PMRI RESEARCH

FAST TRACK YOUR
CAREER & PROJECTS

PMDISTILLED GUIDE TO ITERATION#1

"Predictive, Agile & Hybrid project management best practices

PROJECT MANAGEMENT RESEARCH
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Introduction to Iteration#1

Key objective of Iteration#1 is to introduce the participants to the basic definitions of professional project management (Predictive Project Management PPM), as defined in the Project Management Body Of Knowledge (PMBOK) by PMI, USA.

This document is not a replacement for PMBOK. PMBOK will still remain as the master reference document.

After understanding the concepts in this document, when you refer PBMOK, it will become much easier for you.

Master this document before attempting the quizzes of Week#1

This document is provided to the registered participants of the 10 Week PMdistilled PMP Success Program, hence request you not to circulate.

Best Wishes

Team @ PMRI

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1. What is Predictive Project Management?

In predictive project management, which is also known as traditional project management or Waterfall model,

- The project is sequenced in a well-defined phases of;
    - Requirements Collection
    - Scope definition
    - Design
    - Construction
    - Testing etc
- Predictive project management is good for projects where all the requirements are clear from the start of the project, or if the engineering discipline does not allow for change (like construction).
- Agile project management is good for projects where requirements are continuously changing (New product development, Research & Development projects)

During the first five weeks of this course, we will master Predictive Project Management (PPM), as defined in the latest version of the Project Management Body of Knowledge (PMBOK) by PMI, USA.

2. Professional Ethics of Project Managers

The key pillars of professional ethics of project managers are;

- ✓ Responsibility
- ✓ Respect
- ✓ Fairness
- ✓ Honesty

Understanding the professional ethics of project managers will help you to manage various project management scenarios professional manner, hence it is worth spending some time to understand it in detail.

Responsibility

1. Duty to take ownership
2. We make decisions and take actions based on the best interests of society, public safety, and the environment.
3. We accept only those assignments that are consistent with our background, experience, skills, and qualifications.
4. We fulfil the commitments that we undertake – we do what we say we will do.
5. When we make errors or omissions, we take ownership and make corrections promptly.
6. When we discover errors or omissions caused by others, we communicate them to the appropriate body as soon they are discovered.
7. We accept accountability for any issues resulting from our errors or omissions and any resulting consequences.
8. We protect proprietary or confidential information that has been entrusted to us
9. We uphold this Code and hold each other accountable to it.
10. We inform ourselves and uphold the policies, rules, regulations and laws that govern our work, professional, and volunteer activities.
11. We report unethical or illegal conduct to appropriate management and, if necessary, to those affected by the conduct.
12. We bring violations of this Code to the attention of the appropriate body for resolution.
13. We only file ethics complaints when they are substantiated by facts.
14. We pursue disciplinary action against an individual who retaliates against a person raising ethics concerns.

Respect

1. Respect is our duty to show a high regard for ourselves, others, and the resources entrusted to us.
2. We inform ourselves about the norms and customs of others and avoid engaging in behaviours they might consider disrespectful.
3. We listen to others' points of view, seeking to understand them.
4. We approach directly those persons with whom we have a conflict or disagreement.
5. We conduct ourselves in a professional manner, even when it is not reciprocated.
6. We negotiate in good faith.
7. We do not exercise the power of our expertise or position to influence the decisions or actions of others in order to benefit personally at their expense.
8. We do not act in an abusive manner toward others.
9. We respect the property rights of others.

Fairness

1. Fairness is our duty to make decisions and act impartially and objectively.
2. We demonstrate transparency in our decision-making process.
3. We constantly re-examine our impartiality and objectivity, taking corrective action as appropriate.
4. We provide equal access to information to those who are authorized to have that information.
5. We make opportunities equally available to qualified candidates.
6. We proactively and fully disclose any real or potential conflicts of interest to the appropriate stakeholders.
7. When we realize that we have a real or potential conflict of interest, we refrain from engaging in the decision-making process.
8. We do not hire or fire, reward or punish, or award or deny contracts based on personal considerations, including but not limited to, favouritism, nepotism, or bribery.
9. We do not discriminate against others based on, but not limited to, gender, race, age, religion, disability, nationality, or sexual orientation.

Honesty

1. Honesty is our duty to understand the truth and act in a truthful manner both in our communications and in our conduct.

2. We earnestly seek to understand the truth.
3. We are truthful in our communications and in our conduct.
4. We provide accurate information in a timely manner
5. We make commitments and promises, implied or explicit, in good faith.
6. We strive to create an environment in which others feel safe to tell the truth.

Reference – PMI Code of Ethics & Professional conduct

3. Project Manager's roles and responsibilities

- As per the triple constraints of the project, a project is considered as successful, if it is completed on time, within budget and met the scope of the project.
- This is the basic success criteria of a project, based on the triple constraints of the project, that is time, cost and scope.
- Hence project manager's fundamental responsibility was to complete the project within agreed upon time, cost and meet the scope.
- Of late, the scenario has changed. Even the accomplishment of the project's business case has become the project manager's responsibility.
- As a project manager, one has to manage and meet the project stakeholder's expectations. These stakeholders can be either internal or external to the project.
- As a project manager, one has to have;
    - The technical project management knowledge and skills (Project management best practices like PMBOK, PRINCE2, TCM, Scrum etc)
    - Leadership skills
    - Strategic and business management skills
    - These three forms the talent triangle of the project manager

4. Projects & Operations

What are the Characteristics of Projects?

- Projects deliver unique products or services as outputs
- Projects are temporary in nature. At the end of the project the team is dispersed.
- Projects are progressively elaborated. When we start a project, we have very less information about the project. As the project progresses, we gain more insights about the project.

The following points explain this further

- Every project starts as an idea
- During pre-initiation phase of the project, this idea gets elaborated into a high-level scope document
- During planning this high-level scope gets elaborated further into detailed scope
- During detailed planning and execution of the project we gain more insights about the project
- Projects are constrained by the limited resources of time, cost and scope.
- Projects are managed by project managers.
- Projects are considered as successful when they;
    - Are completed on time
    - Completed within budget
    - Met the business case of the project which was forecasted before the start of the project

Operations

- Operations are ongoing in nature
- Operations deliver standard outputs
- Operations are also constrained by the limited resources of time, cost and scope
- Operations are managed by operations Managers / Functional managers
- Designing a new car is a project whereas manufacturing a particular model of a car shift after shift is operations.

5. What is a Program?

- A program is a collection of interrelated projects which when done together gives more value than doing them one after the other.
- Programs are managed by program managers
- Project managers of the individual projects which are part of the program reports to the program manager

The city has a traffic congestion problem during peak hours. In-order to solve this problem, the authorities launched a program to improve the traffic conditions within the city and the program comprised of the following projects;

- Metro rail project
- Water metro project
- Cycling project
- Traffic and safety awareness programs to drivers and pedestrians
- Improving the condition of the existing roads

Each of these projects had their own project managers and they all reported to the program managers.

6. Portfolio Management

- Organizations have business goals to achieve (say improve sales by 25% in the next financial year)
- Business goals are supported by business strategies. For example;
    - Improved online marketing
    - New product development
    - Marketing existing products in new geographies
- These strategies are supported by projects
    - New web site design, development and deployment
    - Search Engine Optimization (SEO)
    - Design, development, marketing, sales and support of new products
    - Setting up sales & marketing teams, tools and systems to address new markets
- Organizations have very limited funds to spend, so they must allow only the best projects to proceed.

Project Portfolio Management (PPM) or Enterprise Portfolio Management (EPM) involves;

- Identifying and selecting the best projects, programs and other work which are in true alignment to the organization's strategy for growth
- Funding and staffing those projects
- Monitoring and controlling those projects (at a very high level)
- Scanning the environment for environment related risks which may impact the current portfolio of projects, so that they can be optimized. For example, due to the pandemic (environment related risk) most of the organizations had to drop some projects from their portfolio and replace them with more suitable ones (physical store Vs online stores)
- Portfolios are managed by portfolio managers
- The program managers whose projects are part of the portfolio reports to the portfolio managers
- Within portfolios, there can be stand-alone projects which are not part of any programs, those project managers also report to the portfolio managers

7. Project Management Office (PMO)

Project Management Office (PMO) is an organizational structure supporting the project teams within the organization by way of recommending, training and supporting project management related processes definition, tools usage, tailoring guidelines, compliance audits etc.

PMOs can be classified into three types;

- **Supportive** – Supportive PMOs just facilitate professional project management by way of process definition, training, tailoring, sharing lessons learned from other projects etc. The degree of control is very low.
- **Controlling** – Controlling PMOs provide support and at the same time demands compliance through performing audits. The degree of control is moderate.
- **Directive** – Directive PMOs take charge of the projects. Very often all the project managers within the organization report to the PMO. It is the PMO who allocates project managers to projects. The degree of control is very high.

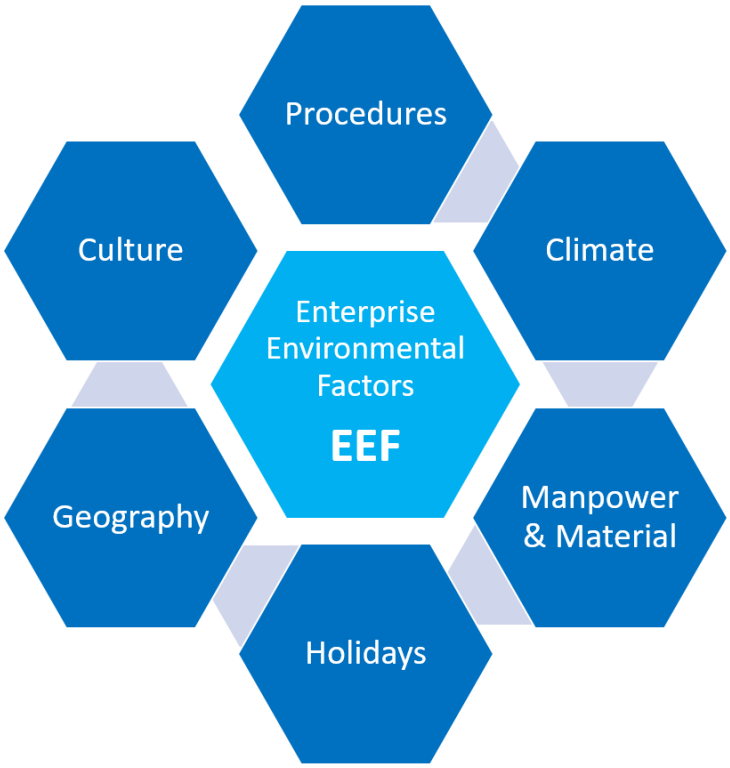
8. Enterprise Environmental Factors (EEF)

Will you start a new project in a country which is badly affected by a pandemic? Will you not check for the medical facilities available before investing? Will you start a project in a country where there is political unrest?

These days large project endeavours look similar to enterprises and PM plays the CEO role within projects.

Large projects are getting more and more complex and project failures will eat into the profitability of the enterprise, if not wiping out the enterprise.

Understanding the project enterprise's environmental factors upfront will help to factor them into Project plans and manage them pro-actively.



Here are some examples;

- Labour laws
- Bank interest rates
- National holidays
- Manpower costs
- Political stability
- Climatic conditions
- Probability for extreme climatic conditions
- Local culture
- Government rules
- Transport facilities
- Geographical conditions
- Trade unions
- Manpower availability
- Corruption levels
- Historical data
- Legal systems
- Health care systems
- Health and safety norms
- Payment terms
- Payroll norms
- Taxation etc

These are just examples. A good understanding of the Enterprise Environmental Factors (EEF) will help to estimate, plan, execute, monitor, control and close projects successfully.

9. Organizational Process Assets (OPA)

Before starting any new project, awareness of the organizational process assets will help to plan the project better. Examples of organizational process assets are;

- Processes, policies and procedures
    - Guidelines for tailoring
    - Specific organizational standards
    - Product and project life cycles
    - Templates
    - Pre-approved supplier lists
    - Change control procedures
    - Traceability matrices
    - Financial controls procedures
    - Issue and defect management procedures
    - Organizational communication requirements
    - Work authorization procedures
    - Verification and validation procedures
    - Closure guidelines
- Organizational knowledge bases

10. Project Phases

The five phases of the projects are;

- Initiation
- Planning
- Execution
- Monitoring & Controlling
- Closing

During the Initiation phase a project charter is prepared, the project manager is appointed and the key stakeholders are identified.

During the planning phase the project manager supported by experts develops the project's management plan which include;

- The integrated project management plan integrating all the subsidiary plans like;
    - Scope management plan
    - Schedule management plan
    - Cost management plan
    - Quality management plan
    - Resource management plan
    - Risk management plan
    - Communications management plan
    - Procurement management plan
    - Stakeholder management plan
    - Change control plan
    - Configuration management plan
    - Environment, Health & Safety (EHS) plans etc

During the execution phase, the project is executed as per the plans

Monitoring & Controlling involve the monitoring and controlling of;

- Schedule
- Scope
- Cost
- Quality
- Risk

- Procurement
- Resource
- Stakeholder engagement
- Environment, Health & Safety

Monitoring and controlling starts from the start of the project till the end of the project.

Closing the project / phase involve formally closing each phase of the project and handing over the product of the phase to the subsequent phase formally. This include the final phase of the project where the final deliverable of the project is formally handed over to the customer and a formal project completion letter is obtained.

11. The 10 Knowledge areas of Project Management

1. Integration management
2. Scope management
3. Schedule management
4. Resource management
5. Cost management
6. Quality management
7. Communications management
8. Risk management
9. Procurement management
10. Stakeholder management

12. Project Initiation

Think of a situation where anyone could start any project within an organization. The end result will be total chaos. First of all, project owners have very limited resources of time and cost and they must utilize it in such a way to gain maximum benefits from the project in the shortest possible time. Secondly, the projects must be in alignment to the organization's strategy for growth.

Formal project initiation ensures that only the right projects get the green signal to proceed further into the subsequent stages of planning, execution, monitoring & control and closing.

The sponsor of the project is accountable for the formal initiation of the project. Two main activities performed during initiation are;

- Developing the project charter
- Identification of the stakeholders

13. Developing Project Charter

Project charter is a document that formally authorizes the existence of a project and appoints a project manager to the project and provides authority to the project manager to use the organizational resources for the project.

It acts as a formal record of the project.

Shows the organizational commitment to the project.

Project charter is created by the sponsor. The sponsor can be an individual, group, group of companies who has the authority to sanction funds to the project.

CONTENTS OF A PROJECT CHARTER

- Purpose of the project
- Success criteria of the project
- High level requirements
- High level scope of the project
- Key deliverables of the project
- Key assumptions and constraints
- Summary milestone schedule
- Pre-approved financial resources
- Key stakeholder list
- Project exit criteria
- Assigned project manager
- Project manager's roles and responsibilities
- Key stakeholder's roles and responsibilities
- Name an authority of the sponsor and other persons authorizing the project

The project charter creates common understanding about the project to key stakeholders

The project charter is approved by the sponsor or the key management representative with proper authority.

All changes to the charter must be re-approved by the sponsor

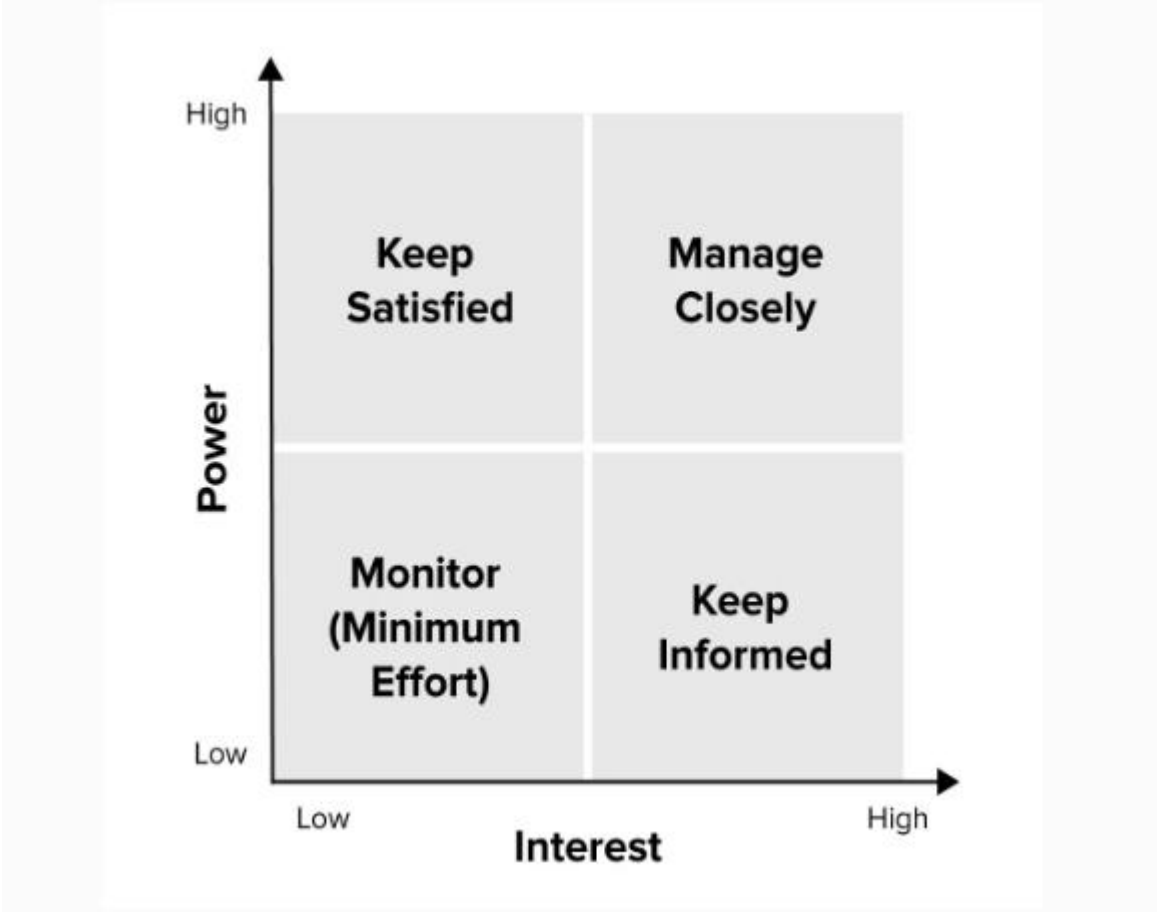
The designated project manager may help the sponsor to draft the charter, and at the same time the approval of the charter is always done by the sponsor.

14. Stakeholder identification and prioritization

Anybody who is affected positively or negatively, by doing a project or by delaying a project is a stakeholder. From a project management context, the main stakeholders are;

- Owner of the project
- Contractor
- Sub-contractors
- Consultants
- Government agencies
- Suppliers
- Political leaders
- Local citizens
- Environmentalists
- Social groups etc

The first step in stakeholder analysis is to prepare a stakeholder list or register. After preparing the stakeholder register, the next step is to classify them based on their interest in the project and their power to influence the project outcomes.



- The high power, high interest group must be managed very closely
- High power, low interest group must be kept satisfied
- The high interest, low power category must be kept informed
- Low power, Low interest group must be monitored without spending much effort

After classifying the stakeholders into these four categories, the next step is to develop strategies to deal with them.

15. Project Management Plan

Projects have many disciplines within them like architecture, engineering, risk management, procurements, quality, construction etc, and they are represented by their own managers like;

- Chief architect
- Engineering managers
- Risk managers
- Procurement managers
- Quality managers
- Resource managers
- Cost managers (Cost controllers)
- Construction managers etc.

These managers develop plans for their scope of work. For example, engineering manager (electrical) will prepare the plans of electrical related work of the project, so is the case with plumbing manager, safety manager, interior manager, structural engineering manager, quality manager etc.

The Project Management Plan binds all these individual subsidiary plans into a cohesive whole covering the scope of work from the start of the project, till the end of the project, and it is owned by the Project manager of the project.

The Project Management Plan describes how the project will be executed, monitored, controlled and closed.

It integrates and consolidates all subsidiary management plans and baselines like;

- Scope management plan
- Requirements management plan
- Schedule management plan
- Cost management plan
- Quality management plan
- Resource management plan
- Communications management plan
- Risk management plan
- Procurement management plan
- Stakeholder engagement plan
- Baselines

- Scope baseline
- Schedule baseline
- Cost baseline
- Change management plan
- Configuration management plan
- Performance measurement baseline – Schedule loaded with scope and cost, against which project performance can be monitored.
- Project life cycle – Series of phases the project passes through
- Development approach – Hybrid, predictive, Agile
- Management reviews etc.

16. Collecting requirements

All projects start with a high-level scope definition and before starting the real work we need to know the detailed requirements. You may start your housing project with a one-line requirement like 'We need a three-bed room, living room, dining and kitchen house'. That is perfectly fine during the very early stages of the project, but before getting into definitive estimates and planning one need to understand the exact requirements in the form of detailed drawings for each room. Before doing that one need to collect the detailed requirements from the key stakeholders of the project.

The key tools and techniques used for requirements collection are;

- Expert judgment
- Brainstorming
- Interviews
- Focus groups
- Questionnaires and surveys
- Bench-marking
- Document analysis
- Voting
- Multi-criteria decision analysis
- Affinity diagrams
- Mind mapping
- Nominal group techniques
- Observation/Conversation
- Facilitation
- Context diagrams
- Prototypes

17. Project scope management

Assume that you want to construct a house. Where do you start? You start dreaming or thinking about it. Then you sketch it. Discuss with others. Refine the sketch. Appoint a consultant to detail it for you. He comes out with the high-level layout. Which goes through multiple iterations, till the final plan is approved by you and your family. Then he gets into the detailed layout. At this stage a construction contractor is identified. He comes out with the detailed engineering drawings for civil work, plumbing and electrical if all these are done by the same person, or else each of these may have different contractors or sub-contractors. When all the detailing is done and approved by the owner, The work breakdown structure is prepared, and the scope gets base lined. There after any changes to the scope will have to follow the change management process and will have implications on the cost and schedule.

As we can see, the scope of the project undergoes continuous elaboration, starting from the idea till the freezing of scope. It does not end there. The scope gets refined further and further throughout the project, and they are managed through change requests. Whether it is a single house or the largest airport in the world, the scope definition process remains the same, except in the change in magnitude of time, cost, scope and the number of stakeholders.

The process of defining and managing the scope of the project from initiation till the project close out comes under the purview of project scope management. The structured approach to project scope management as defined in the project management body of knowledge is depicted below in the Plan, Do, Check, Act (PDCA) cycle by Deming, which makes it much easier to understand and remember.

We start with planning for scope management, followed by Collecting requirements, Defining the scope and then Creating the Work Breakdown Structure (WBS). Scope validation happens while base-lining the scope and continues throughout the execution phase of the project. So, is the case with ‘Control’ scope.

Scope can be categorized into two types;

Product scope – Scope of the product to be delivered (Scope of the house)
Project scope – The work involved in delivering the product of the project (Work involved in constructing the house)

Commonly used tools and techniques

- Expert judgment
- Data gathering
- Data analysis
- Meetings
- Decomposition
- Decision making
- Data representation
- Inter personal and team skills
- Context diagram
- Prototypes
- Inspection
- Product analysis

Common artifacts associated with scope management

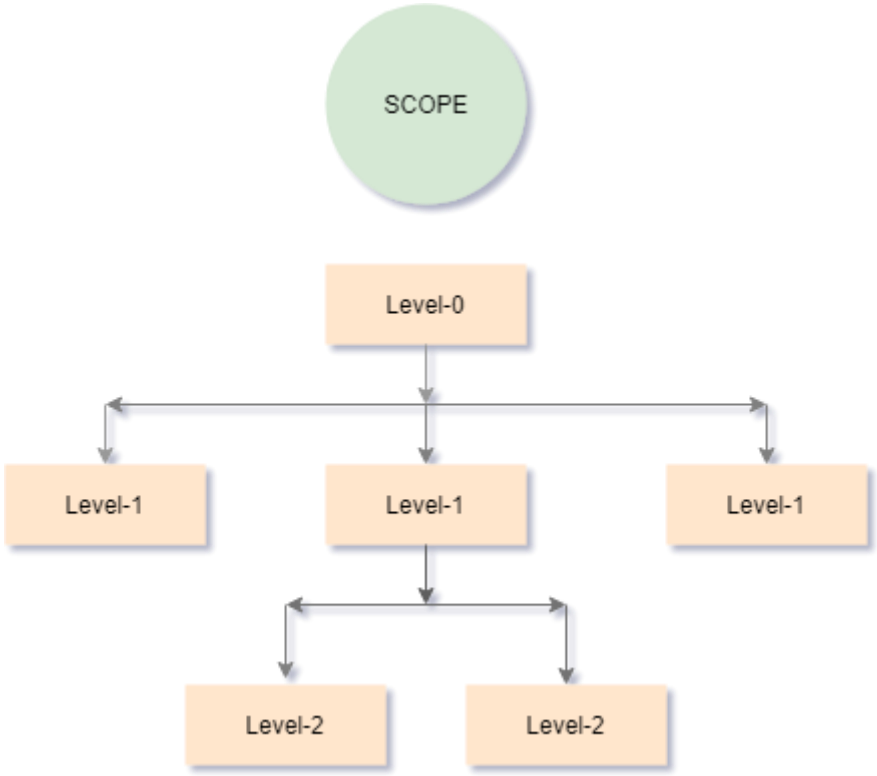
- Scope management plan
- Requirements management plan
- Requirement's documentation
- Requirement's traceability matrix
- Project scope statement
- Project documents updates
- Scope baseline (Project scope statement, Work Breakdown Structure (WBS), WBS Dictionary)
- Accepted deliverables
- Change requests

18. Decomposing the scope into a Work Breakdown Structure

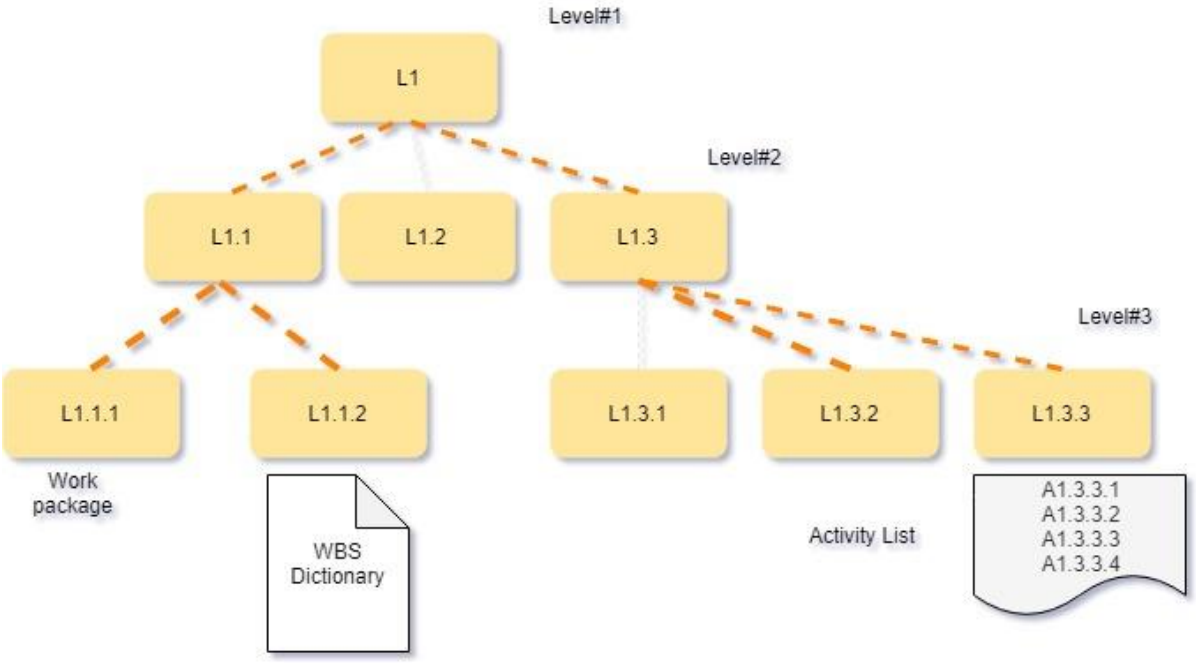
Once the scope of the project is defined, the next step is to decompose the scope of the project into a Work Breakdown Structure (WBS). The steps involved in developing the work breakdown structure are as follows;

- Decompose the scope of work into a Product Breakdown Structure (PBS)
- Super-impose the Product Breakdown Structure (PBS) with the work required to be performed to build that component of the product of the project to arrive at the Work Breakdown Structure.

High level WBS



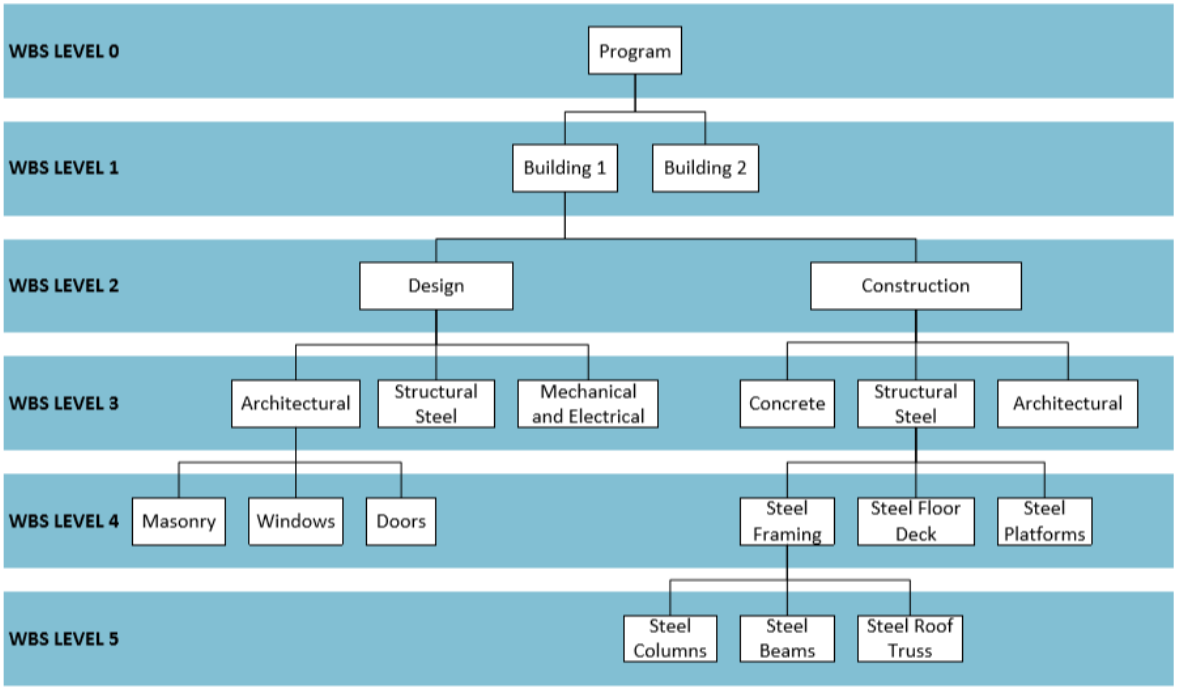
WBS decomposed further



- The lowest level in the WBS is known as the work packages
- There is a general rule of thumb which states that work packages should contain work which can be completed between 8 hours and 80 hours. We call it as the 8-80 rule. For smaller projects, the affinity of the work packages will be towards 8 hours and for large projects the affinity of the work packages must be towards 80 hours. For very large projects, one may have work packages bigger than 80 hours chunks of work.
- Work package sizing is very important for the effective monitoring and controlling of projects. For very small projects if we have very large work packages, there will not be any status change for a very long-time interval where as if for large projects if we have very small work packages, then we end up doing micro management.
- Every work package is supplemented with a WBS dictionary, which contains;
    - Description of the work to be performed
    - Successors and predecessors
    - Quality standards to be followed
    - Reference to engineering drawings etc
- The WBS should cover the entire scope of the project. We call this as the 100 percent rule. The scope which is not captured in the WBS will not be there in the final product.

WBS can be represented as a tree structure or as a list structure

Tree structure



List structure

LEVEL	WBS CODE	WBS ELEMENT DESCRIPTION
0	00.	Program
1	00.01	Building 1
2	00.01.01	Building 1 – Design
3	00.01.01.01	Building 1 – Design – Architectural
4	00.01.01.01.01	Building 1 – Design – Architectural – Masonry
4	00.01.01.01.02	Building 1 – Design – Architectural – Windows
4	00.01.01.01.03	Building 1 – Design – Architectural – Doors
3	00.01.01.02	Building 1 – Design – Structural Steel
3	00.01.01.03	Building 1 – Design – Mechanical and Electrical
2	00.01.02	Building 1 – Construction
3	00.01.02.01	Building 1 – Construction – Concrete
3	00.01.02.02	Building 1 – Construction – Structural Steel
4	00.01.02.02.01	Building 1 – Construction – Structural Steel – Steel Framing
5	00.01.02.02.01.01	Building 1 – Construction – Structural Steel – Steel Framing – Columns
5	00.01.02.02.01.02	Building 1 – Construction – Structural Steel – Steel Framing – Beams
5	00.01.02.02.01.03	Building 1 – Construction – Structural Steel – Steel Framing – Roof Truss
4	00.01.02.02.02	Building 1 – Construction – Structural Steel – Steel Floor Deck
4	00.01.02.02.03	Building 1 – Construction – Structural Steel – Steel Roof Truss
3	00.01.02.03	Building 1 – Construction – Architectural
1	00.02	Building 2

WBS dictionary

WBS Code	WBS Element Description	Date	Revision
00.01.01	**Phase 1 – Site Preparation**	**3/1/2016**	**1**
WBS Element Description			
Work product: This shall include the initial clearing, grubbing, mass excavation, and rough grading of the site per specifications. *Relationships:* Dependent on obtaining site permits. *Risk Factors:* Unknown underground conditions (boulders, utilities). *Assumptions:* Will be constructed on a 5 day 40 hour workweek. *Specifications:* Civil specification 31.10.00			

Once the WBS is approved, the WBS along with the scope document will become the scope baseline of the project. The basis for all further estimates will be based on the WBS.