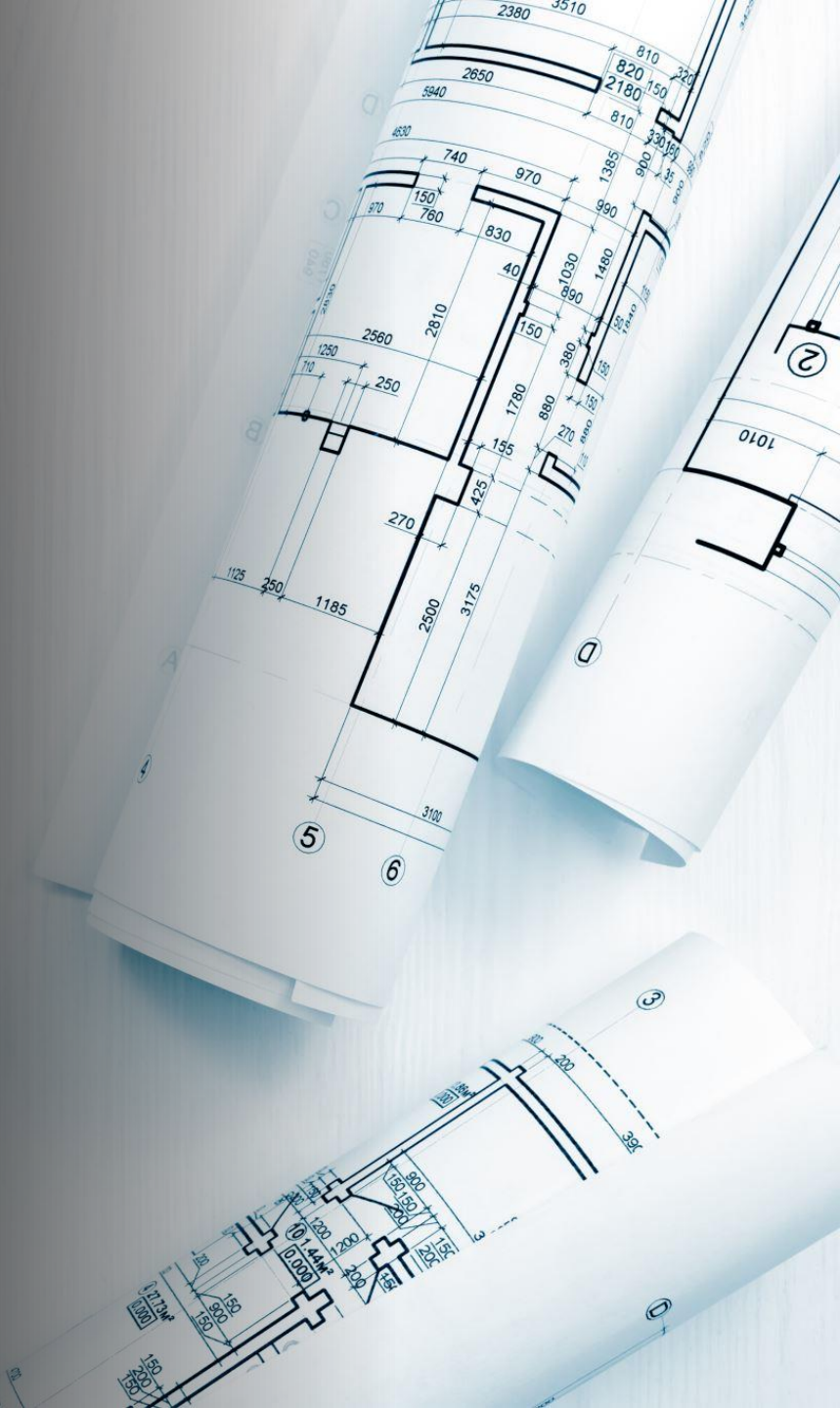
IS 2108 – IT Project Management

Lecture 02

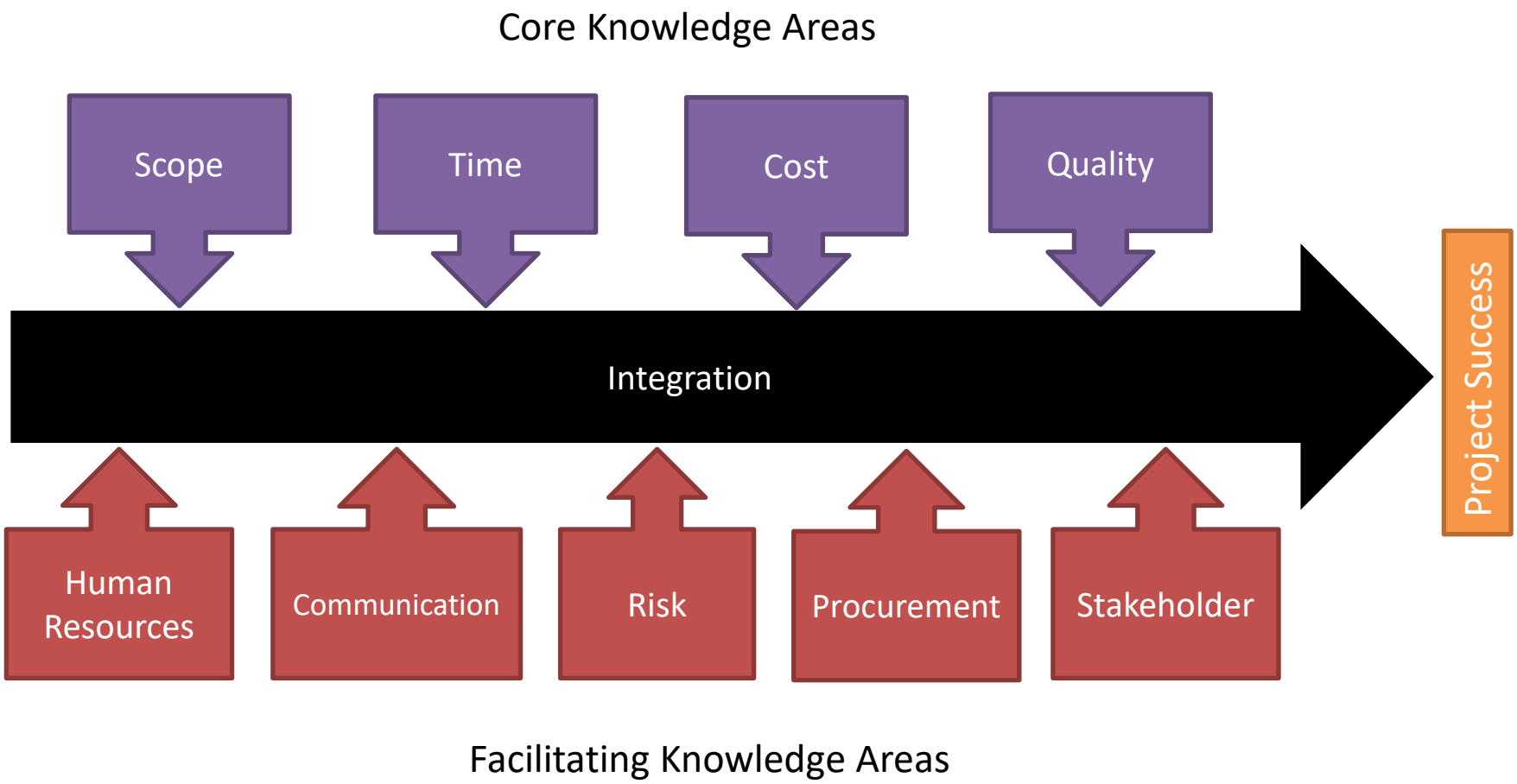
Project Planning



What is Management?

- Planning – what is to be done
- Organizing – making arrangements
- Directing – giving instructions
- Monitoring – checking on progress
- Controlling – taking actions to remedy hold-ups

The PMBOK® divided the project management knowledge in to 10 knowledge areas.

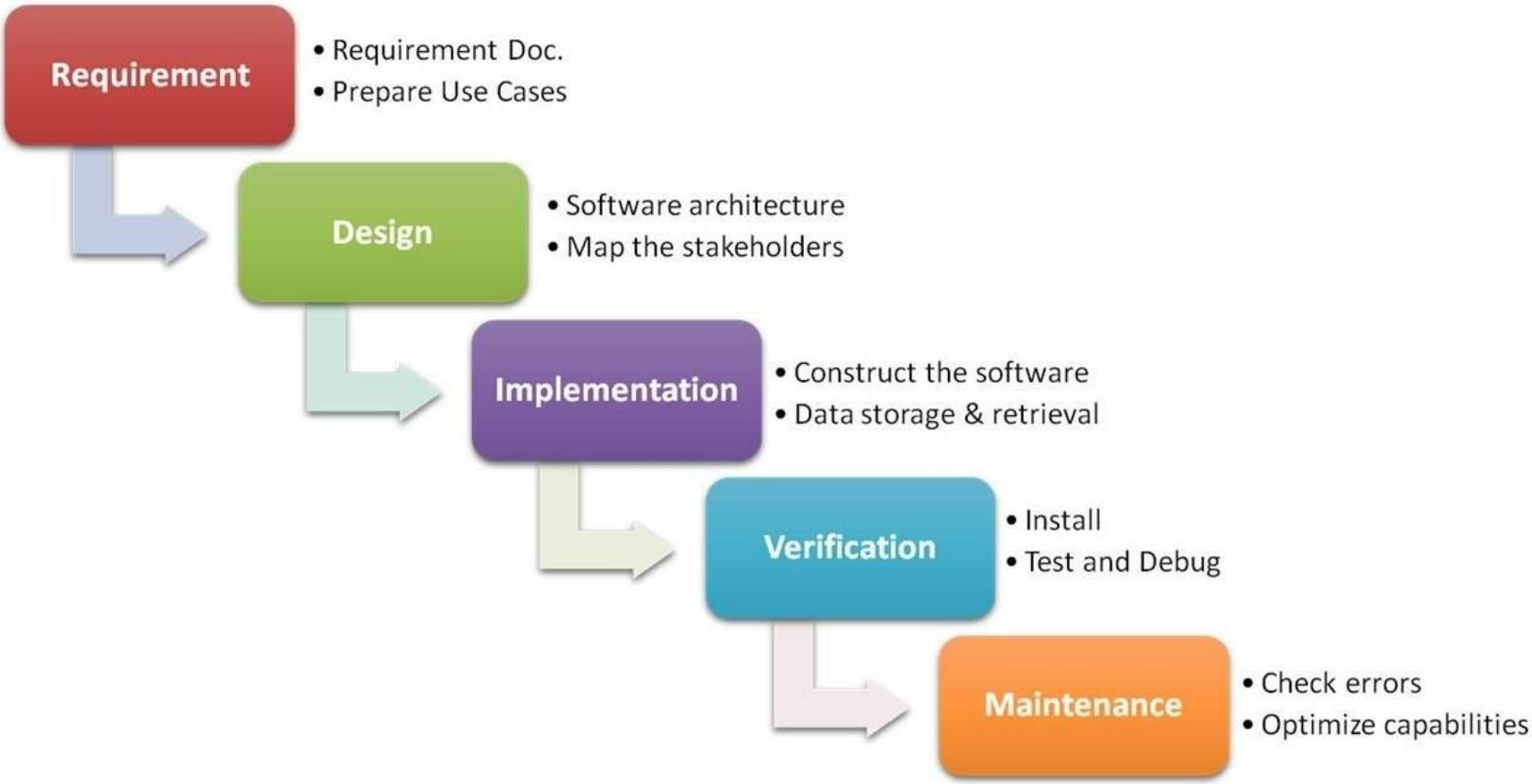


IT Project Lifecycle

- There are several different approaches to manage an IT project that affect the project lifecycle.
- Organizations can select one of these popular approaches to help reduce the risk of expensive rework, risks from quickly changing technology, or expansive planning at the launch of the project.
- The project life cycle of a typical IT project moves through iterations of planning, executing, and controlling until the project is ultimately closed and transferred into operations.

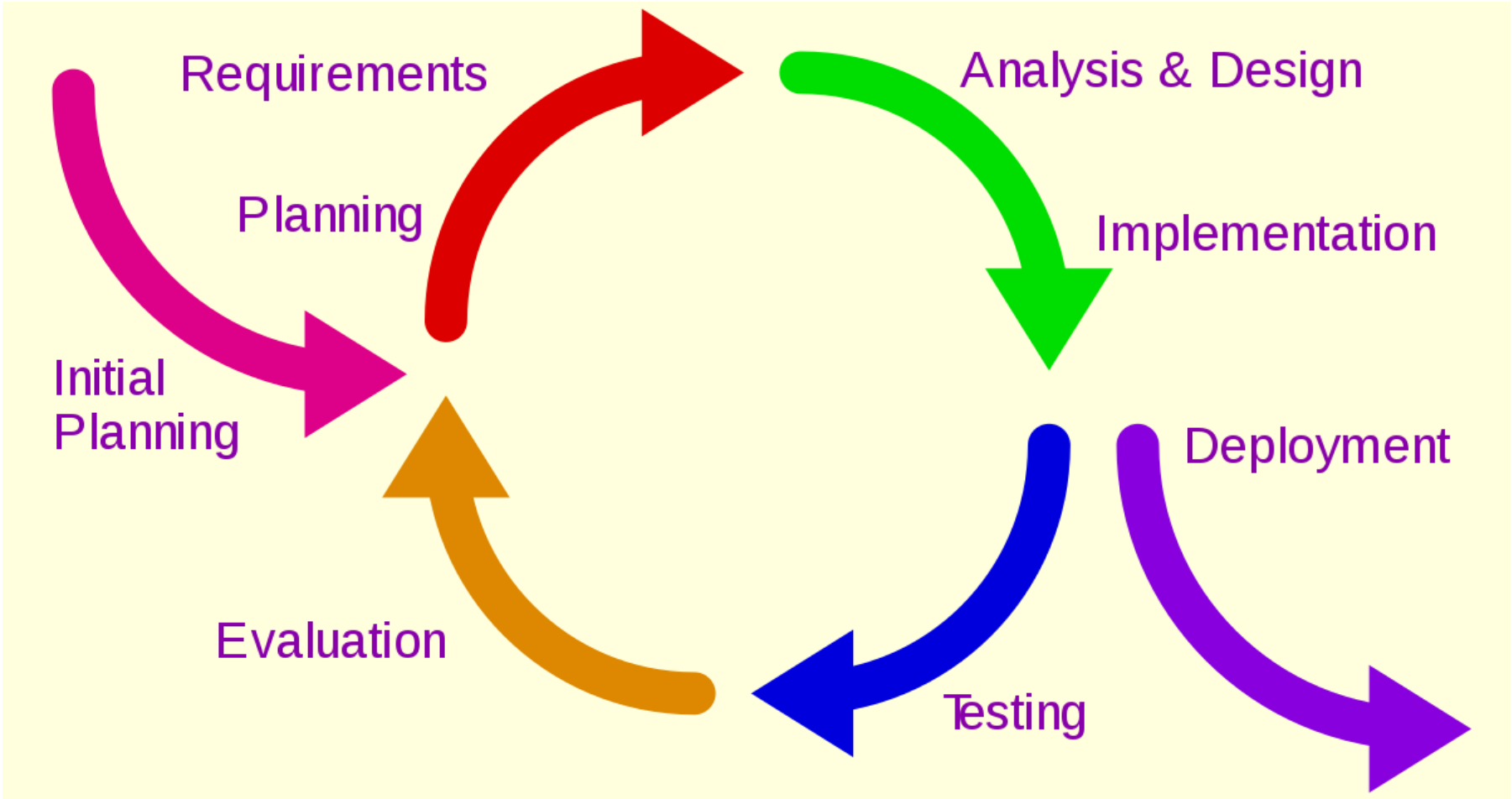
Waterfall Lifecycle

- The most common and traditional project lifecycle for IT projects.
- In this approach the project manager and the project team first define the project scope, project schedule, and expected project costs before the project execution begins.
- In order for the project to move from its initiation to its closure each phase must be started and completed in the specific order as planned.
- This type of approach is sometimes called a waterfall approach as the project “waterfalls” down the phases of the project.


Requirement
• Requirement Doc.
• Prepare Use Cases
Design
• Software architecture
• Map the stakeholders
Implementation
• Construct the software
• Data storage & retrieval
Verification
• Install
• Test and Debug
Maintenance
• Check errors
• Optimize capabilities

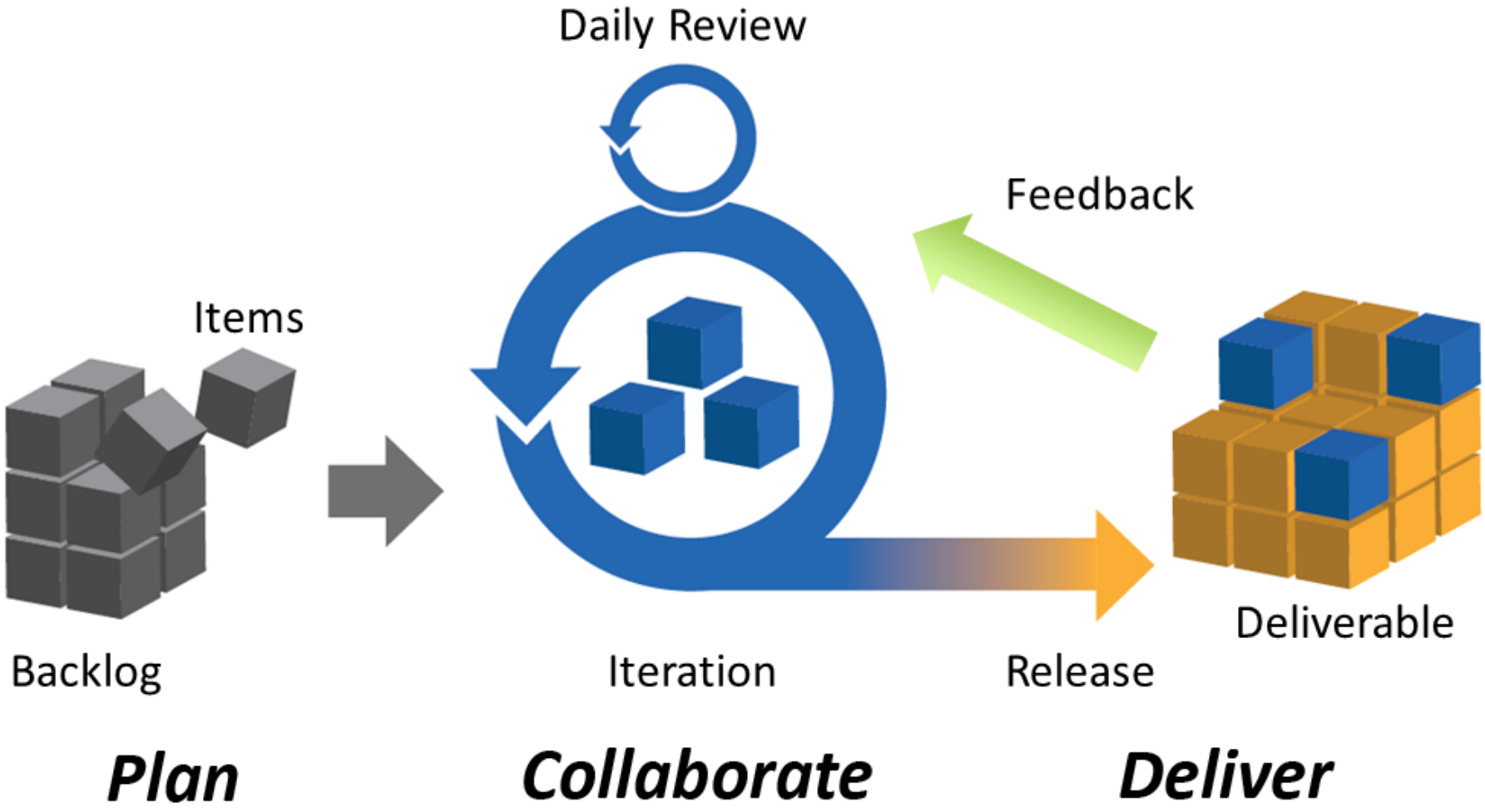
Iterative Lifecycle

- This approach to IT project management requires that the project management be defined early in the project, but the cost estimates and activity duration estimating are planned at a higher level early in the project.
- As the project execution occurs costs and duration estimates are created for the most imminent work through iterations of planning.
- The iterative life cycle also plans for iterations of benefits released to the organization. For example, an iterative life cycle may create a new software with more features with each new release as part of the project.


Requirements
Analysis & Design
Planning
Implementation
Initial
Planning
Deployment
Evaluation
Testing

Agile

- This project lifecycle also uses an iteration of planning and executing, but the planning that typically last for two weeks.
- This approach uses a rolling wave of planning and executing through short bursts of both planning and executing.
- Change is expected in this approach to the IT project and it's ideal for software development project. Agile project management is an example of the adaptive lifecycle.


Daily Review
Feedback
Items
Backlog
Iteration
Release
Deliverable
Plan
Collaborate
Deliver

Problems with IT Projects

- Manager's point of view
  - Poor estimates and plans
  - Lack of quality standards and measures
  - Lack of guidance about making organizational decisions (internal stakeholders)
  - Lack of techniques to make progress visible
  - Poor role definition – who does what

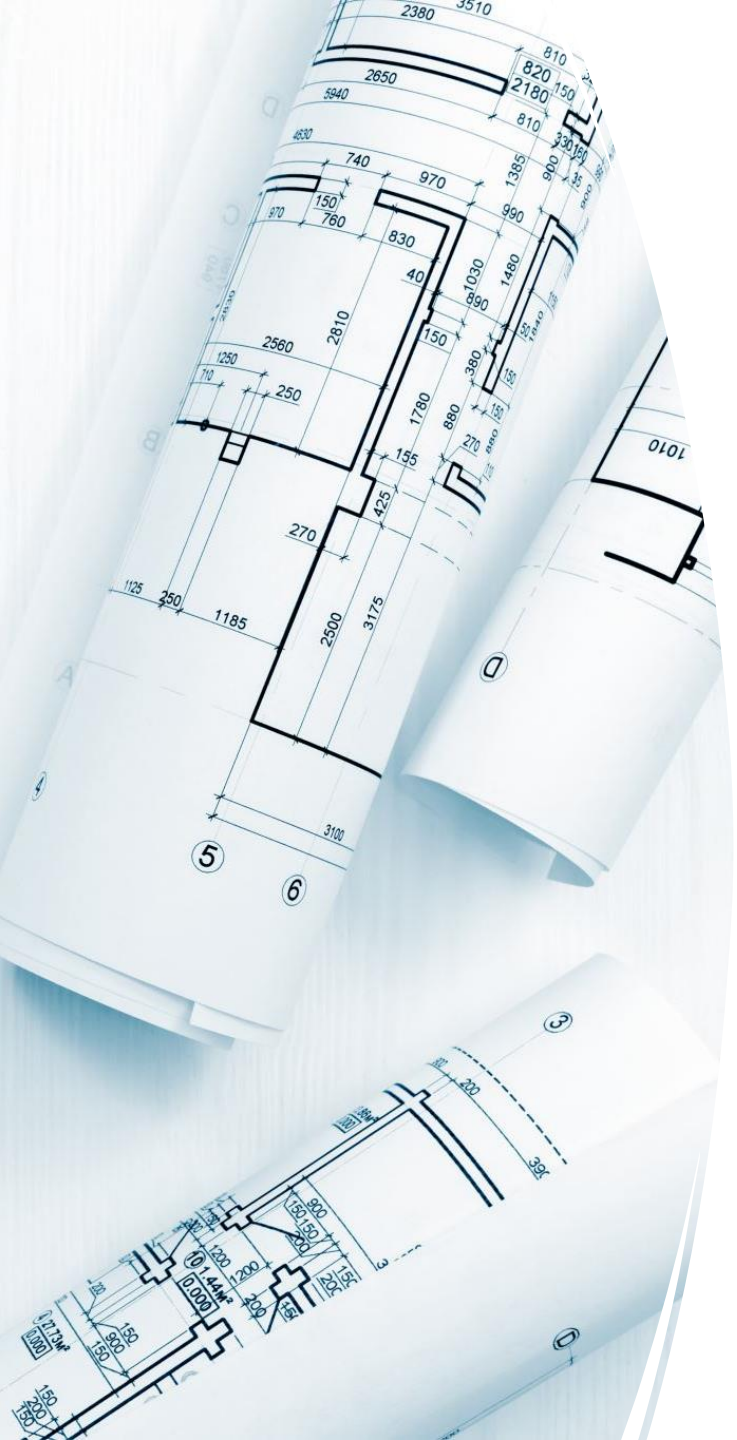
Problems with IT Projects contd…

- Project staff's point of view
  - Inadequate specification of work
  - Management ignorance of IT
  - Lack of knowledge of application area
  - Lack of standards
  - Lack of up-to-date documentation
  - Preceding activities not completed on time
  - Lack of communication between users
  - Lack of communication leading to duplication of work

Problems with IT Projects contd…

Project staff's point of view

- Lack of commitment
- Narrow scope of technical experience
- Changing requirements
- Changing software environment
- Deadline pressure
- Lack of quality control
- Remote management
- Lack of training



Project Management Process

- Initiating
- Planning
- Executing
- Monitoring and Controlling
- Closing

Project Management Process

- Initiation
  - the project goal needs, or problem is identified. The project manager is assigned to the project and the project charter is created.
- Planning
  - the project manager and the project team work together to plan all of the needed steps to reach a successful project conclusion. The project planning processes are iterative in nature and it's expected that planning will happen often throughout the project.

Project Management Process

- Execution
  - once the project plan has been created, the project team goes about executing the project plan to create the deliverables of the project. The project can shift to project planning as needed throughout project execution.

- Monitoring and controlling
  - As the project is being executed by the project team, the project manager monitors and controls the work for time, cost, scope, quality, and risk of the project. Monitoring and controlling is also an ongoing process to ensure that the project addresses its targets for each project objective.

Project Management Process

- Closing
  - At the end of each phase and at the end of the entire project, project closure happens to ensure that all of the work has been completed, is approved, and ultimately transferred ownership from the project team to operations/users.

Project Initiation

- High level scope is determined, deliverables are set and budgets are estimated

- Define a new project or a new phase of an existing project by obtaining authorization to start the project or phase

Project Initiation - Majoractivities:

- Develop a Business Case
- Undertake a feasibility study
- Create a Project Initiation Document (PID) –Top-level project planning document /or a Project Charter
- Project announcement-press release
- Appoint the project team & establish a project office
- Prepare a communication plan
- Conduct the phase review

Objectives of the Initiation phase

- Align the stakeholders' **expectations** with the project's **purpose**
- Provide **visibility** about the **scope** and **objectives**, ensuring that project will achieve the expectations
- Set the **vision** of the project—what is needed to be accomplished.
- Create a **shared understanding** of success criteria
- Improve deliverable acceptance, customer satisfaction, and other stakeholder satisfaction.

Business Case Document

1. Introduction and background to the proposal
2. The proposed project
3. The market
4. Organizational and operational infrastructure
5. The benefits
6. Outline implementation plan
7. Costs
8. The financial case
9. Risks
10. Management plan

Business Case Document - Why?

- Justifies the start-up of a project
- Includes a description of the business problem or opportunity
- Provides the costs and benefits of each alternative solution and the recommended solution for approval.
- Justifies expenditure on the project
- Requires Sponsor's approval
- Is referred to frequently during the project, to determine whether it is currently on track
- At the end of the project, success is measured against the ability to meet the objectives defined in the Business Case
- Completion of a Business Case is critical to the success of the project.

Feasibility Study

- An exercise that involves documenting each of the potential solutions to a particular business problem or an opportunity.

- **Purpose**: identify the likelihood of one or more solutions meeting the stated business requirements – to decide whether the solution will deliver the expected outcome

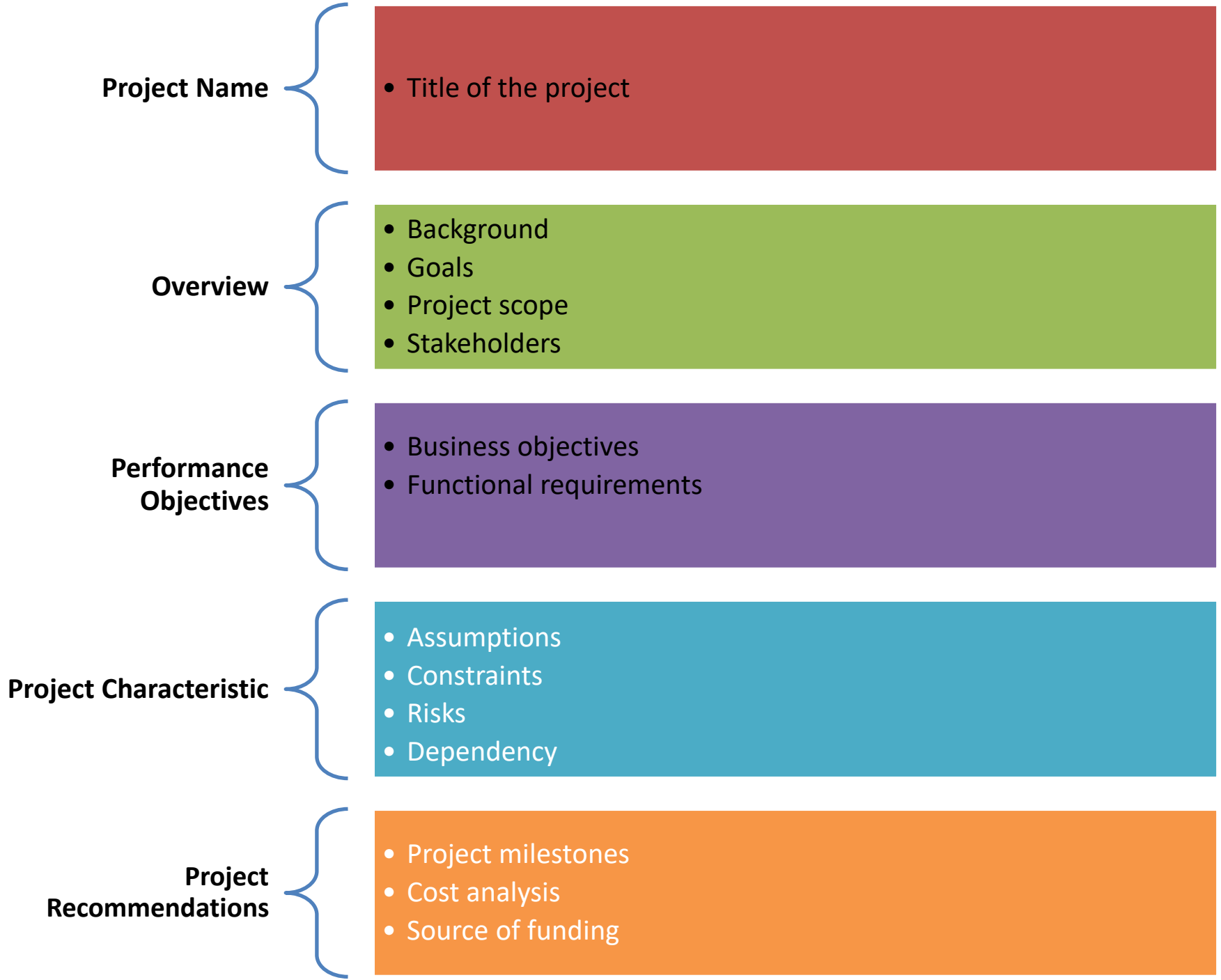
- **Outcome**: a confirmed solution for implementation.

Project Charter

- Defines the purpose (goal and objectives) of the project - document high-level requirements
- Decides the project duration
- Identifies the project scope and deliverables
- Identifies financial and other resource requirements
- Identifies the stakeholders and defines their roles and responsibilities
- Presents by the senior management to the sponsor

Project Charter includes

- Project vision and objectives
- Scope of the project
- Project deliverables
- The list of project stakeholders and their roles and responsibilities
- Organizational structure for the project
- Project plan
- Any risks, issues and assumptions


Project Name
Title of the project
Overview
Background
Goals
Project scope
Stakeholders
Performance Objectives
Business objectives
Functional requirements
Project Characteristic
Assumptions
Constraints
Risks
Dependency
Project Recommendations
Project milestones
Cost analysis
Source of funding

Project Announcement

- Publicly announce the start of the project
  - Do a press release or a press conference
- Publish sponsor ownership
- Formally delegate authority to the project manager
- Commit resources to initiate the project

Project Evaluation

A high level assessment of the project to see whether it is worthwhile to proceed with the project.

1. **Strategic assessment**
   a. To see whether the project will fit in the strategic planning of the whole organization
2. **Technical assessment**
   a. To determine whether it is desirable to carry out the development and operation of the software system
3. **Economic assessment**
   a. To decide which of the several alternative projects has a better success rate, and a higher turnover

Strategic Assessment

- Used to assess whether a project fits in the long-term goal of the organization
- Evaluates individual projects against the strategic plan or the overall business objectives
- Carried out by senior management

Technical Assessment

- Identifies functions that the software is expected to perform
- Evaluates whether the required functionality can be achieved with current or affordable technologies
- Considers the organizational policy on providing technical infrastructure
- Prepares the strategic information system plan (SISP) of the organization
- Identifies any constraints imposed by the IS plan

Economic Assessment

- Considers whether the project is the best among other options
- Prioritizes projects –can allocate resources more effectively
- Methods
  - Cost-benefit analysis -NPV and IRR
  - Cash flow forecasting

Cost-benefit analysis

- Net benefit = Benefits –Costs
- Costs
  - Development cost –staff payments, infrastructure
  - Set up cost-new infrastructure, staff recruitment and training
  - Operational cost –to operate the system after installation
  - Maintenance cost –for updates or enhancements
- Benefits
  - Quantified and valued –sales income
  - Quantified and but not valued–decrease in # of complains
  - Identified but not easily quantified –public approval of the organization

Cash Flow Forecasting

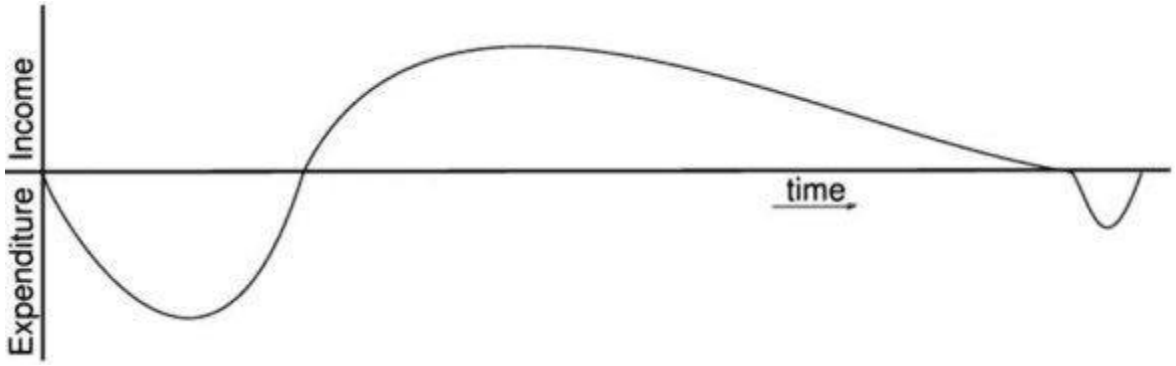
What?

- Estimation of net profit (cash flow) over time

Why?

- Estimated net-benefits over the estimated costs is not sufficient
- Need detailed estimation of benefits and costs versus time

Typical product life cycle cash flow



- Not easy to estimate future cash flows accurately
- Need to revise the forecast from time to time

Cost-benefit Evaluation Techniques

Net present value

$$NPV = \sum_{i=1}^{n} \frac{R_i}{(1+r)^i} - \text{Initital Investment}$$

Where:

R_i is the estimated net cash flow for i^{th} period,

r is the required rate of return per period, and

n is the life of the project in months, years etc.

Internal Rate of Return

Net present value

- Takes into account the profitability of a project and the timing of the cash flows

$$\text{Present Value} = \frac{\text{Value in year } t}{(1+r)^t}$$

r –discount rate expressed as a decimal value

t –*number of years into the future that cash flow occurs*

Net present value

- Discount rate is the annual rate by which we discount future earning
  - e.g. if discount rate is 10% and the return of an investment in a year is Rs.110, the present value of the investment is Rs.100. (110/1.1)

- Exercise:
  - If discount rate is 20% and the expected return of an investment in a year is Rs.24,000 what would be the present value.

Discount factor

$$\frac{1}{(1+r)^t}$$

r = **discount rate** and t= **number of years**

NPV of a cash flow(Discounted cash flow)

= Cash Flow x Discount Factor

NPV of project = Σ discounted Cash Flows

Example

Calculate the NPV for each of the project A and B using the discount rates of 10%.

Year	Project A	Project B
0	-100,000	-100,000
1	10,000	30,000
2	20,000	60,000
3	20,000	30,000
4	100,000	60,000

Year	Project A	Project B
0	-100000	-100000
1	10000/(1+0.1)^1 = 9091	30000/(1+0.1)^1 = 27273
2	20000/(1+0.1)^2 = 16529	60000/(1+0.1)^2 = 49587
3	20000/(1+0.1)^3 = 15026	30000/(1+0.1)^3 = 22539
4	100000/(1+0.1)^4 = 68301	60000/(1+0.1)^4 = 40981
Total cash flow from year 1 to 4	9091+16529+15026+68301 = **108947**	27273+49587+22539+40981 = **140380**
NPV	108947 – 100000 = 8947	140380 – 100000 = 40380

Exercise

Calculate the NPV foreach of the project A, B and C using each of the discount rates 12%, 10% and 8%.

	Year 0	Year 1	Year 2	Year 3	Year 4	12%,
Project A	($1000)	$400	$400	$400	$400	215
Project B	($1000)	$600	$500	$300	$200	320
Project C	($1000)	$200	$300	$500	$600	280

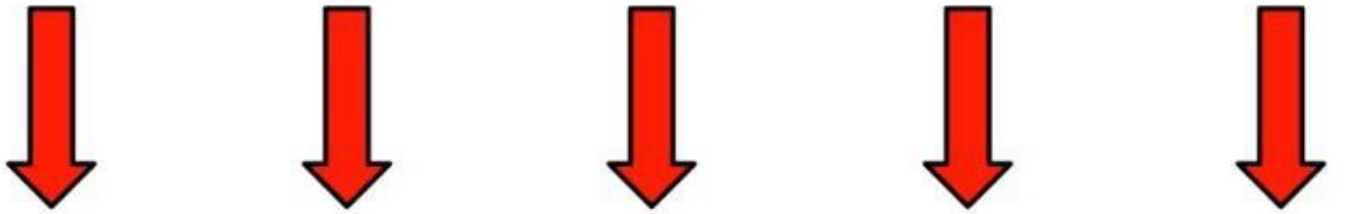
Issues with NPV

- Choosing an appropriate discount rate is difficult
- Ensuring that the rankings ofprojects are not sensitive to small changes in discount rate
- NPV might not be directly comparable with earnings from other investments or the costs of borrowing capital

Internal Rate of Return

- A discount rate results in an NPV of zero
- The initial cash investment for the beginning period will be equal to the present value of the future cash flows of that investment
- Estimates the profitability of potential investments
- Can be directly comparable with interest rates
- Use IRR or XIRR functions in Excel
- Disadvantage
  - Does not indicate the absolute size of return
  - In some cases it is possible to find more than one rate of return that will produce a zero NPV

	Year 0	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Project A	($1000)	$400	$400	$400	$400



$$NPV = 0 = (\$1000) + \frac{\$400}{(1+IRR)} + \frac{\$400}{(1+IRR)^2} + \frac{\$400}{(1+IRR)^3} + \frac{\$400}{(1+IRR)^4}$$

IRR Formula

$$0 = CF_0 + \frac{CF_1}{(1+IRR)} + \frac{CF_2}{(1+IRR)^2} + \frac{CF_3}{(1+IRR)^3} + \ldots + \frac{CF_n}{(1+IRR)^n}$$

Or

$$0 = NPV = \sum_{n=0}^{N} \frac{CF_n}{(1+IRR)^n}$$

Other Cost-benefit Evaluation Techniques

- ROI= (profit/investment)100
- Net profit =Total income –Total costs
- benefit-cost ratio (BCR) = (benefit/cost)100
- Payback period =Time taken to break even
- Decision trees

Exercise

The initial investment for project A is $2500. The discount ratefor this project is 15%. This project will yield $1000, $750 and $1000 in the coming three years.

Calculate the **Net Profit, ROI, NPV, BCR** at the end of three years.

Exercise

Calculate the Net Profit, Payback time and ROI

Year	Project A	Project B	Project C
0	-100,000	-100,000	-120,000
1	10,000	30,000	30,000
2	10,000	30,000	30,000
3	20,000	30,000	30,000
4	20,000	20,000	25,000
5	100,000	350,000	50,000
Net Profit			
Payback			
ROI			

Risk evaluation

- Identify risks and quantify their effects
- Can prepare a risk matrix
- Prepare a checklist of possible risks
- Classify risks according to their importance(high[H], medium[M], low[L])
- Classify risks according to their likelihood(high[H], medium[M], low[L], exceedingly unlikely[—])

Risk and NPV

- A risk is an uncertainty attached to the future cash flows.
- NPV → present value of a rupee one year later is definitely less than one rupee.
- NPV with risk → A safe rupee is worthier than a risky one.
- There is risk associated with future cash flows.
- High risk → use a high discount rate to calculate NPV