 the introduction of quality control

Charles Babbage (1792-1871) English mathematician and inventor (motivation)

Wharton School (U. Penn) -First College of Business

“Scientific management”

1800 Frederick Winslow Taylor (1856 to 1915) is an American engineer (Time and Motion) The Principles of Scientific Management (1911).

Bethlehem Steel Company 12.5 t → 47.5 t

In 1917, under pressure from the trade unions His method were banned.

„Scientific Management”

Frank, Lillian Gilbreth (1868-1924)
120 brick pile of brick / brick hour 350 / hour
Harvey Gantt American engineer, track schedule, Gantt chart. 1916

Golden Gate bridge

*1933-1937
*Charles Alton Ellis
Equation system with 30.000 variables
Bernoulli (1667-1748), Lagrange (1731-1813) 1788, Kronecker (1823-1891), Gyula Farkas (1847-1930) 1902

Management

1927 George Elton Mayo (1880-1949) operational psychologist (Human Relations)
The Western Electric Company Hawthorne experiments were dated between 1927-1939.
Goal: Increase Productivity
Hypothesis: Performance = f (Physical Working Conditions)
21,000 questionnaires / interviews
RESULT: Power = f (emotional factors)

Management

*Abraham Maslow pyramid of needs 1957

The need for self-realization

Esteem, the need for respect and place in the social hierarchy, self-confidence.

Social inclusion, acceptance by others.

Sense of security, physical security have enough food, drink, clothing.

Physiological needs, drinking, eating, sleeping clothing.

Literature

*http://www.lenola.hu/muvelodestorteneti_morzsak/mi-volt-az-okor-het-csodaja/

*Engel Pál: Beilleszkedés Európába a kezdetektől 1440-ig
