

PM in construction I.

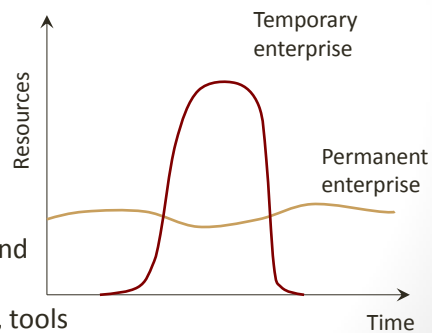
Construction management 2.

(BMEEPEKT601-BMEEPEKK601)

24.02.2016

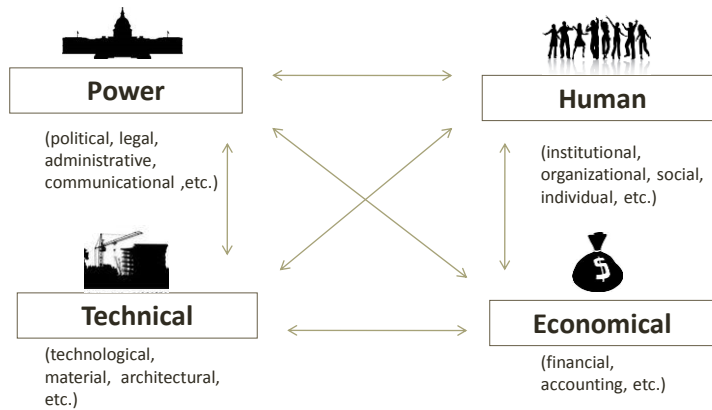
PM in construction

- From **Idea** to **Hand-over** and use
 - Find out
 - Plan/Prepare
 - Perform
 } an investment
- Permanent enterprise
 - Longer time
 - Slightly (slowly) changing resources
- Temporary enterprise
 - 3-5 to 4-7 years
 - High intensity of human and material resources
 - Unique aims, participants, tools



PM in construction

SYSTEMS OF MEANS

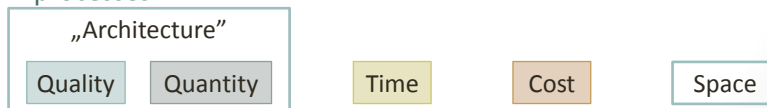


The four definitive systems of means in the construction project management.

PM in construction

Someone

- Wants a building (has the idea / plot / money)
- Has to determine how the building will look (programme, design)
- Has to produce required materials, products, equipment for the construction of building
- Has to build it – control and direct
- Has to **coordinate** and **harmonise** the participants and the processes



PM in general

Project integration management

- Project plan development
- Project plan execution
- Integrated change control

Project scope management

- Initiation
- Scope planning
- Scope definition
- Scope verification
- Scope change control

Project time management

- Activity definition
- Activity sequencing
- Activity duration estimating
- Schedule development
- Schedule control

Project cost management

- Resource planning
- Cost estimating
- Cost budgeting
- Cost control

Project quality management

- Quality planning
- Quality assurance
- Quality control

Project human resource management

- Organisational planning
- Staff acquisition
- Team development

Project communications management

- Communications planning
- Information distribution
- Performance reporting
- Administrative closure

Project risk management

- Risk management planning
- Risk identification
- Qualitative risk analysis
- Quantitative risk analysis
- Risk response planning
- Risk monitoring and control

Project procurement management

- Procurement planning
- Solicitation planning
- Solicitation
- Source selection
- Contract administration
- Contract closeout

Human resource management

What is obligatory?

?

Can we have a free choice?

?

What are the main constraints?

?

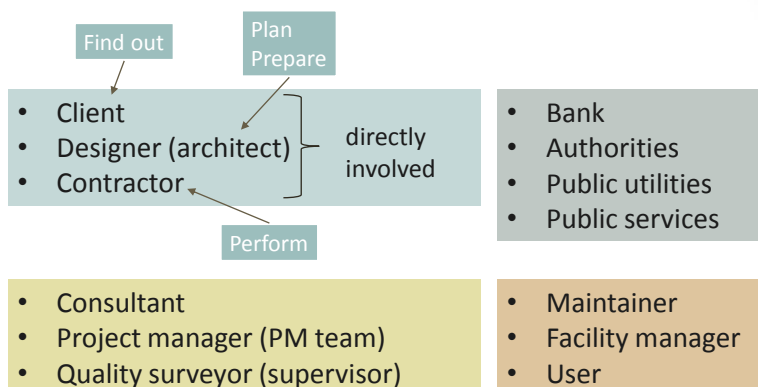
?

Participants of a project

Participants

- Direct
 - Client Find out
 - Designer
 - Architect Plan
 - Structural engineer Prepare
 - Civil engineer
 - Mechanical engineer
 - Electrical engineer
 - Contractor
 - General contractor Perform
 - Sub-contractors
- Indirect
 - Authorities
 - Public services
 - Financing organisations
 - Insurance companies
 - Etc.
 - External
 - Public
 - Media

Participants of a project



Participants of a project



Historical model

client (investor)



design
construction

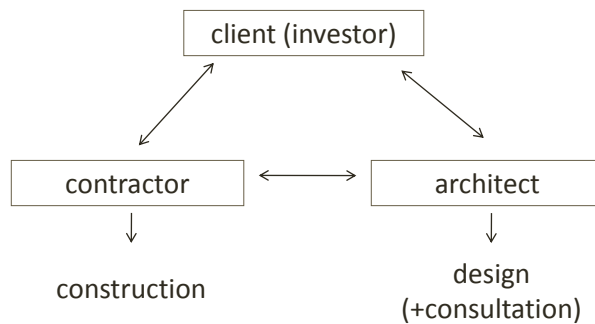
architect
(master builder)



Participants of a project

Basic model

Directly involved participants



Participants of a project

Client

- Form
 - Individual / firm / institute
- Role
 - define the aim of the project
 - ensure financial background
 - select other participants (according to the legal commitments if exist)
- Tasks and duties
 - provide financial background, liquidity of the project
 - dispose with the construction site
 - procure the rights to build (attain building consent)
 - establish contract with the architect, consultant, contractor, etc.
 - share rights and risks
 - attain permission of use

Participants of a project

Designer - architect

- Form
 - Individual / firm
 - Role
 - prepare the necessary drawings and documentations:
 - outline planning consent
 - planning consent/ building permit
 - construction plan
 - fulfilment plan
 - architectural supervision during the construction
 - Tasks and duties
 - help the client in professional way to attain building permit
 - prepare documentations according the national/international standards and legal prescriptions
 - coordinate the work of the co-operative designers and professionals
- } according to their contract

Participants of a project

Cooperative designers and professionals

- Form
 - Individual / firm
- Role
 - prepare supplementary specialist documentation in different fields:
 - structural design
 - installation design
 - electric design
 - landscape architecture
 - fire protection
 - monument, archaeological research
 - cost and time estimation/calculation, etc.
- Tasks and duties
 - prepare documentations according the national/international standards and legal prescriptions
 - continuous co-operation and communication with the designer architect

Additional drawings,
plans or papers to
the architectural
documentation

Participants of a project

Project Manager or PM team

- Form
 - Individual / firm
- Role
 - help the project with their professional work according to their contract in some or all of the following fields:
 - quality surveying
 - consultation
 - communication between the participants of the project
 - preparation of the construction project
 - selection of the other participants of the project (organizing architectural competition, tender, etc.), etc.
- Tasks and duties
 - depend on their contract - coordination

Participants of a project

Consultants

- Form
 - Individual / firm / (institute)
- Role
 - help the project with their professional advices (consulting)
 - directly or in a form of documentation
 - for the whole project or for single tasks
 - on different subjects:
 - feasibility
 - economy
 - investment
 - technology
 - architecture
 - real estate development
 - law,
 - etc.
- Tasks and duties
 - Depend on their contract

Participants of a project

Contractor(s)

- Form
 - Firm
- Role
 - prepare the construction process
 - construct the building according the contract
- Tasks and duties
 - participate in the tendering process
 - contract with the client and with sub-contractors
 - construct the building according the national/international standards and legal prescriptions
 - co-operation and communication with the designer team, the authority and the client/PM

Participants of a project

Quality surveyor

- Form
 - Individual (firm)
- Role
 - ensure professionalism by controlling the plans and the construction work
 - propose alteration of the plan for the client, if it is technically or financially reasonable
 - take part in the hand over process
- Tasks and duties
 - control the plans in accordance with the standards and the legal prescriptions
 - control the assignment of the building
 - ensure the prosecution of the prescribed tests (e.g. soil mechanics)
 - control the construction: the construction logbook, hidden structures, quality, used materials, the volume of the completed work
 - inform the client if the completed work is according to the contract

Participants of a project

Authorities

- Typical authorities
 - local authorities – building department
 - Hungarian National Public Health and Medical Officer Service (ÁNTSZ)
 - local fire department (disaster prevention)
 - National Inspectorate for Environment, Nature and Water
 - National Office of Cultural Heritage (KÖH)
- Role
 - ensure the legal environment
- Tasks and duties
 - provide building permit
 - provide permission of use
 - give consent for the plans, for the technical solutions, etc., according to the legal prescriptions

Participants of a project

Public utilities, public services

- Public utilities
 - electric power supplying companies
 - gas works
 - water works
 - sewage works
- Public services
 - local chimneysweep service
- Tasks and duties
 - give a consent for the plans (capacity, standards, etc.)
 - verify the finished work

Participants of a project

Bank (financing institute)

- Form
 - Firm
- Role
 - provide credit for financing
 - ensure the liquidity of the project in case credit is granted
- Tasks and duties
 - consider the requests for credit
 - grant credit by schedule for the project
 - control the use of money

Participants of a project

Users

- Form
 - Individual / firm / institute – target group(s)
- Role
 - The activities of the users are in relation with the main function or with some of the sub-functions of the building.
- Tasks and duties
 - No defined task, but a representative group of users recommended to be involved in the planning phase of the project to define functional requests.

Participants of a project

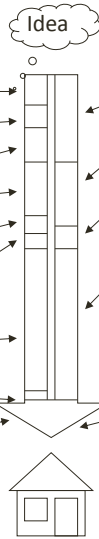
Maintainer

- Form
 - Individual / firm / organisation – the client, the user or independent
- Role
 - responsible for the operation and maintenance of the building
- Tasks and duties
 - facility management

Phases of a project

Phases of a construction project

- Inception phase - initiation
- Preliminary analysis
- Pre-feasibility study
- Planning
- Feasibility study
- Tendering + contract
- Construction phase
- Hand-over
- Operation and maintenance



Preparation

- Project preparation
- Planning
- Preparation of implementation

Implementation (construction)

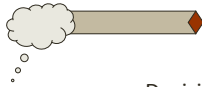
Implementation

Project closing

Phases of a project

Phases of a construction project

Time →



Decision
Planning

Quality
Time

Quantity
Cost

- Idea
- Real Estate development
- Project development
- Formulating the **AIM**
- Finding the participants
- Project organisation
- Examining feasibility

Project preparation

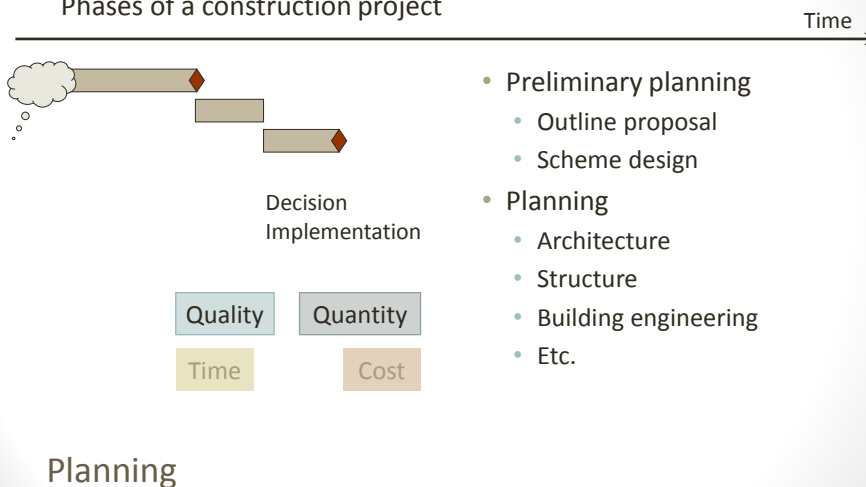
Phases of a project

Phases of a construction project: project preparation

- Initiation
 - Preliminary brief
 - List the client's wishes and ideas about the building
 - Programme of the building (rooms/functions)
 - Preliminary analysis
 - Detailed brief
 - Feasibility study
- Quality
Quantity
- Information required
 - General limiting conditions
 - Budget
 - Deadline
 - Code requirements
 - Community values
 - General building costs
 - by occupancy type
 - by location, etc.
 - General forms of construction
 - which are appropriate?
- Time
Cost

Phases of a project

Phases of a construction project



Phases of a project

Phases of a construction project: planning

- Preliminary drawings and models
 - Proposed design
 - Quality
 - Quantity
 - ↓
 - Detailed drawings
 - Written specifications
 - GOAL: to completely describe the desired construction
 - Rough/preliminary cost estimate
 - Cost
 - Draft schedule
 - Time
- Architect
 - Other specialists
 - Structural engineers
 - Civil engineers
 - Landscape designers
 - Mechanical engineers
 - Electrical engineers
 - Interior design
 - Etc.
 - Outside consultants or employees

Phases of a project

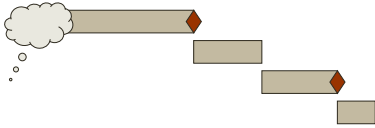
Phases of a construction project: planning

- Preliminary design
 - General building size and form
 - Selected basic construction and type of structural system
 - General use of materials
 - Definitive design
 - Layouts of plans and elevations
 - Selection of essential control dimensions and modules
 - Description of basic materials and products
 - Quality
 - Quantity
- Information required
 - General planning requirements
 - Reasonable alternatives for the basic construction
 - Unit costs (selected systems and materials)
 - Cost
 - ↓
 - Construction details appropriate to design goals and choices for materials and products
 - Dimensions and planning modules

Phases of a project

Phases of a construction project

Time →



- Approval by authorities
- Approval by public services
- Building permit
According to regulation

Phases of a project

Phases of a construction project

Time →



- Detail design
 - Documentation for tendering (tender set of drawings)
 - Documentation for construction
- Tendering
 - Getting a bid from the contractor
 - Choosing from several possible contractors
- Signing the contract

Space

Quality

Quantity

Time

Cost

Phases of a project

Phases of a construction project: preparation of implementation

- Set of contract documents
 - Complete construction details
 - Complete specifications (precise descriptions of quality, performance requirements)
- Typical questions for final design
 - What specific material or product is to be used for a given item of the construction?
 - What specific data must be recorded to completely identify a chosen material or product for design purposes?
 - What are appropriate details for the construction of various elements of the building?

Quality
Quantity

Phases of a project

Phases of a construction project: preparation of implementation

- Qualification/prequalification
 - Tendering
 - Open tender
 - Restricted tender
 - Negotiated tender
- } dep. on the number of contractors invited
- Contracting
 - Final cost estimate, cost plan
 - General time plan, detailed time plan
 - Construction site plans

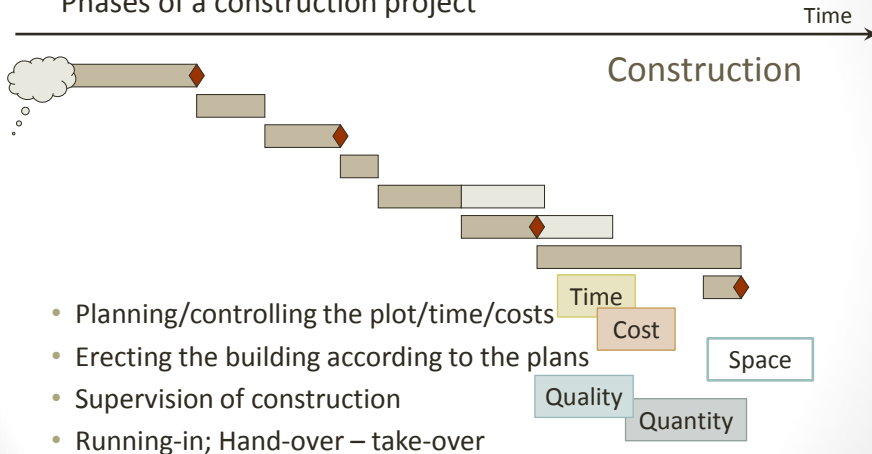
Cost

Time

Space

Phases of a project

Phases of a construction project

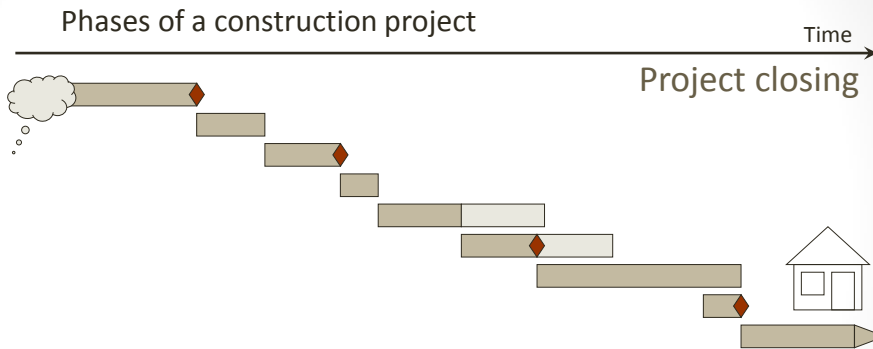


Phases of a project

Phases of a construction project: construction

- Managing resources
 - Labour
 - Materials
 - Machinery
 - Money
 - Managing changes
 - Acceptable range for performance and alternatives
 - Managing time
 - Verification of time schedules
 - Managing quality
 - Procedures for inspections, tests, certifications, etc.
- Time
- Cost
- Space
- Quality
- Quantity
- Time
- Quality

Phases of a project



- Operation and maintenance, FM

Phases of a project

Phases of a construction project: project closing

- Operation and maintenance of the building
 - Setting up and operating a Facility Management System
- Selling/renting the building
 - Users needs
- Evaluation of the project - Benchmarking
 - Comparing with other closed projects
 - Feed-back for future projects
 - Post-occupancy evaluation

PM in construction

