1. **Project Management**
   a. **Introduction: Why Project Management? What is a project (definition)?**
   

   A project is a unique endeavor with a definite beginning and end undertaken to meet certain objectives within the parameters of a given cost, schedule and quality. A project always has defined scope and objectives, clear timeline and the budget allocated to it. It is unique and separate from the ongoing work of an organization, 'it takes place outside the process world'.

   **Elements:**
   - Complex, one-time process
   - Limited by budget, schedule and resources
   - Developed to attain a clear goal or a set of goals
   - Involves a defined group of people

   **General Project Characteristics:**
   - Presenting an endeavor with a clear life cycle
   - Building blocks in the design and execution of organizational strategies
   - Developing new and improved products, services and organizational processes
   - Providing vision and strategy for change management
   - Linking organization’s functional entities
   - Applying traditional management methodologies in planning, organizing, motivating, directing and controlling
   - Delivering results which satisfy stakeholder requirements within technical, cost and schedule constraints
   - Ending when its objectives have been successfully achieved
Project
Takes place outside the “process world”.
Unique and separate from the ongoing work of the organization

Process
Ongoing, day-to-day activities.
Uses existing systems, properties and capabilities

b. Project life cycle, success factors

4 Stages of the Project Life Cycle:
1. Initiating: Outlining the project goal, defining the initial scope, identifying the stakeholders and necessary resources,
2. Planning: Defining and refining objectives, developing the project management plan with specific schedules, creating work breakdown structure, estimating duration and cost, planning communications, risk and responses and procurements
3. Executing: actual processes performed to complete work defined in the planning stage to satisfy the project certifications
4. Closing: completing the project, obtaining acceptance and sign-off of the customer, reassigning the resources and disbanding the project team

Project Life Cycle Stages and Their Development Over Time

Project success is mainly determined by four factors: Budget, Schedule, Quality and Acceptance. Acceptance is the necessary long-run goal to ensure sustainability of the project’s effects. Most likely conflicting goals are Budget and Schedule as well as Budget and Quality.
c. **Leadership and the project manager**

**Requirements for project managers**

A manager is not automatically a leader! Managers have official titles in an organization but real leaders focus on interpersonal relationships rather than administration.

Important differences exist between the two in creation of a vision, network development, task execution, focus on outcomes, and time frame.

Effective project leaders have to communicate well, be flexible, be good team players and should be skilled at influencing others.

Useful skills for relationship building and maintenance in a team are

- Self-awareness (own strengths and weaknesses)
- Self-regulation (behavior)
- Motivation (internal, to measure progress and set challenging goals)
- Empathy
- Social skills

Project Managers function as mini-CEOs and manage both ‘hard’ technical details and ‘soft’ people issues. They:

- Acquire project resources
- Motivate and build teams
- Have a vision and “fight fires”
- Communicate well, keep close contact with the project’s stakeholders

**Team building/leading, communication**

It is critical for a project manager to maintain strong contact with all stakeholders. Project meetings are characterized by including **task-oriented** and **group**-building activities and serve to:

- Update all participants
- Increase understanding and commitment
- Make decisions
- Provide visibility
Team Development Stages:

1. Forming
2. Storming
3. Norming
4. Performing

When a new team is set up, four phases of a group development take place:

The focus of the first, Forming Phase is on inclusion of the team members. Everyone involved is testing the new environment, leading to a quiet, status quo atmosphere. Especially, if the team members have not met before, interaction in the beginning of this phase could be rather guarded and on the surface.

In the second, Storming phase is where team leaders claim their authority and the team is confronted with first conflicts due to conflicting personal agendas. The aim at this stage is always to manage and contain occurring disagreements and mediate conflict among team members.

5 methods of conflict resolution can be helpful during this phase:

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem solving</td>
<td>An attempt is made to solve the actual problem</td>
</tr>
<tr>
<td>Competition</td>
<td>Direct order to resolve something</td>
</tr>
<tr>
<td>Accommodation</td>
<td>Focus on the positive to distract the focus from the negative</td>
</tr>
<tr>
<td>Avoidance</td>
<td>Ignoring the problem and hoping it will fix itself/disappear - no actual conflict resolution, no proactivity</td>
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In the third phase, after the team started Norming itself and got out of the conflict phase, work can take place in an organized way. Procedures are established, team skills are developed and disputes are resolved in an orderly manner.

During Performing or the last phase actual team building and team leadership take place. Team members trust each other, are supportive, flexible, confident and perform their work in a highly productive and efficient way. This phase is reached when leaders do their best in communicating well with all members, solving conflicts and motivating the team.

Further measures for building high performing teams can be:

- Making the team tangible (publicity, terminology and language)
• Rewarding good behavior (flexibility, creativity, pragmatism)
• Adding a personal touch (leading by example, providing positive feedback, being accessible and consistent)

**d. Scope management**

**Project scope** is a detailed description of the project – work that needs to be accomplished as well as expected results.

**Scope management**, as a process to ensure the project includes all the work required to achieve its goals and objectives, consists of six steps:

1. Conceptual development
2. Scope definition
3. Work authorization
4. Scope verification
5. Monitoring
6. Project closeout

1. **Conceptual development**
   The process of defining best ways to meet the project’s objectives. Key steps:
   - A statement of a problem/ need. To reduce complexity, goals and objectives should be clearly stated and reference points have to be provided to aid with understanding of the problem. This is important as in the beginning the goal is not always completely clear
   - Information gathering on constraints and other project-related circumstances, etc.
   - Analysis of alternatives
   - Definition of concrete project objectives
   This step results with a formulation of a statement of work (SOW), a detailed narrative description of the project deliverables.

2. **Scope statement**
   A detailed statement that describes the project’ deliverables and work required to reach that goal (cost, schedule, performance, deliverables, review dates). Development of three structures is essential to this step:
   - Development of a management plan for the project
   - Creation of work breakdown structure (WBS)
Work packages are at lowest detailed components of WBS. They always have a certain deliverable, an owner and can be tracked, like miniature projects themselves.

3. Work authorization
This is the formal ‘go ahead’ to begin work. All involved group members understand what needs to be done and are given the “go ahead” to start to project.

4. Scope reporting
Determines what types of information have to be reported, to whom, who receives copies as well as when and how information is acquired and disseminated.

5. Monitoring
Collecting data that documents progress of the project. Can be done regularly (e.g. yearly or twice a year) or be ongoing.
First, criteria have to be developed that will be measured during implementation. They should be:

S specific    well-defined
M measurable  to understand if a goal is attainable and how far it is from completion
A achievable  a goal can be achieved within agreed timeframe
R relevant    pertinent to the project and its goal
T time-based  sufficient time to achieve a goal

6. Project closeout
The project is not finished after everything is implemented. Closeout work is essential for documenting and communicating project’s success.

Closeout documentation is used to resolve disputes, train project managers or facilitate auditing. It includes historical records, post-work analysis and financial closeout.

e. Risk management (Identification, analysis, mitigation, control)

The diagram below portrays identification and analysis of risks throughout the lifecycle of a project.
Risk management encompasses four stages:
1. Risk identification
2. Analysis of a probability and consequences
3. Risk mitigation strategies (accept, minimize, share, transfer, reserves, mentoring, training) that minimize the potential impact of an adverse event
4. Control and documentation helps to classify and codify risks, responses to them and outcomes. This helps to create a knowledge base for the future.

**Qualitative methods for identifying risk factors**
- Brainstorming: Bringing team together. Gathering many ideas from the stakeholders
- Delphi method: Collect expert opinions. Can be very expensive. With this method, no opportunity for synergies between the individuals
- “Experience Counts”: Lessons learned from individuals in the organization that have had similar experiences
- Multiple (team-based) assessments: A diverse group of team members that are specialized in different aspects come together, they all bring different perspectives

**Risk clusters:**
- Financial
- Technical (new and unproven technology, unique technical elements)
- Contractual/Legal
- Execution (unknowns that can occur when the plan is carried out)

Common Types: absenteeism, resignation, staff being pulled away, time overruns, unavailability of required skill-set, ineffective training, incomplete specifications, change in circumstances.

**f. Cost estimation and budgeting**

<table>
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<tr>
<th>Type of Cost</th>
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<tbody>
<tr>
<td>Direct costs</td>
<td>Directly attributable to the project, spent only in the course of the project work (material to build solar collectors)</td>
</tr>
<tr>
<td>Indirect costs</td>
<td>Needed for project but not restricted to it (rent, electricity)</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>Consistent on the project regardless of how many are used (design of a book cover)</td>
</tr>
<tr>
<td>Variable costs</td>
<td>Fluctuate with the number that is produced (printing each copy of a book)</td>
</tr>
</tbody>
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**Most common problems with cost estimation are** low initial estimates, unexpected technical difficulties, lack of definition, specification changes, and external factors. Creating budget contingencies or including extra funds into the budget to cover uncertainties can be a part of the solution to the cost estimation issues.

**Cost estimation methods**
- Analogous (top down) – compare to a previous project
- Bottom up – individual items are estimated, then summed up
- Activity Based Costing (ABC)
  - Assign costs to activities that use resources
  - Identify cost drivers
  - Compute a cost rate per cost driver unit or transaction
  - Multiply cost driver rate * the volume of used

Parametric – the estimate is build around certain parameters
Computerized/Monte Carlo – individual items are estimated, then summed up

**9. Project evaluation and control**

The Project control cycle illustrates four steps to be performed during project evaluation and control.

In the first step we have set a clear goal. In the second step, progress towards reaching that goal is measured according to pre-defined indicators. Third step compares the actual/measured situation with that planned initially. Should the two not match, in step four corrective measures are to be taken to get back on track as planned. After step four, the control-cycle restarts from the beginning.

**2. Relation to donors**

*a. What to communicate*

- Regular updates on state of work
- Special milestones, e.g. start-up meetings or the beginning of implementation on the ground (e.g. first building refurbished) should be highlighted
- Successes or media outreach are something you can be proud of – show your donors!
- Always think about how much information you really want to expose. Donors have to be kept updated but you should be sure that you are ready to share and discuss details with someone who, first, is not involved in the project as deep as you are and, second, is your donor and therefor has a big say.

*b. How to communicate*

An adequate means of communication has to be figured out in the beginning. Most of communication will happen in written form via letters or e-mailing. If closer contact is required, regular phone or skype calls or meetings could be suitable.

State of the art technical appliances like clouds and other online devices allow to share information (in this case all your project documents) with anyone you want. Think about giving your donors access to
certain files documenting your work in order to give him/her deep insight in the project. But again, consider how much you want to show.

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