PROJECT PLANNING & CONTROL

Lesson 2: Project Planning

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Chapter Description

- **Aims**
  - The aim of this chapter is to expose students to processes, tools and techniques that are useful in project planning and control in relation to project management
- **Expected Outcomes**

  At the conclusion of this chapter, the students should be able to:
  - Justify the need for planning in achieving project success
  - Understand the planning process
  - Apply basic planning tools for project management
- **Other related Information**
  - Chapter 6: Developing Project Plan, pg.60, Project Management Textbook
- **References**
  - Erik W. Larson & Clifford F. (2014). Project Management: The Managerial Process (6th Ed.). McGraw-Hill Education, New York.

CONTENT of LESSON 2
PROJECT PLANNING

- Overview of Project Planning
- The Project Plan Structure
- The Business Case
- Cost/Benefit Analysis
- The Planning Approach
- Creating WBS
- Deliverables-based Planning
- PERT charts and the Critical Path
- Using Gantt Chart
- The Team Planning Method
- Resource Planning
- Assigning Resources

Overview of Project Planning

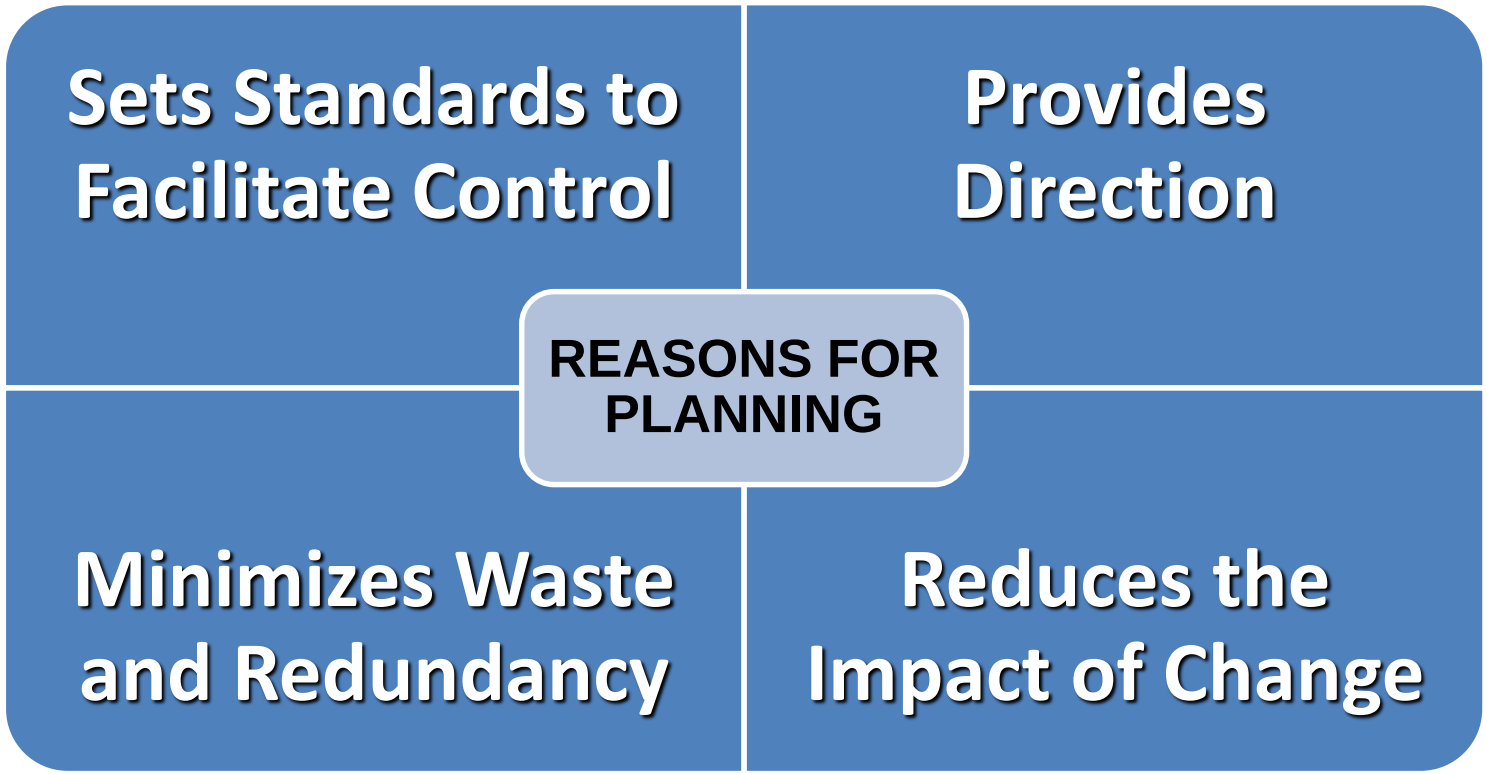
Why Plan?

- PROJECT PEOPLE needs:
  - **To know exactly what their ROLE is**
  - **What are EXPECTED &**
  - **WHEN is it WANTED**.

- **CUSTOMERS WANTS:**
  - To be confident that Contractor knows what they are **DOING**, &
  - Have **CLEAR IDEA** of where they are going.

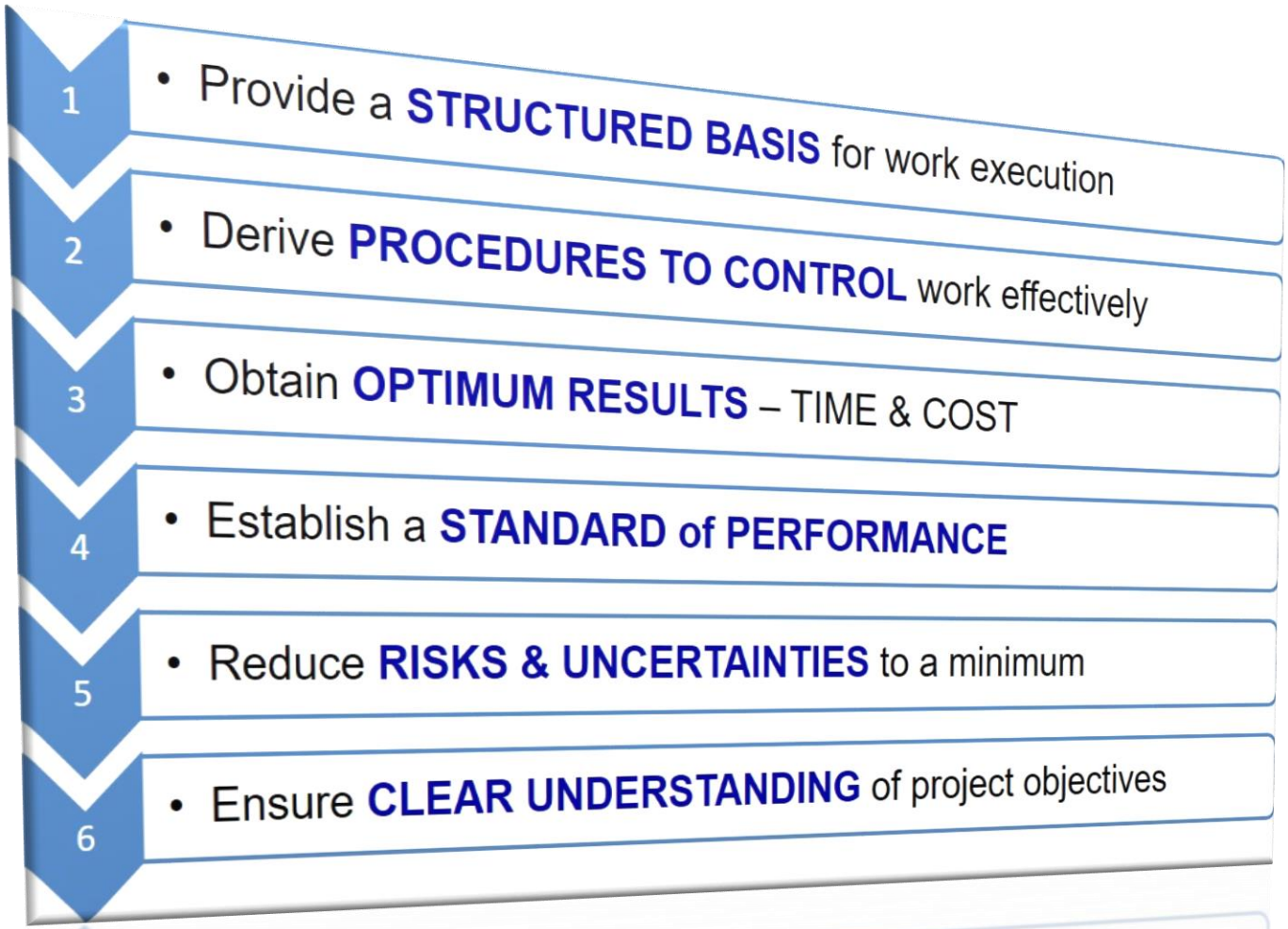
- **MANAGEMENT & his PROJECT MANAGER NEEDS:**
  - To know whether the project is:
    - **ON SCHEDULE & WITIN BUDGET**, &
    - Whether **CORRECTIVE ACTIONS** are needed.

Overview of Project Planning
Reasons for Planning



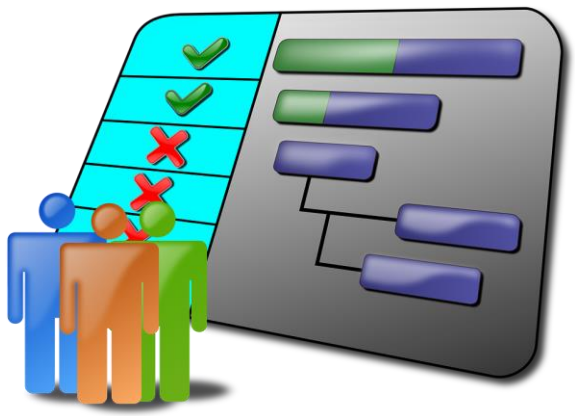
Overview of Project Planning

Objectives of Planning

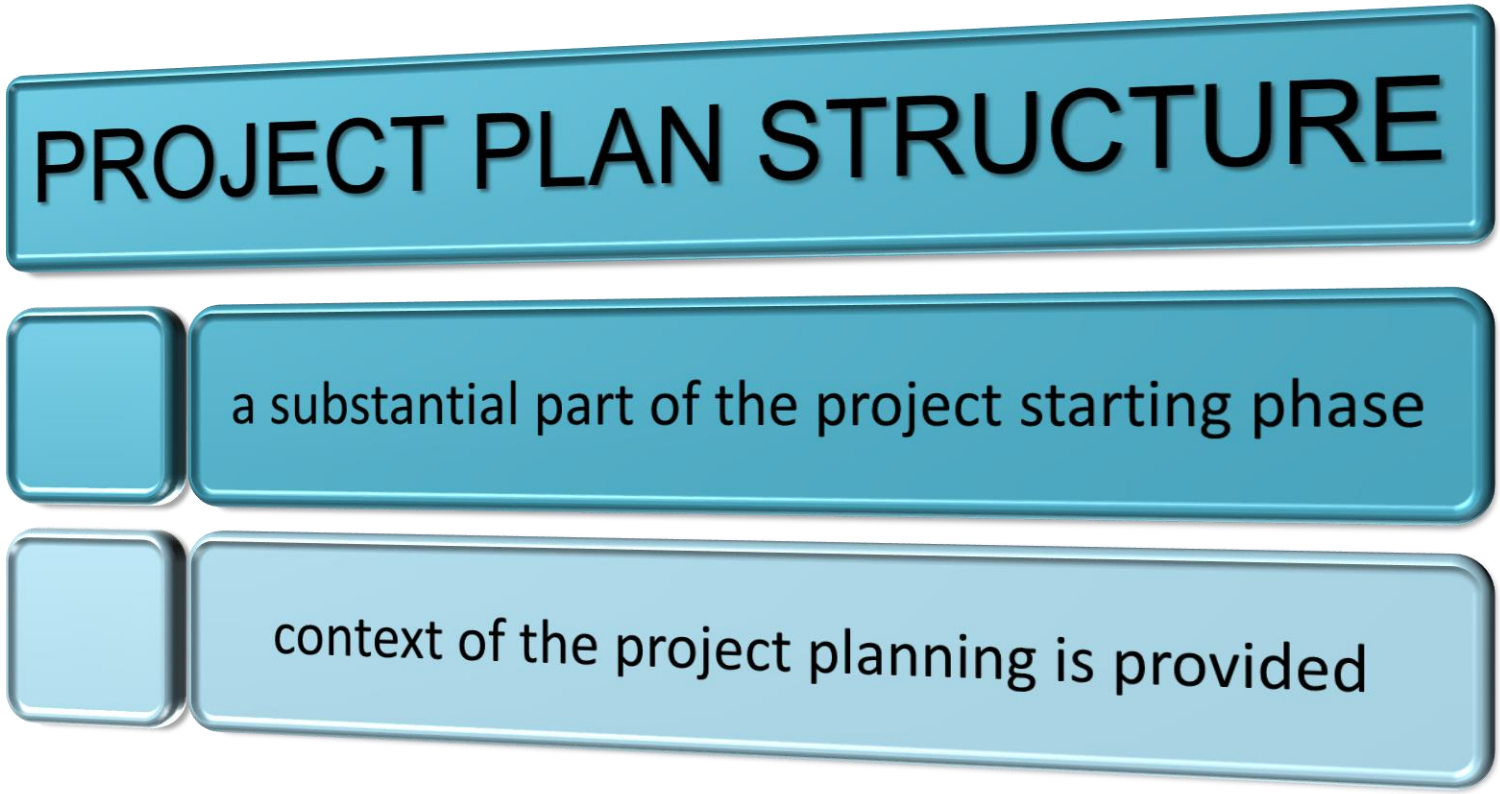


Overview of Project Planning
Main Component of Planning

1. to establish the desired objectives
2. determine strategy to achieve results
3. derive plan & schedule showing when results can be achieve
4. projections of what will happen at certain specific point
5. derive a budget to establish expenditure
6. establish procedures for control & communication
7. set standard of performance measurement



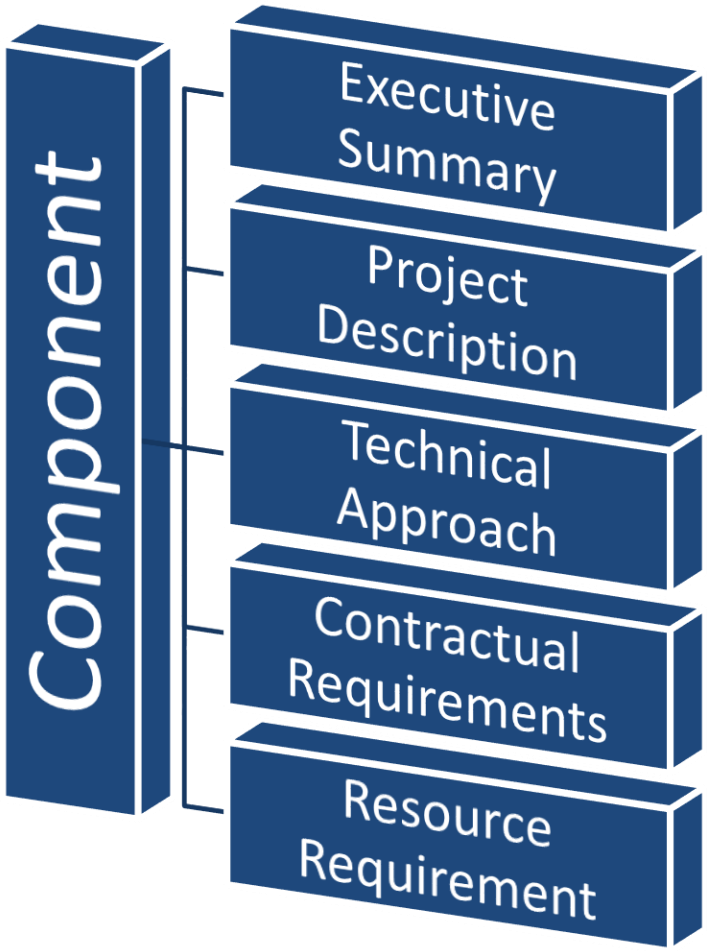
The Project Plan Structure



Do You Know?

50% of a project's budget is spent during the planning process.

Component of Project Plan Structure

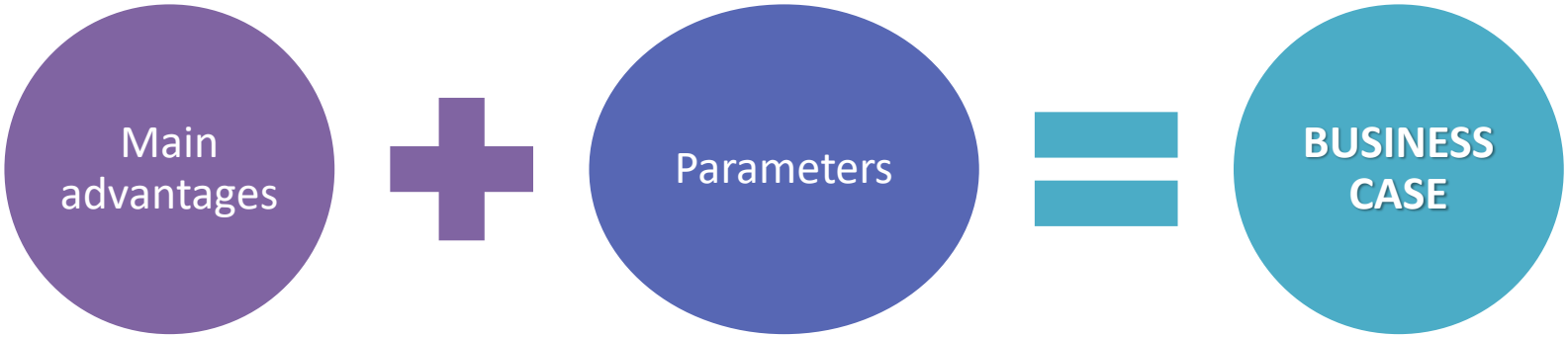


Project Team Structure

The project team outlines the relationship between the project manager and the other team members. The membership of this structure may be dynamic, as seconded members move in and out of the project office.

The Business Case

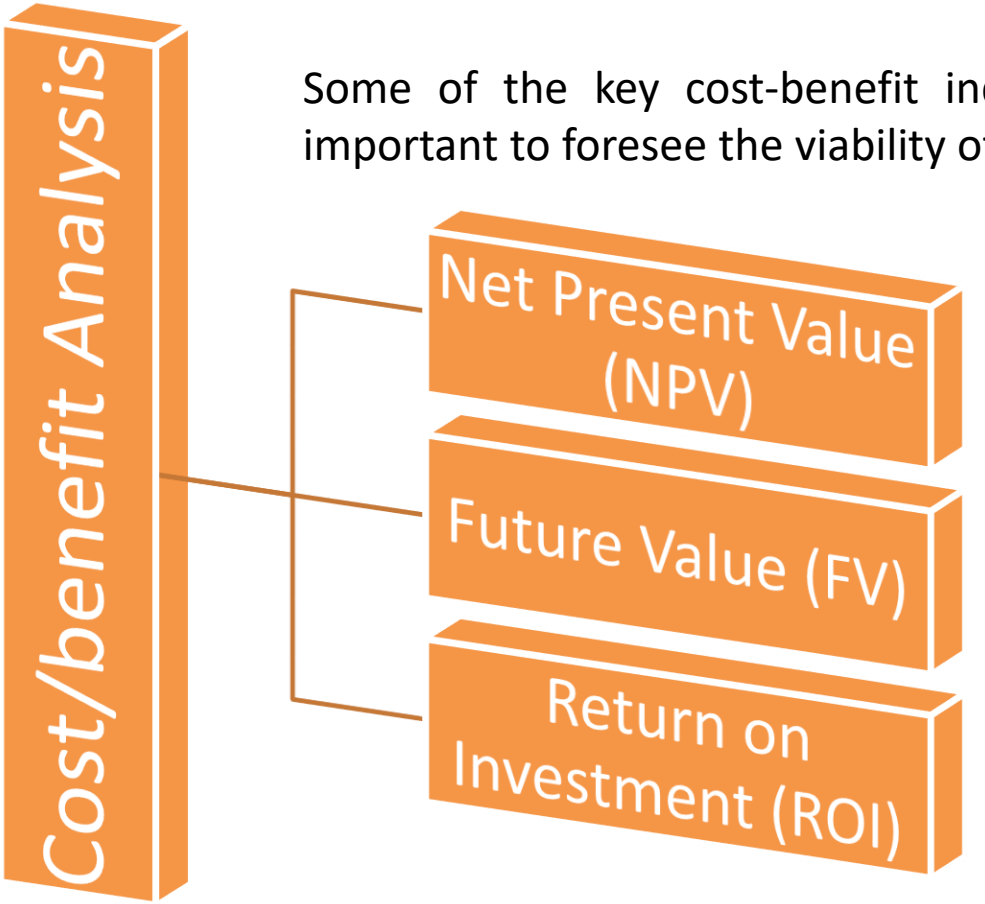
- Business case has to be prepared before a project can be started.
- Business case is the ***first document*** to be submitted to the directorate of an organization to enable this body to discuss the purpose and virtues or quality of the project before making any financial commitments.



Creating a Project Business Case

- Why is the project required?
- What are we trying to achieve?
- What are the deliverables?
- What is the anticipated cost?
- How long will it take to complete?
- What quality standards must be achieved?
- What are the performance criteria?
- What are Key Performance Indicators (KPI)?
- What are the main risks?
- What are success criteria?
- Who are the main stakeholders?

Cost/Benefit Analysis



Some of the key cost-benefit indicators are important to foresee the viability of a project.

Cost/Benefit Analysis
Net Present Value

Net Present Value = Present value of cash flows minus initial investment

NPV = PV – Cost (or Investment)

1. NPV is absolute measure
2. The basis of NPV method is that all future payments/receipts are converted to present value.
3. can be used as a means of determining whether a project is profitable enough to be considered a worthwhile investment.
4. Project with the highest NPV is the most favorable to invest

Cost/Benefit Analysis
Net Present Value

- Example, how much do you have to put into your bank account **today**, so that in **1** year the balance is RM110.00 at the rate of 10 *% ?*
- Answer:

Formula:

$$PV = \frac{110}{(1+0.10)^1} = ???$$

❖RM110 in a year = RM100 deposit in a bank today at 10% interest

Cost/Benefit Analysis
Future Value

- Future Value (FV) is what we have if we invest the cash for some period
- **Tomorrow's value of today's money**
- The future value of *A* today at *r%* at the end of *n* years is

Formula

Example
Future Value

Suppose you get two payments: RM5000 today and RM5000 exactly one year from now. Put these payments into a saving account and earn interest at the rate of 5%. What is the balance in your saving account exactly 5 years from now?

The FV of cash flow:

$$FV = 5000(1+0.05)^5 + 5000(1+0.05)^4$$
$$= RM12{,}458.94$$

Cost/Benefit Analysis
Return on Investment (ROI)

- E.g.: IF a project investment is RM 10,000 and gives a net profit of 4000.
- Hence, the return of investment %

$$= \frac{4000}{10,000} \times 100$$

$$= 40\%$$

Source retrieved: http://www.rptechvalley.com/wp-content/uploads/2016/08/ROI-return-on-investment-Aliraza.co_.jpg

The Planning Approach

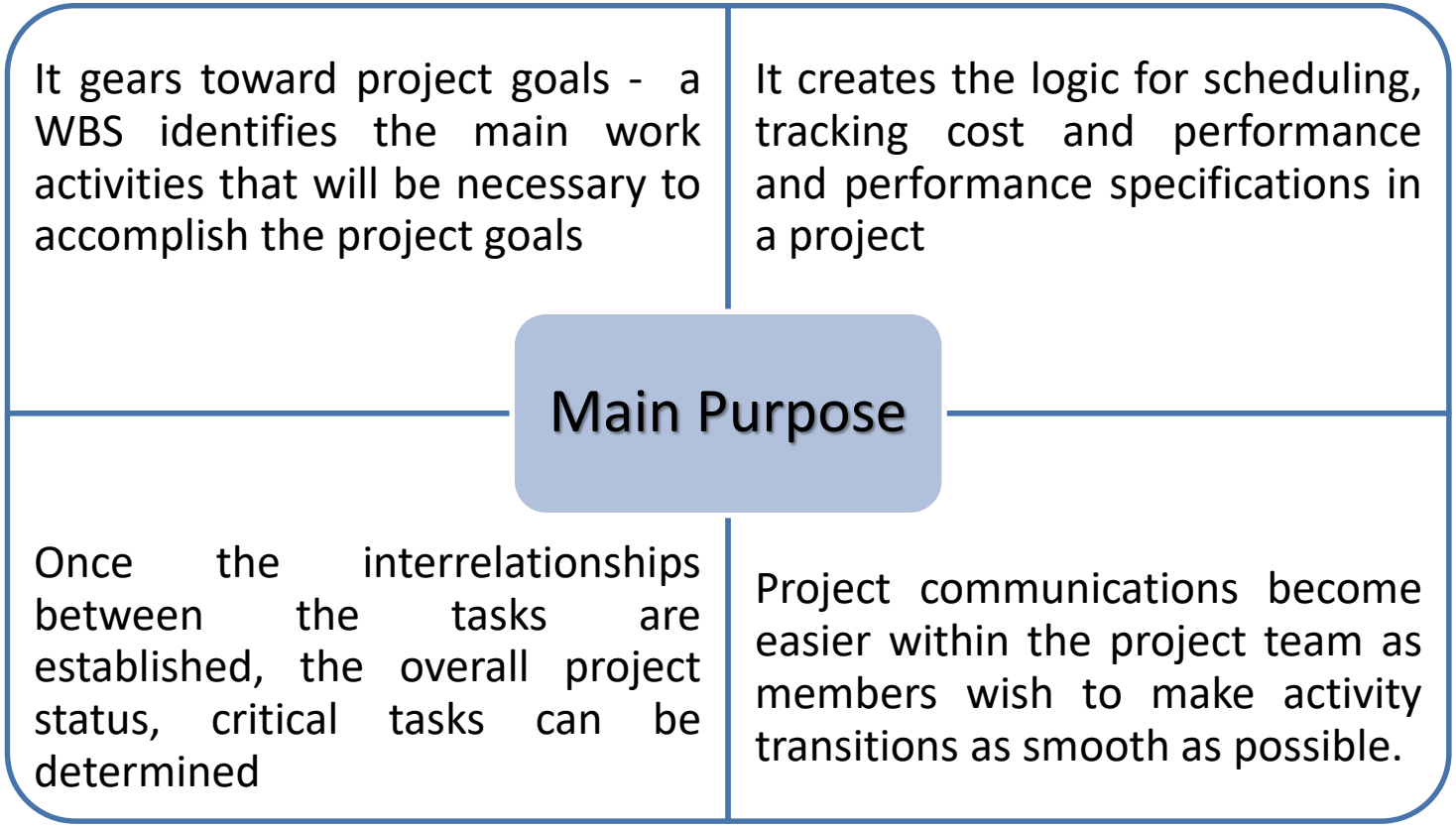
Work Breakdown Structure (WBS)

	Definition
1	WBS defines the work to be performed, identifies the needed expertise, assists in selection of the project team, and establishes a base for project scheduling and control
2	*WBS is the breaking-up of a project into manageable tasks (activities) from start to finish and to establish the interrelationships among activities*

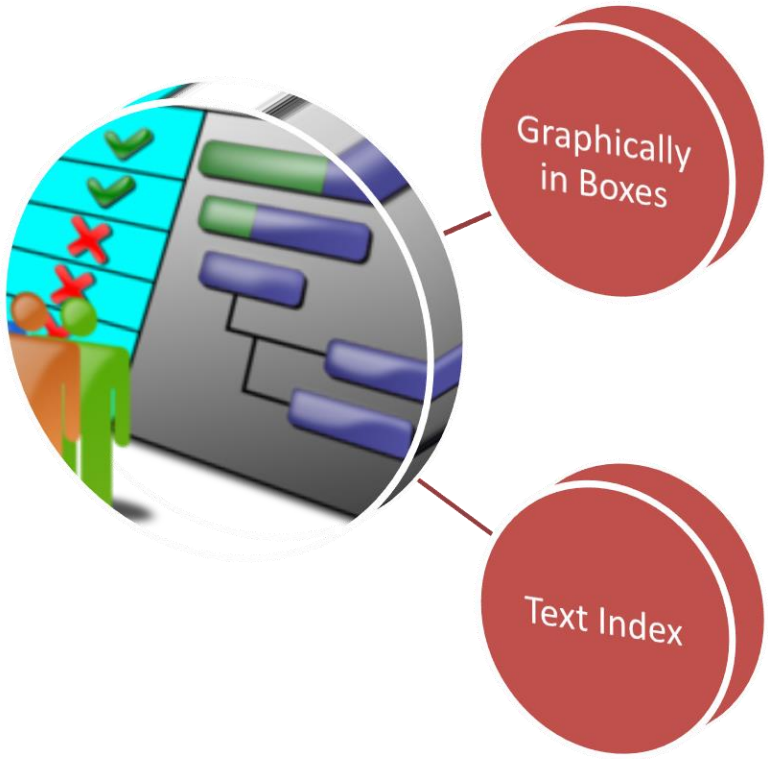
A simple WBS consist of :

- Project
- Work Packages
- Tasks
- Subtasks

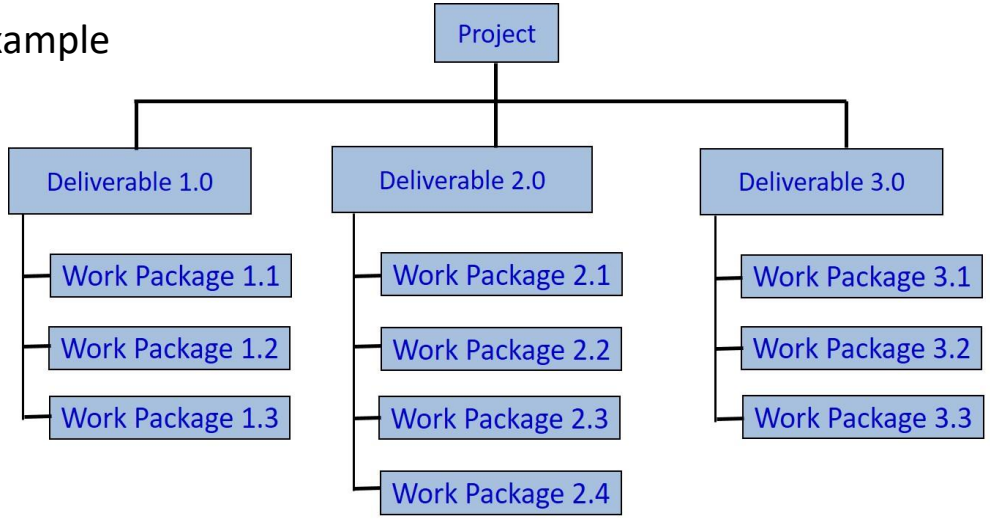
Main Purpose of WBS



Two (2) ways Presenting the WBS

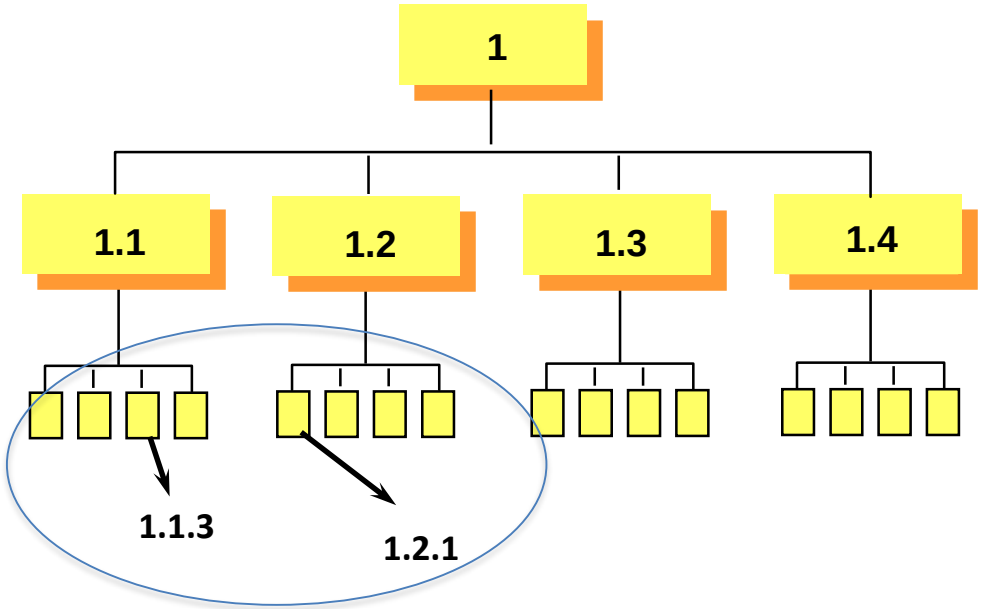


Example



1.0 House Project
- 1.1.0 Civil
  - 1.1.1 Foundations
  - 1.1.2 Walls and Roof
- 1.2.0 Plumbing
  - 1.2.1 Piping
  - 1.2.2 Sewerage
- 1.3.0 Electrical
  - 1.3.1 Wiring
  - 1.3.2 Appliances

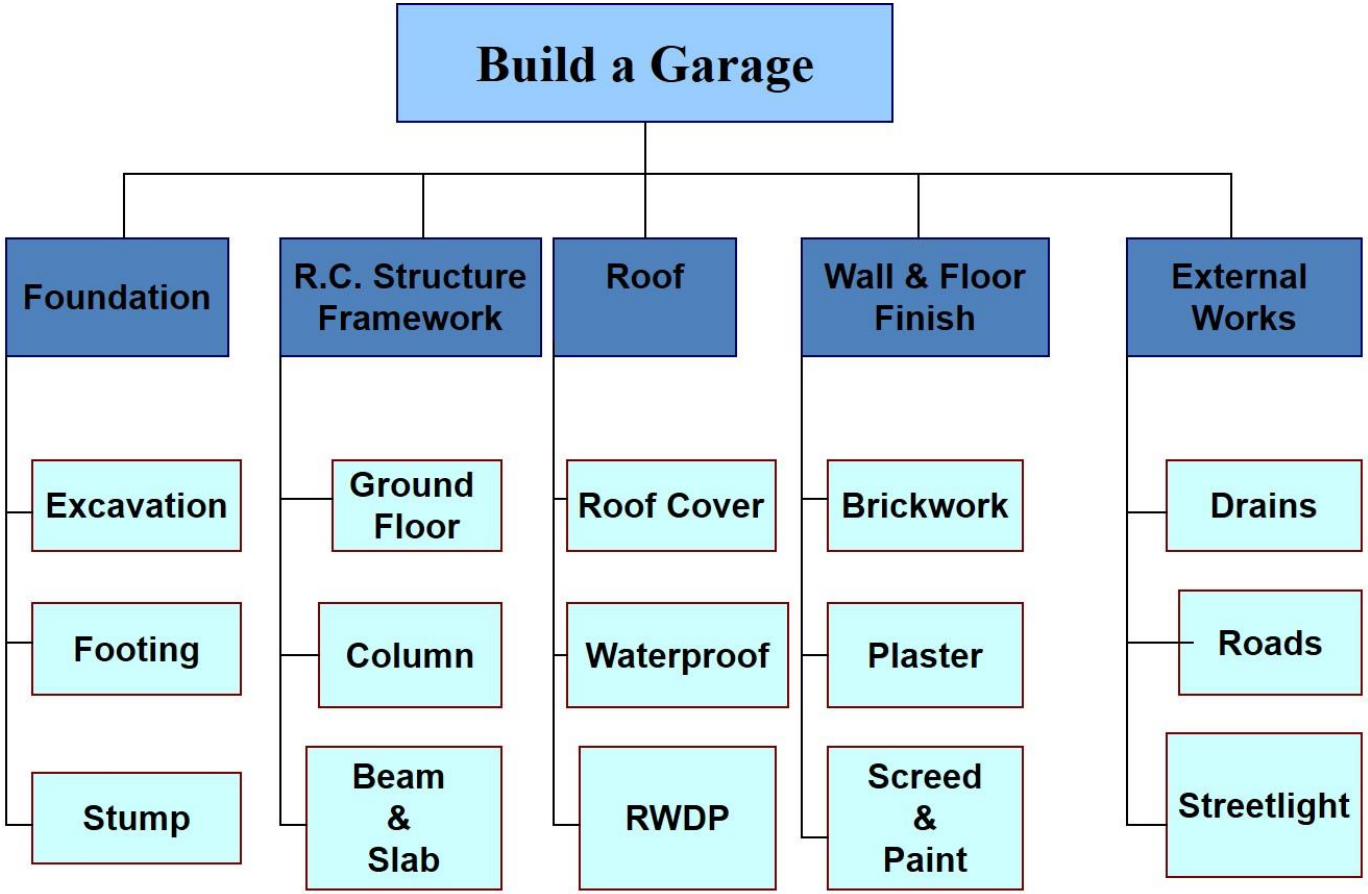
Level and Components of WBS



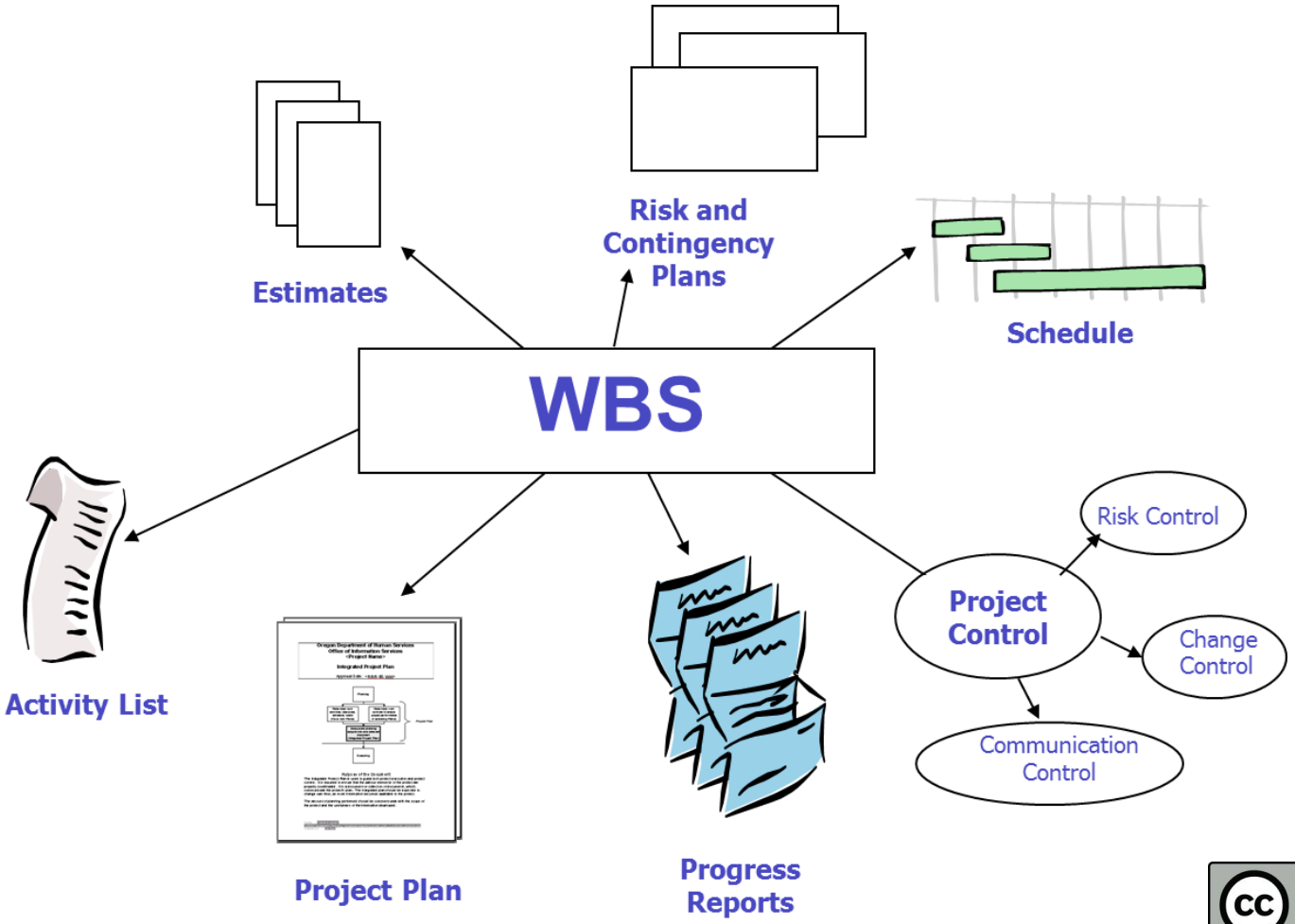
WBS has its ability to uniquely identified by a number or code of all the elements of work in a numerical and logical manner.

From the example, the number [1.1] represents the first work element on the level 2. Number [1.1.2] represents subdivision for the first work element.

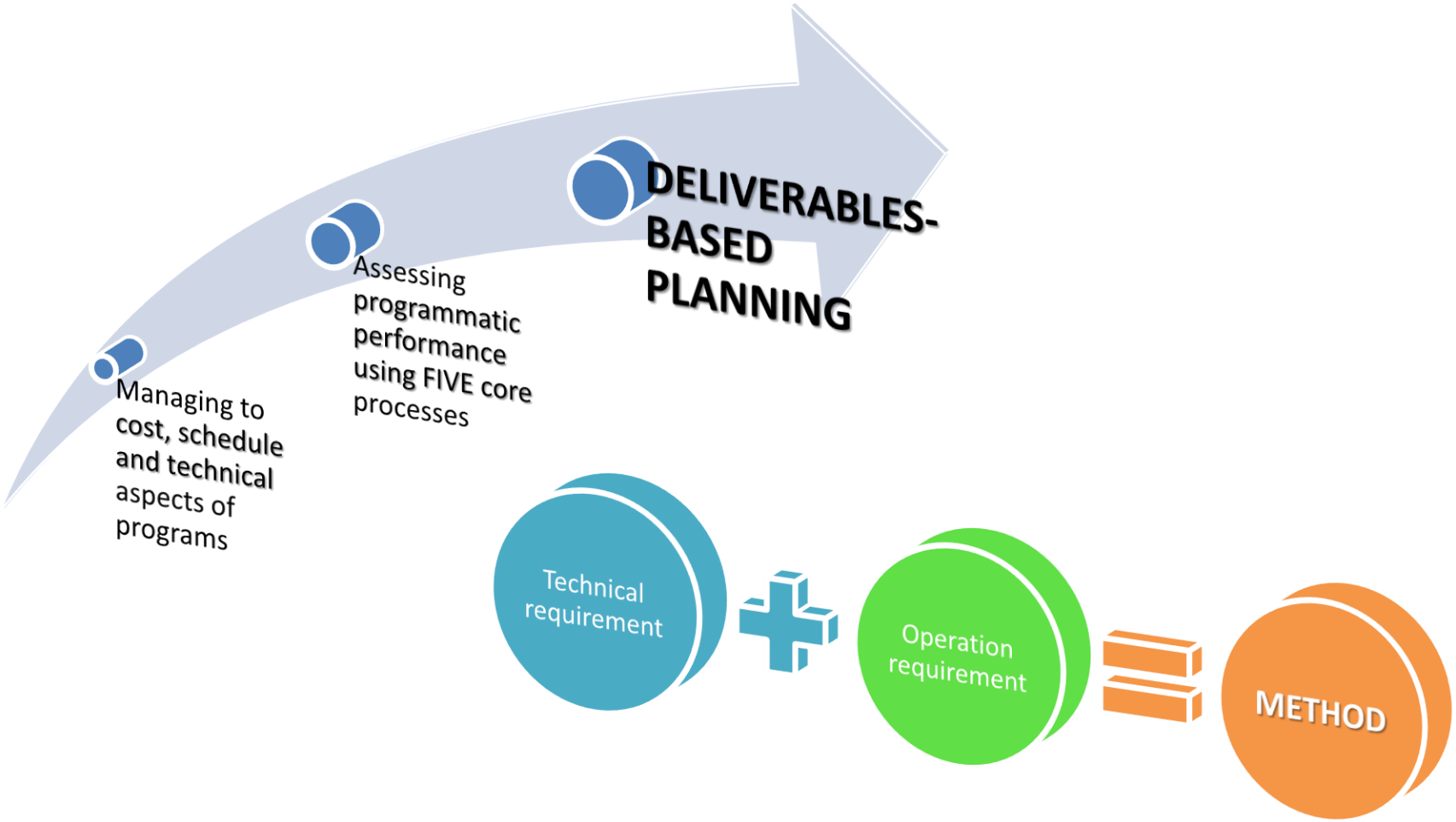
Sample of WBS



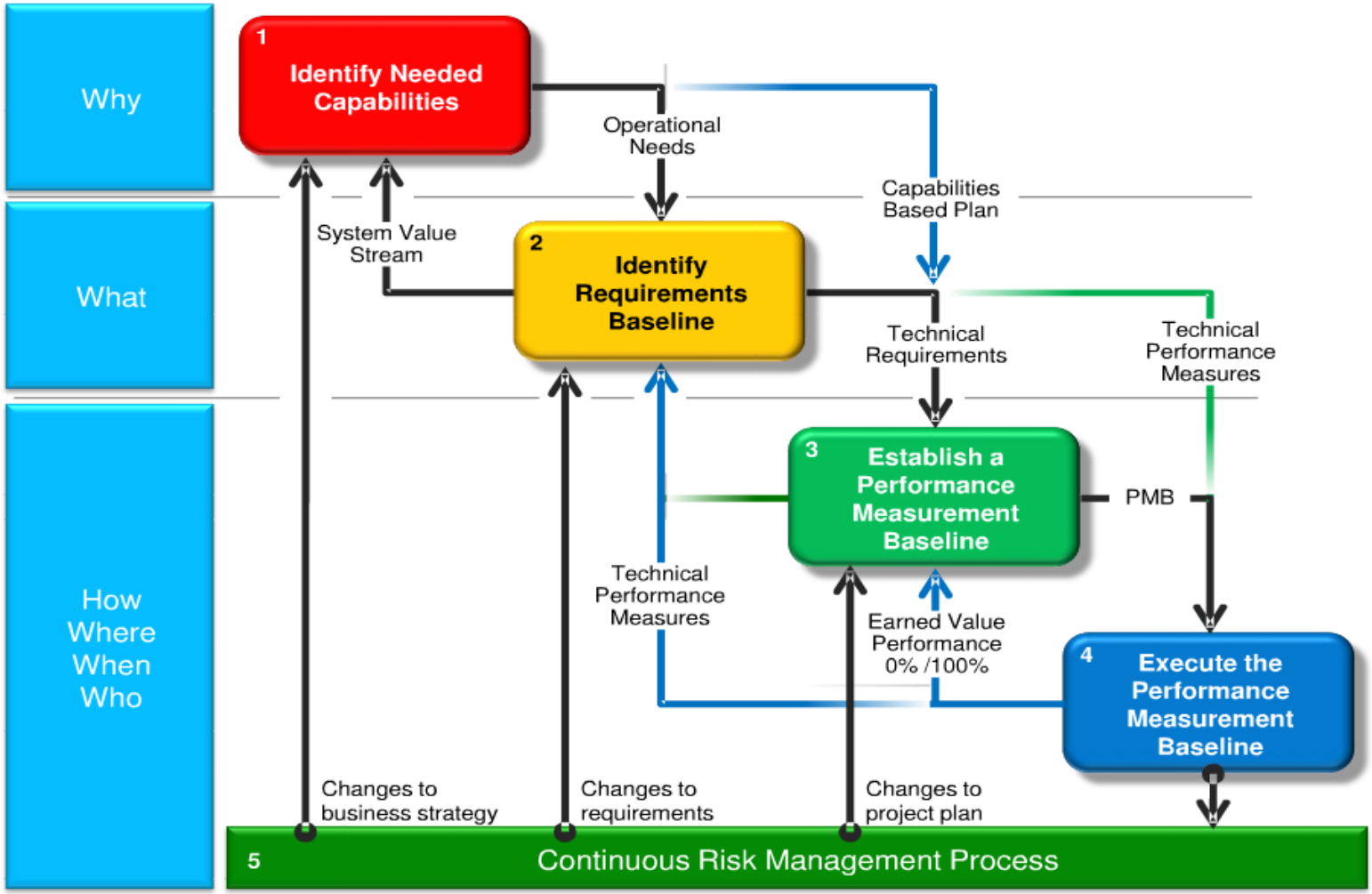
Benefits of WBS



Deliverables-based Planning



The 5 Practice Areas of Deliverables Based Planning®



Source: http://herdingcats.typepad.com/my_weblog/2009/03/deliverables-based-planningsm.html

By: Lewis & Fowler

The Core Processes of Deliverables Based Planning[sm]

1	**Identify Needed Capabilities**	Define the set of capabilities needed to achieve the program objectives or the particular end state for a specific scenario. Using the Concept of Operations, define the details of who, where, and how it is to be accomplished, employed and executed. ***What capabilities are needed to fulfill the ConOps and System Requirements?***
2	**Establish the Requirements Baseline**	Define the technical and operational requirements that must be in place for the system capabilities to be fulfilled. First, define these requirements in terms isolated from any implementation details. Only then bind the requirements with technology. ***What technical and operational requirements are needed to fulfill these capabilities?***
3	**Establish the Performance Measurement Baseline**	Build a time–phased network of schedule activities describing the work to be performed, the budgeted cost for this work, the organizational elements that produce the deliverables, and the performance measures showing this work is proceeding according to plan. ***What is the schedule that delivers products or services to meet the requirements?***
4	**Execute the Performance Measurement Baseline**	Execute work packages, while assuring all performance assessment are 0%/100% complete before proceeding. No rework, no forward transfer of activities to the future. Assure every requirement is traceable to work and all work is traceable to requirements. ***What are the periodic measures of physical percent complete?***
5	**Performance Continuous Risk Management**	Perform the 6 process areas of Continuous Risk Management for each Deliverables Based Planning[sm] process area to Identify, Analyze, Plan, Track, Control, and Communicate programmatic and technical risk ***What risks will be impediments to success and what are the mitigations ?***

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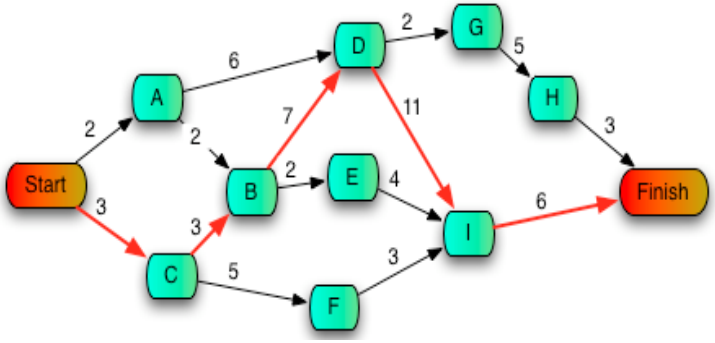
Source: http://herdingcats.typepad.com

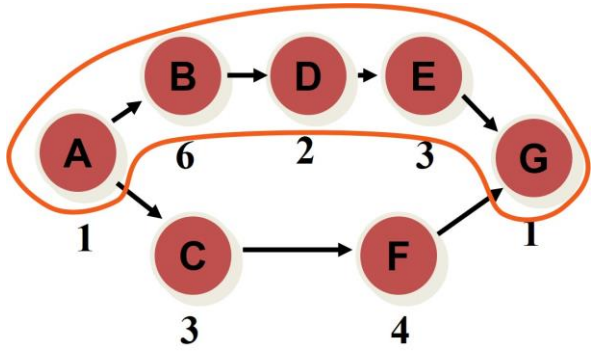
PERT Charts and the Critical Path

- The **Program** (or **Project**) **Evaluation and Review Technique**, (**PERT)**, is a network model that allows for randomness in activity completion times.
- PERT is a method to analyze the involved tasks in completing a given project, especially the time needed to complete each task, and to identify the minimum time needed to complete the total project.
- Primarily, the PERT chart identifies the critical path for the project.

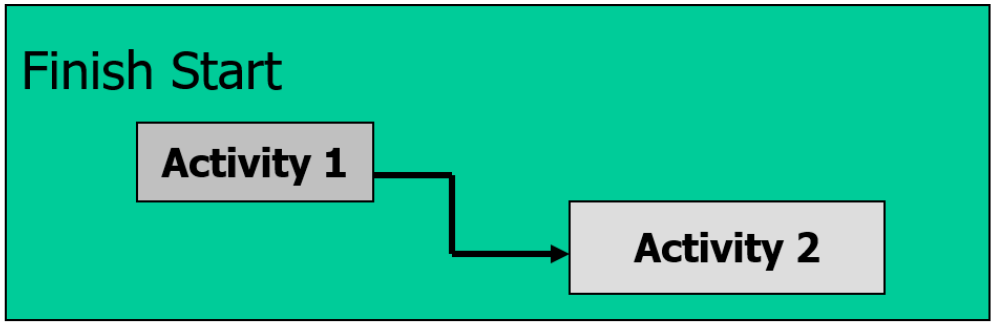


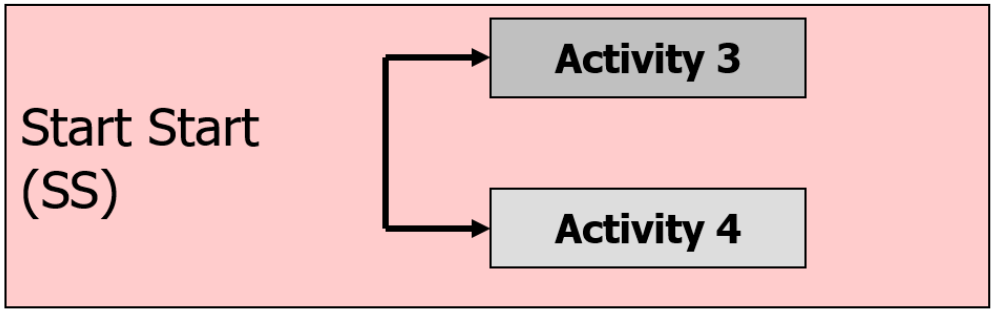
CRITICAL PATH

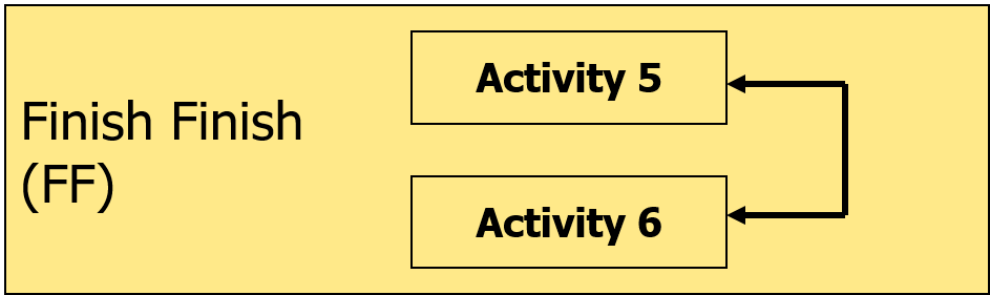
- A critical path is the series of tasks that will push out the project's end date if the tasks are delayed.
- The longest path through the network that establishes the minimum overall project duration
- A continuous chain of activities through the network with zero total float



Precedence Relationship

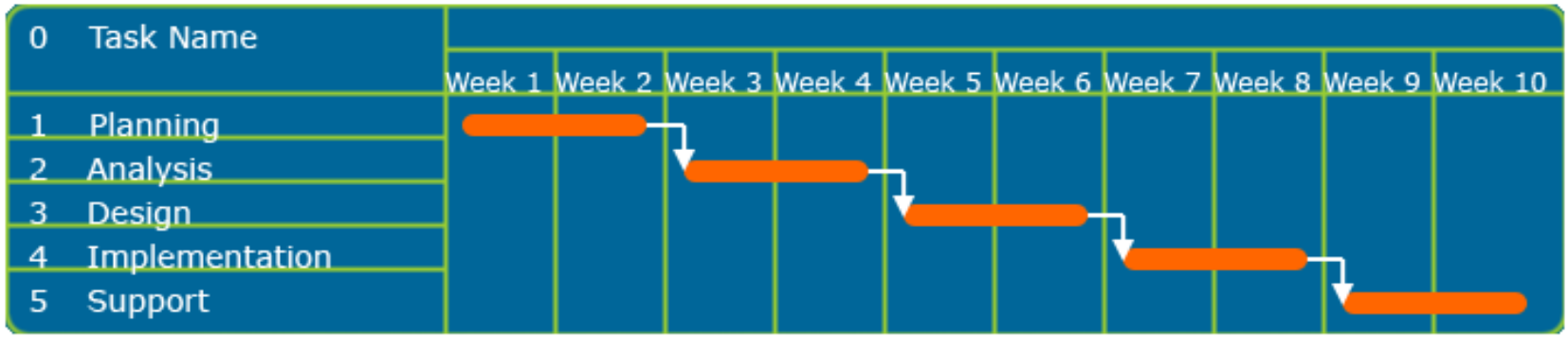


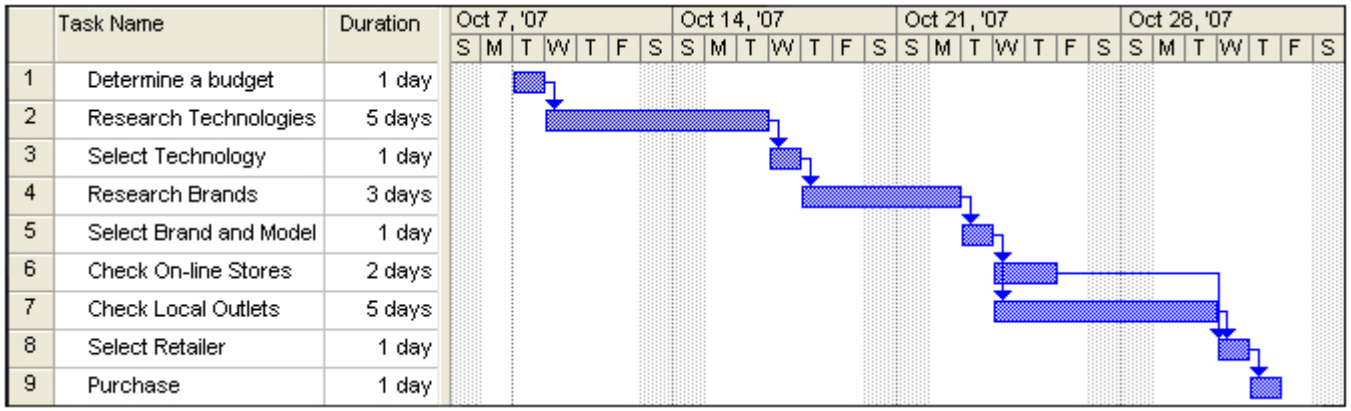




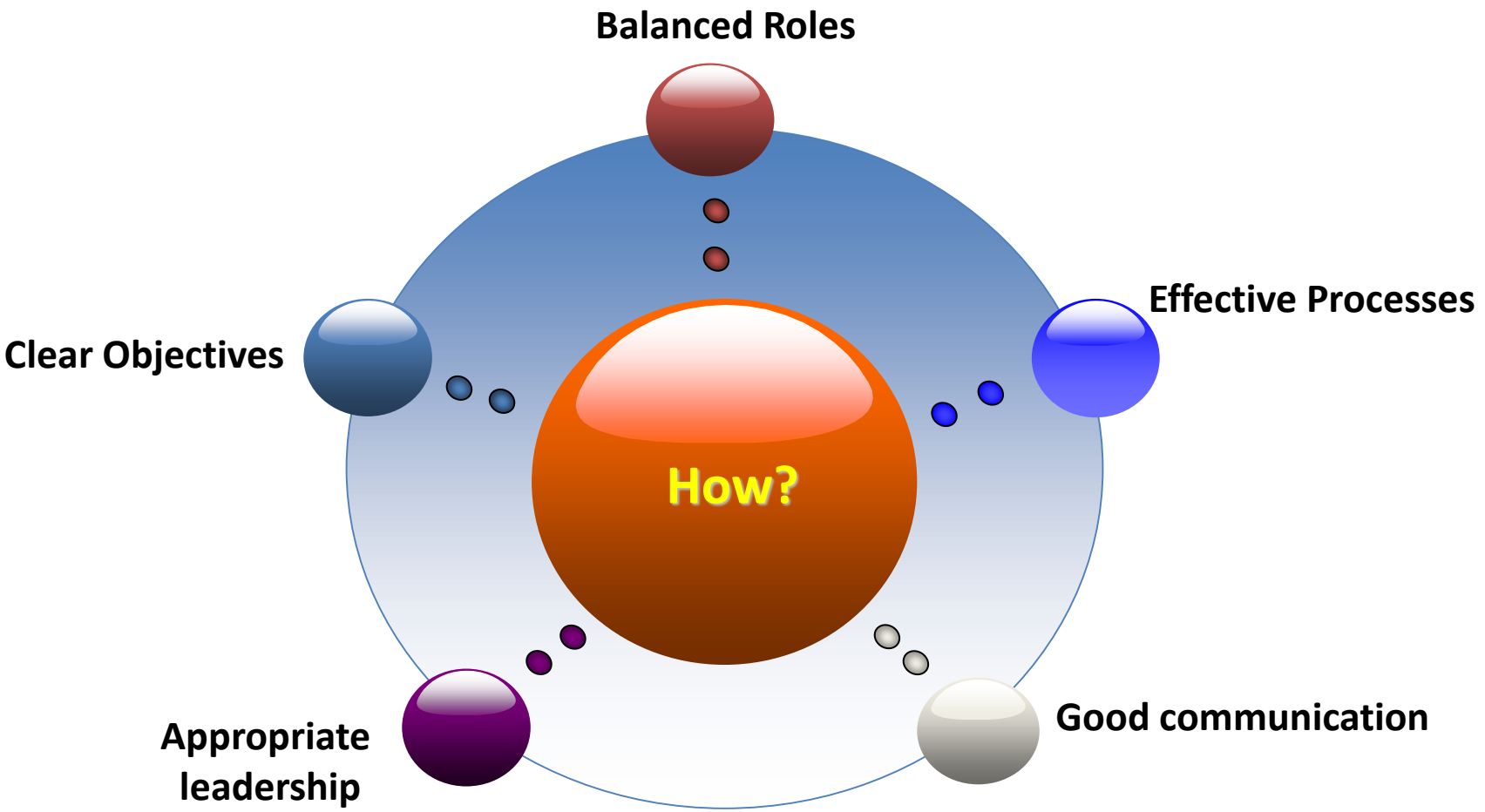
Gantt Chart

- A **Gantt chart** is a type of bar chart that illustrates a project schedule. Gantt charts illustrate the start and finish dates of the terminal elements and summary elements of a project.
- The **Gantt chart** allows the project team, as well as the stakeholders, to visualize the schedule and to determine the completion date.

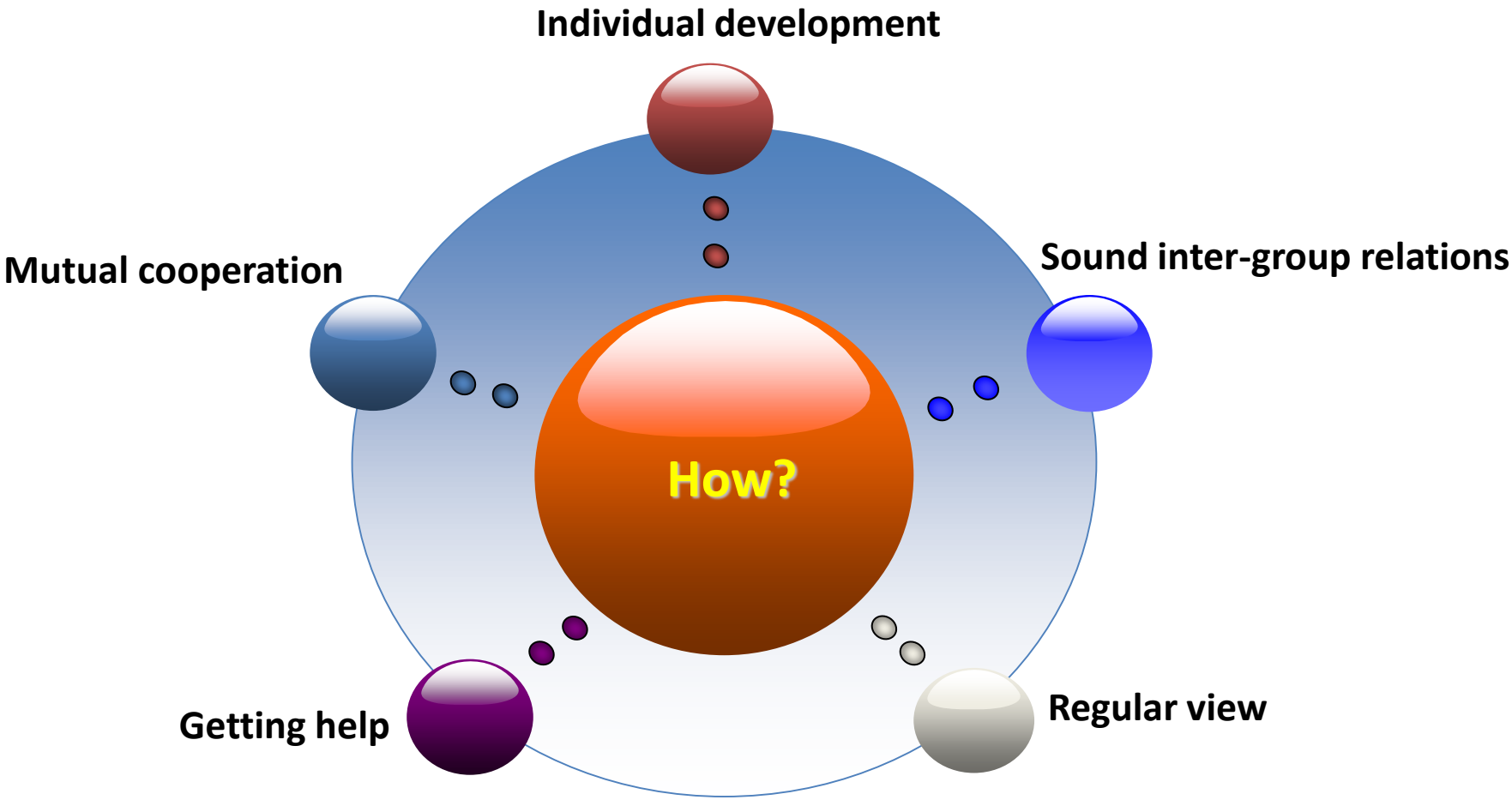




The Team Planning Method



The Team Planning Method (cont'd)



Resource Planning

- Proper management of workforce starts with a good planning on the amount of workforce needed to execute the task at hand.
- The project plan needs to account for various kinds of resources, including people, equipment , and facilities .
- Supervision of the work done is important to make sure all work is done according to the requirement and the quality needed.
- No one should be kept idle at anytime because it would mean a waste of money and time to the employer

Conclusion of the Chapter

- Conclusion #1
  - To establish a realistic project master schedule or programme on which to bade the appointments of consultants and contractors and commission the occupancy phase of the scheme.
  - Proper planning will reduce overlapping and wasteful activities.

- Conclusion #2
  - People are the reason why a project succeeds or fails.
  - The implementation of the project planning and control techniques is through people, therefore to effectively implement the system one must gain support and commitment from the project team and other stakeholders.

Credits to:
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MILLION THANKS