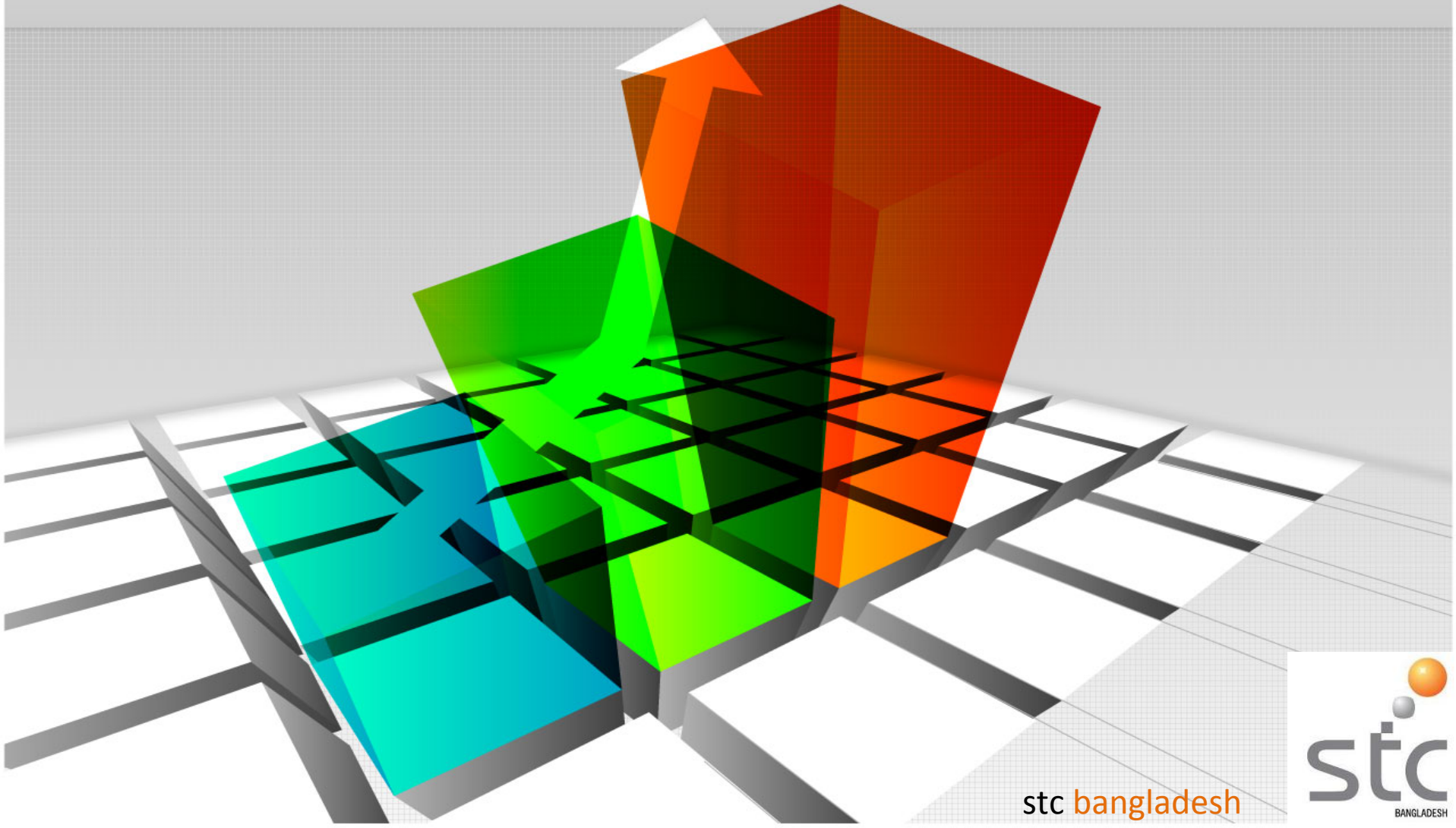
PMP® Exam Preparation Course with Tips & Tricks

Based on PMBOK ® Guide- 6th Edition



stc bangladesh

CHAPTER 1: INTRODUCTION

Copyright © Strategic Transformation Consultants Ltd.

PMBOK Guide

Project **M**anagement **B**ody **o**f **K**nowledge is a recognized standard for Project management Profession.

- A standard describes established norms, methods, processes and practices.

Standard

- Methodology indicates "our way of doing things" – clear, step by step, no questions asked.

Methodology

Copyright © St[illegible]ormation Consultants Ltd.

Project

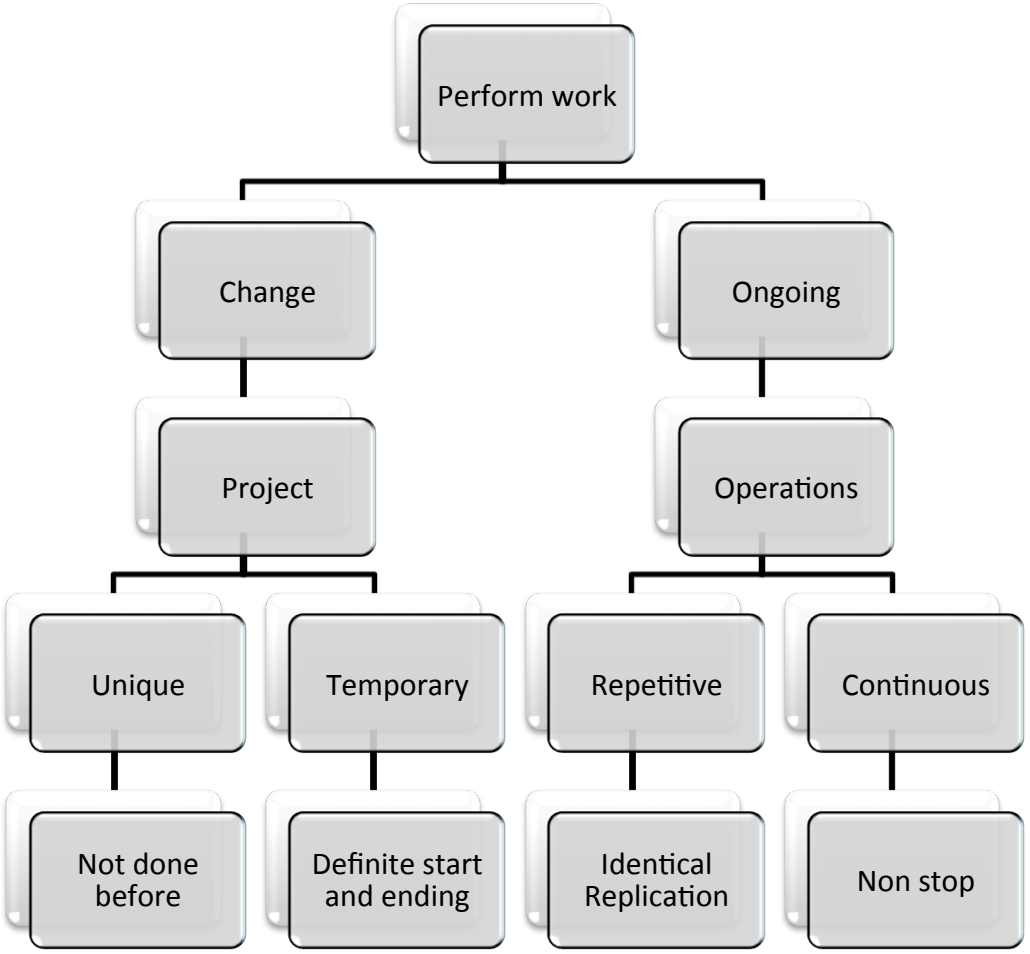
Project is a temporary endeavor undertaken to create unique product, service or result

Temporary	Unique	Product Service or Result

Definite beginning and end	Does not mean short in duration	Does not apply to the outcome of the project	Fundamental uniqueness of the project	Component, capability, outcome

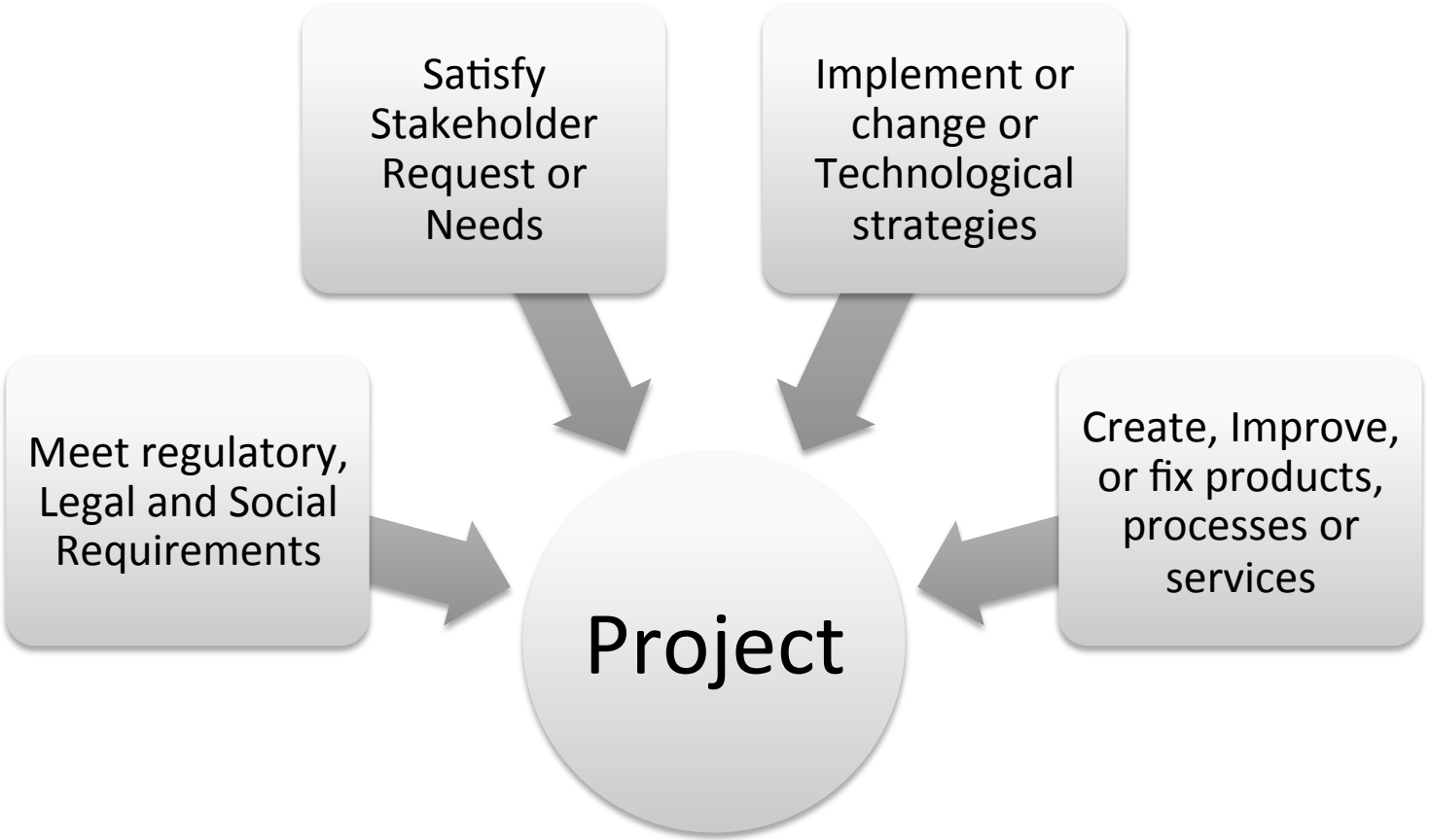
Copyright © Strategic Transformation Consultants Ltd.

Project Vs. Operations



Copyright © Strategic Transformation Consultants Ltd.

PROJECT INITIATION CONTEXT



Copyright © Strategic Transformation Consultants Ltd.

Project Management

Project management is the application of knowledge, skills, tools and techniques to project activities to meet project requirement.

5 Process Group

49 Project Management Processes

Copyright © Strategic Transformation Consultants Ltd.

Effective project management helps individuals, groups, and public and private organizations to:

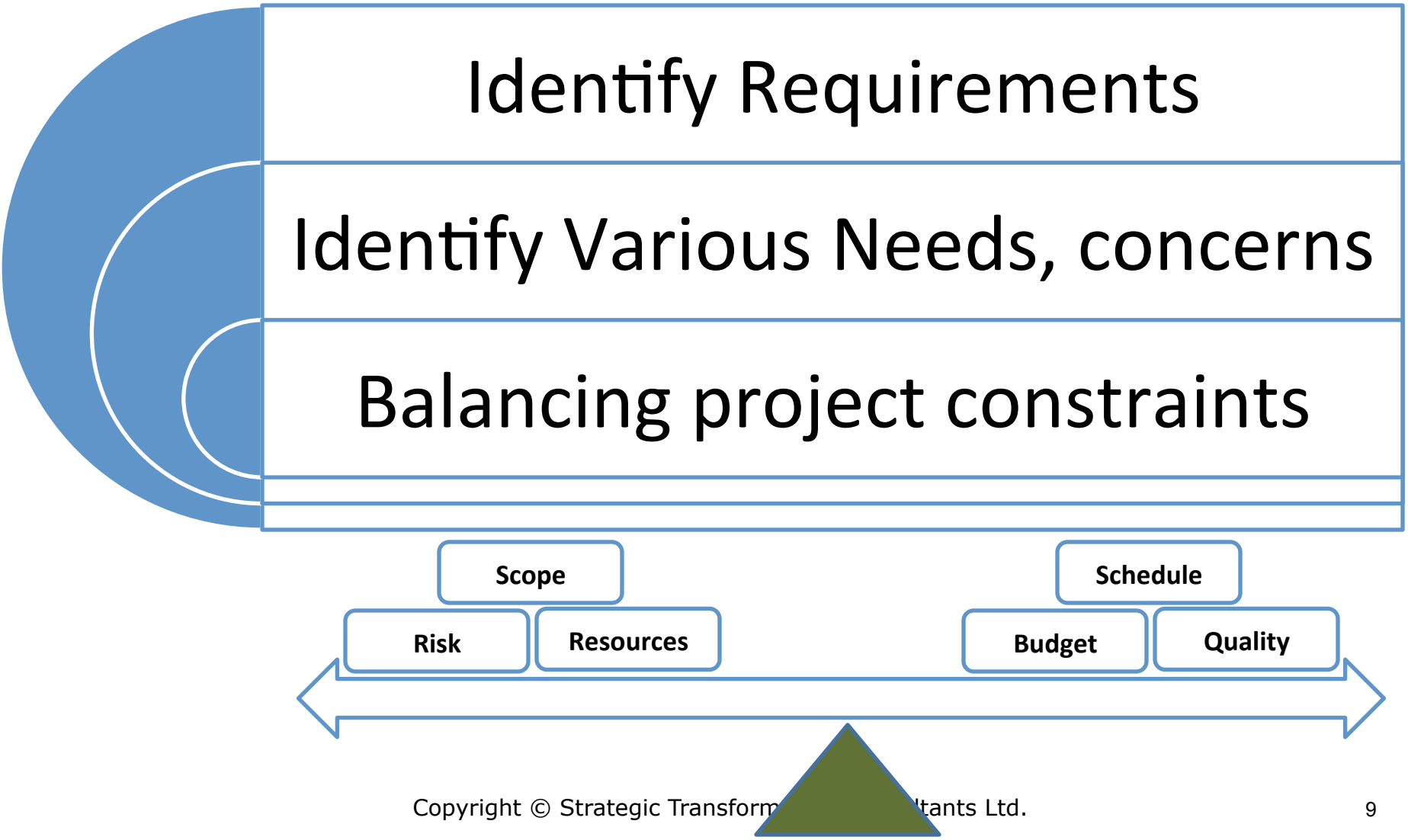
- Meet business objectives;
- Satisfy stakeholder expectations;
- Be more predictable;
- Increase chances of success;
- Deliver the right products at the right time;
- Resolve problems and issues;
- Respond to risks in a timely manner;
- Optimize the use of organizational resources;
- Identify, recover, or terminate failing projects;
- Manage constraints (e.g., scope, quality, schedule, costs, resources);
- Balance the influence of constraints on the project (e.g., increased scope may increase cost or schedule); and
- Manage change in a better manner.

Poorly managed projects or the absence of project management may result in:

- Missed deadlines,
- Cost overruns,
- Poor quality,
- Rework,
- Uncontrolled expansion of the project,
- Loss of reputation for the organization,
- Unsatisfied stakeholders, and
- Failure in achieving the objectives for which the project was undertaken

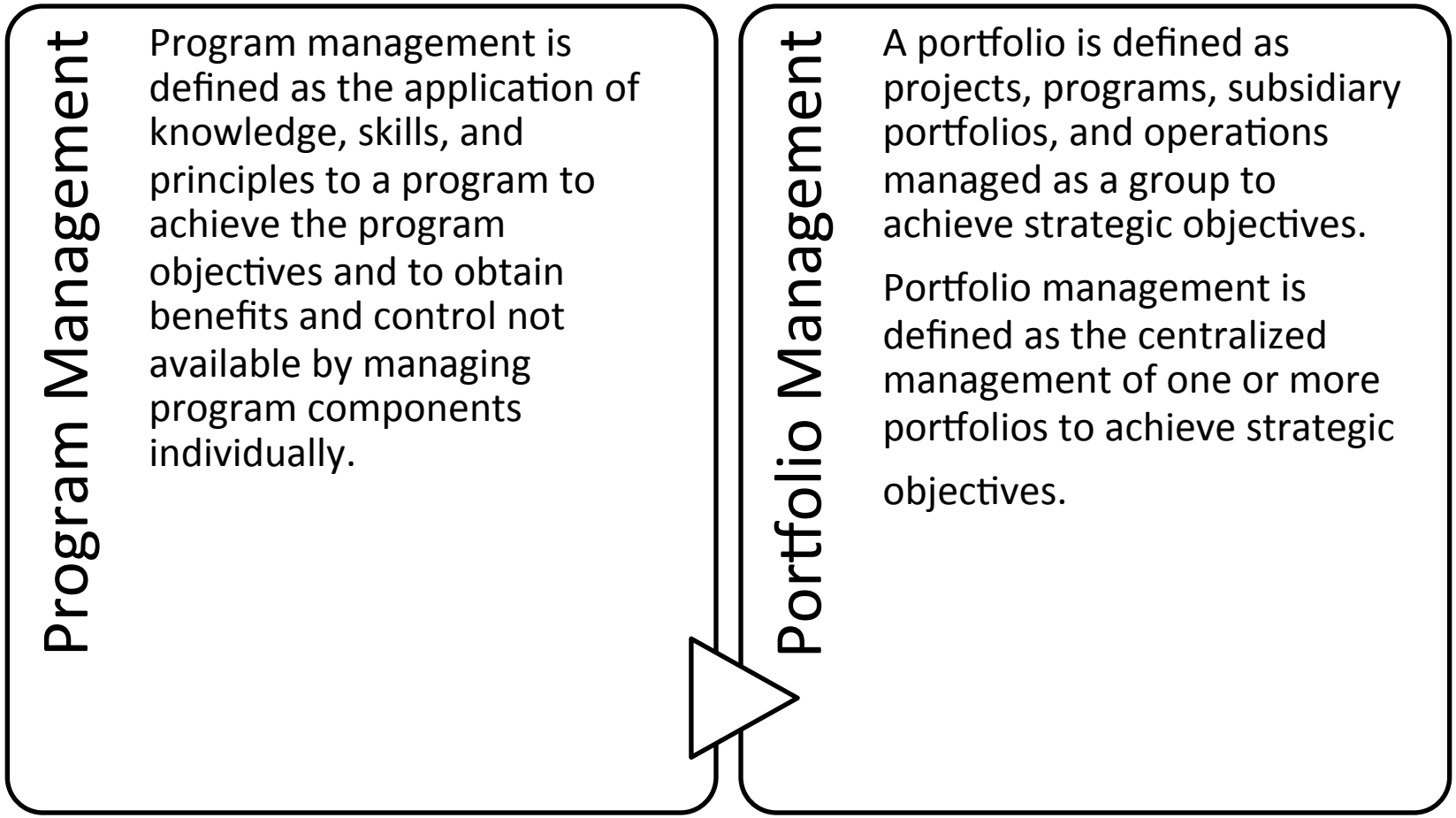
Copyright © Strategic Transformation Consultants Ltd.

Project Management



Copyright © Strategic Transform tants Ltd.

RELATIONSHIP OF PROJECT, PROGRAM, PORTFOLIO, AND OPERATIONS MANAGEMENT



Copyright © Strategic Transformation Consultants Ltd.

- Program and project management focus on doing programs and projects the “right” way; and
- Portfolio management focuses on doing the “right” programs and projects.

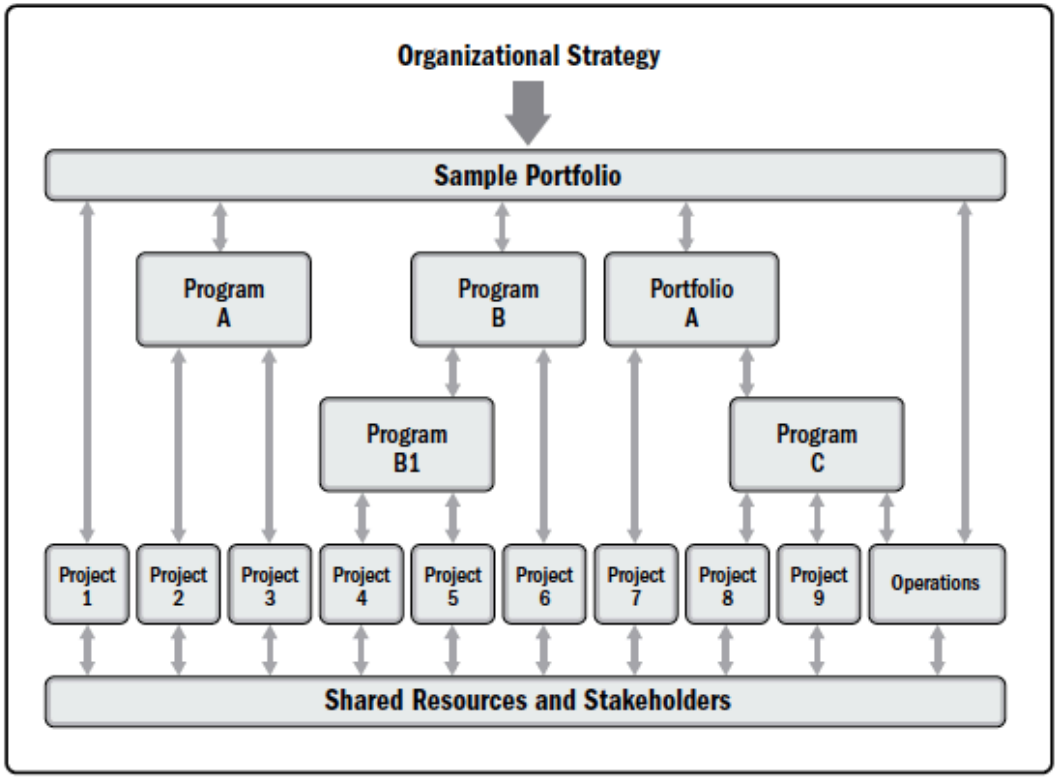


Figure 1-3. Portfolio, Programs, Projects, and Operations

Copyright © Strategic Transformation Consultants Ltd.

ORGANIZATIONAL PROJECT MANAGEMENT (OPM) AND STRATEGIES

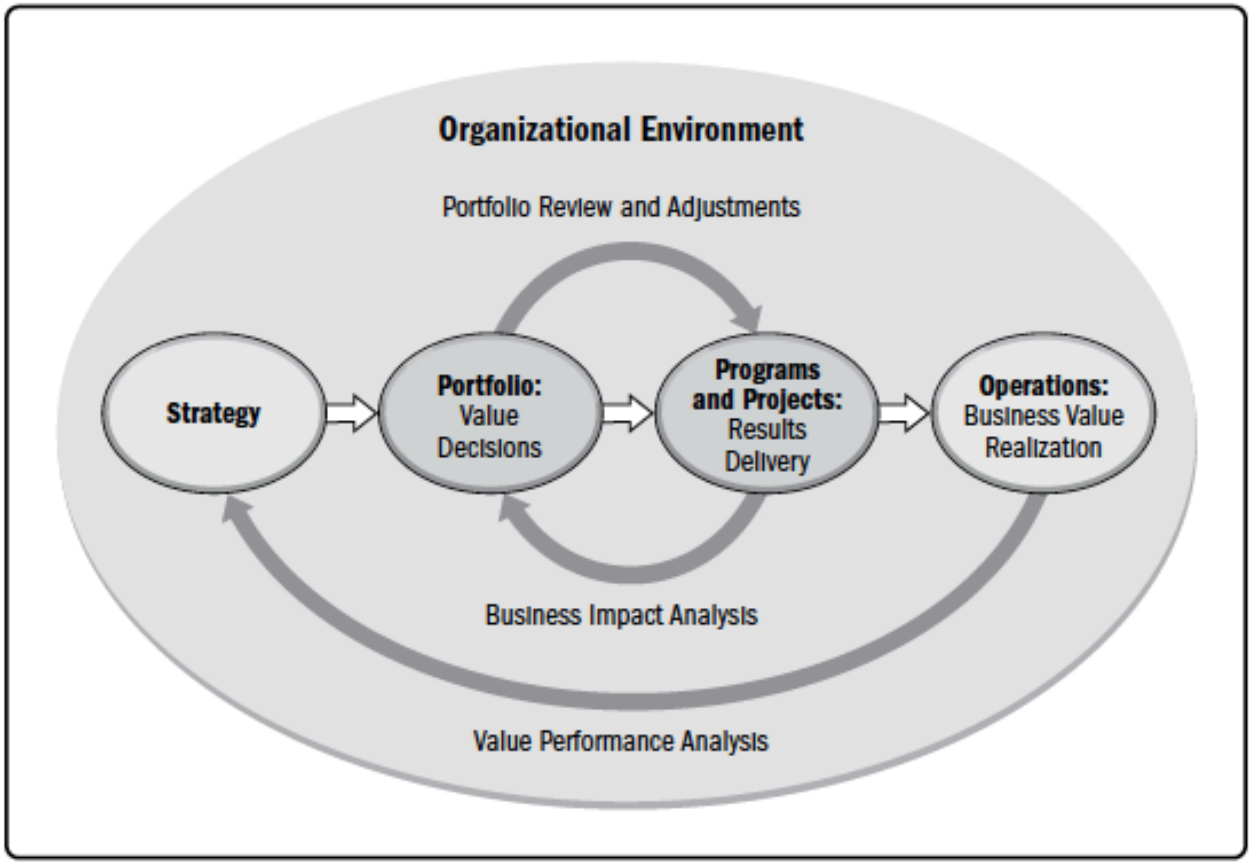


Figure 1-4. Organizational Project Management

Copyright © Strategic Transformation Consultants Ltd.

COMPONENTS OF THE GUIDE

Project life cycle	•The series of phases that a project passes through from its start to its completion.
Project phase	•A collection of logically related project activities that culminates in the completion of one or more deliverables
Phase gate	•A review at the end of a phase in which a decision is made to continue to the next phase, to continue with modification, or to end a program or project.
Project management processes	•A systematic series of activities directed toward causing an end result where one or more inputs will be acted upon to create one or more outputs.
Project Management Process Group	•A logical grouping of project management inputs, tools and techniques, and outputs. The Project Management Process Groups include Initiating, Planning, Executing, Monitoring and Controlling, and Closing. Project Management Process Groups are not project phases.
Project Management Knowledge Area	•An identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools, and techniques.

Copyright © Strategic Transformation Consultants Ltd.

COMPONENTS OF THE GUIDE

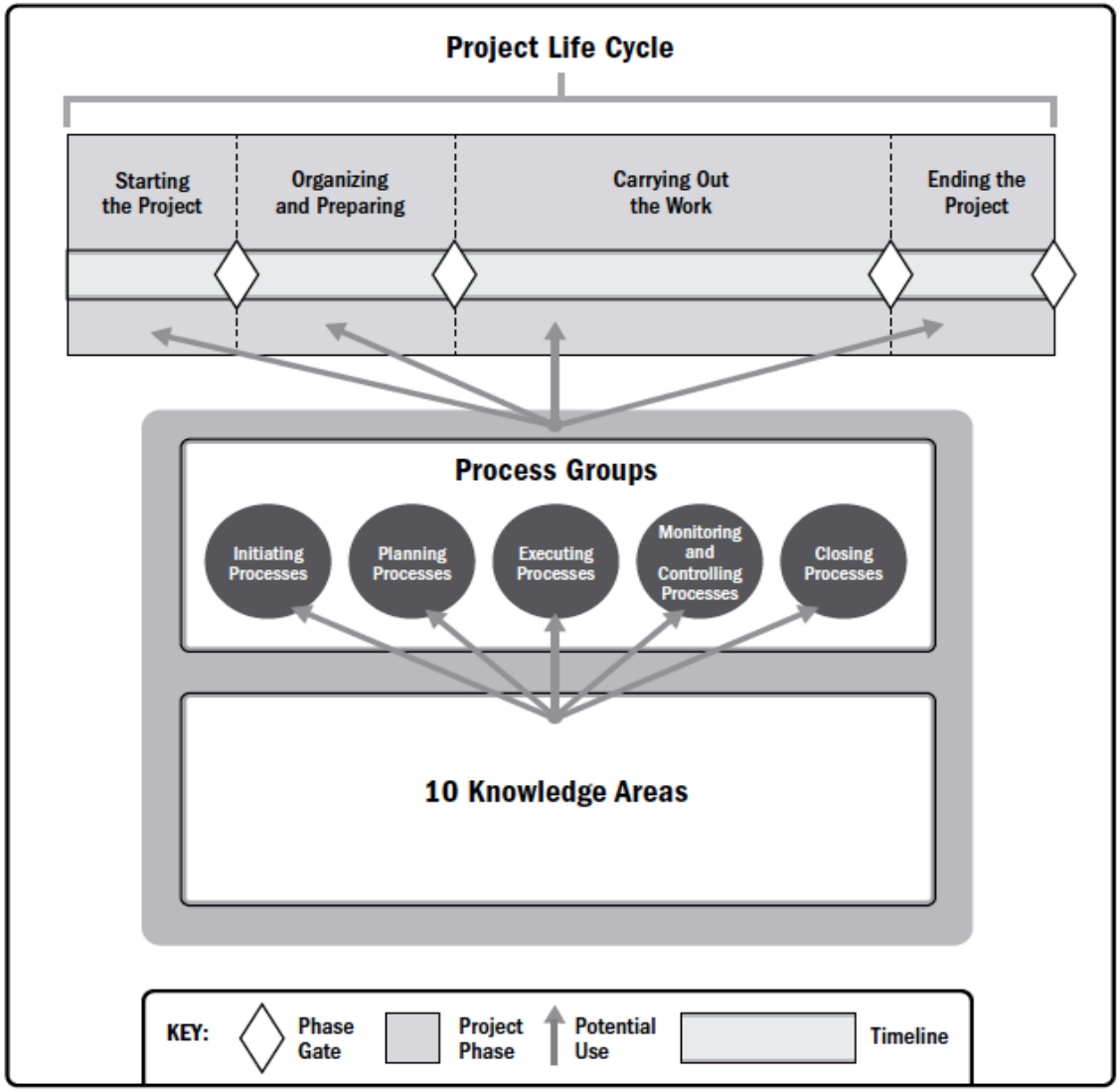
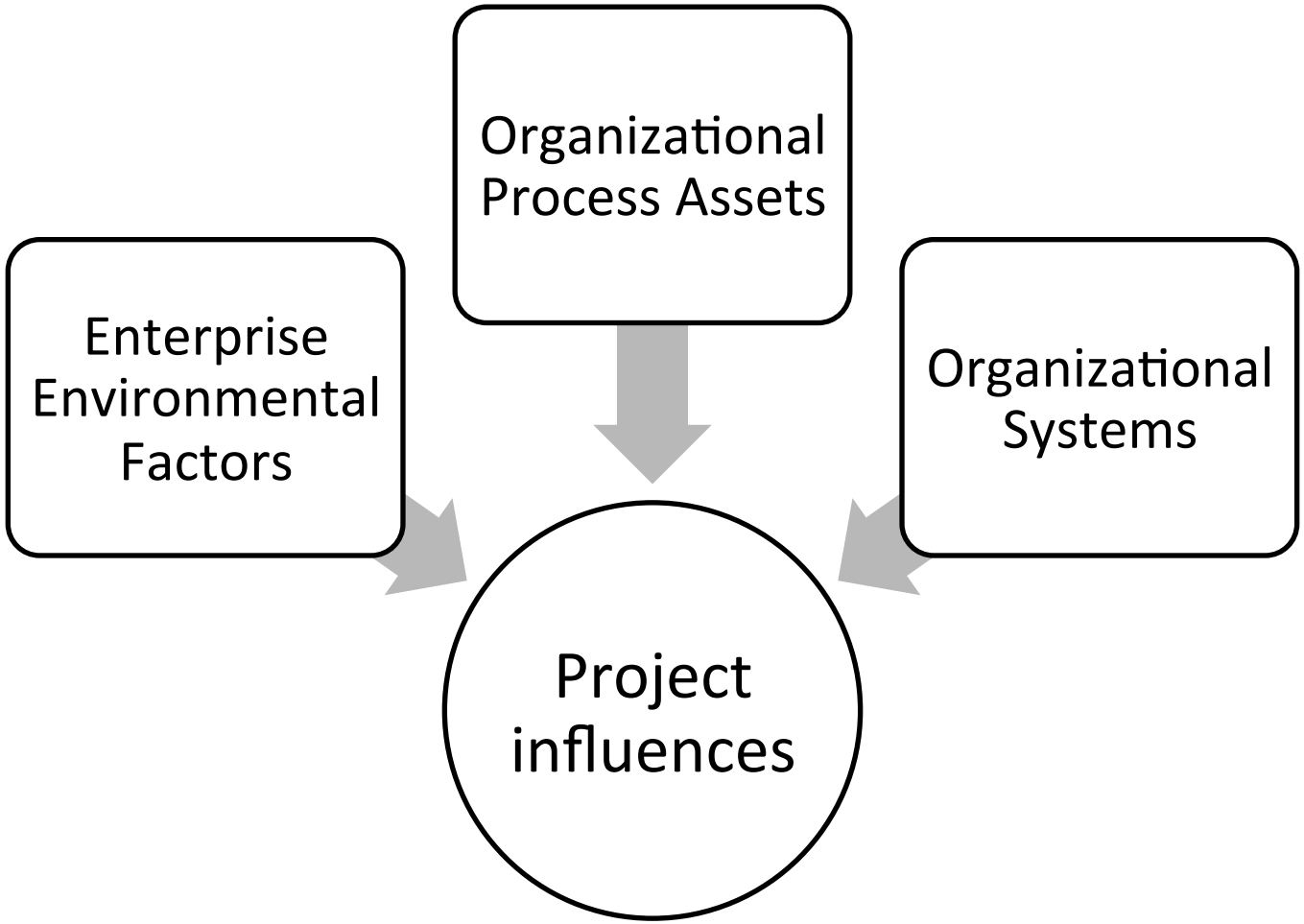


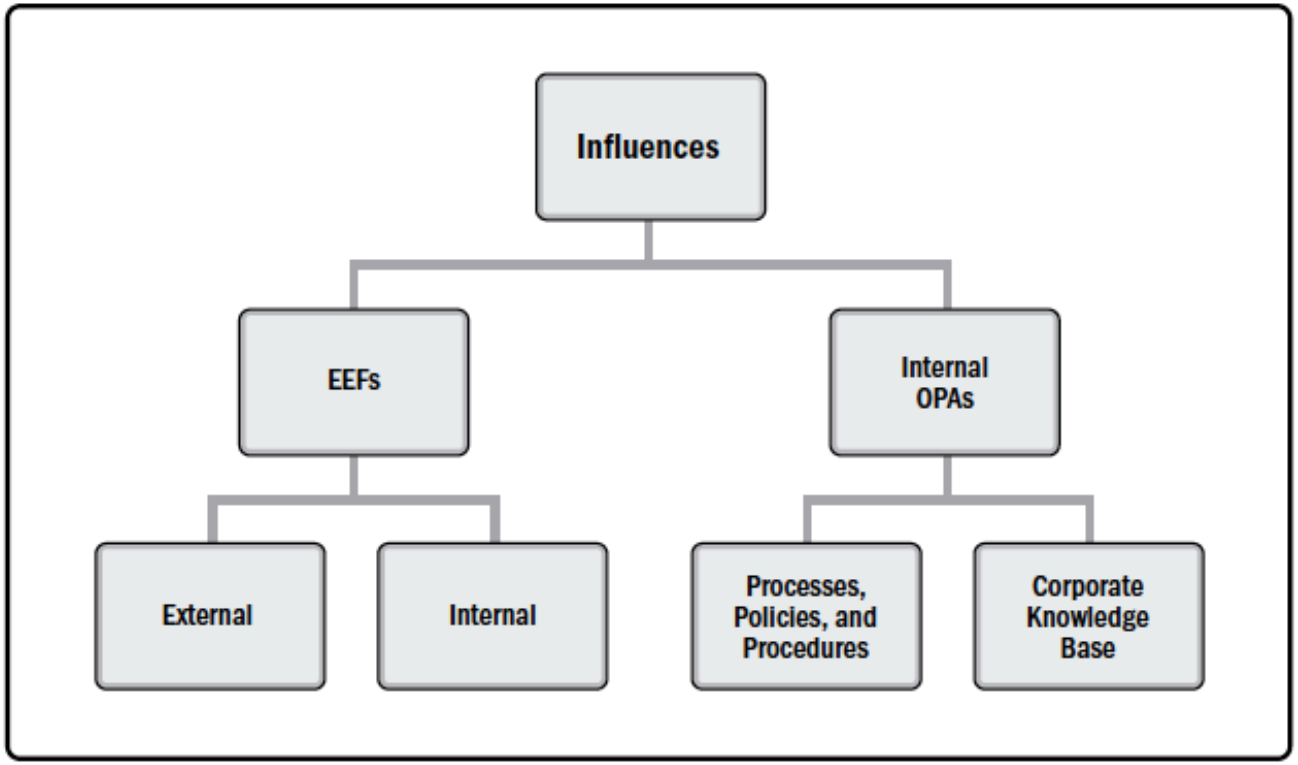
Figure 1-5. Interrelationship of *PMBOK® Guide* Key Components in Projects

CHAPTER 2: THE ENVIRONMENT IN WHICH PROJECTS OPERATE

Copyright © Strategic Transformation Consultants Ltd.



Copyright © Strategic Transformation Consultants Ltd.



Copyright © Strategic Transformation Consultants Ltd.

Organizational Structure Type	Project Characteristics					
	Work Groups Arranged by:	Project Manager's Authority	Project Manager's Role	Resource Availability	Who Manages the Project Budget?	Project Management Administrative Staff
Organic or Simple	Flexible; people working side-by-side	Little or none	Part-time; may or may not be a designated job role like coordinator	Little or none	Owner or operator	Little or none
Functional (centralized)	Job being done (e.g., engineering, manufacturing)	Little or none	Part-time; may or may not be a designated job role like coordinator	Little or none	Functional manager	Part-time
Multi-divisional (may replicate functions for each division with little centralization)	One of: product; production processes; portfolio; program; geographic region; customer type	Little or none	Part-time; may or may not be a designated job role like coordinator	Little or none	Functional manager	Part-time
Matrix – strong	By job function, with project manager as a function	Moderate to high	Full-time designated job role	Moderate to high	Project manager	Full-time
Matrix – weak	Job function	Low	Part-time; done as part of another job and not a designated job role like coordinator	Low	Functional manager	Part-time
Matrix – balanced	Job function	Low to moderate	Part-time; embedded in the functions as a skill and may not be a designated job role like coordinator	Low to moderate	Mixed	Part-time
Project-oriented (composite, hybrid)	Project	High to almost total	Full-time designated job role	High to almost total	Project manager	Full-time
Virtual	Network structure with nodes at points of contact with other people	Low to moderate	Full-time or part-time	Low to moderate	Mixed	Could be full-time or part-time
Hybrid	Mix of other types	Mixed	Mixed	Mixed	Mixed	Mixed
PMO*	Mix of other types	High to almost total	Full-time designated job role	High to almost total	Project manager	Full-time

*PMO refers to a portfolio, program, or project management office or organization.

PMO

A Project management office (PMO) is a management structure that standardizes the project-related governance processes and facilitates the sharing of resources, methodologies, tools and techniques. The responsibilities of a PMO can range from providing project management support function to actually being responsible for the direct management of a project

Identifying Provides consultative role by providing templates, best practices, training, access to information and lesson learned from other projects.

Provide support and require compliance through various mean. Compliance may involve adapting PM frameworks or methodologies, using specific templates, forms, tools or conformance to governance.

Takes control by directly managing the project.

identifying methodology, best practices

Coaching, mentoring

Managing shared resources

Coordinating communication across projects

CHAPTER 3: THE ROLE OF THE PROJECT MANAGER

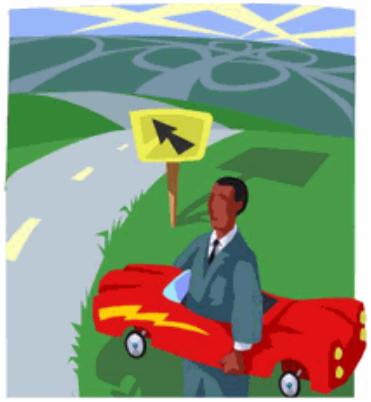
Copyright © Strategic Transformation Consultants Ltd.

Role of a Project Manager

The role of a project manager is distinct from that of a functional manager or operations manager. Typically, the functional manager focuses on providing management oversight for a functional or business unit. Operations managers are responsible for ensuring that business operations are efficient. The project manager is the person assigned by the performing organization to lead the team that is responsible for achieving the project objectives.

Copyright © Strategic Transformation Consultants Ltd.

Role of a Project Manager



- *Have the accountability and authority to accomplish the project work*
- *Make sure the project is completed within Schedule and within budget*
- *Determine and deliver required level of quality*
- *Select Appropriate process for the project*
- *Identifies and analyses constrains and assumptions*
- *Leads and directs project planning effort*
- *Identifies dependencies between activities*
- *Assist project team during execution*
- *Reports Project progress on time*

Project Manager is accountable for project success or failure

THE PROJECT MANAGER'S SPHERE OF INFLUENCE

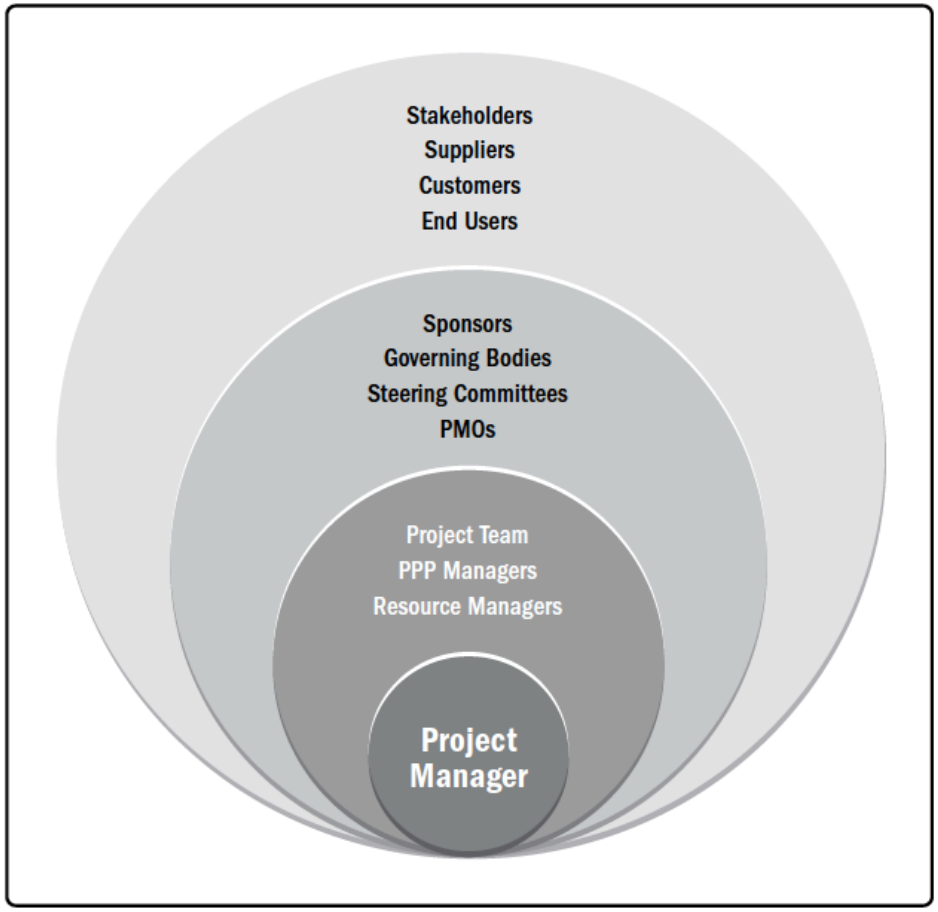


Figure 3-1. Example of Project Manager's Sphere of Influence

Copyright © Strategic Transformation Consultants Ltd.

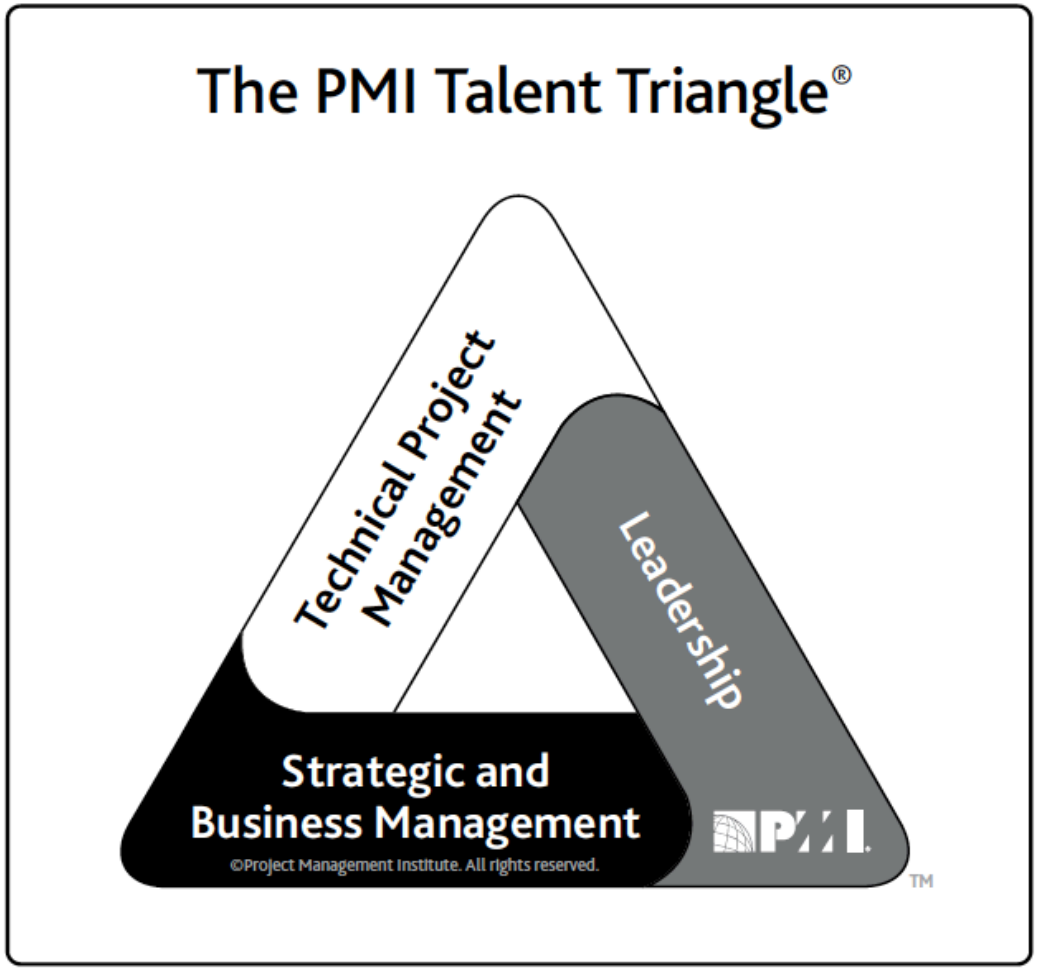


Figure 3-2. The PMI Talent Triangle®

Copyright © Strategic Transformation Consultants Ltd.

PERSONALITY

- Personality refers to the individual differences in characteristic patterns of thinking, feeling, and behaving. Personality characteristics or traits include but are not limited to:
- Authentic (e.g., accepts others for what and who they are, show open concern);
- Courteous (e.g., ability to apply appropriate behavior and etiquette);
- Creative (e.g., ability to think abstractly, to see things differently, to innovate);
- Cultural (e.g., measure of sensitivity to other cultures including values, norms, and beliefs);
- Emotional (e.g., ability to perceive emotions and the information they present and to manage them; measure of interpersonal skills);
- Intellectual (e.g., measure of human intelligence over multiple aptitudes);
- Managerial (e.g., measure of management practice and potential);
- Political (e.g., measure of political intelligence and making things happen);
- Service-oriented (e.g., evidence of willingness to serve other people);
- Social (e.g., ability to understand and manage people); and
- Systemic (e.g., drive to understand and build systems).

Copyright © Strategic Transformation Consultants Ltd.

Leadership Type

Laissez-faire

- Allowing the team to make their own decisions and establish their own goals, also referred to as taking a hands-off style);

Transactional

- (e.g., focus on goals, feedback, and accomplishment to determine rewards; management by exception);

Servant leader

- (e.g., demonstrates commitment to serve and put other people first; focuses on other people' growth, learning, development, autonomy, and well-being; concentrates on relationships, community and

collaboration;

- leadership is secondary and emerges after service);

Transformational

- (e.g., empowering followers through idealized attributes and behaviors, inspirational motivation, encouragement for innovation and creativity, and individual consideration);

Charismatic

- (e.g., able to inspire; is high-energy, enthusiastic, self-confident; holds strong convictions); and

Interactional

- (e.g., a combination of transactional, transformational, and charismatic).

Copyright © Strategic Transformation Consultants Ltd.

Project Stakeholders

- Customer/user
- Sponsor
- Portfolio Manager/Portfolio Management board
- Program Manager
- PMO
- Project Manager
- Project Team
- Functional Manager
- Operations Management
- Seller/business partner

Copyright © Strategic Transformation Consultants Ltd.

Project Lifecycle

Project lifecycle is the collection of generally sequential and sometimes overlapping project phases. It has following lifecycle structure

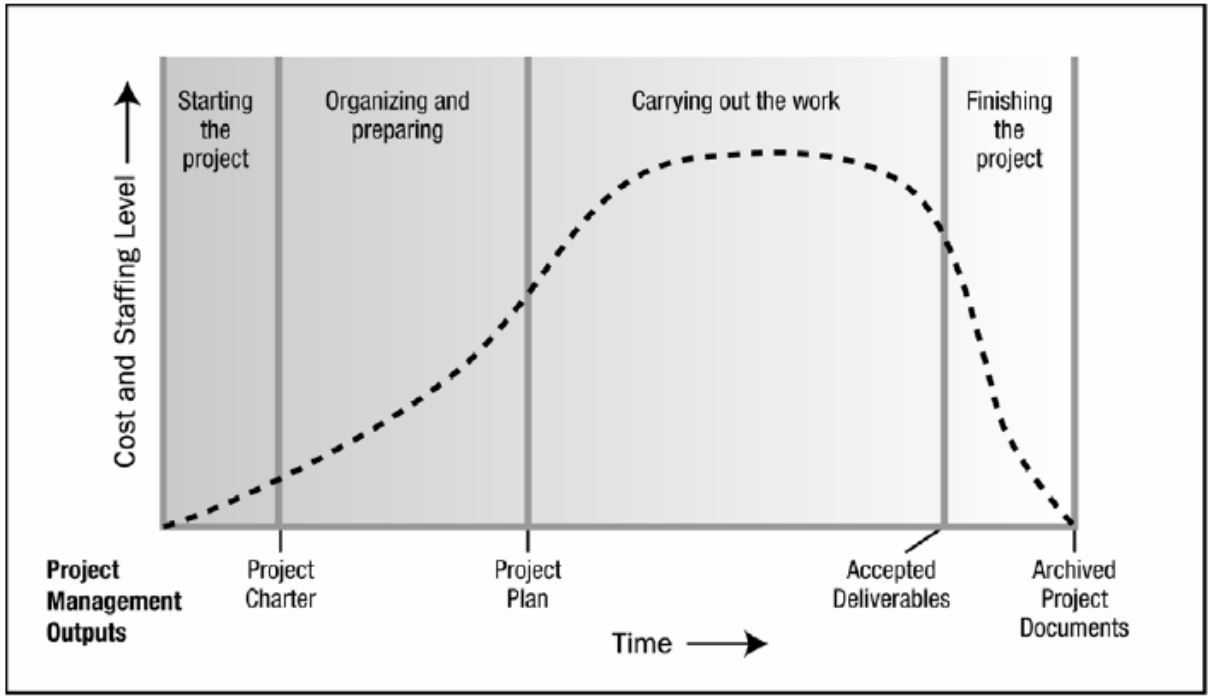


Figure 2-1. Typical Cost and Staffing Levels Across the Project Life Cycle

Cost and staffing level

Impact of variable

Stakeholders influence, risk and uncertainty are greatest at the start

Cost of changes increases as the project progresses

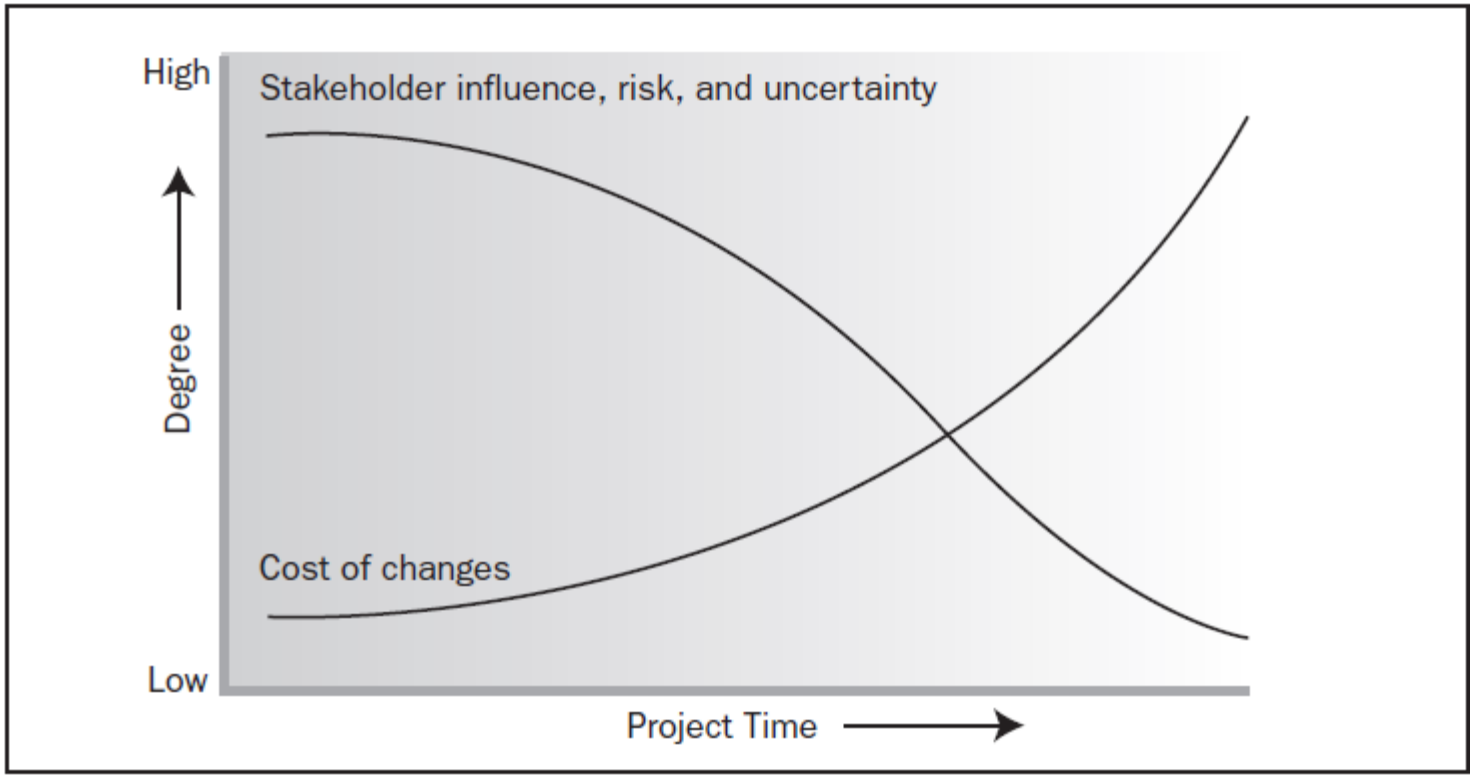


Figure 2-2. Impact of Variable Based on Project Time

Project Boundary

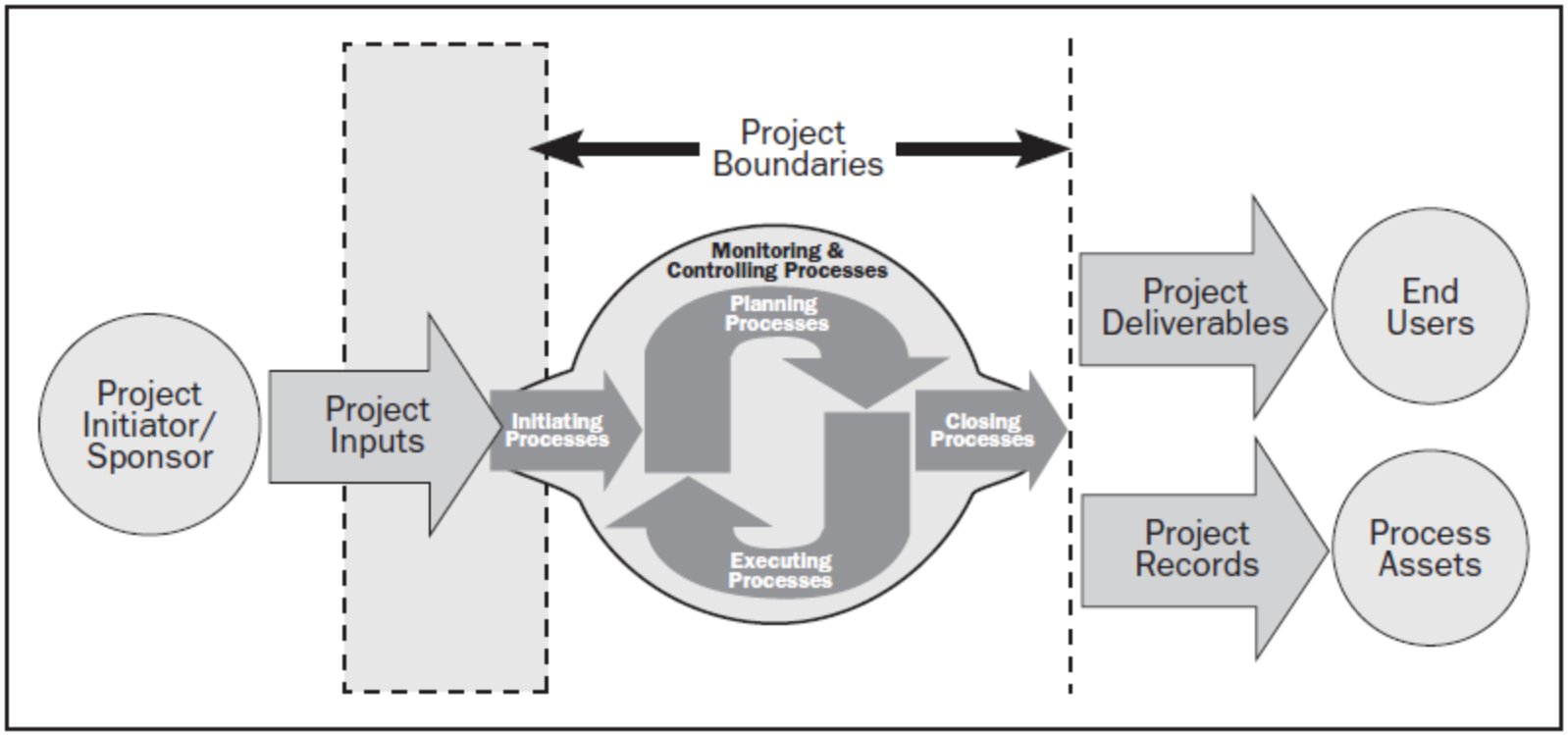
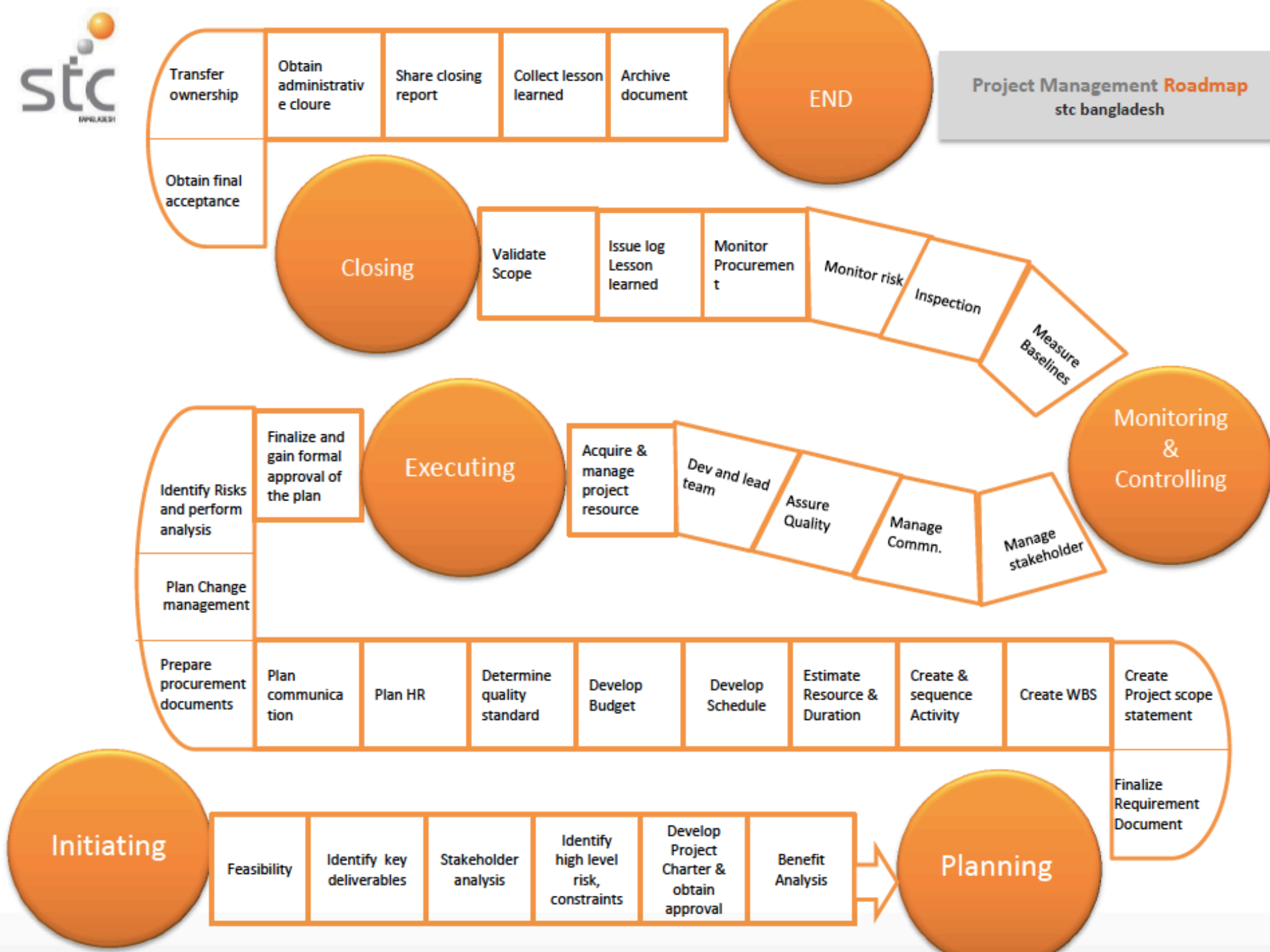
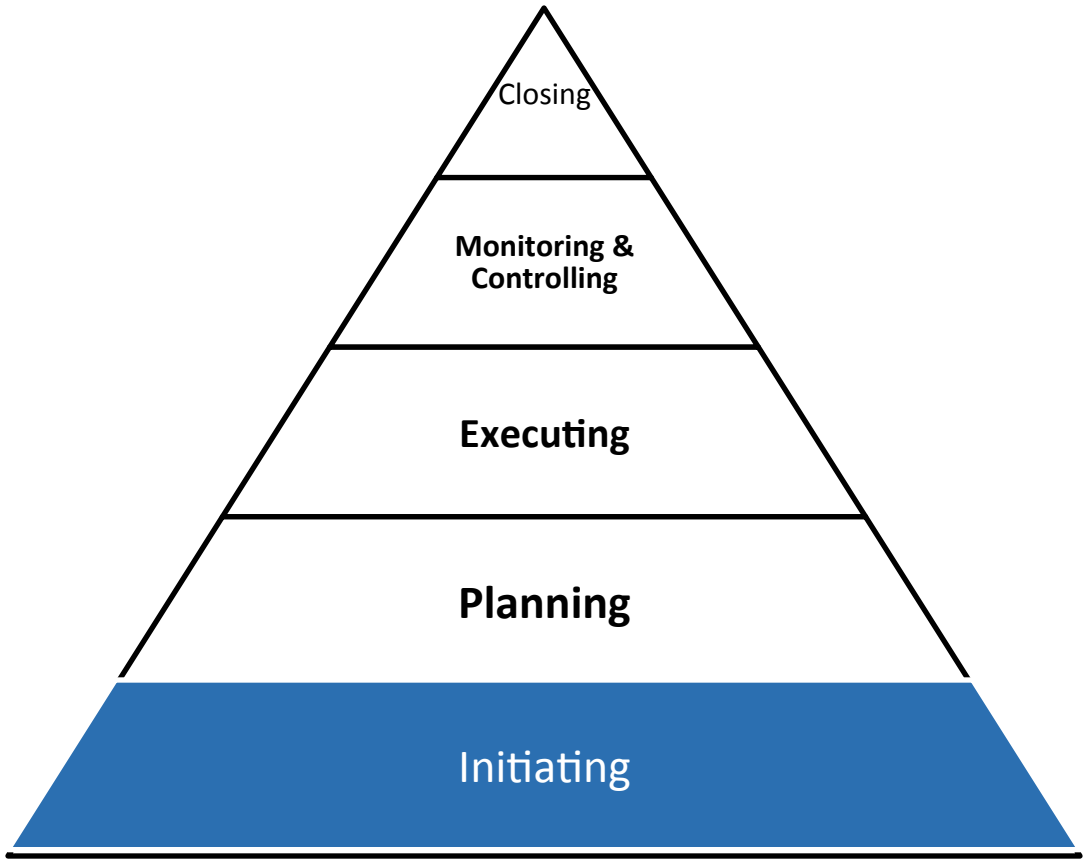


Figure 3-4. Project Boundaries

Copyright © Strategic Transformation Consultants Ltd.


Project Management Roadmap
stc bangladesh
Initiating
Feasibility
Identify key deliverables
Stakeholder analysis
Identify high level risk, constraints
Develop Project Charter & obtain approval
Benefit Analysis
Planning
Finalize Requirement Document
Create Project scope statement
Create WBS
Create & sequence Activity
Estimate Resource & Duration
Develop Schedule
Develop Budget
Determine quality standard
Plan HR
Plan communication
Prepare procurement documents
Plan Change management
Identify Risks and perform analysis
Finalize and gain formal approval of the plan
Executing
Acquire & manage project resource
Dev and lead team
Assure Quality
Manage Commn.
Manage stakeholder
Monitoring & Controlling
Monitor risk
Inspection
Measure Baselines
Closing
Validate Scope
Issue log Lesson learned
Monitor Procurement
Obtain final acceptance
Transfer ownership
Obtain administrative cloure
Share closing report
Collect lesson learned
Archive document
END

5 process groups



Copyright © Strategic Transformation Consultants Ltd.

Develop Project Charter-ITTO

Process

Develop Project Charter

Output

- Project Charter
- Assumption Log

Inputs	Tools & Techniques	Outputs
.1 Business documents • Business case • Benefits management plan .2 Agreements .3 Enterprise environmental factors .4 Organizational process assets	.1 Expert judgment .2 Data gathering • Brainstorming • Focus groups • Interviews .3 Interpersonal and team skills • Conflict management • Facilitation • Meeting management .4 Meetings	.1 Project charter .2 Assumption log

Figure 4-2. Develop Project Charter: Inputs, Tools & Techniques, and Outputs

Copyright © Strategic Transformation Consultants Ltd.

Reason

- formally authorizes the existence of a project and provides the project manager
- Provide with the authority to apply organizational resources to project activities.
- Creates a formal record of the project, and shows the organizational commitment to the project.

Copyright © Strategic Transformation Consultants Ltd.

Some basic facts

- Sponsor
- Project manager can assist him in the process

Who creates the charter

- Someone external to the project like sponsor, PMO, portfolio steering committee
- Who has the ability to fund the project

Signed by

- Should have name of the project manager
- Should be within 2/3 pages.
- It should be broadly framed with very high level milestones, tentative cost etc to initiate data

Consist of

- As early as possible
- Best when the project is assigned
- If not possible, PM must be assigned before planning

When

Copyright ultants Ltd.

Data flow

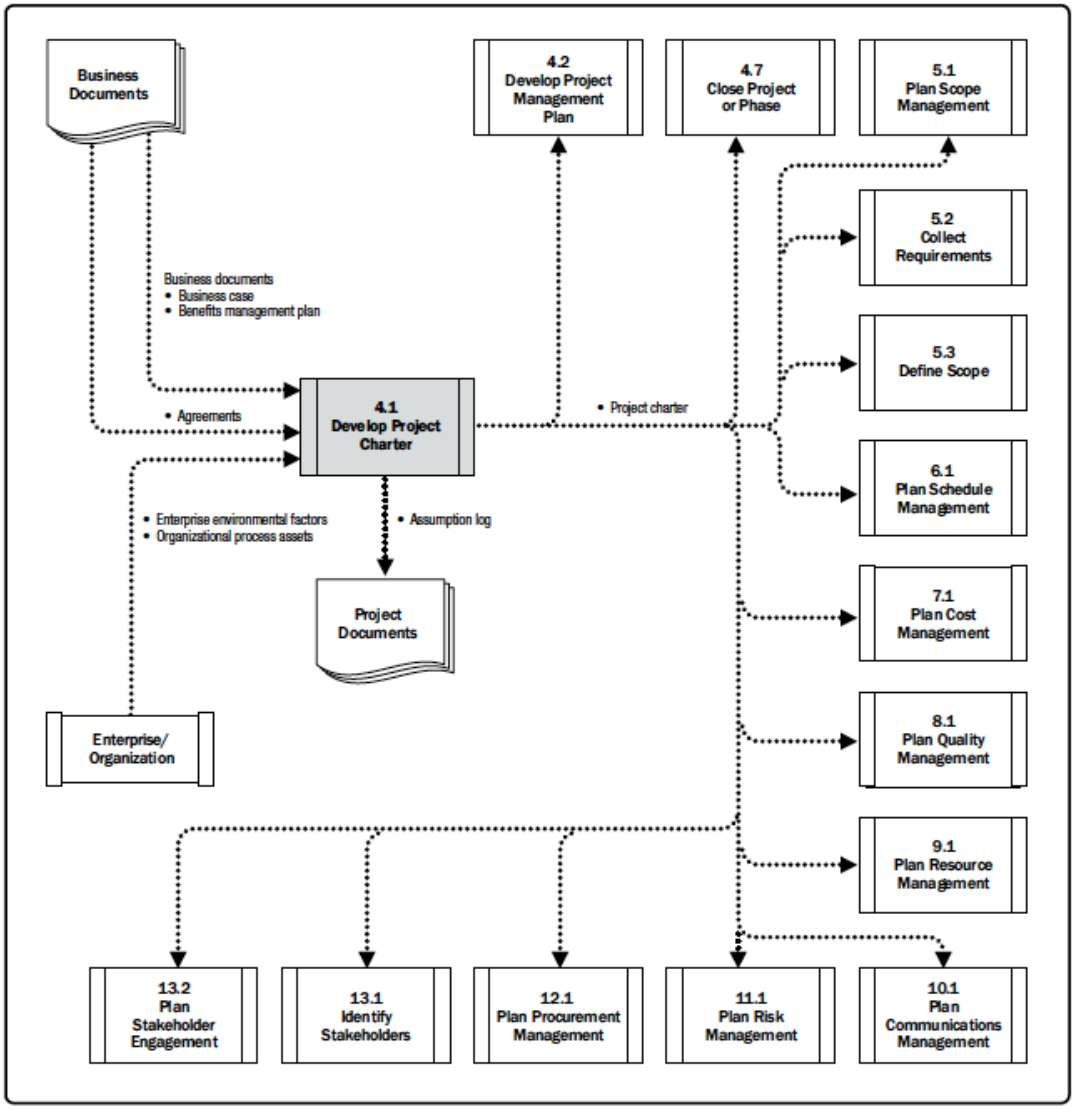


Figure 4-3. Develop Project Charter: Data Flow Diagram

Input: Business Documents

Generally it contains business need and cost benefit analysis to justify the project

Market Demand	• A company authorizes to develop solar energy sub station to reduce load shedding
Organizational Need	• A telecom company initiate a VAS project to increase its revenue
Customer Request	• A training company initiates new course based on customer request
Technological Advance	• Nokia authorizes a new set development project which can compete with I pad
Legal Requirement	• A garments kicks off a project to establish a procedure to handle reducing draining toxic chemical in the river
Ecological impact and social need	• Project to improve echological and social condition like; lessen environmental impact, improve sanitation etc

Project Selection

Project Selection
PV = FV / (1+r)^n
FV = PV * (1+r)^n
NPV = Select biggest number.
ROI = Select biggest number.
IRR = Select biggest number.
Payback Period = Add up the projected cash inflow minus expenses until you reach the initial investment.
BCR = Benefit / Cost
CBR = Cost / Benefit
Opportunity Cost = The value of the project not chosen.
Exp. Value = Probability % x Consequence $

PV=Present value
R=interest rate
N=number of time period

BCR<1 is bad. Project with bigger BCR is better. CBR>1 is bad

Copyright © Strategic Transformation Consultants Ltd.

Estimates

Classes of Estimates
Order of Magnitude estimate = -25% to +75%
Preliminary estimate = -15% to + 50%
Budget estimate = -10% to +25%
Definitive estimate = -5% to +10%
Final estimate = 0%

Copyright © Strategic Transformation Consultants Ltd.

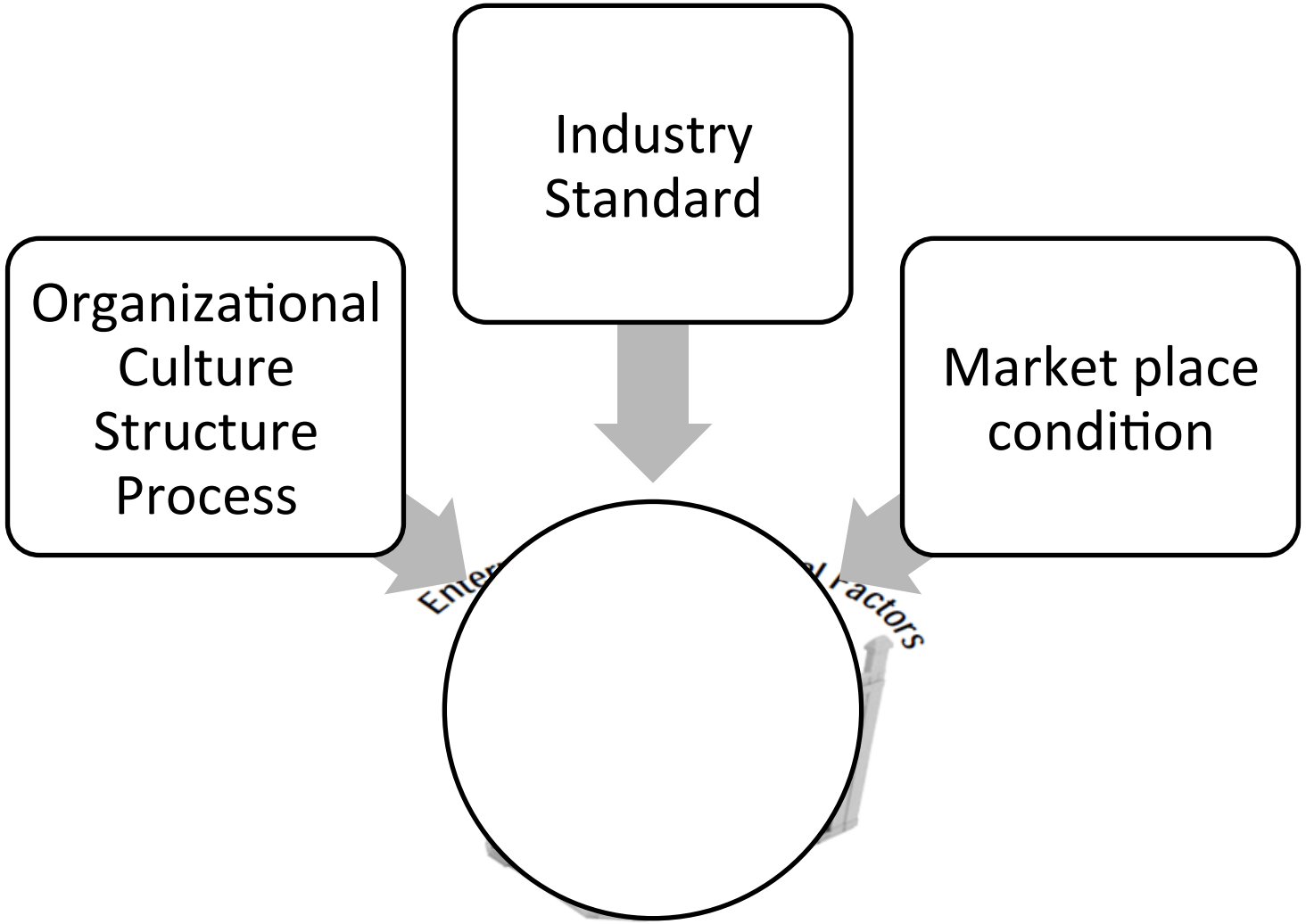
Input2: Agreement

Agreements are used to define initial intentions for a project

- Contract
- Memorandum of understanding (MOU)
- Service Level Agreement (SLA)
- Letter of agreement
- Letter of intention

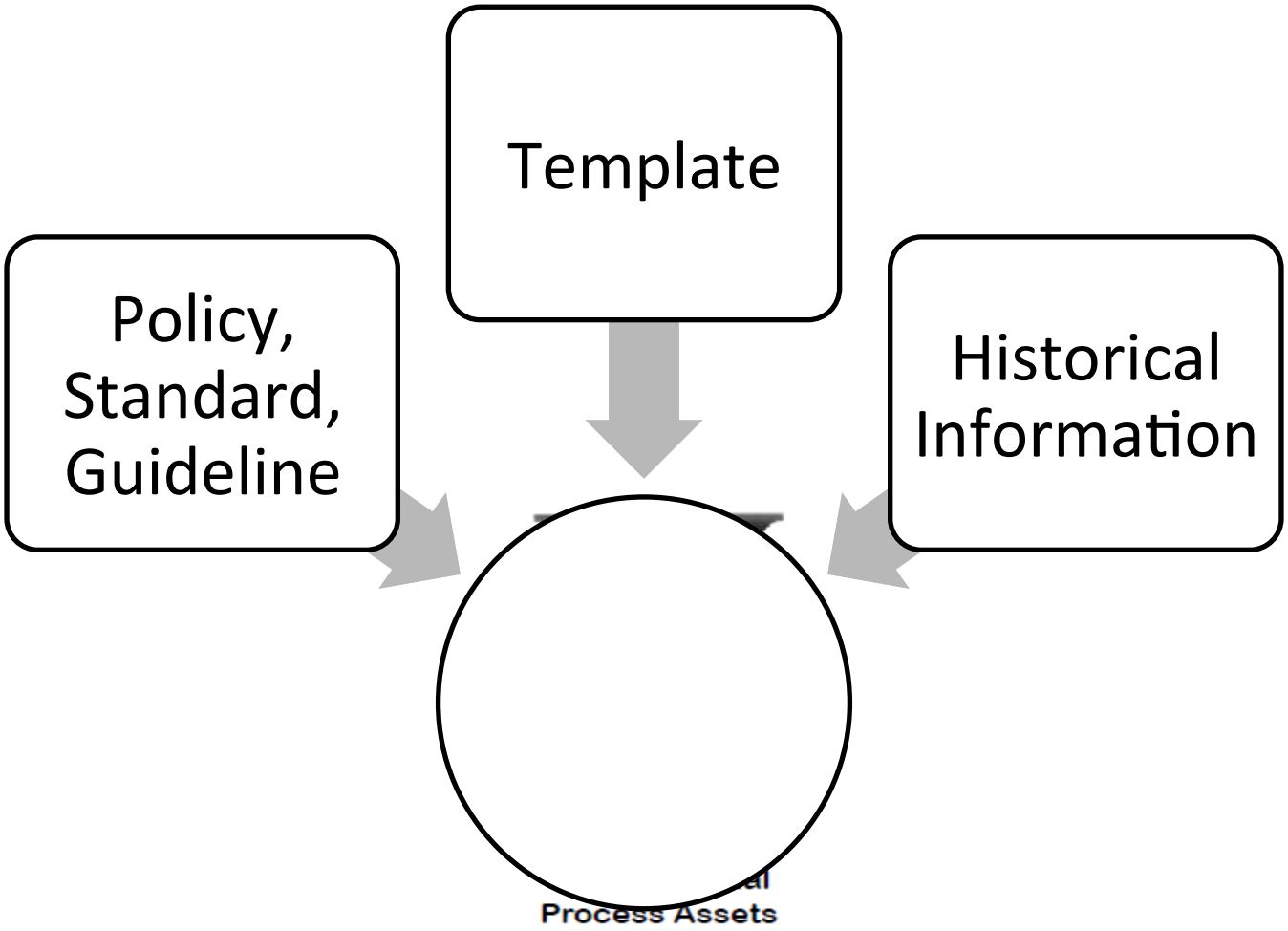
Copyright © Strategic Transformation Consultants Ltd.

Input4: Enterprise Environmental Factor



Copyright © Strategic Transformation Consultants Ltd.

Input5: Organizational Process Assets

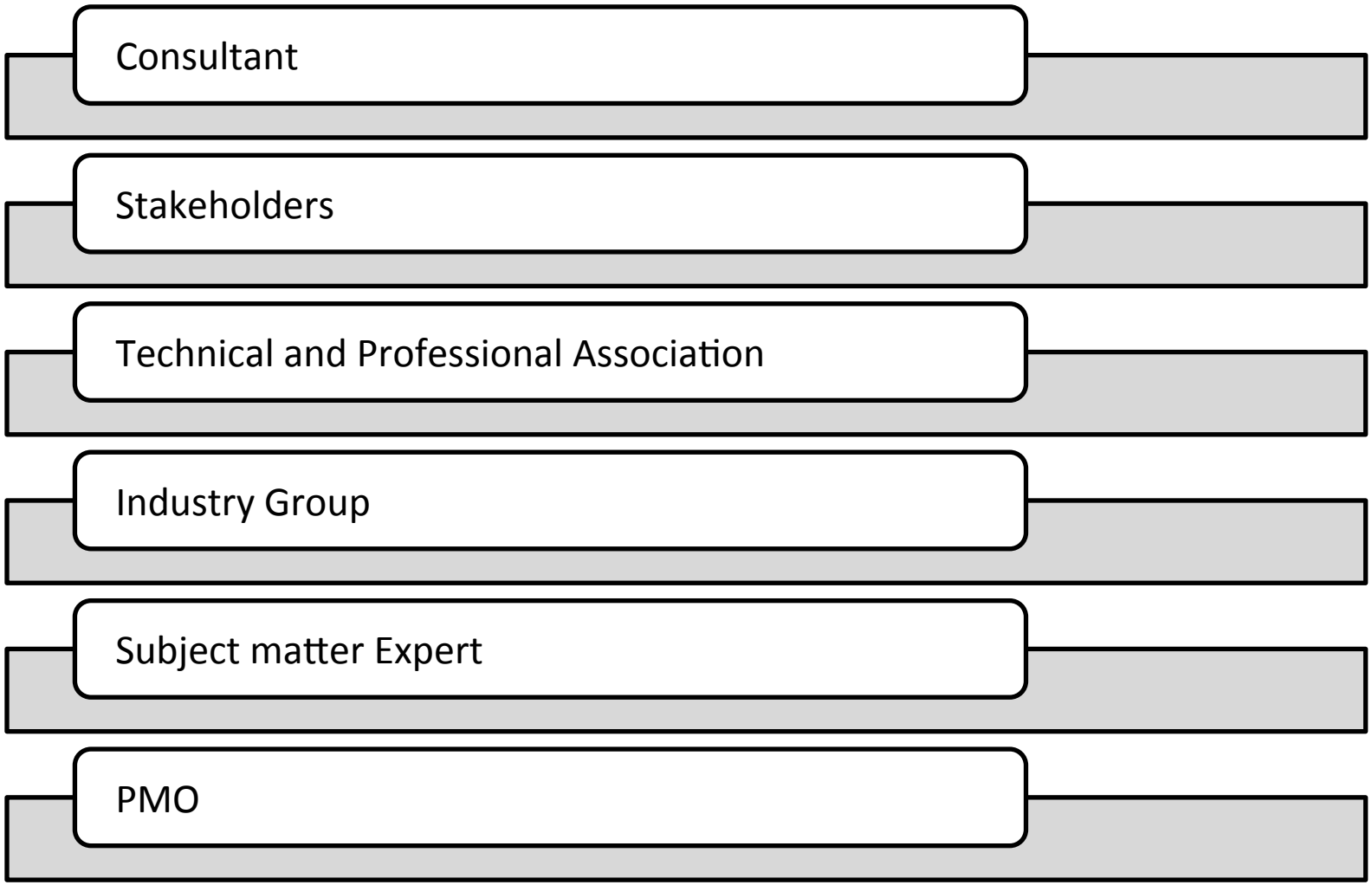


Copyright © Strategic Transformation Consultants Ltd.

Develop Project Charter: TT

Copyright © Strategic Transformation Consultants Ltd.

Expert Judgment



Copyright © Strategic Transformation Consultants Ltd.

Data gathering

2. Data gathering

- Brainstorming, Focus group, interview

3. INTERPERSONAL AND TEAM SKILLS

- Conflict management, facilitation, meeting management

4. Meetings

Copyright © Strategic Transformation Consultants Ltd.

1. Charter contains

- Project purpose;
- Measurable project objectives and related success criteria;
- High-level requirements;
- High-level project description, boundaries, and key deliverables;
- Overall project risk;
- Summary milestone schedule;
- Preapproved financial resources;
- Key stakeholder list;
- Project approval requirements (i.e., what constitutes project success, who decides the project is successful, and who signs off on the project);
- Project exit criteria (i.e., what are the conditions to be met in order to close or to cancel the project or phase);
- Assigned project manager, responsibility, and authority level; and
- Name and authority of the sponsor or other person(s) authorizing the project charter.

Copyright © Strategic Transformation Consultants Ltd.

2:Assumption Log

- High-level strategic and operational assumptions and constraints are normally identified in the business case before the project is initiated and will flow into the project charter

Copyright © Strategic Transformation Consultants Ltd.

Group Exercise : project charter

Project Name :	Rebeka's Wedding		
Project Start By	27 Feb 2011	**Project Complete By**	27 April 2011
Business Need and Project Justification	As custom of our country, the wedding has to be arranged properly to keep all stakeholders satisfied. (for business, we have to show, cost benefit analysis of the project)		
Project Manager & Authority Level	Riadh, he has the full authority to manage budget, decide on quality, manage risk etc		
Resources Pre-assigned	Jinat (your cousin) has previously managed gaye holud's dala decoration for her sister. Your father liked it and suggested you to keep her in your team to do the same.		
Stake holders	**Name**	**Role**	
	Sponsor (Your father)	Pay money	
	Groom's and brides relative	Give requirement	
	Supplier (flower, food, jewelry)	Manage individual	
	Beneficiary	Rebeka and Mithu	
	Project team	Play different role in the project	
Brief Project Scope	▪ Manage gaye holud ▪ Manage reception party ▪ Arrange jewelry ▪ Arrange photographer ▪ Invitation cards		
Initial Risk	▪ Good community halls might not be available in next 3 months		
Project Assumption and constraints	Time: 2 months Cost: 15 lakh BDT Quality: specified by your father Scope: all above		
Project Sponsor Signature		**Project Manager Signature**	

Identify Stakeholders-ITTO

The process of identifying all people or organizations impacted by the project, and documenting relevant information regarding their interests, involvement, and impact on project success

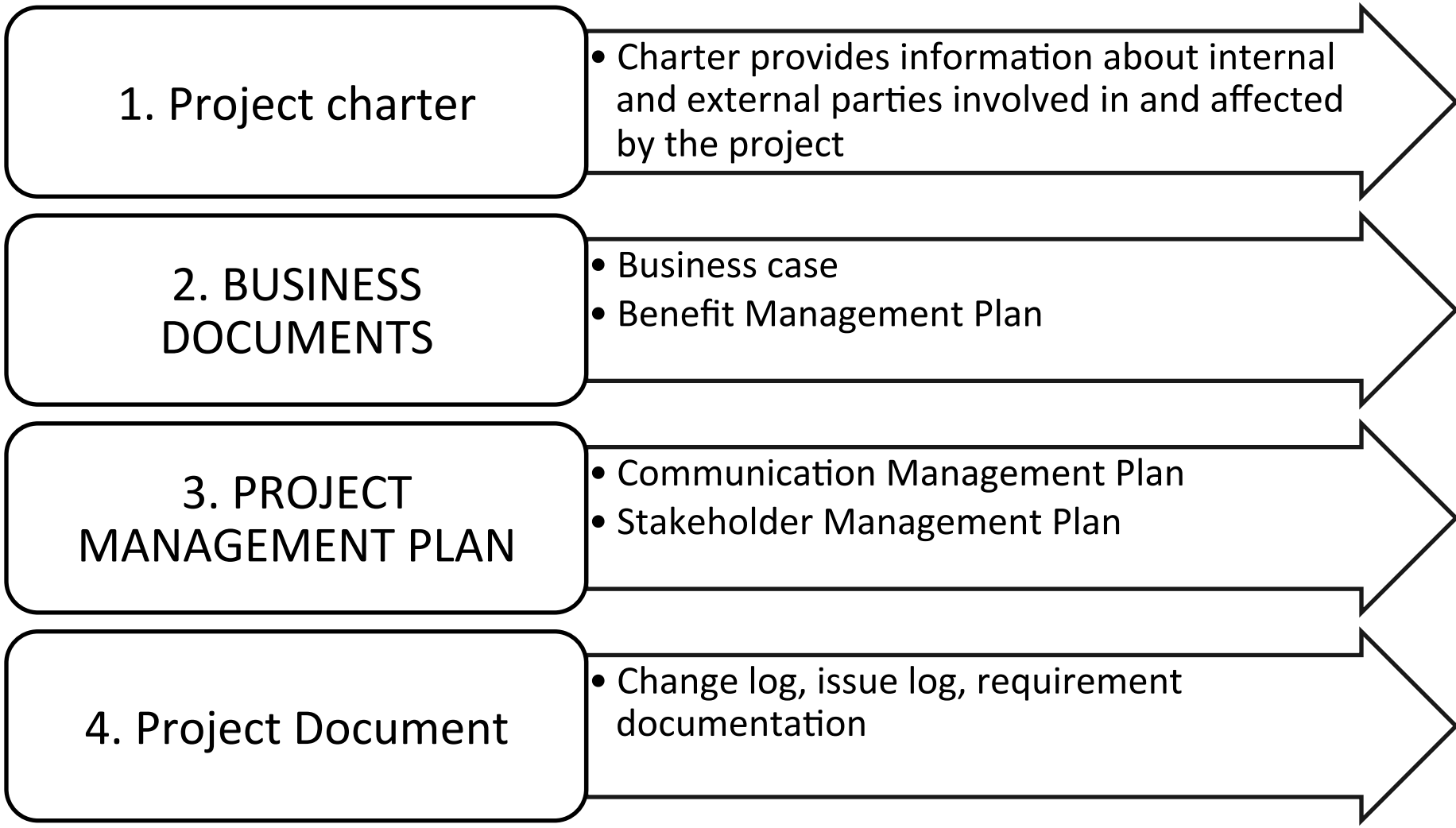
Identify Stakeholders

- Stakeholder Register

Inputs	Tools & Techniques	Outputs
.1 Project charter .2 Business documents • Business case • Benefits management plan .3 Project management plan • Communications management plan • Stakeholder engagement plan .4 Project documents • Change log • Issue log • Requirements documentation .5 Agreements .6 Enterprise environmental factors .7 Organizational process assets	.1 Expert judgment .2 Data gathering • Questionnaires and surveys • Brainstorming .3 Data analysis • Stakeholder analysis • Document analysis .4 Data representation • Stakeholder mapping/ representation .5 Meetings	.1 Stakeholder register .2 Change requests .3 Project management plan updates • Requirements management plan • Communications management plan • Risk management plan • Stakeholder engagement plan .4 Project documents updates • Assumption log • Issue log • Risk register

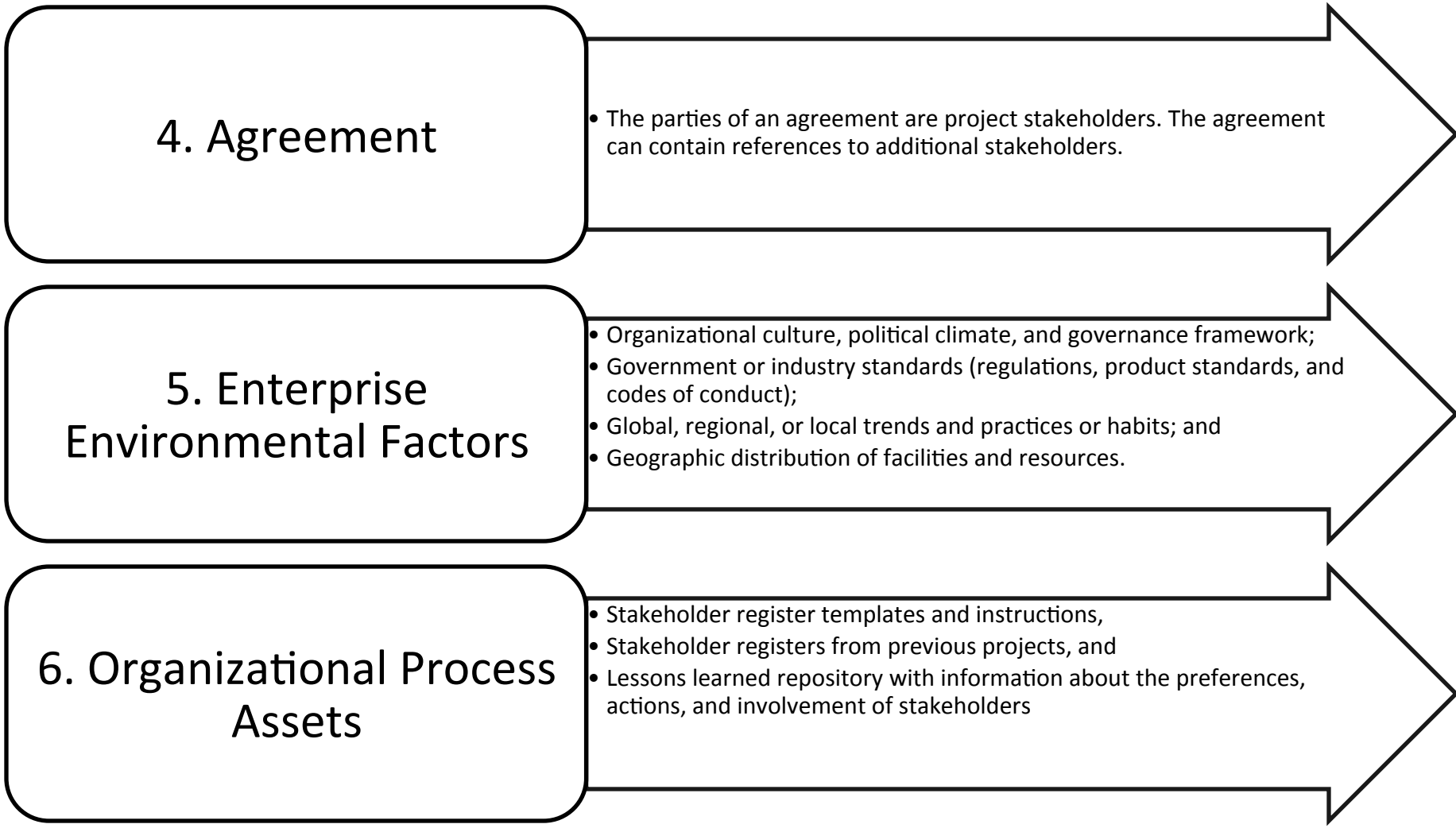
Figure 13-2. Identify Stakeholders: Inputs, Tools & Techniques, and Outputs

Input to identify stakeholders



Copyright © Strategic Transformation Consultants Ltd.

Input to identify stakeholders



Copyright © Strategic Transformation Consultants Ltd.

Identify stakeholders-TT

Copyright © Strategic Transformation Consultants Ltd.

Identify stakeholders-TT

1. Expert Judgment

- Understanding the politics and power structures in the organization,
- Knowledge of the environment and culture of the organization and other affected organizations including customers and the wider environment,
- Knowledge of the industry or type of project deliverable, and
- Knowledge of individual team member contributions and expertise

2. Data Gathering

- Questionnaires and surveys
- Brainstorming

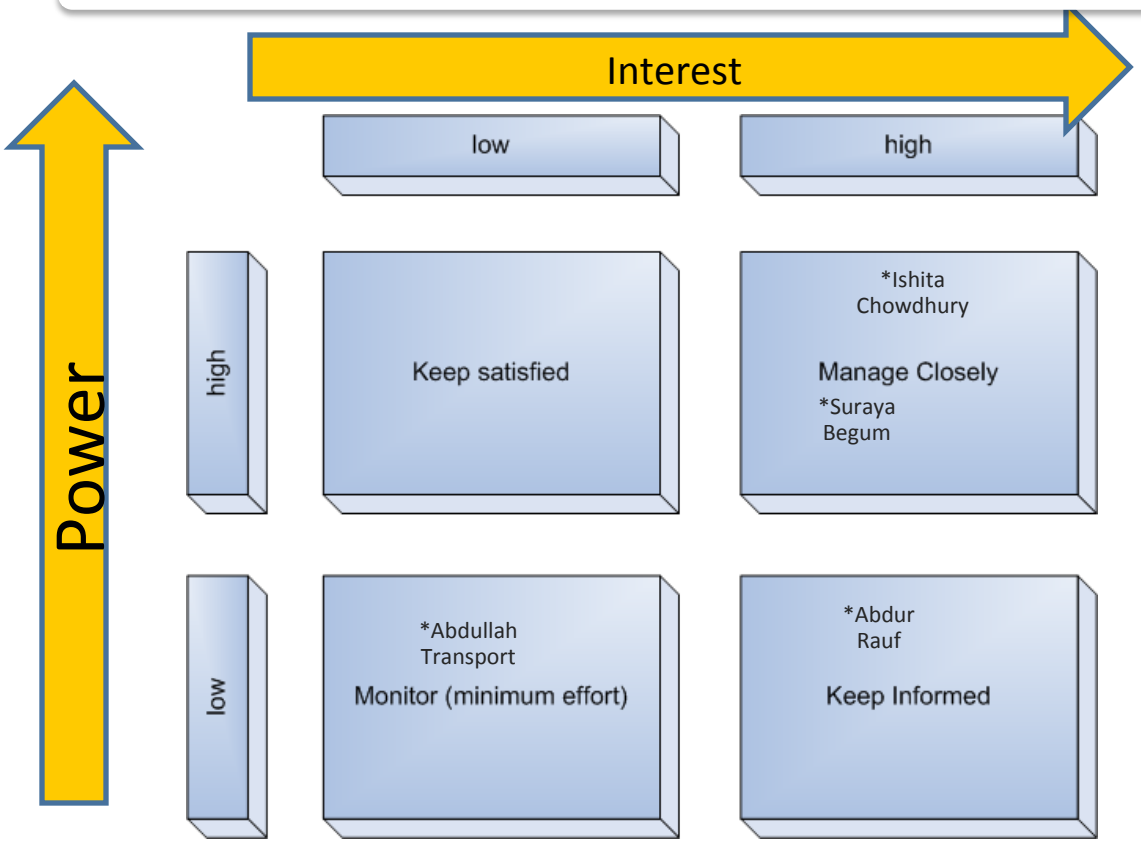
3. Data Analysis

- Stakeholder Analysis: Interest, right, ownership, knowledge, contribution
- Document Analysis: Assessing the available project documentation and lessons learned from previous projects to identify stakeholders and other supporting information

Copyright © Strategic Transformation Consultants Ltd.

Power/interest grid

2. Data Representation



Meetings

- To identify project stakeholders

Copyright © Strategic Transformation Consultants Ltd.

Identify Stakeholders-output

1. Stakeholder register	•Identification: name, position, role in project •Assessment: major requirement, main expectation •Classification: internal/ external
Change Request	•As stakeholder identification continues throughout the project, new stakeholders, or new information about stakeholders, may result in a change request to the product, project management plan, or project documents.
Project Management Plan update	•Requirement Management Plan, Communication Management Plan, Risk Management Plan, Stakeholder engagement plan
Project Documents update	•Assumption log, Issue Log, Risk register

Copyright © Strategic Transformation Consultants Ltd.

Stakeholder Register for Ishita's Wedding
BD Wedding Planners Ltd.

Name/Group	Internal/ external	Role	Contact information	Major requirement/ Expectation	Phase with interest	Power, Interest	Classification
Abdur Rauf Chowdhury	Father of bride- Internal	Sponsor	abdur.rouf@abc.com +880 141001231	- Excellent card, venue - Guest satisfaction	All	LH	Supporter
Suraiya Begum	Mother of bride- Internal	Provide requirements	+880 412998761	- jewelry should be top in class	All	HH	Supporter
Ishita Chowdhury	Bride- Internal	Provide requirement, finalize options	ishita@abc.com +880 141330029	-Perfect reception and other arrangement	All	HH	Supporter
Star decorator	Decorator- External/ business partner	Stage decoration, supply flowers etc.	+880 141267937	Receive finalized requirement for stage and flowers five days before the program	Execution	LL	Neutral
Mehedi Alam	Groom- external	Finalize grooms outfit and excessories	Mehedi.al@abc.com +880 146044839	Groom's family should be happy No conflict in the program	Planning	LH	Supporter
Mukul Jamil	Cousin of Ishita	Coordinate with grooms family	mukul@abc.com +880 1455443322	The gaye holud program should be well organized	Execution	LH	Supporter
Abdullah Transport	Business partner	Provide transportation when required	+880 14986732	Give 2 days prior notice	Execution	LL	Neutral

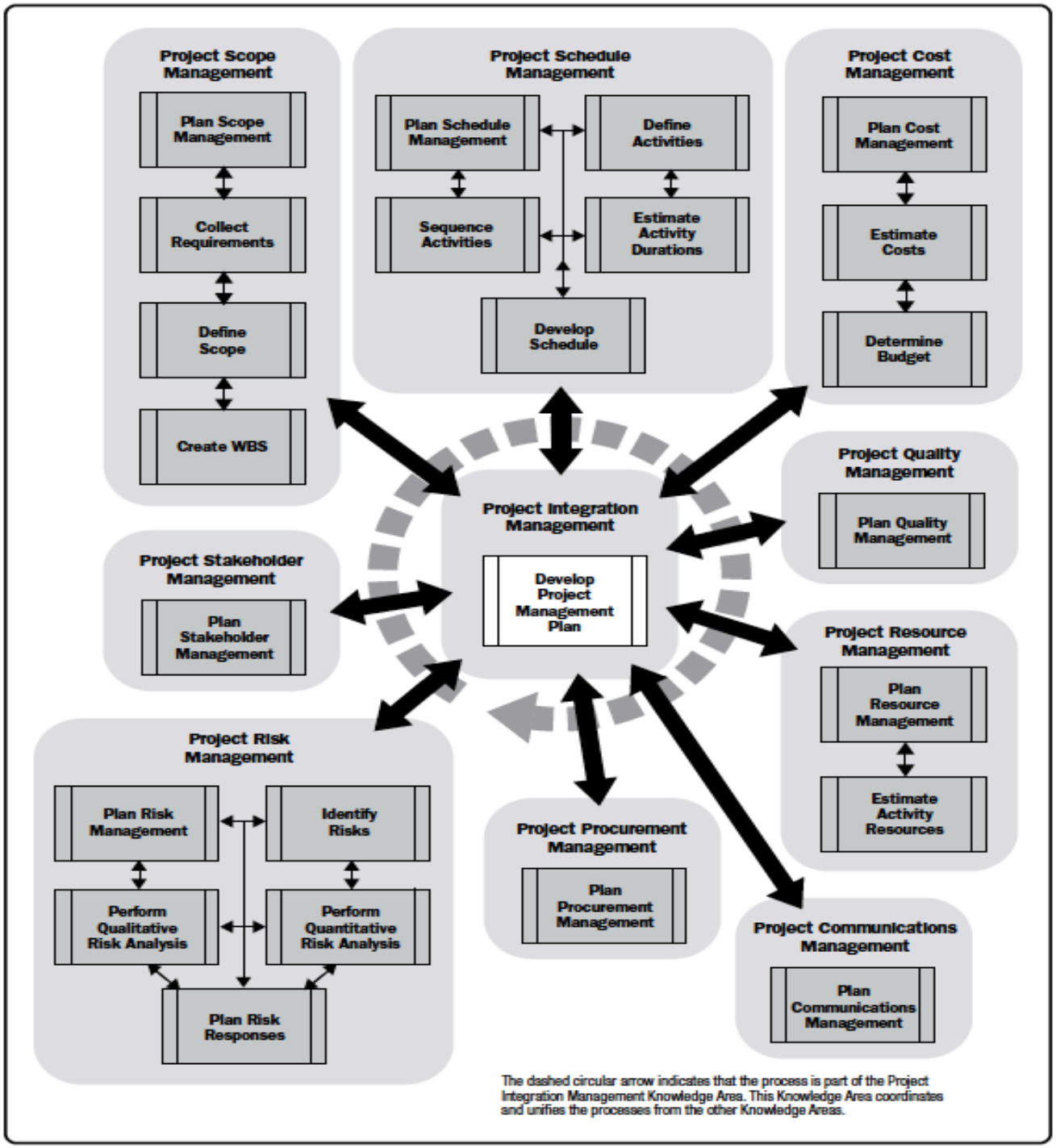
Copyright © Strategic Transformation Consultants Ltd.

End of Initiating Process Group

Copyright © Strategic Transformation Consultants Ltd.

Planning Process Group

Copyright © Strategic Transformation Consultants Ltd.


Project Scope Management
Plan Scope Management
Collect Requirements
Define Scope
Create WBS
Project Schedule Management
Plan Schedule Management
Define Activities
Sequence Activities
Estimate Activity Durations
Develop Schedule
Project Cost Management
Plan Cost Management
Estimate Costs
Determine Budget
Project Quality Management
Plan Quality Management
Project Integration Management
Develop Project Management Plan
Project Stakeholder Management
Plan Stakeholder Management
Project Resource Management
Plan Resource Management
Estimate Activity Resources
Project Risk Management
Plan Risk Management
Identify Risks
Perform Qualitative Risk Analysis
Perform Quantitative Risk Analysis
Plan Risk Responses
Project Procurement Management
Plan Procurement Management
Project Communications Management
Plan Communications Management
The dashed circular arrow indicates that the process is part of the Project Integration Management Knowledge Area. This Knowledge Area coordinates and unifies the processes from the other Knowledge Areas.

Project Scope Management

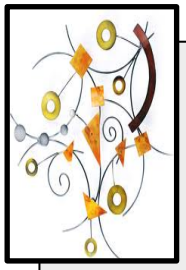
- Project Scope Management includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully.
- Managing the project scope is primarily concerned with defining and controlling what is and is not included in the project.

Copyright © Strategic Transformation Consultants Ltd.

Project Scope Management Processes

Plan Scope Management

- Plan Scope Management—The process of creating a scope management plan that documents how the project and product scope will be defined, validated, and controlled.



Collect Requirements

- The process of determining, documenting, and managing stakeholder needs and requirements to meet project objectives.

Define Scope

- The process of developing a detailed description of the project and product.

Create WBS

- The process of subdividing project deliverables and project work into smaller, more manageable components.

Validate Scope

—The process of formalizing acceptance of the completed project deliverables.

Control Scope

- The process of monitoring the status of the project and product scope and managing changes to the scope baseline.

Copyright © Strategic Transformation Consultants Ltd.

Product and Project Scope

In the project context, scope can be referred to

Product Scope

- The features and functions that characterize a product, service, or result.

Project Scope

- The work performed to deliver a product, service, or result with the specified features and functions. The term “project scope” is sometimes viewed as including product scope.

Copyright © Strategic Transformation Consultants Ltd.

Plan Scope Management: ITTO

Plan Scope Management is the process of creating a scope management plan that documents how the project and product scope will be defined, validated, and controlled.

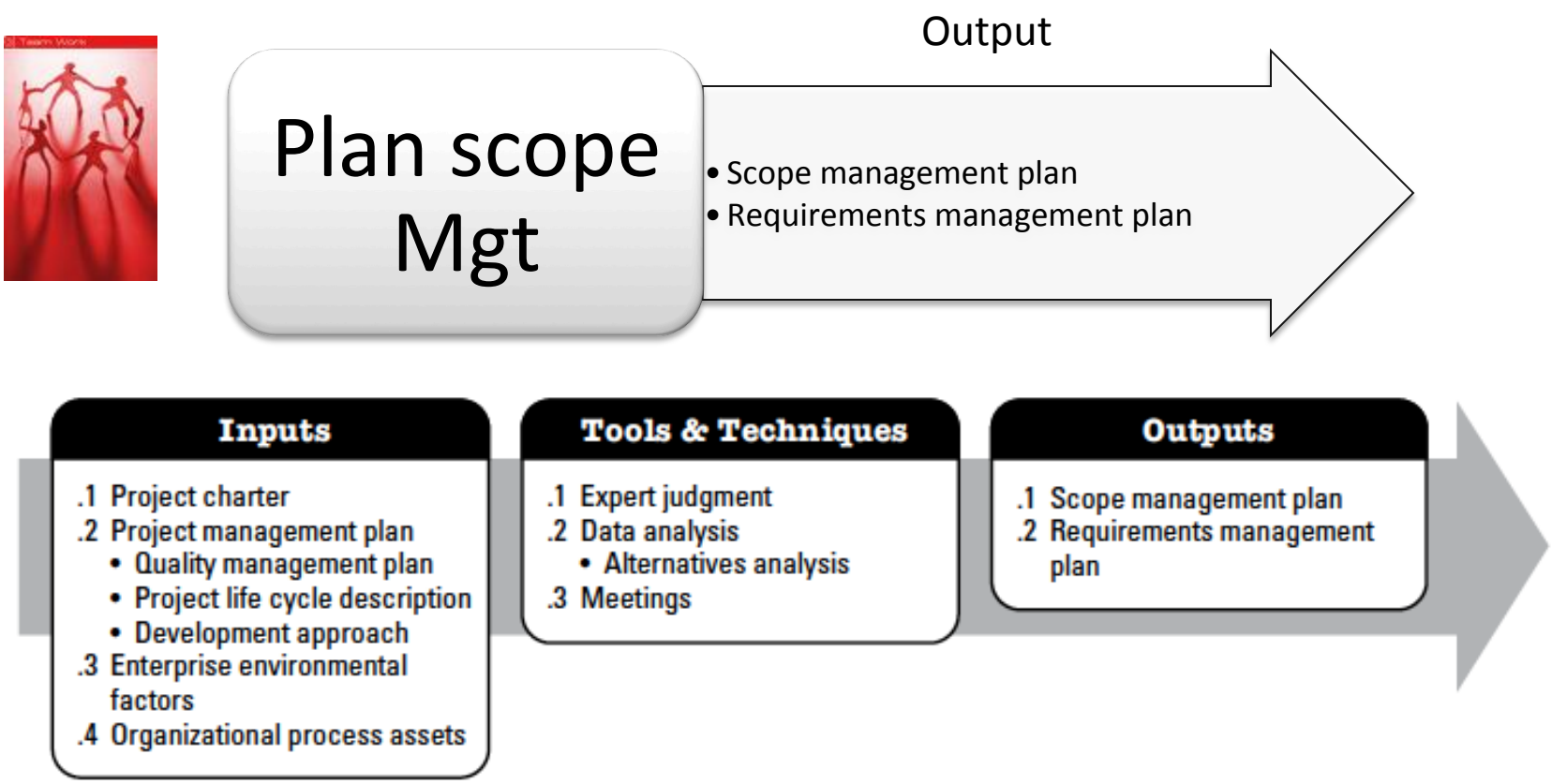


Figure 5-2. Plan Scope Management: Inputs, Tools & Techniques, and Outputs

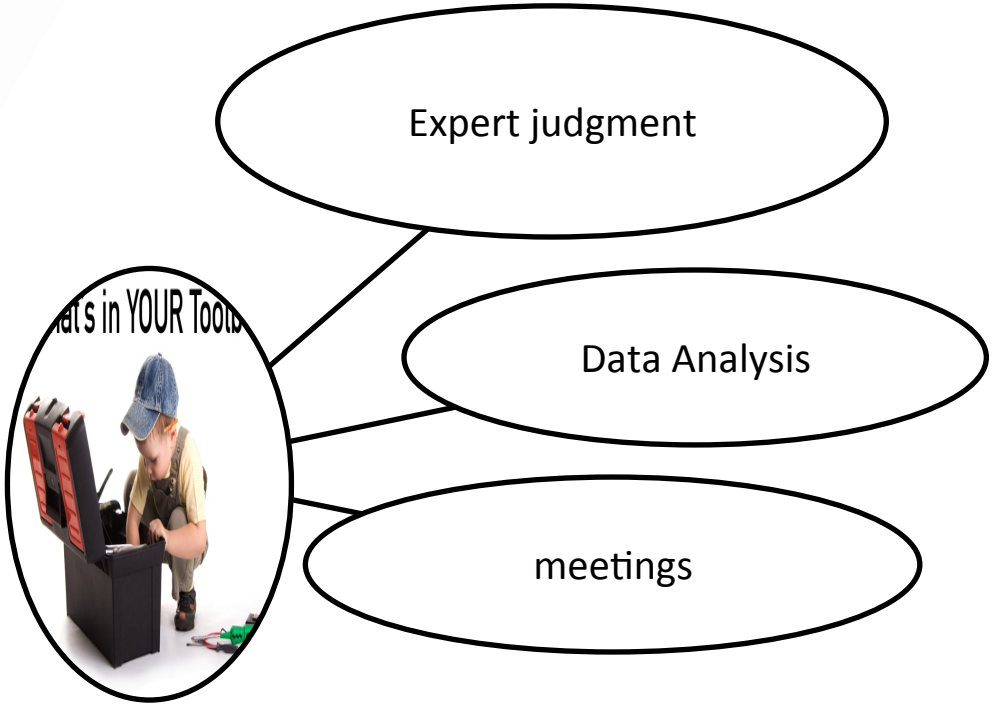
Copyright © Strategic Transformation Consultants Ltd.

Plan Scope Management -Input

Project charter	• From project charter, we get project purpose, high-level project description, assumptions, constraints, and high-level requirements that the project is intended to satisfy.
Project Mgt plan	• Quality management plan, Project life cycle description, Development approach
EEF	• Organizations culture, infrastructure, personnel administration and marketplace condition
OPA	• Policy, procedure, historical information, lesson learned

Copyright © Strategic Transformation Consultants Ltd.

Plan scope mgt- Tools and Techniques



Copyright © Strategic Transformation Consultants Ltd.

Plan Scope Management -TT

Expert judgment

- From knowledgeable and experienced parties

Data Analysis

- A data analysis technique that can be used for this process includes but is not limited to alternatives analysis.
  Various ways of collecting requirements, elaborating the project and product scope, creating the product, validating
  the scope, and controlling the scope are evaluated.

Meetings

- Attendees at these meeting my include project manager, project sponsor, selected team members etc.

Copyright © Strategic Transformation Consultants Ltd.

Plan Scope Management -output

Scope management plan

- The scope management plan is a component of the project management plan that describes how the scope will be defined, developed, monitored, controlled, and validated. The - components of a scope management plan include:
  - Process for preparing a project scope statement;
  - Process that enables the creation of the WBS from the detailed project scope statement;
  - Process that establishes how the scope baseline will be approved and maintained; and
  - Process that specifies how formal acceptance of the completed project deliverables will be obtained.

Requirement management plan

- Components of the requirements management plan can include but are not limited to:
  - How requirements activities will be planned, tracked, and reported;
  - Configuration management activities such as: how changes will be initiated; how impacts will be analyzed; how they will be traced, tracked, and reported; as well as the authorization levels required to approve these changes;
  - Requirements prioritization process;
  - Metrics that will be used and the rationale for using them; and
  - Traceability structure that reflects the requirement attributes captured on the traceability matrix.

Copyright © Strategic Transformation Consultants Ltd.

Collect Requirements ITTO

Process

Collect Requirements

Output

- Requirement Documentation
- Requirement Traceability Matrix

Inputs	Tools & Techniques	Outputs
.1 Project charter .2 Project management plan • Scope management plan • Requirements management plan • Stakeholder engagement plan .3 Project documents • Assumption log • Lessons learned register • Stakeholder register .4 Business documents • Business case .5 Agreements .6 Enterprise environmental factors .7 Organizational process assets	.1 Expert judgment .2 Data gathering • Brainstorming • Interviews • Focus groups • Questionnaires and surveys • Benchmarking .3 Data analysis • Document analysis .4 Decision making • Voting • Multicriteria decision analysis .5 Data representation • Affinity diagrams • Mind mapping .6 Interpersonal and team skills • Nominal group technique • Observation/conversation • Facilitation .7 Context diagram .8 Prototypes	.1 Requirements documentation .2 Requirements traceability matrix

Figure 5-4. Collect Requirements: Inputs, Tools & Techniques, and Outputs

Copyright © Strategic Transformation Consultants Ltd.

Collect Requirements-Input

Project Charter

- The project charter documents the high-level project description and high-level requirements that will be used to develop detailed requirements.

Project Management Plan

- Scope management plan.
- Requirement management plan
- Stakeholder management plan

Project Documents

- Assumption log
- Lesson learned register
- Stakeholder register

Copyright © Strategic Transformation Consultants Ltd.

Collect Requirements-Input

Business Documents

- A business document that can influence the Collect Requirements process is the business case, which can describe required, desired, and optional criteria for meeting the business needs.

Agreement

- Agreements can contain project and product requirements.

EEF

- Organization's culture, Infrastructure, Personnel administration, and Marketplace conditions.

OPA

- Policies and procedures, and Historical information and lessons learned repository with information from previous projects.

Copyright © Strategic Transformation Consultants Ltd.

Collect Requirements- TT

1. Expert Judgment
2. Data Gathering
.3 Data analysis
4 Decision making
.5 Data representation
6 Interpersonal and team skills
7 Context diagram
.8 Prototypes

Copyright © Strategic Transformation

Collect Requirements-TT

1. Expert Judgment

Expertise should be considered from individuals or groups with specialized knowledge
or training in the following topics:

- Business analysis,
- Requirements elicitation,
- Requirements analysis,
- Requirements documentation,
- Project requirements in previous similar projects,
- Diagramming techniques,
- Facilitation, and
- Conflict management.

Copyright © Strategic Transformation Consultants Ltd.

Collect Requirements-TT

2. Data Gathering

- Brainstorming is a technique used to generate and collect multiple ideas related to project and product requirements.

Brainstorming:

- An interview is a formal or informal approach to elicit information from stakeholders by talking to them directly.

Interview

- Focus groups bring together prequalified stakeholders and subject matter experts to learn about their expectations and attitudes about a proposed product, service, or result.

Focus Group

- Questionnaires and surveys are written sets of questions designed to quickly accumulate information from a large number of respondents

Questionnaire and Surveys

- Benchmarking involves comparing actual or planned products, processes, and practices to those of comparable organizations

Benchmarking

Collect Requirements-TT

	3. Data Analysis Agreements, Business plans, Business process or interface documentation; Business rules repositories; Current process flows; Marketing literature; Problem/issue logs; Policies and procedures, Regulatory documentation such as laws, codes, or ordinances, etc.; Requests for proposal; and Use cases.

Copyright © Strategic Transformation Consultants Ltd.

Collect Requirements-TT

4. Decision Making

- Voting
  - Unanimity: 100% agreement
  - Majority: 50% +
  - Plurality: largest block
- Autocratic Decision Making
- Multicriteria decision analysis

5. Data Representation

- Affinity Diagram
- Mind Mapping

6. Interpersonal and Team skills

- Nominal group technique
- Observation and conversation
- facilitation

Copyright © Strategic Transformation Consultants Ltd.

Collect Requirements-TT

7. Context diagram

- Example of a scope model
- Visualy depict the product scope by showing business system and how people and other system interact with it.

8.Prototype

Prototyping is a method of obtaining early feedback on requirements by providing a model of the expected product before actually building it.

Copyright © Strategic Transformation Consultants Ltd.

Collect Requirements-Output

Requirement Documentation

- Business requirement
- Stakeholders requirements
- Solution requirements
  - Functional & non functional requirements
- Transition and readiness requirements
- Project requirement
- Quality requirement

Requirement traceability matrix

- Requirement to
  - business need, opportunity, goal
  - Project objectives
  - WBS deliverables
  - Product design and development
  - Test scenario
  - High level to detail level

Copyright © Strategic Transformation Consultants Ltd.

Snapshots of Requirement Document

Functional Requirement

3.1 Functional Requirement

SALES FEATURES		Priority	High
Name	S.001 Include all existing Utility Service Provider		
Summary	They system should be able to handle payment request of all existing utility service providers		
Rationale	The solution is expected to be very		
Requirement	Warid's Utility Bill Payment service should be a hassle free and secured solution to pay the following bills by both the Warid and other operators subscribers: • DPDC (formerly DESA) • DESCO • TITAS • BPDB • WASA • BTCL (formerly BTTB)		
Comments from Technical	Engr Feedback: Need the detailed process description of all the utility services to be implemented along with the interfaces Outcome of discussion: Engineering requested to make sure that Utility bill company inform any changes in their system configuration Engineering in advance. PMO to make sure the same is properly addressed in contract, MOU or other document.		

3.2 Non-Functional Requirement

Name	C021 Security	Priority	High
Summary	The system should be fully secured. All data should be encrypted...		
Rationale	To protect customer, Channel Partner and Warid interest		
Requirement			
Comment			
Comments from Technical	This depends on the access channel.		

Non-Functional Requirement

Copyright © Strategic Transformation Ltd.

Example

Requirements Traceability Matrix								
Project Name:								
Cost Center:								
Project Description:								
ID	**Associate ID**	**Requirements Description**	**Business Needs, Opportunities, Goals, Objectives**	**Project Objectives**	**WBS Deliverables**	**Product Design**	**Product Development**	**Test Cases**
001	1.0							
	1.1							
	1.2							
	1.2.1							
002	2.0							
	2.1							
	2.1.1							
003	3.0							
	3.1							
	3.2							
004	4.0							
005	5.0							

Copyright © Strategic Transformation Consultants Ltd.

Define Scope

The process of developing a detailed description of the project and product

Process

Output

Define Scope

- Project Scope Statement
- Project Document Updates

Inputs	Tools & Techniques	Outputs
.1 Project charter .2 Project management plan • Scope management plan .3 Project documents • Assumption log • Requirements documentation • Risk register .4 Enterprise environmental factors .5 Organizational process assets	.1 Expert judgment .2 Data analysis • Alternatives analysis .3 Decision making • Multicriteria decision analysis .4 Interpersonal and team skills • Facilitation .5 Product analysis	.1 Project scope statement .2 Project documents updates • Assumption log • Requirements documentation • Requirements traceability matrix • Stakeholder register

Figure 5-8. Define Scope: Inputs, Tools & Techniques, and Outputs

Copyright © Strategic Transformation Consultants Ltd.

Define Scope-Input

1 Project charter

- The project charter provides the high-level project description, product characteristics, and approval requirements.

2 Project management plan

- A project management plan component includes but is not limited to the scope management plan, which documents how the project scope will be defined, validated,
  and controlled.

3 Project documents

- Assumption log
- Requirements documentation
- Risk register

Copyright © Strategic Transformation Consultants Ltd.

Define Scope-Input

4 Enterprise environmental factors

- Organization's culture,
- Infrastructure,
- Personnel administration, and
- Marketplace conditions.

5 Organizational process assets

- Policies, procedures, and templates for a project scope statement;
- Project files from previous projects; and
- Lessons learned from previous phases or projects.

Copyright © Strategic Transformation Consultants Ltd.

Define Scope-Tools and Techniques

1. Expert judgment
2. Data Analysis
3. Decision Making
4. Interpersonal and team skills
5 Product analysis

Copyright © Strategic Transformation Consultants Ltd.

Define scope-TT

1. Expert Judgment	• Expertise should be considered from individuals or groups with knowledge of or experience with similar projects.
DATA ANALYSIS	• An example of a data analysis technique that can be used in this process includes but is not limited to alternatives analysis. Alternatives analysis can be used to evaluate ways to meet the requirements and the objectives identified in the charter.
DECISION MAKING	• Described in Section 5.1.2.2. A decision-making technique that can be used in this process includes but is not limited to multicriteria decision analysis.

Copyright © Strategic Transformation Consultants Ltd.

Define scope-TT

4 Interpersonal And Team Skills	• Described in Section 4.1.2.3. An example of an interpersonal and team skills technique is facilitation. Facilitation is used in workshops and working sessions with key stakeholders who have a variety of expectations or fields of expertise. T
5. Product Analysis	• Product breakdown, • Requirements analysis, • Systems analysis, • Systems engineering, • Value analysis, and • Value engineering.

Copyright © Strategic Transformation Consultants Ltd.

Define Scope-Output

1. Project scope statement

- Product scope description.
- Deliverables
- Acceptance criteria
- Project exclusion

document

- Assumption log
- Requirement documentation
- Requirement tractability matrix
- Stakeholder register

Copyright © Strategic Transformation Consultants Ltd.

1.1 Civil Works for Data Center

1.1.1 Dismantling Works:

Dismantling of the any existing 10"/5" bricks wall, RCC work, carefully removing other fitting, door, shutter & frame opening etc, existing chamber as per drawing-design and stack the debris to the safe distance as per instruction.

1.1.2 Brick Works:

125mm brick work with 1st class bricks in cement mortar (1:4) and making bond with connected walls in/c racking out joints, filling the intersects with mortar, cleaning and soaking the bricks at least for 24 hours before use and washing of sand, necessary scaffolding, curing at least 7 days.

Copyright © Strategic Transformation Consultants Ltd.

1.1.3 Plaster Works with Damp proof chemical curing:

Minimum 1/2" plaster to wall (1:3) inner surface of the building, finishing the corner and edges in/c removing the existing damp plaster (if necessary), washing of sand, cleaning the surface with clean water, necessary scaffolding.

1.1.4 Paint Works: Plastic emulsion paint of approved color of Berger to wall/column of inside wall of two coats over a coat of brand specified primer / scalar collapsing specified time for drying/recoating including cleaning, drying, making free from dirt grease, wax, removing all chalked and scald materialism fungus, mending grid the surface defects, sand papering the surface and necessary scaffolding by roller/ spray etc and printing with two coats of synthetic enamel paint approved color over a coat of priming etc all complete as per direction. Epoxy Paint, Fire proof, Damp proof industrial paint, 3 coat.

Copyright © Strategic Transformation Consultants Ltd.

Create work Breakdown Structure

Create WBS is the process of subdividing project deliverables and project work into smaller, more manageable components. The key benefit of this process is that it provides a framework of what has to be delivered.

Create WBS

- Scope Baseline
- Project Document Update

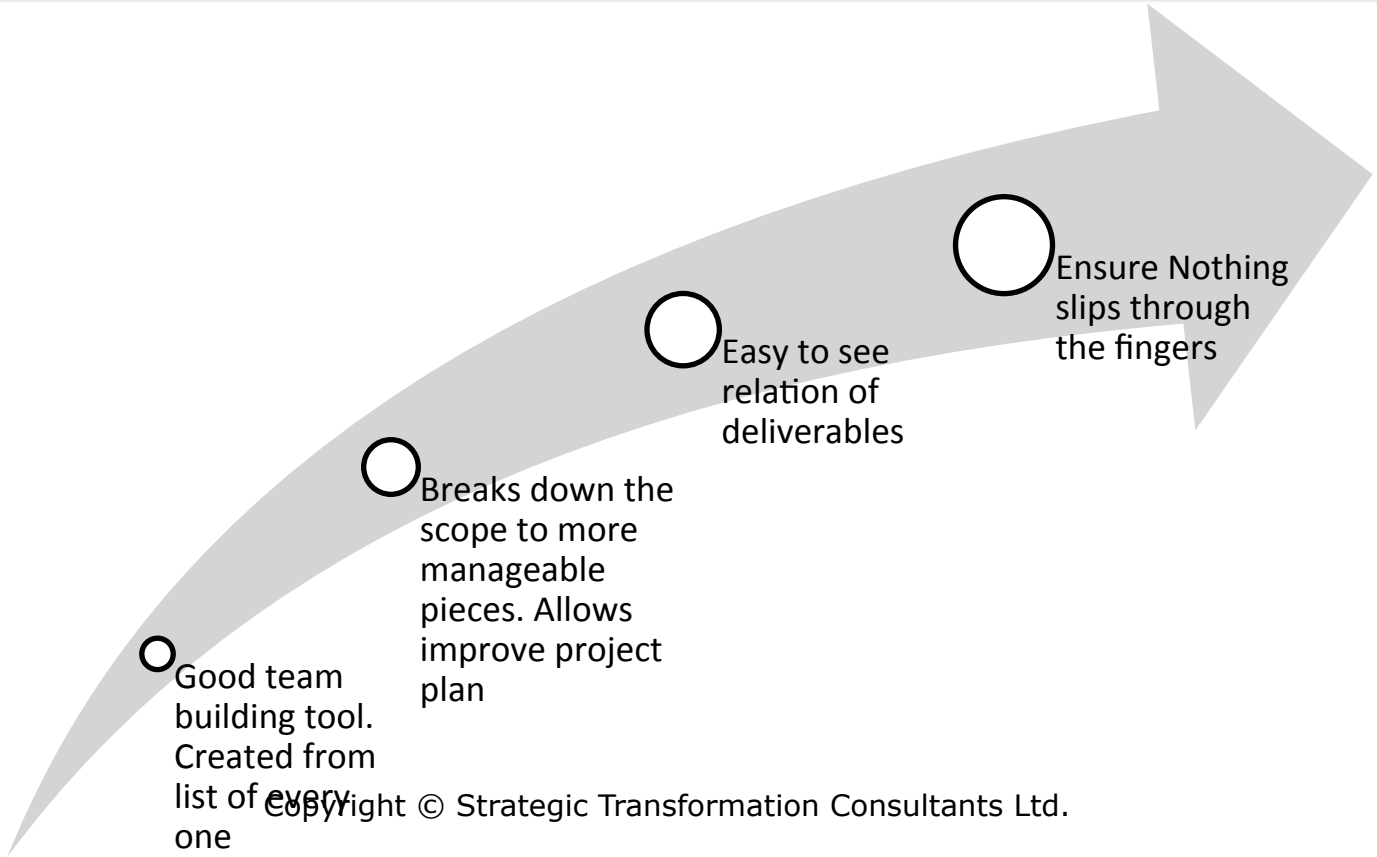
Inputs	Tools & Techniques	Outputs
.1 Project management plan • Scope management plan .2 Project documents • Project scope statement • Requirements documentation .3 Enterprise environmental factors .4 Organizational process assets	.1 Expert judgment .2 Decomposition	.1 Scope baseline .2 Project documents updates • Assumption log • Requirements documentation

Figure 5-10. Create WBS: Inputs, Tools & Techniques, and Outputs

Copyright © Strategic Transformation Consultants Ltd.

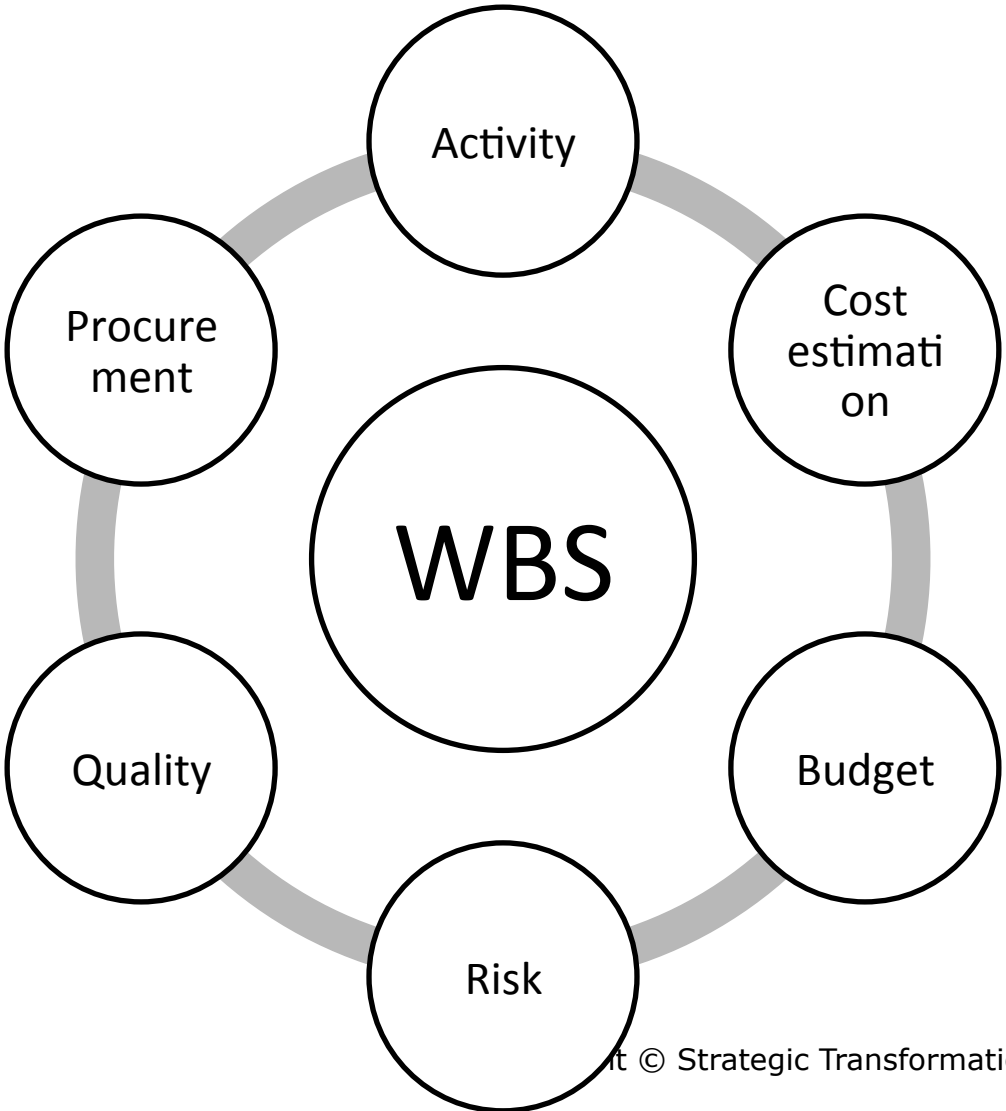
Basic idea-Why WBS

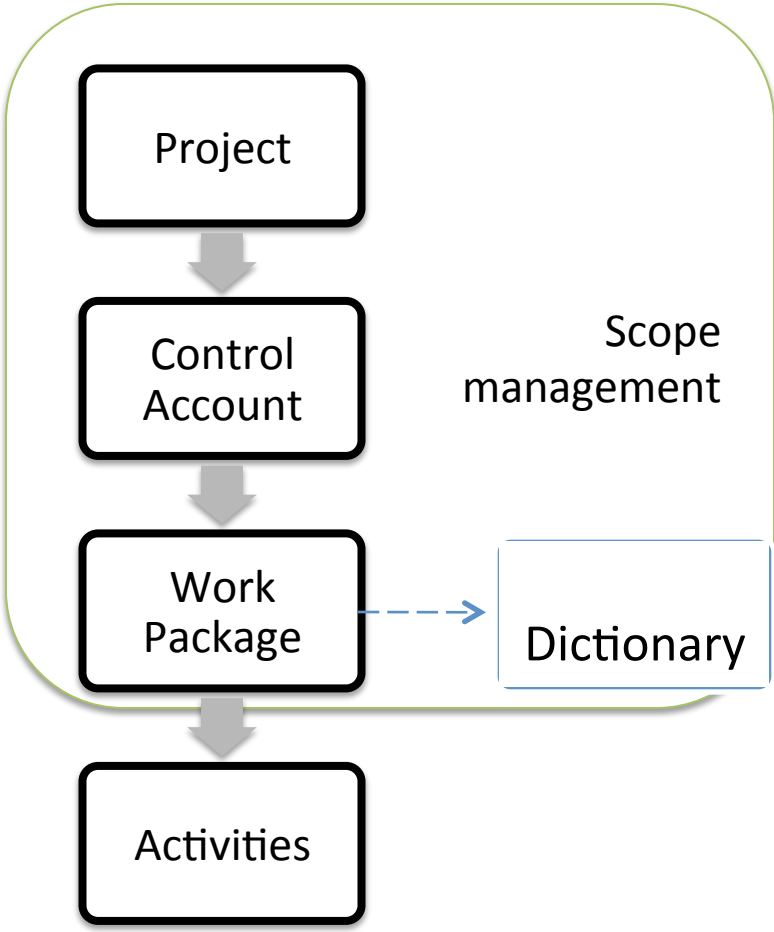
PMIism: WBS is used for every project



Copyright © Strategic Transformation Consultants Ltd.

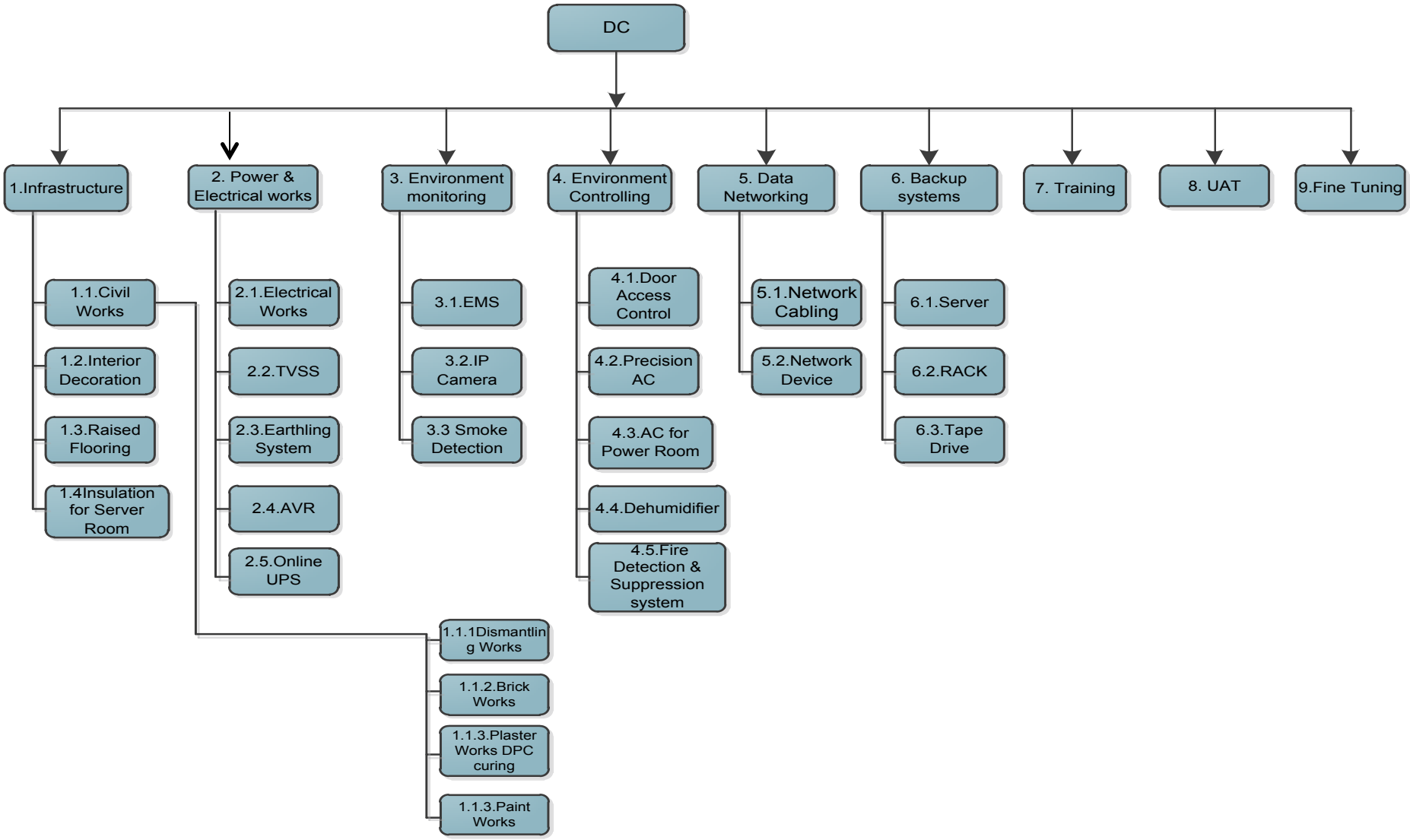
Basic idea-WBS output and relationship





nt © Strategic Transformation Consultants Ltd.

WBS of Data Center



Copyright © Strategic Transformation Consultants Ltd.

Create WBS-Input

1 Project management plan

- A project management plan component includes but is not limited to the scope management plan.

.2 Project documents

- Project scope statement
- Requirement documentation

.3 Enterprise environmental factors

- The enterprise environmental factors that can influence the Create WBS process include but are not limited to industry-specific WBS standards that are relevant to the nature of the project

.4 Organizational process assets

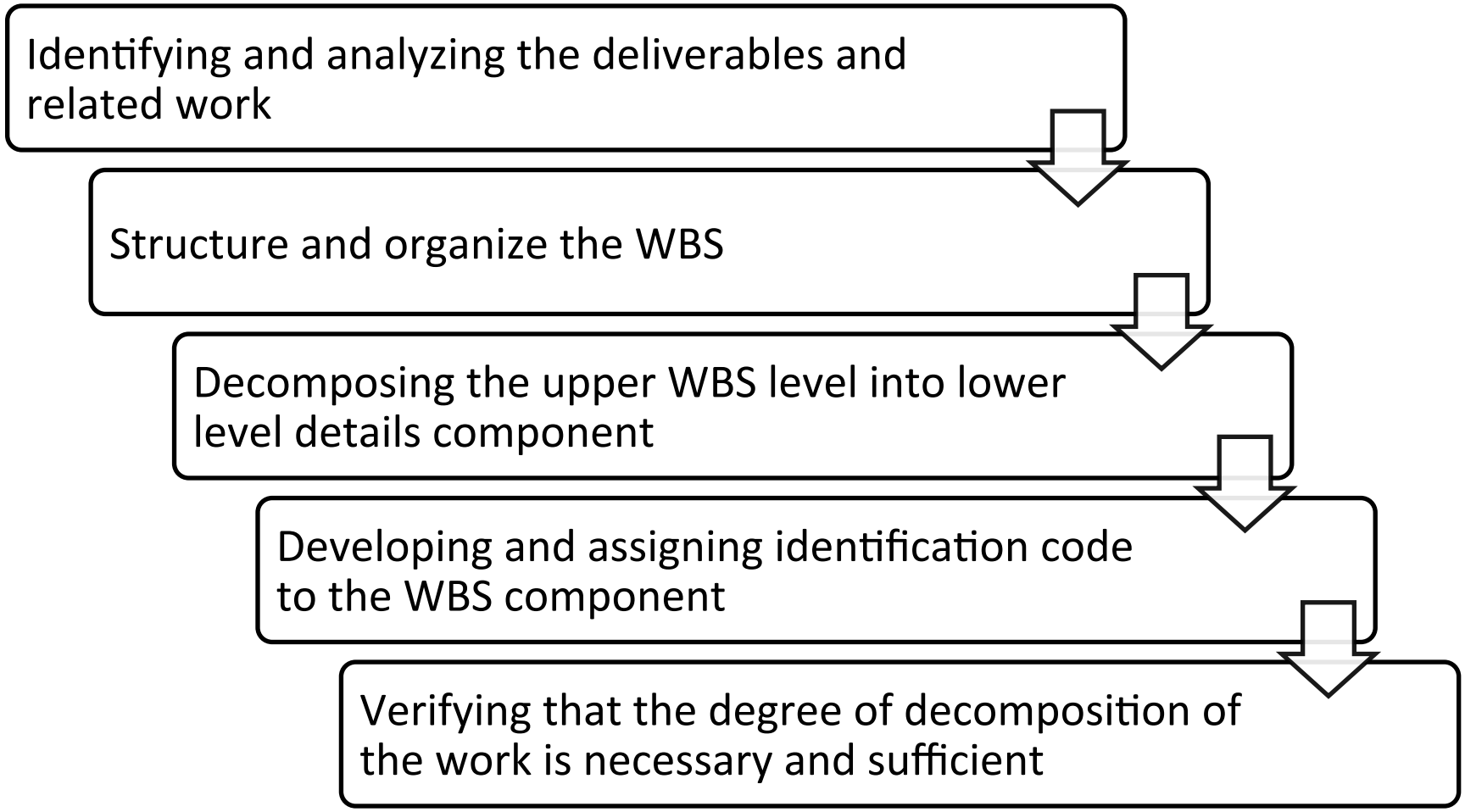
- that can influence the Create WBS process include but are not limited to:
  -Policies, procedures, and templates for the WBS;
  - Project files from previous projects; and
  - Lessons learned from previous projects.

Copyright © Strategic Transformation Consultants Ltd.

Create WBS-TT

Copyright © Strategic Transformation Consultants Ltd.

Decomposition Activity



- Rolling wave planning applies in case of decomposition
- 100 % rule

Copyright © Strategic Transformation Consultants Ltd.

WBS

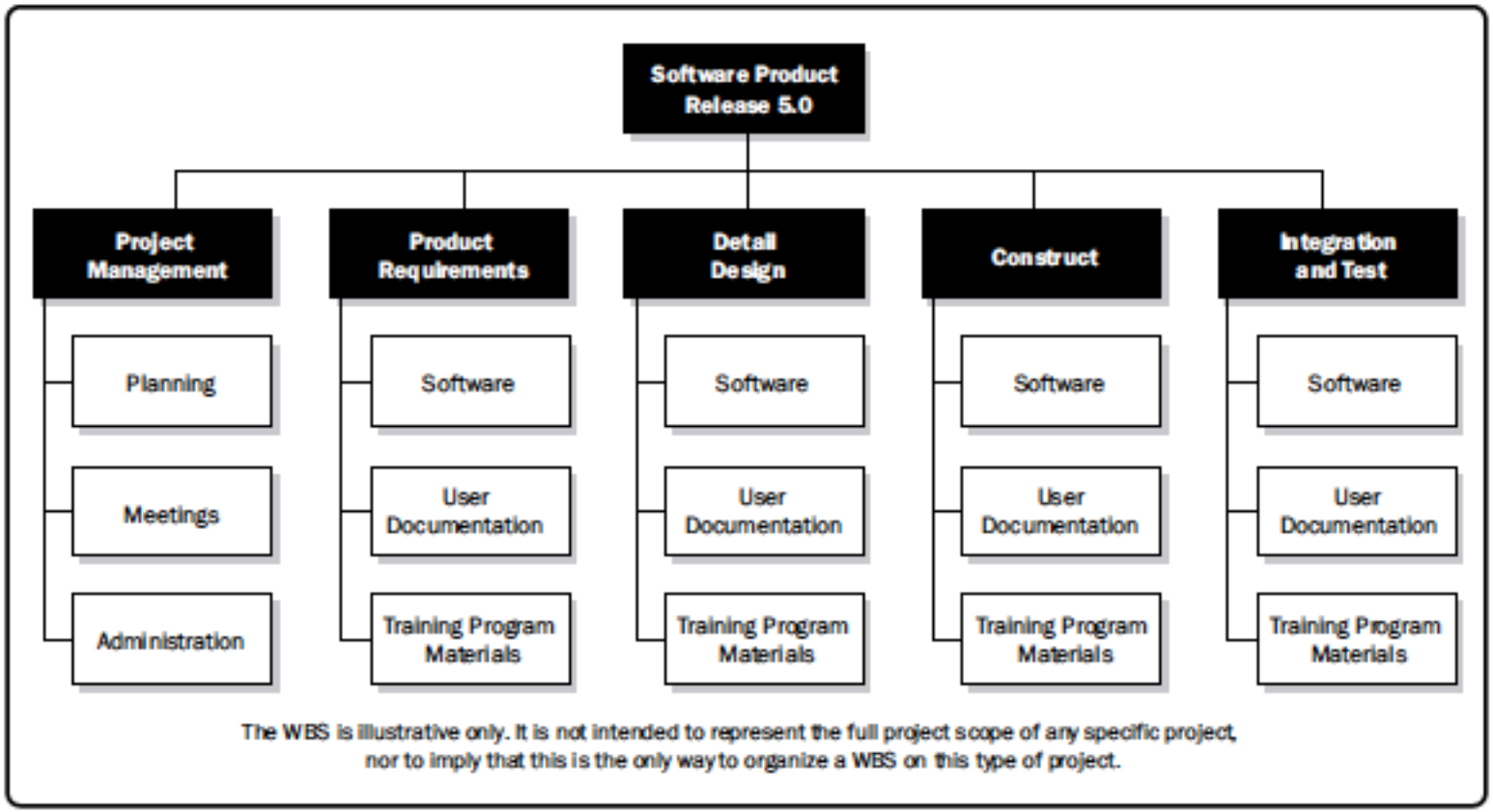


Figure 5-13. Sample WBS Organized by Phase

Copyright © Strategic Transformation Consultants Ltd.

WBS Sample

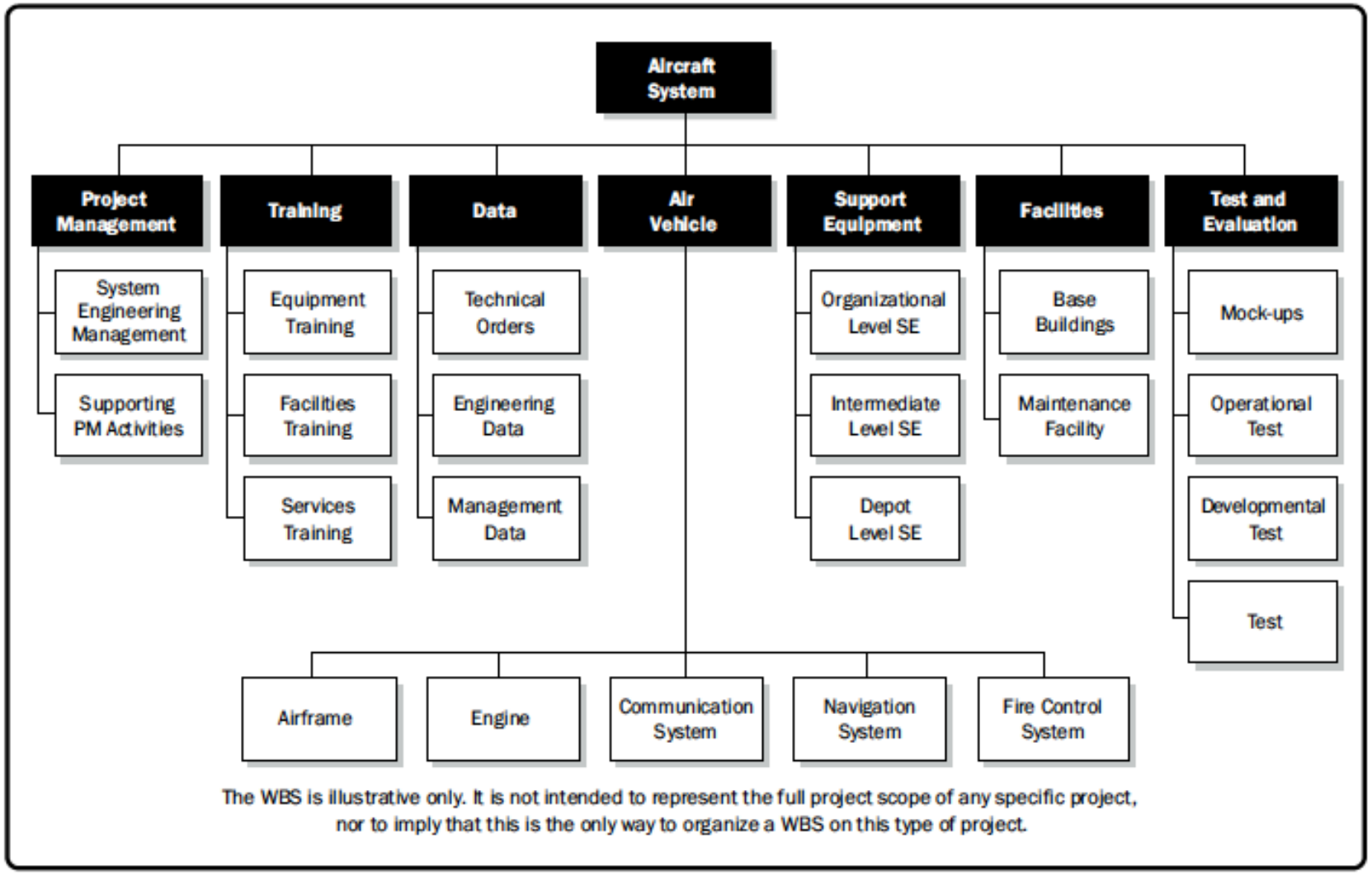


Figure 5-14. Sample WBS with Major Deliverables

Output

Project Scope Baseline

- Project Scope Statement
- WBS
- Work Package
- Planning Package
- WBS Dictionary
  - Code of account identifier
  - Description of work
  - Responsible organization
  - Schedule milestones, associated activities
  - Resource required, cost estimation,
  - acceptance criteria

Project Documents Update

- Assumption log
- Requirement Document

Copyright © Strategic Transformation Consultants Ltd.

Project Schedule Management Processes

6.1 Plan Schedule Management

- The process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule.

6.2 Define Activities

- The process of identifying and documenting the specific actions to be performed to produce the project deliverables.

6.3 Sequence Activities

- The process of identifying and documenting relationships among the project activities.

6.4 Estimate Activity Durations

- The process of estimating the number of work periods needed to complete individual activities with the estimated resources.

6.5 Develop Schedule

- The process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model for project execution and monitoring and controlling.

6.6 Control Schedule

- The process of monitoring the status of the project to update the project schedule and manage changes to the schedule baseline.

Figure 6-1 provides an overview of the Project Schedule Management

Copyright © Strategic Transformation Consultants Ltd.

Plan Schedule Management-ITTO

The process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule.

Plan schedule management

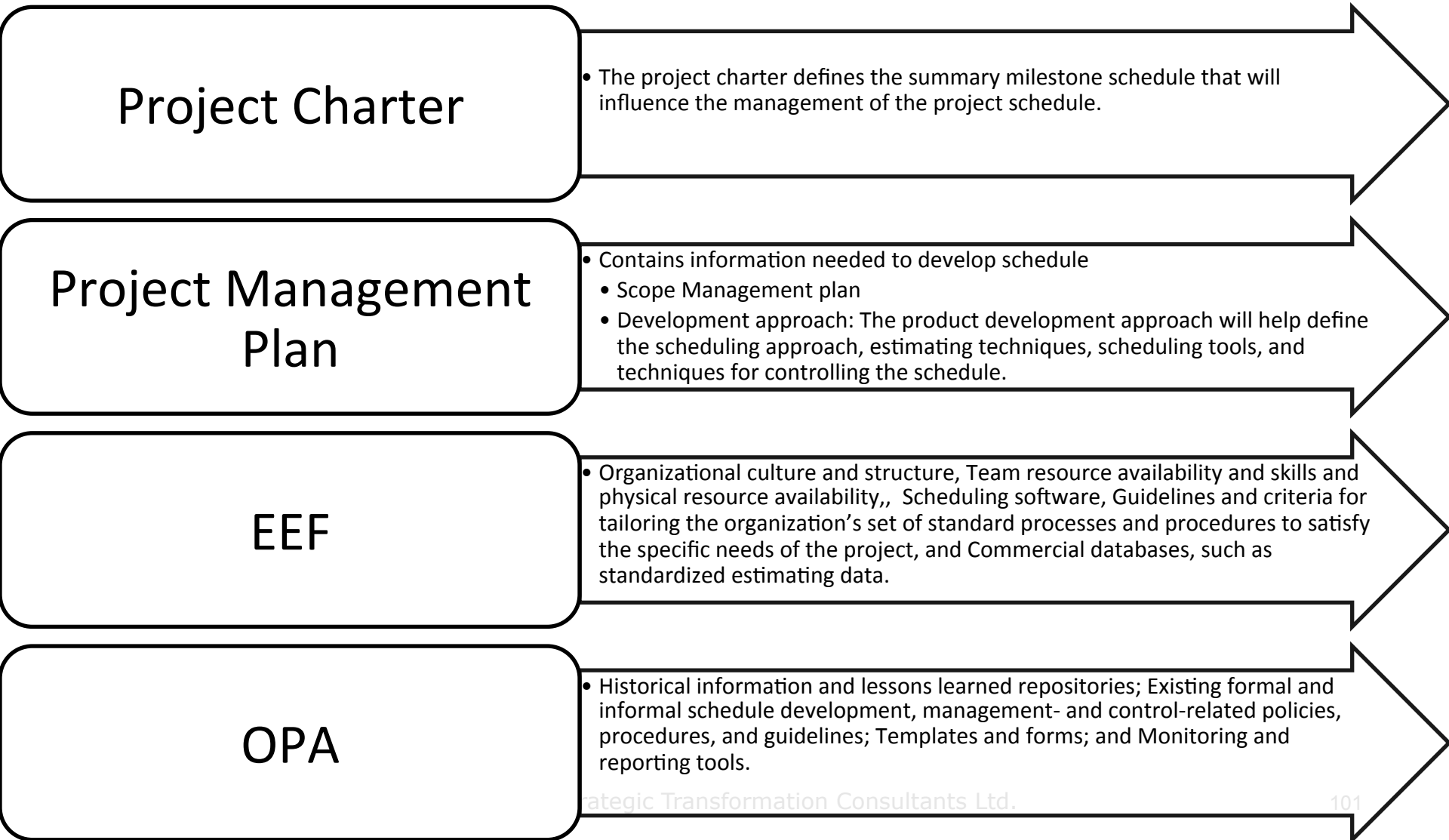
- Schedule Management Plan

Inputs	Tools & Techniques	Outputs
.1 Project charter .2 Project management plan • Scope management plan • Development approach .3 Enterprise environmental factors .4 Organizational process assets	.1 Expert judgment .2 Data analysis .3 Meetings	.1 Schedule management plan

Figure 6-3. Plan Schedule Management: Inputs, Tools & Techniques, and Outputs

Copyright © Strategic Transformation Consultants Ltd.

Input to Plan Schedule Management



Plan Schedule Management-TT

Copyright © Strategic Transformation Consultants Ltd.

Tools for plan schedule management

Expert judgment

- Those who have experience on similar project
  - Schedule development, management, and control;
  - Scheduling methodologies (e.g., predictive or adaptive life cycle);
  - Scheduling software; and
  - The specific industry for which the project is developed.

Data Analysis

- Alternatives analysis can include determining which schedule methodology to use, or how to combine various methods on the project.

Meeting

- Project team may hold meetings to develop the schedule management plan

Copyright © Strategic Transformation Consultants Ltd.

Output of schedule management plan

Schedule management plan

- Schedule Model: Scheduling methodologies and scheduling tools
- Release and iteration length. When using an adaptive life cycle, the time-boxed periods for releases, waves, and iterations are specified.
- Prescribed level of details necessary to manage the work
- Level of accuracy : acceptable range used to determining activity duration
- Unit of measure: staff hour, meter, liters, tons, kilometers etc
- Control threshold: variance threshold
- Rule of performance measurement: Earned value measurement technique (baseline, fixed formula) schedule performance measurement (SV, SPI)
- Reporting formats: format and frequency
- Process descriptions: schedule management processes are documented.

Copyright © Strategic Transformation Consultants Ltd.

Define Activities-ITTO

The process of identifying and documenting the specific actions to be performed to produce the project deliverables.

Define Activities

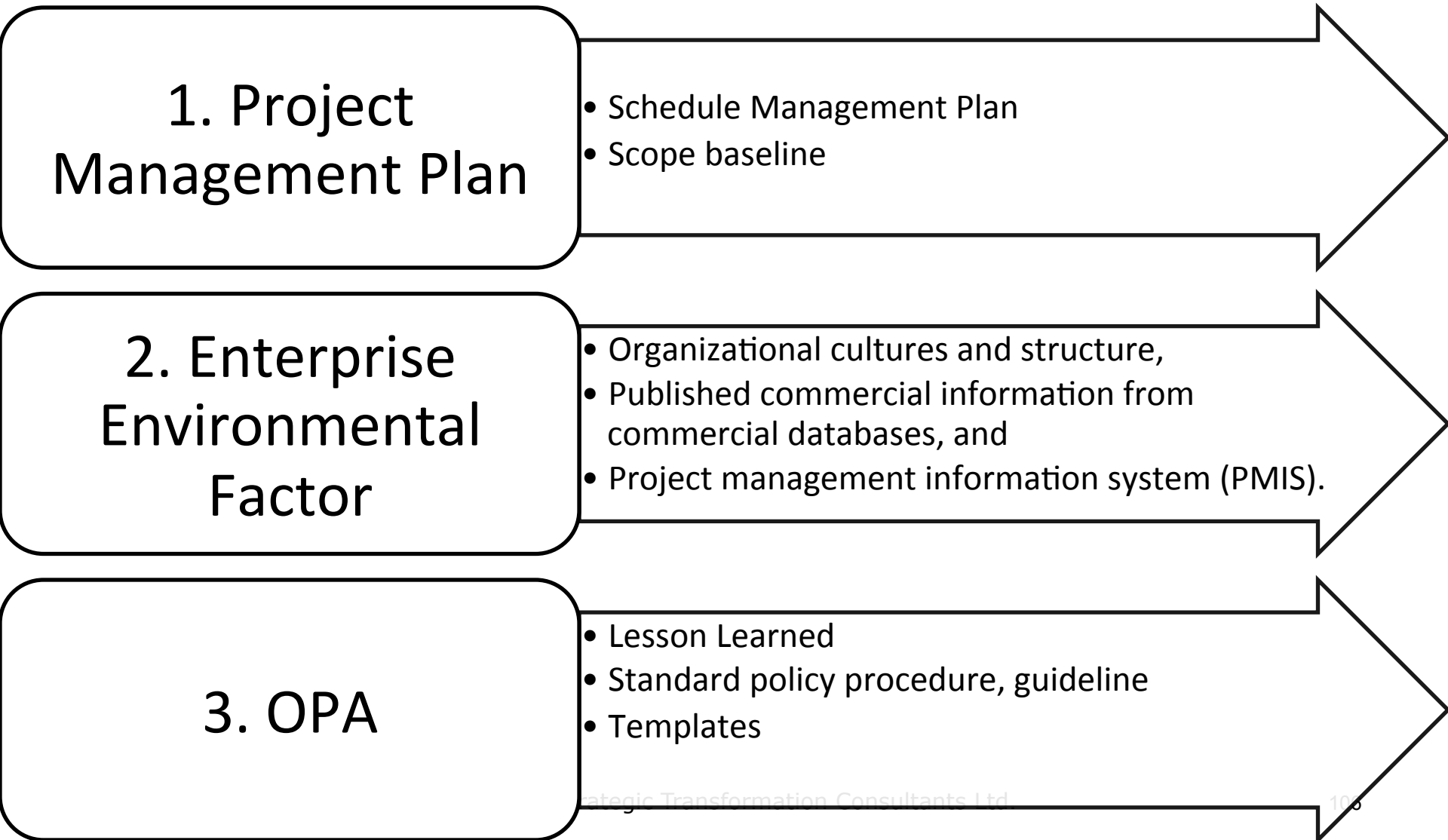
- Activity List
- Activity Attributes
- Milestone List

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Schedule management plan • Scope baseline .2 Enterprise environmental factors .3 Organizational process assets	.1 Expert judgment .2 Decomposition .3 Rolling wave planning .4 Meetings	.1 Activity list .2 Activity attributes .3 Milestone list .4 Change requests .5 Project management plan updates • Schedule baseline • Cost baseline

Figure 6-5. Define Activities: Inputs, Tools & Techniques, and Outputs

Copyright © Strategic Transformation Consultants Ltd.

Input to Define Activities



Define Activities-TT

Copyright © Strategic Transformation Consultants Ltd.

Tools for Define activities

1. Expert Judgment	• Team member • Other Expert
2. Decomposition	• Decomposition is a technique used for dividing and subdividing the project scope and project deliverables into smaller, more manageable parts.
3. Rolling Wave planning	• Near term is planned in detail, while work further in the future is planned at a higher level. It is a form of progressive elaboration applicable to work packages, planning packages, and release planning when using an agile or waterfall approach.
3. Meeting	• Meetings may be face-to-face, virtual, formal, or informal. Meetings may be held with team members or subject matter experts to define the activities needed to complete the work.

Copyright © Strategic Transformation Consultants Ltd.

Output of Define Activities

Activity List

- Comprehensive list including all schedule activities
- Included activity identifies and scope of work description

Activity Attributes

- the activity identifier, activity codes, activity description, predecessor activities, successor activities, logical relationships, leads and lags, resource requirements, imposed dates, constraints and assumptions

Milestone List

- Identifies all the milestones and indicates whether the milestone is mandatory (required by the contract) or optional (based on project requirements)

Copyright © Strategic Transformation Consultants Ltd.

Output of Define Activities

Change Request

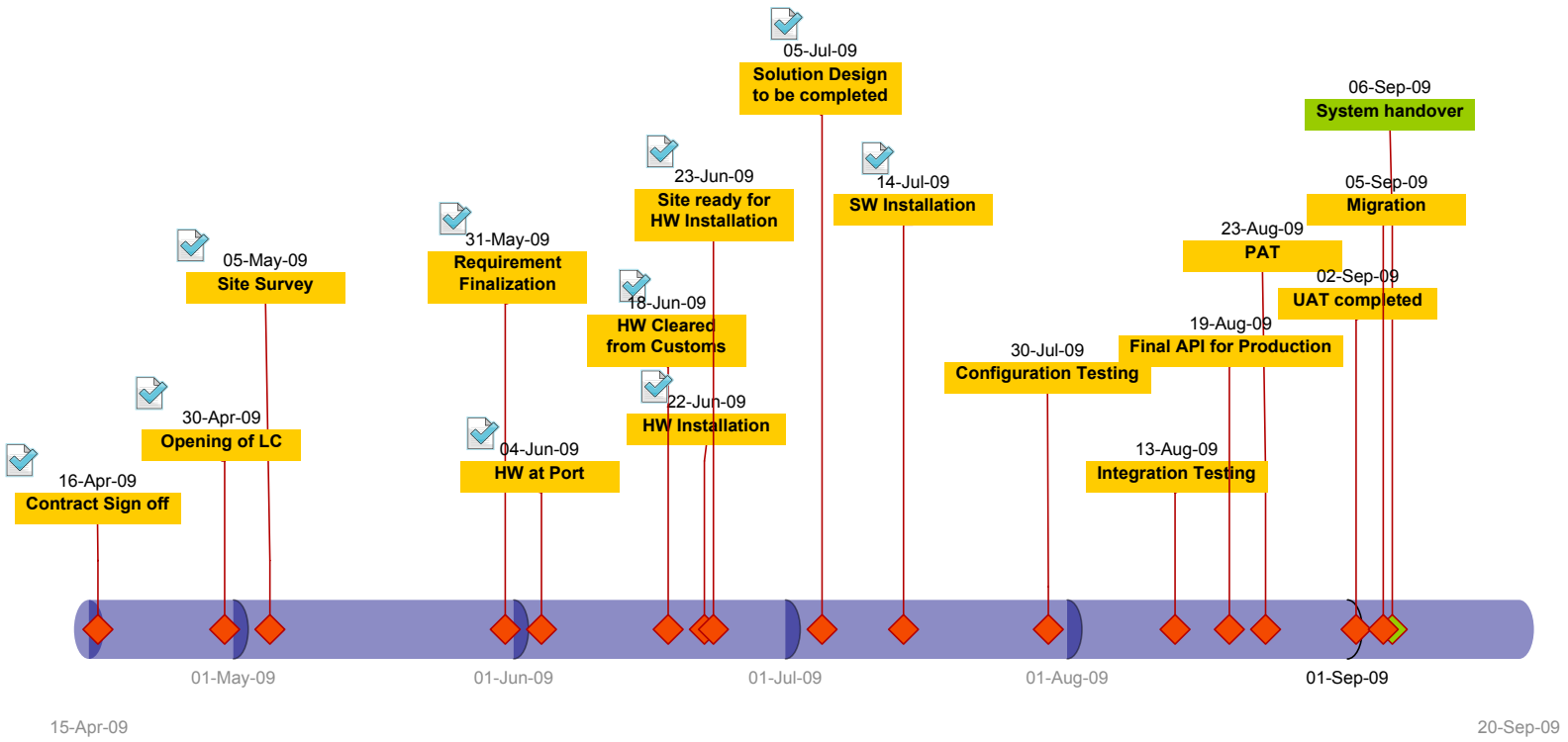
- Once the project has been baselined , the progressive elaboration of deliverables into activities may reveal work that was not initially part of the project baselines.

Project Management Plan Update

- Schedule baseline
- Cost baseline

Copyright © Strategic Transformation Consultants Ltd.

Milestone list



Back

Copyright © Strategic Transformation Consultants Ltd.

Sequence Activities-ITTO

Sequence Activities is the process of identifying and documenting relationships among the project activities. The key benefit of this process is that it defines the logical sequence of work to obtain the greatest efficiency given all project constraints.

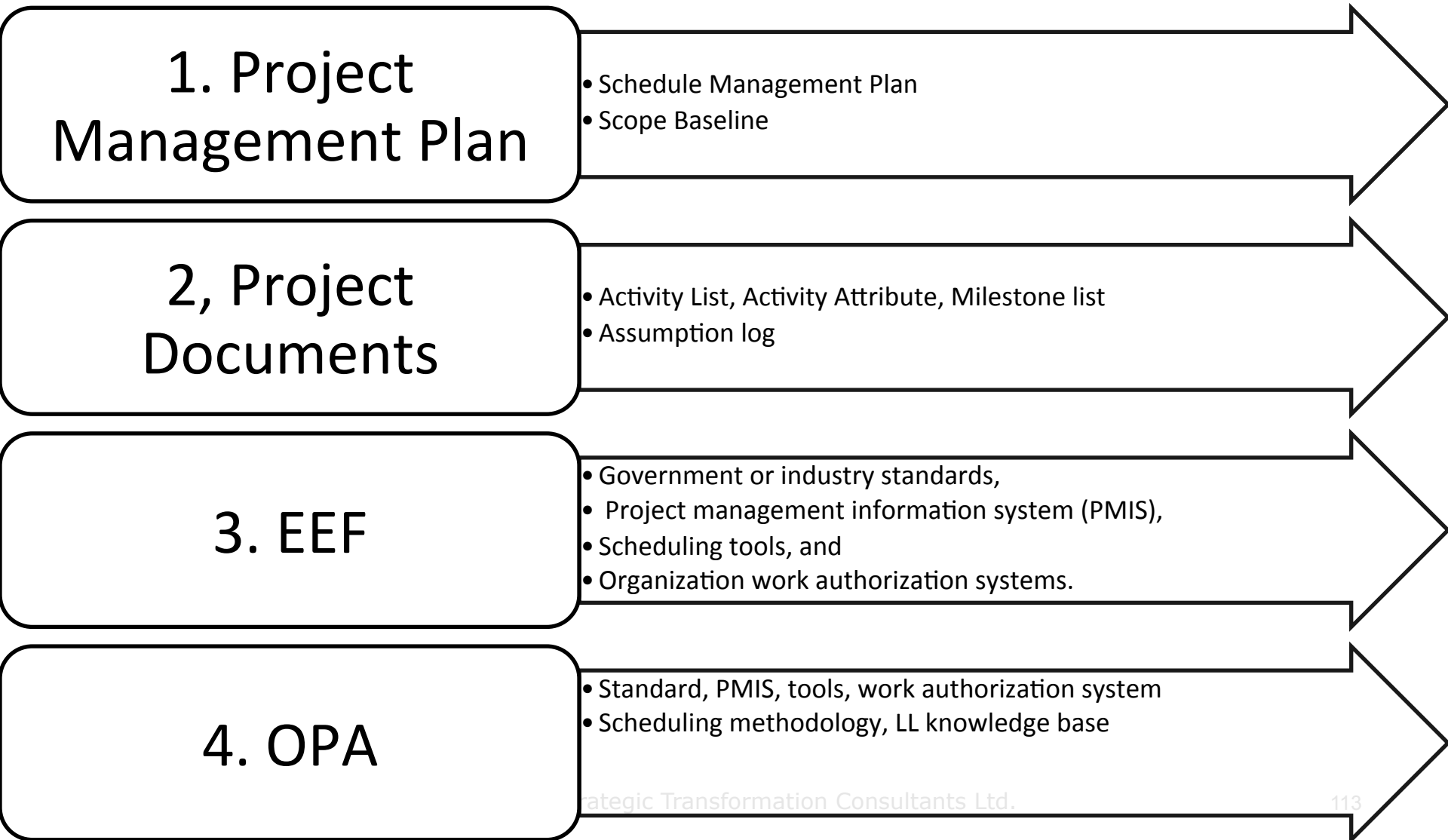
Sequence Activities

- Project Schedule Network Diagram
- Project Documents update

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Schedule management plan • Scope baseline .2 Project documents • Activity attributes • Activity list • Assumption log • Milestone list .3 Enterprise environmental factors .4 Organizational process assets	.1 Precedence diagramming method .2 Dependency determination and integration .3 Leads and lags .4 Project management information system	.1 Project schedule network diagrams .2 Project documents updates • Activity attributes • Activity list • Assumption log • Milestone list

Figure 6-7. Sequence Activities: Inputs, Tools & Techniques, and Outputs

Input to Sequence Activities



Define Activities-TT

Copyright © Strategic Transformation Consultants Ltd.

1. Input-Precedence Diagramming Method (PDM)

The precedence diagramming method (PDM) is a technique used for constructing a schedule model in which activities are represented by nodes and are graphically linked by one or more logical relationships to show the sequence in which the activities are to be performed.

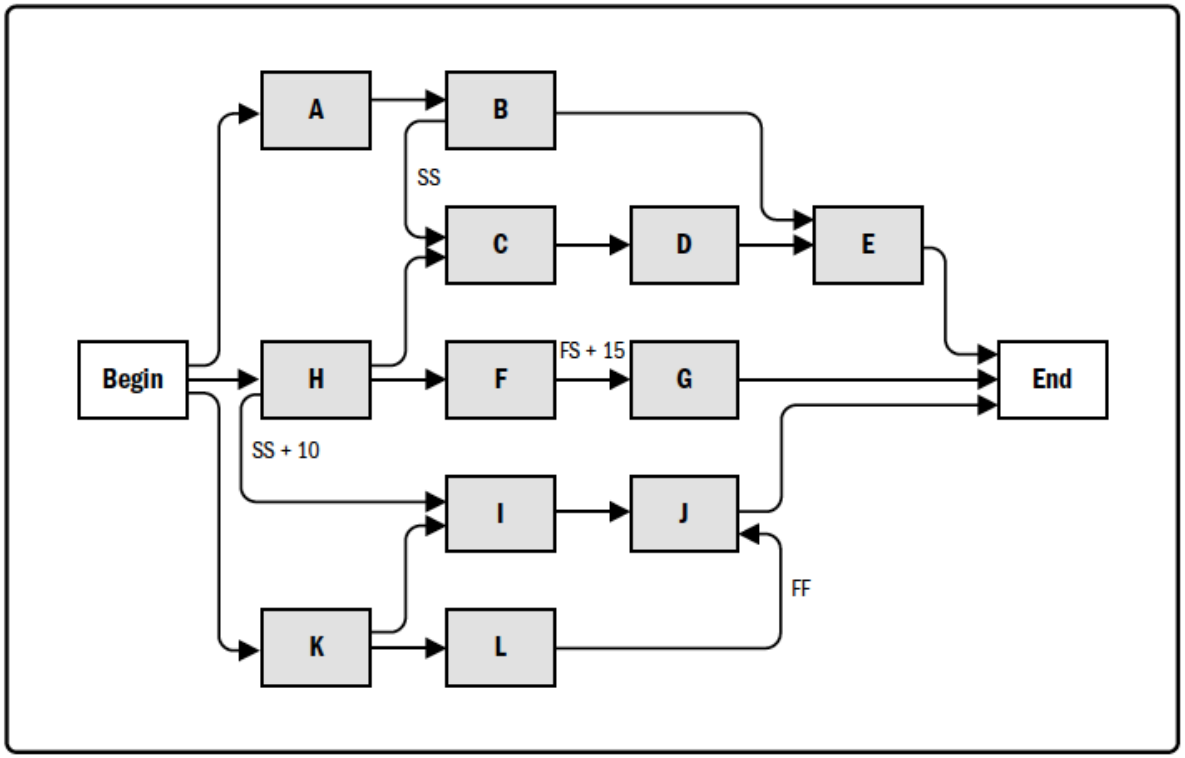
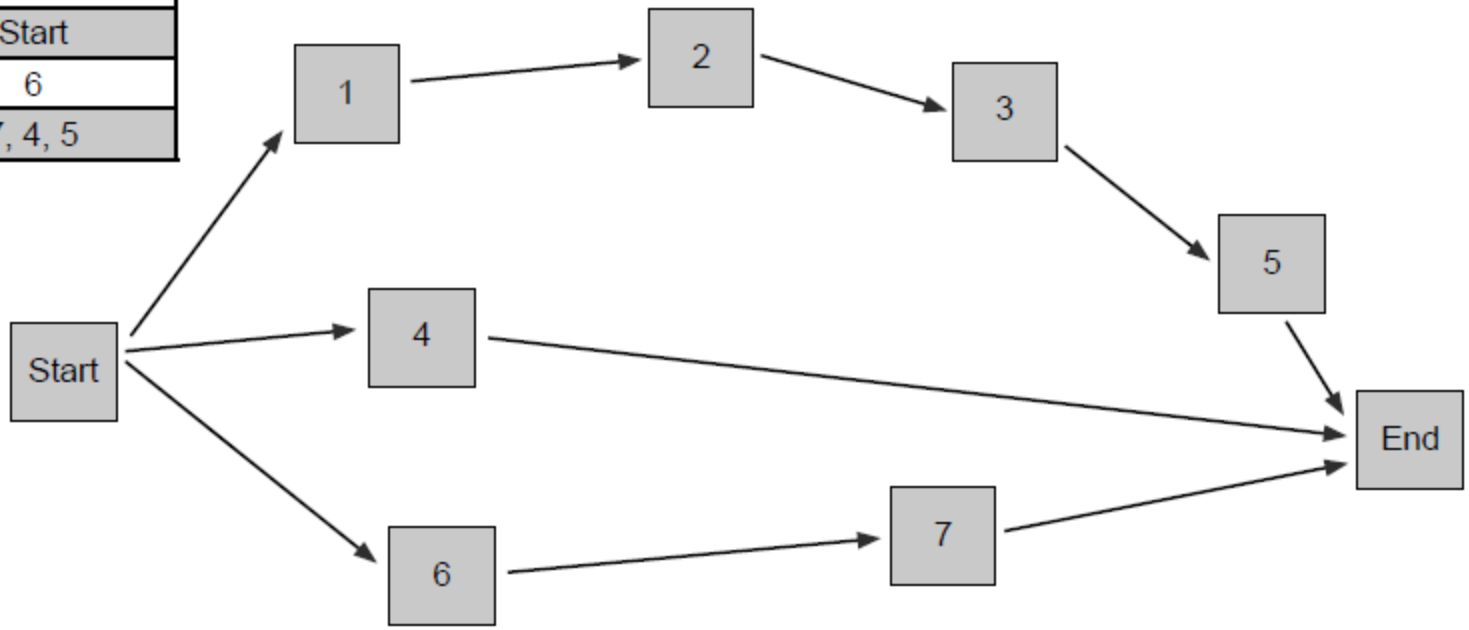


Figure 6-11. Project Schedule Network Diagram

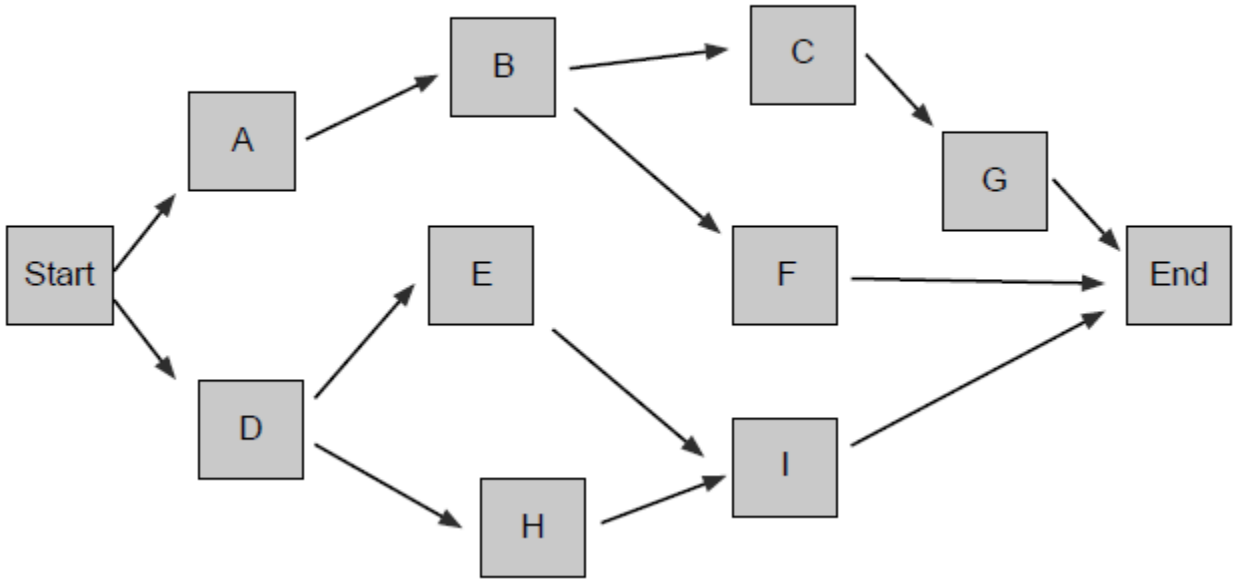
Name	Predecessor
Start	—
1	Start
2	1
3	2
4	Start
5	3
6	Start
7	6
Finish	7, 4, 5



Copyright © Strategic Transformation Consultants Ltd.

activities

Name	Predecessor
Start	—
A	Start
B	A
C	B
D	Start
E	D
F	B
G	C
H	D
I	E, H
Finish	F, G, I



Copyright © Strategic Transformation Consultants Ltd.

Types of dependency

Finish to Start (F-S)	Start-to-start (S-S)	Finish-to-finish (F-F)	Start-to-finish (S-F)
The initiation of the successor activity depends upon the completion of the predecessor activity	The initiation of the successor activity depends upon the initiation of the predecessor activity	The completion of the successor activity depends upon the completion of the predecessor activity	The completion of the successor activity depends upon the initiation of the predecessor activity
- You must finish digging a hole before you plant a tree	- You must start pouring concrete before you start leveling the concrete.	- You must finish testing before you can finish documentation	- Rarely used

Copyright © Strategic Transformation Consultants Ltd.

2. Dependency Determination

- Contractually required or inherent in the nature of the work (called hard logic) e.g. on an
- It is impossible to erect a multistoried building until foundation is built

Mandatory

- defined by project management team. Known as "softlogic", "preferential logic" or "preferred logic"
- Until UAT documents are finalized, team will not start implementation

Discretionary

- "Relationships to non-project activities"
- Money transfer can not be performed until govt provide guideline on this

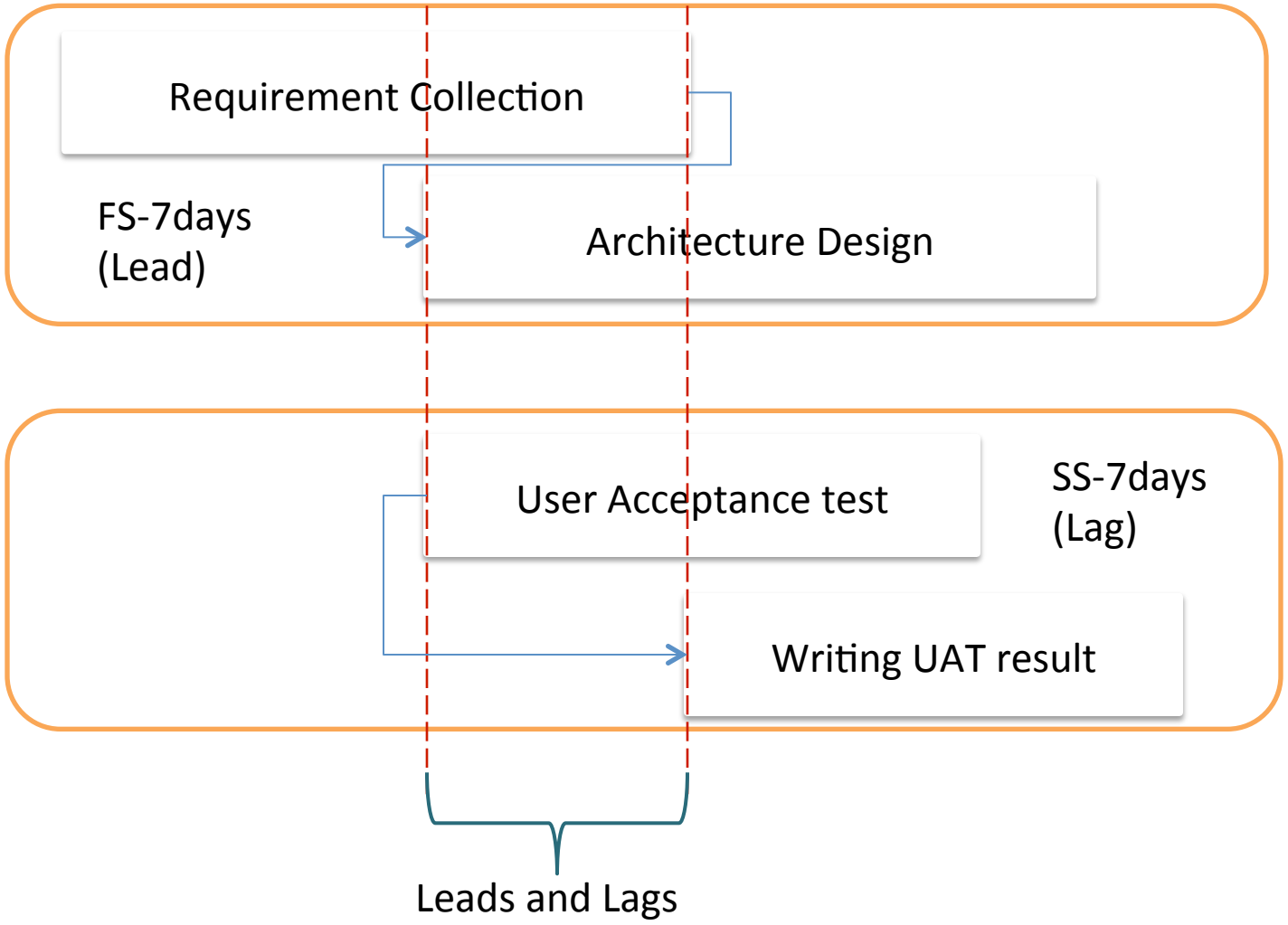
External Dependency

- Precedence relationship between project activities and are generally inside the project team control
- Team can not start installing server until raised floor is completed.

Internal Dependency

Copyright © Strategic Transformation Consultants Ltd.

3. Leads and Lags



Copyright © Strategic Transformation Consultants Ltd.

Output of Sequence Activities

Project Schedule Network Diagram

- Schematic displays of the project's activities and their logical relationship

Project Document update

- Activity list
- Activity attribute
- Risk register

Copyright © Strategic Transformation Consultants Ltd.

Estimate Activity Durations-ITTO

Estimate Activity Durations is the process of estimating the number of work periods needed to complete individual activities with estimated resources. The key benefit of this process is that it provides the amount of time each activity will take to complete.

Estimate Activity Durations

- Activity Duration estimates
- Project documents update

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Schedule management plan • Scope baseline .2 Project documents • Activity attributes • Activity list • Assumption log • Lessons learned register • Milestone list • Project team assignments • Resource breakdown structure • Resource calendars • Resource requirements • Risk register .3 Enterprise environmental factors .4 Organizational process assets	.1 Expert judgment .2 Analogous estimating .3 Parametric estimating .4 Three-point estimating .5 Bottom-up estimating .6 Data analysis • Alternatives analysis • Reserve analysis .7 Decision making .8 Meetings	.1 Duration estimates .2 Basis of estimates .3 Project documents updates • Activity attributes • Assumption log • Lessons learned register

Figure 6-12. Estimate Activity Durations: Inputs, Tools & Techniques, and Outputs

Input to Estimate Activity duration

1.Project Mgt Plan

- Schedule Management Plan
- Schedule baselines

2. Project Documents

- Activity attributes
- Activity list, Assumption log, Lessons learned register, Milestone list, Project team assignments, Resource breakdown Structure, Resource calendars, Resource requirements, Risk register

3. EEF

- Duration estimating databases and other reference data,
- Productivity metrics,
- Published commercial information, and
- Location of team members.

4. OPA

- Historical duration information,
- Project calendars,
- Estimating policies,
- Scheduling methodology, and
- Lessons learned repository.

Estimate Activity Durations-TT

Copyright © Strategic Transformation Consultants Ltd.

Estimate activity duration-TT

1. Expert Judgment

- From previous similar project experience, duration can be estimated

2. Analogous Estimating

- "Also called 'Top-Down-Estimating', means using the actual duration of a previous, similar activity as the basis for estimating the duration of a future activity."
- Frequently used when limited amount of detailed information is available
- Less costly and time consuming
- More reliable when previous activities are similar in fact and circumstance and not only in appearance and when the individual preparing the estimate has the experience of similar activities
- Gross value estimation approach. Adjusted according to the difference

3. Parametric estimates

- Quantity of work multiplied by productivity rate can be used to estimate activity duration

© Strategic Transformation Consultants Ltd.

Estimate activity duration-TT

4. Three points estimates

- To improve the accuracy of estimates
  - Most likely
  - Optimistic
  - Pessimistic
  - **Triangular Distribution.** $tE = (t0 + tM + tP) / 3$

5. Bottom up estimating

- Bottom-up estimating is a method of estimating project duration or cost by aggregating the estimates of the lower level components of the WBS.

6 Data analysis

- Alternatives analysis
- Reserve analysis

Copyright © Strategic Transformation Consultants Ltd.

Estimate activity duration-TT

.7 Decision making

- Can be used in this process include but are not limited to voting. One variation of the voting method that is often used in agile-based projects is called the fist of five (also calledmfist to five).

.8 Meeting

- The project team may hold meetings to estimate activity durations. When using an agile approach, it is necessary to conduct sprint or iteration planning meetings to discuss prioritized product backlog items (user stories) and decide which of these items the team will commit to work on in the upcoming iteration.

Copyright © Strategic Transformation Consultants Ltd.

Output of activity duration estimates

Duration Estimates

- Duration estimates are quantitative assessments of the likely number of time periods that are required to complete an activity, a phase, or a project.
  - A range of 2 weeks ± 2 days, which indicates that the activity will take at least 8 days and not more than 12

    (assuming a 5-day work week); or
  - A 15% probability of exceeding 3 weeks, which indicates a high probability—85%—that the activity will take 3 weeks or less.

2. Basis of estimates

- How it was developed
- Assumption
- Constraints
- Confidence level etc.

3. Project Documents Update

- Activity Attributes
- Assumptions log
- Lesson learned register

Copyright © Strategic Transformation Consultants Ltd.

Develop Schedule-ITTO

Develop Schedule is the process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create a schedule model for project execution and monitoring and controlling. The key benefit of this process is that it generates a schedule model with planned dates for completing project activities.

Develop Schedule

- Schedule baseline
- Project schedule
- Schedule data
- Project calendar
- Project management plan updates
- Project documents update

Inputs

.1 Project management plan
- Schedule management plan
- Scope baseline

.2 Project documents
- Activity attributes
- Activity list
- Assumption log
- Basis of estimates
- Duration estimates
- Lessons learned register
- Milestone list
- Project schedule network diagrams
- Project team assignments
- Resource calendars
- Resource requirements
- Risk register

.3 Agreements

.4 Enterprise environmental factors

.5 Organizational process assets

Tools & Techniques

.1 Schedule network analysis
.2 Critical path method
.3 Resource optimization
.4 Data analysis
- What-if scenario analysis
- Simulation

.5 Leads and lags
.6 Schedule compression
.7 Project management information system
.8 Agile release planning

Outputs

.1 Schedule baseline
.2 Project schedule
.3 Schedule data
.4 Project calendars
.5 Change requests
.6 Project management plan updates
- Schedule management plan
- Cost baseline

.7 Project documents updates
- Activity attributes
- Assumption log
- Duration estimates
- Lessons learned register
- Resource requirements
- Risk register

Figure 6-14. Develop Schedule: Inputs, Tools & Techniques, and Outputs

Input to Develop Schedule

1 Project management plan	•Schedule management plan •Scope baseline
2 Project documents	•Activity attributes, Activity list, Assumption log, Basis of estimates, Duration estimates, Lessons learned register, Milestone list, Project schedule network diagrams, Project team assignments, Resource calendars, Resource requirements, Risk register
3 Agreements	•Vendors may have an input to the project schedule as they develop the details of how they will perform the project work to meet contractual commitments.
4 Enterprise environmental factors	•Government or industry standards, and •Communication channels.
5 Organizational process assets	•Scheduling methodology containing the policies governing schedule model development and maintenance, and •Project calendar(s).

Copyright © Strategic Transformation Consultants Ltd.

Develop Schedule-TT

- .1 Schedule network analysis
- 2 Critical path method
- .3 Resource optimization
- .4 Data analysis
- .5 Leads and lags
- .6 Schedule compression
- .7 Project management information system
- .8 Agile release planning

Copyright © Strategic Transformation Consultants Ltd.

Develop Schedule -TT

1. Schedule Network Analysis

- Schedule network analysis is the overarching technique used to generate the project schedule model. It employs several other techniques such as critical path method, resource optimization techniques, and modeling techniques. Additional analysis includes but is not limited to:
  - Assessing the need to aggregate schedule reserves to reduce the probability of a schedule slip
  - Reviewing the network to see if the critical path has high-risk activities or long lead items that would necessitate

    use of schedule reserves or the implementation of risk responses to reduce the risk on the critical path.

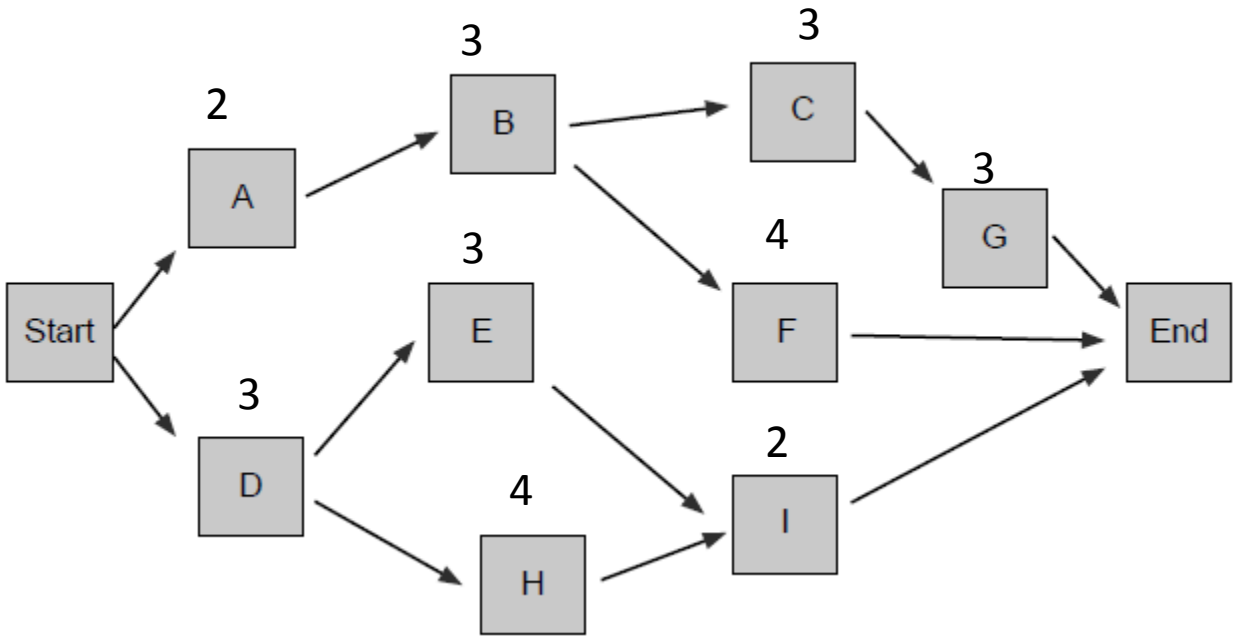
2. Critical path method

- A method used to estimate the minimum project duration
- Determine the schedule flexibility
- Calculates Early start, early finish, late start and late finish
- Performs forward and backward pass
- Without regarded for any resource limitation

Copyright © Strategic Transformation Consultants Ltd.

activities

Name	Predecessor
Start	—
A	Start
B	A
C	B
D	Start
E	D
F	B
G	C
H	D
I	E, H
Finish	F, G, I



Copyright © Strategic Transformation Consultants Ltd.

Schedule related formulas

Network Diagram

Forward Pass

ES = EF of the predecessor node

EF = ES + Dur

Backward Pass

LF = LS of the Successor

LS = LF – Dur

ES	Dur	EF
	Node	
LS	Float	LF

Concept	Formula	Result In
Free Float Determines how many days you can delay an activity without delaying the early start of the next activity. On most sample PMP exam questions, the network diagrams are too small to show activities where free float and total float are different. In most sample questions they will be the same.	ES(Successor) - EF(Predecessor)	Number of days this activity can be delayed without delaying the early start of the next activity. Note: If the present activity has more than one following activities, then use the *Earliest* ES of any of the following activities.
Total Float Determines how many days you can delay an activity without delaying the project. There are two formulas both will give the same result.	Total Float = LS - ES Total Float = LF – EF	Number of days this activity can be delayed without delaying the project.

Copyright © Strategic Transformation Consultants Ltd.

Example of Critical Path

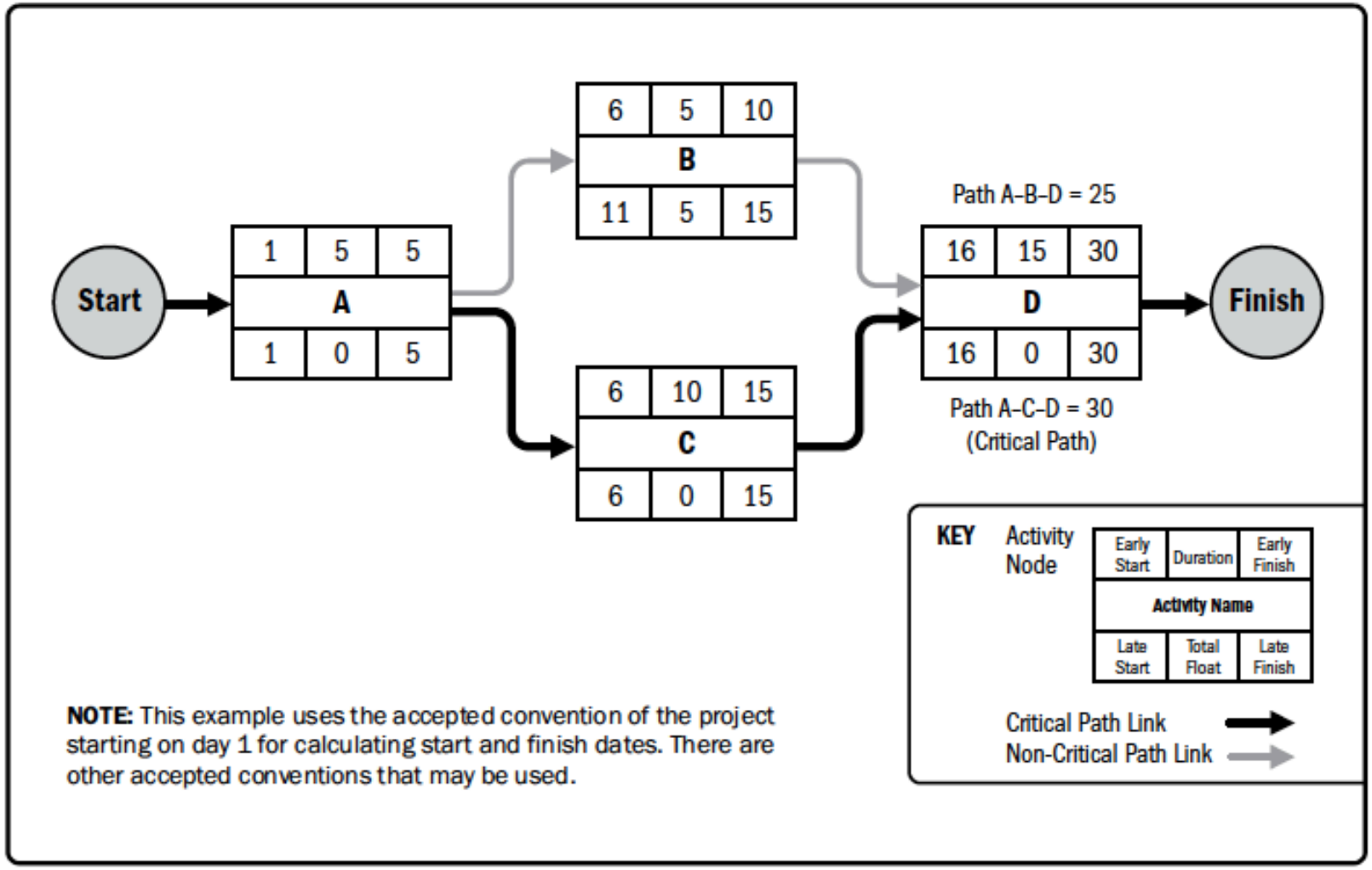
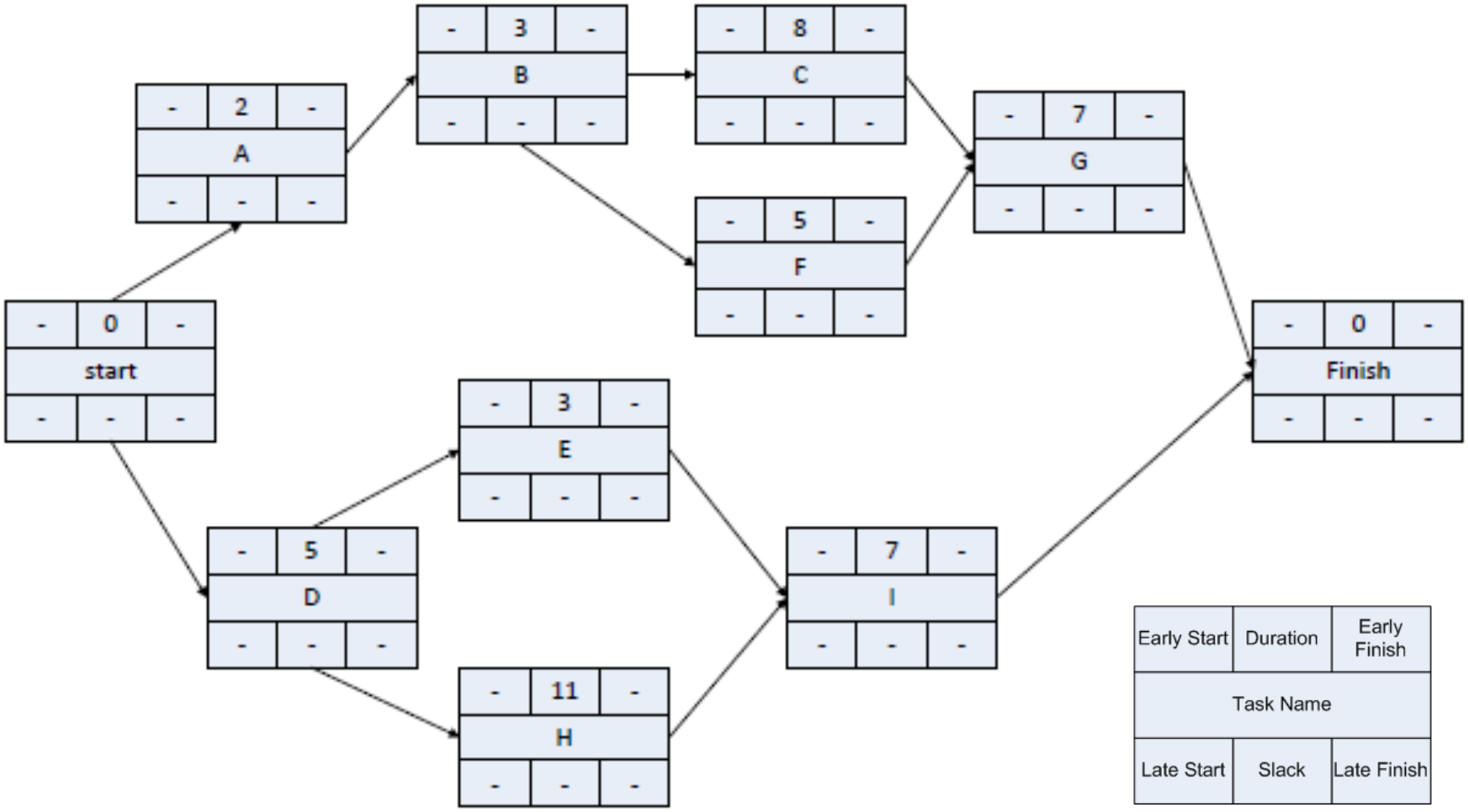


Figure 6-16. Example of Critical Path Method

Copyright © Strategic Transformation Consultants Ltd.

ES: EF of Pred+1
EF: (ES + Duration)-1

LF: LS of successor-1
LS: (LF-duration)+1



Copyright © Strategic Transformation Consultants Ltd.

Develop Schedule -TT

3. Resource Optimization

- **Resource leveling.**
  - A technique in which start and finish dates are adjusted based on resource constraints with the goal of balancing the demand for resources with the available supply.
  - Resource leveling can often cause the original critical path to change. Available float is used for leveling resources. Consequently, the critical path through the project schedule may change.
- **Resource smoothing.**
  - A technique that adjusts the activities of a schedule model such that the requirements for resources on the project do not exceed certain predefined resource limits. In resource smoothing, as opposed to resource leveling, the project's critical path is not changed and the completion date may not be delayed. In other words, activities may only be delayed within their free and total float. Resource smoothing may not be able to optimize all resources.

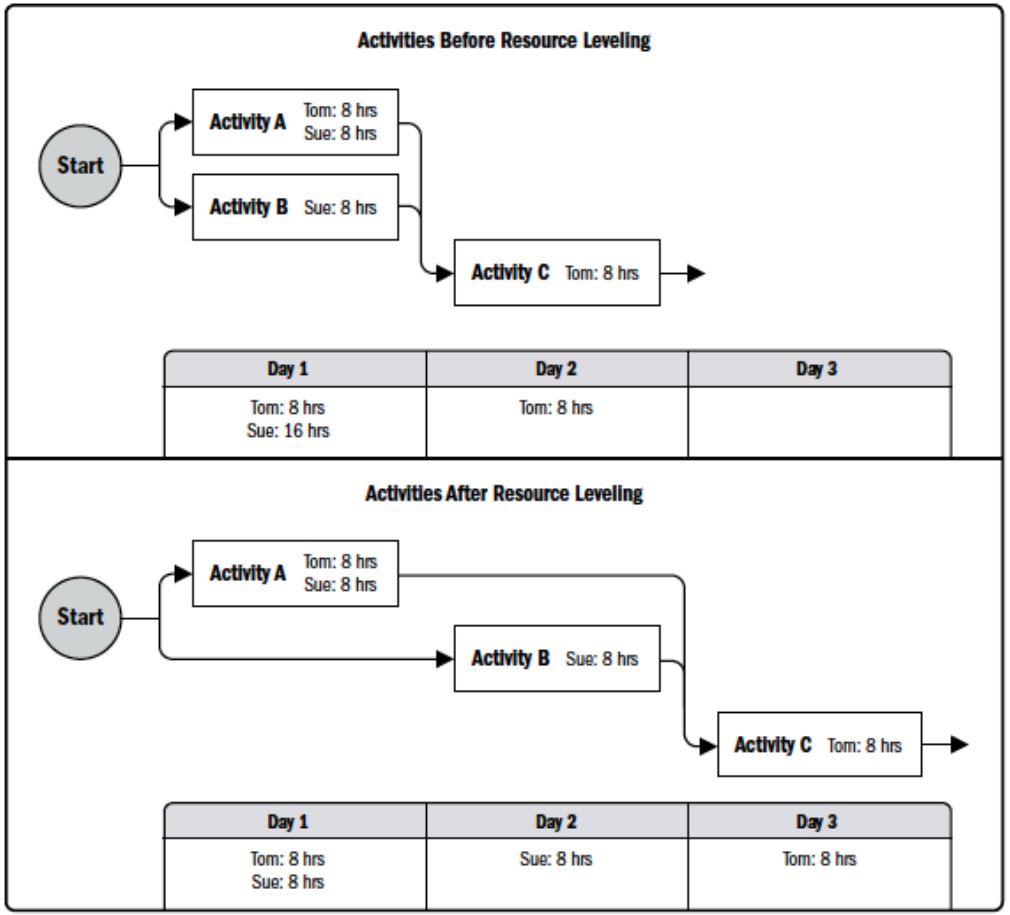


Figure 6-17. Resource Leveling

Copyright © Strategic Transformation Consultants Ltd.

Develop Schedule -TT

4. Data Analysis

- **What-if scenario analysis.**
  - What-if scenario analysis is the process of evaluating scenarios in order to predict their effect, positive or negative, on project objectives.
  - This is an analysis of the question, “What if the situation represented by scenario X happens?”
  - The outcome of the what-if scenario analysis can be used to assess the feasibility of the project schedule under different conditions, and in preparing schedule reserves and response plans to address the impact of unexpected situations.
- **Simulation.**
  - Simulation models the combined effects of individual project risks and other sources of uncertainty to evaluate their potential impact on achieving project objectives.
  - The most common simulation technique is Monte Carlo analysis (see Section 11.4.2.5), in which risks and other sources of uncertainty are used to calculate possible schedule outcomes for the total project.

5. Leads and lags

- Leads are used to advance a successor activity with respect to the predecessor activity, and
- Lag are used in limited circumstances where processes require a set period of time to elapse between the predecessor and successor without work or resource impact.

Copyright © Strategic Transformation Consultants Ltd.

Example of simulation

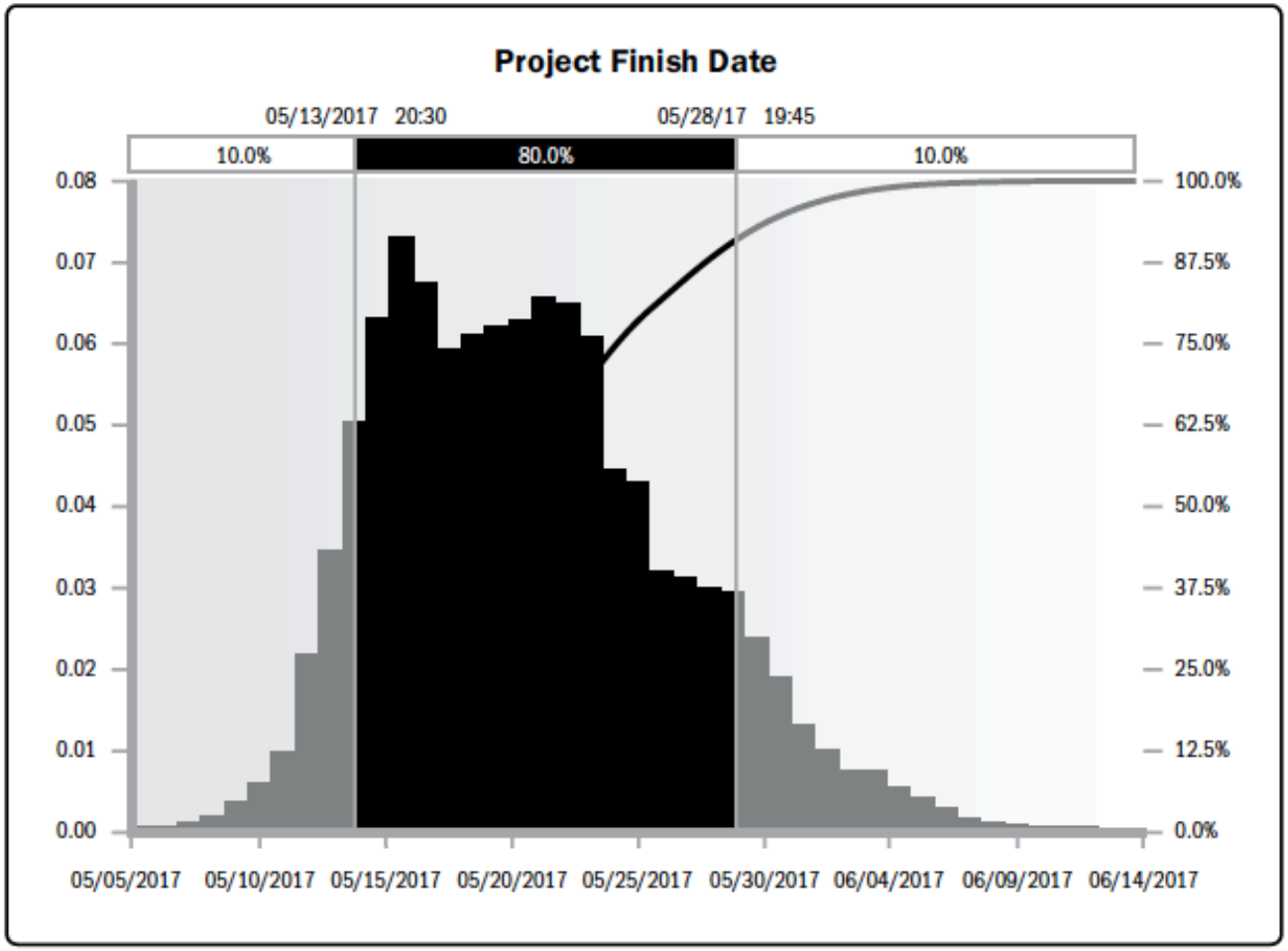


Figure 6-18. Example Probability Distribution of a Target Milestone

Copyright © Strategic Transformation Consultants Ltd.

Develop Schedule -TT

6. Schedule compression

- Schedule compression techniques are used to shorten or accelerate the schedule duration without reducing the project scope in order to meet schedule constraints, imposed dates, or other schedule objectives. A helpful technique is the negative float analysis. The critical path is the one with the least float. Due to violating a constraint or imposed date, the total float can become negative.
- Schedule compression techniques are compared in Figure 6-19 and include:

- Crashing.
  - A technique used to shorten the schedule duration for the least incremental cost by adding resources. Crashing does not always produce a viable alternative and may result in increased risk and/or cost.
- Fast tracking.
  - A schedule compression technique in which activities or phases normally done in sequence are performed in parallel for at least a portion of their duration

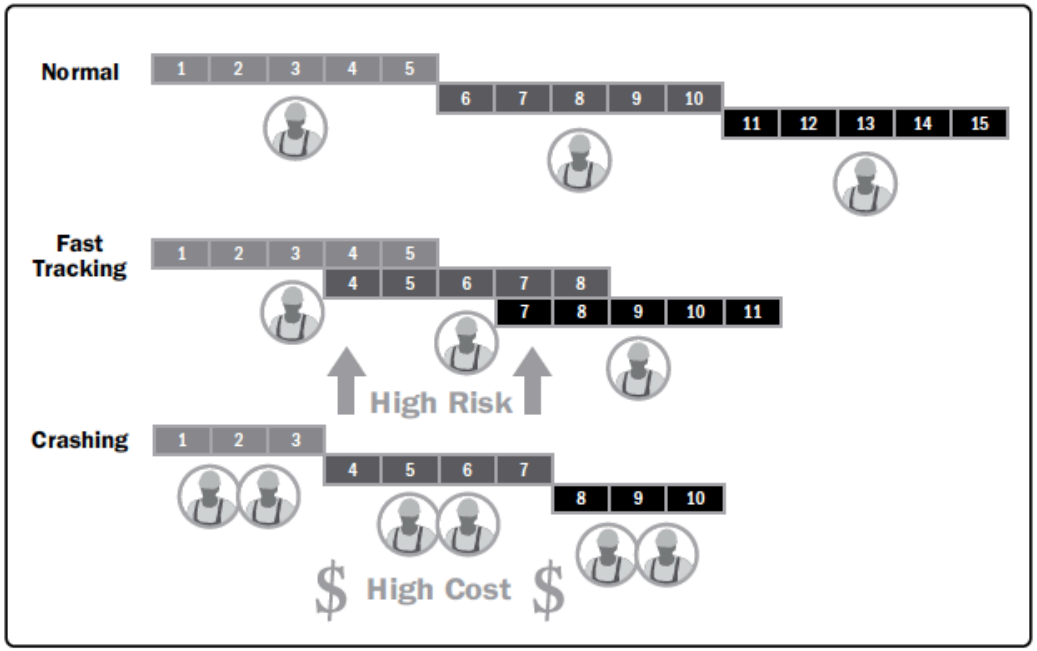


Figure 6-19. Schedule Compression Comparison

Copyright © Strategic Transformation Consultants Ltd.

Develop Schedule -TT

7 Project Management Information System (PMIS)

- Project management information systems include scheduling software that expedites the process of building a schedule model

8 Agile Release Planning

- Agile release planning provides a high-level summary timeline of the release schedule (typically 3 to 6 months) based on the product roadmap and the product vision for the product's evolution. Agile release planning also determines the number of iterations or sprints in the release, and allows the product owner and team to decide

  how much needs to be developed and how long it will take to have a releasable product based on business goals, dependencies, and impediments. Since features represent value to the customer, the timeline provides a more easily understood project schedule as it defines which feature will be available at the end of each iteration, which is exactly the depth of information the customer is looking for.

Copyright © Strategic Transformation Consultants Ltd.

Figure 6-20 shows the relationship among product vision, product roadmap, release planning, and iteration planning.

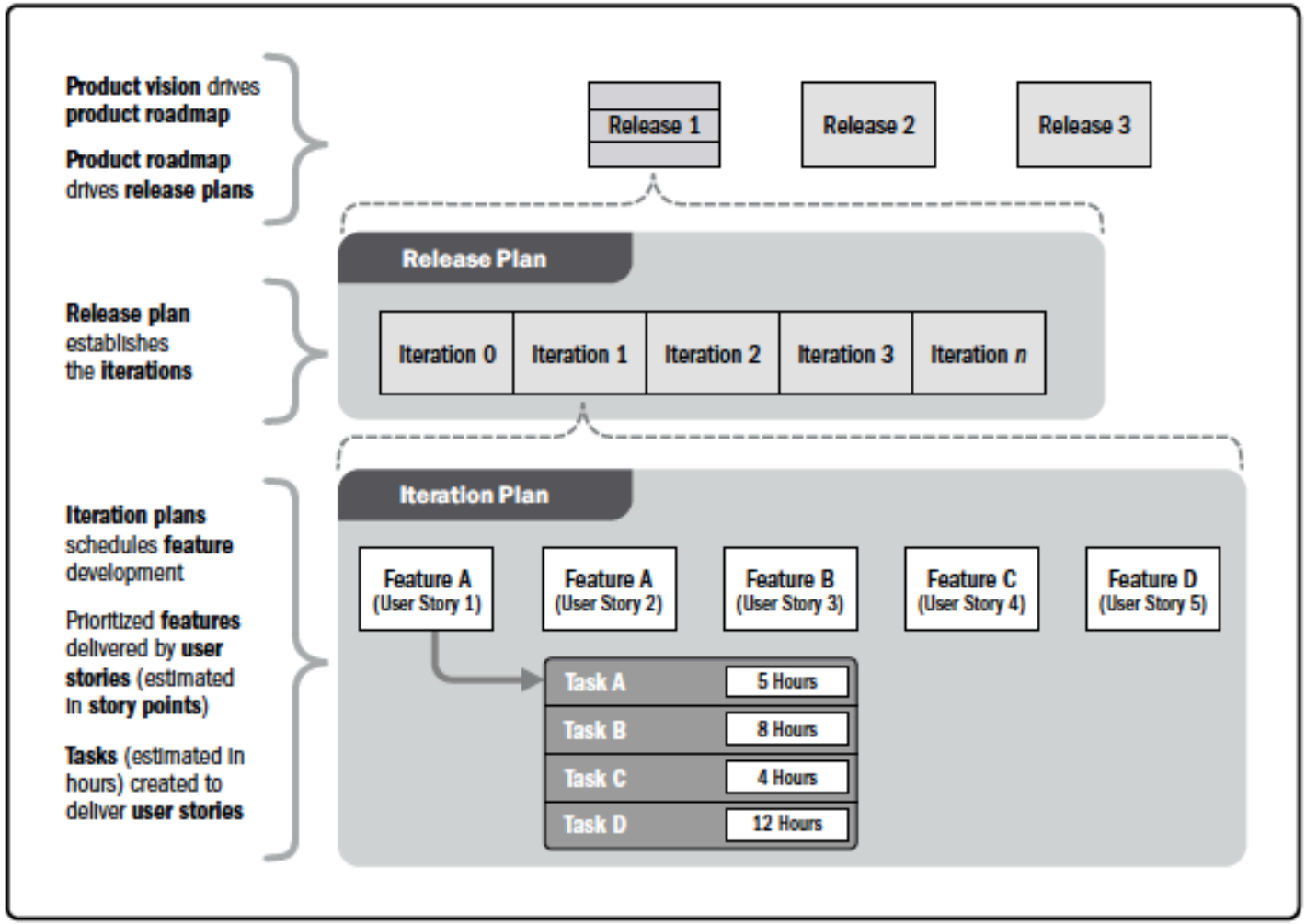


Figure 6-20. Relationship Between Product Vision, Release Planning, and Iteration Planning

Copyright © Strategic Transformation Consultants Ltd.

Output-Develop Schedule

1. Schedule Baseline

- Specific approved version of the project schedule model
- Can be changed through formal change control
- Used as the basis for comparison

2. Project Schedule

- Bar chart
- Milestone Chart
- Project schedule network diagram

3. Schedule Data

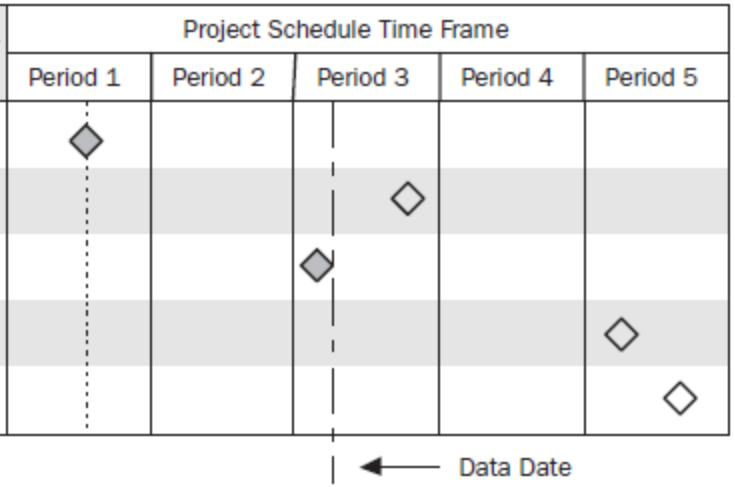
- Resource requirement by the time period,
- Alternative schedule (best case, worst case),
- Scheduling of contingency reserve

Copyright © Strategic Transformation Consultants Ltd.

Example

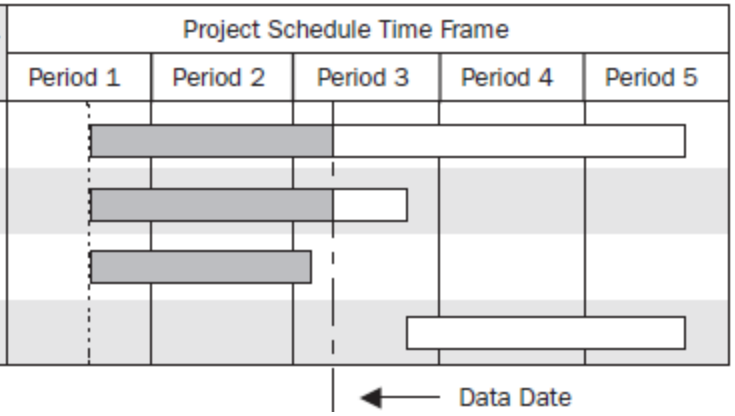
Milestone Schedule

Activity Identifier	Activity Description	Calendar units
1.1.MB	Begin New Product Z	0
1.1.1.M1	Complete Component 1	0
1.1.2.M1	Complete Component 2	0
1.1.3.M1	Complete Integration of Components 1 & 2	0
1.1.3.MF	Finish New Product Z	0



Summary Schedule

Activity Identifier	Activity Description	Calendar units
1.1	Develop and Deliver New Product Z	120
1.1.1	Work Package 1: Component 1	67
1.1.2	Work Package 2: Component 2	53
1.1.3	Work Package 3: Integrated Components 1 and 2	53



Copyright © Strategic Transformation Consultants Ltd.

Output-Develop Schedule

4. Project calendars

- Identifies working days and shifts
- Time period in days or part in days is available or not available

5. Change Requests

- Modifications to the project scope or project schedule may result in change requests to the scope baseline, and/or other components of the project management plan.

6. Project management plan update

- Schedule management plan
- Cost baseline

7. Project Document update

- Activity attribute, Assumption log, Duration estimates, LL register, Resource requirement, Risk register

Copyright © Strategic Transformation Consultants Ltd.

Project Cost Management

Project Cost Management includes the processes involved in planning, estimating, budgeting, financing, funding, can be completed within the approved budget.

Project Cost Management Processes

7.1 Plan Cost Management—The process of defining how the project costs will be estimated, budgeted, managed, monitored, and controlled

7.2 Estimate Costs—The process of developing an approximation of the monetary resources needed to complete project work.

7.3 Determine Budget—The process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline.

7.4 Control Costs—The process of monitoring the status of the project to update the project costs and manage changes to the cost baseline.

Copyright © Strategic Transformation Consultants Ltd.

Plan Cost Management-ITTO

The process of defining how the project costs will be estimated, budgeted, managed, monitored, and controlled

Plan cost management

- Cost Management Plan

Inputs	Tools & Techniques	Outputs
.1 Project charter .2 Project management plan • Schedule management plan • Risk management plan .3 Enterprise environmental factors .4 Organizational process assets	.1 Expert judgment .2 Data analysis .3 Meetings	.1 Cost management plan

Figure 7-2. Plan Cost Management: Inputs, Tools & Techniques, and Outputs

Copyright © Strategic Transformation Consultants Ltd.

Input to Plan Cost Management

1. Project Charter	•The project charter provides the preapproved financial resources from which the detailed project costs are developed. • The project charter also defines the project approval requirements that will influence the management of the project costs.
2. Project Management Plan	•Schedule management plan: The schedule management plan provides processes and controls that will impact cost estimation and management. • Risk management plan: The risk management plan provides processes and controls that will impact cost estimation and management.
3. EEF	•Organization culture, market condition, exchange rate, PMIS etc •Organizational culture and structure can influence cost management. •Market conditions describe what products, services, and results are available in the regional and global markets. •Currency exchange rates for project costs are sourced from more than one country.
4. OPA	•Financial controls procedures (e.g., time reporting, required expenditure and disbursement reviews, accounting codes, and standard contract provisions); •Historical information and lessons learned repository; •Financial databases; and •Existing formal and informal cost estimating and budgeting-related policies, procedures, and guidelines.

Plan Cost Management-TT

Copyright © Strategic Transformation Consultants Ltd.

Tools for plan cost management

1. Expert judgment	• Expertise should be considered from individuals or groups with specialized knowledge or training in the following topics: • Previous similar projects; • Information in the industry, discipline, and application area; • Cost estimating and budgeting; and • Earned value management.
2. Analytical techniques	• A data analysis technique that can be used for this process includes but is not limited to alternatives analysis. • Alternatives analysis can include reviewing strategic funding options such as: self-funding, funding with equity, or funding with debt.
3. Meeting	• Project team may hold meetings to develop the cost management plan

Copyright © Strategic Transformation Consultants Ltd.

Output of plan cost management

Cost management plan

- Unit of measure: staff hour, meter, liters, tons, kilometers etc
- Level of precision : how it will be rounded e.g., 100.49, 100)
- Level of accuracy: the acceptable range
- Organizational procedure links: WBS to performing organizations accounting system
- Control threshold
- Rules of performance measurement
- Reporting format
- Process description etc

Copyright © Strategic Transformation Consultants Ltd.

Estimate Cost-ITTO

The process of developing an approximation of the monetary resources needed to complete project activities

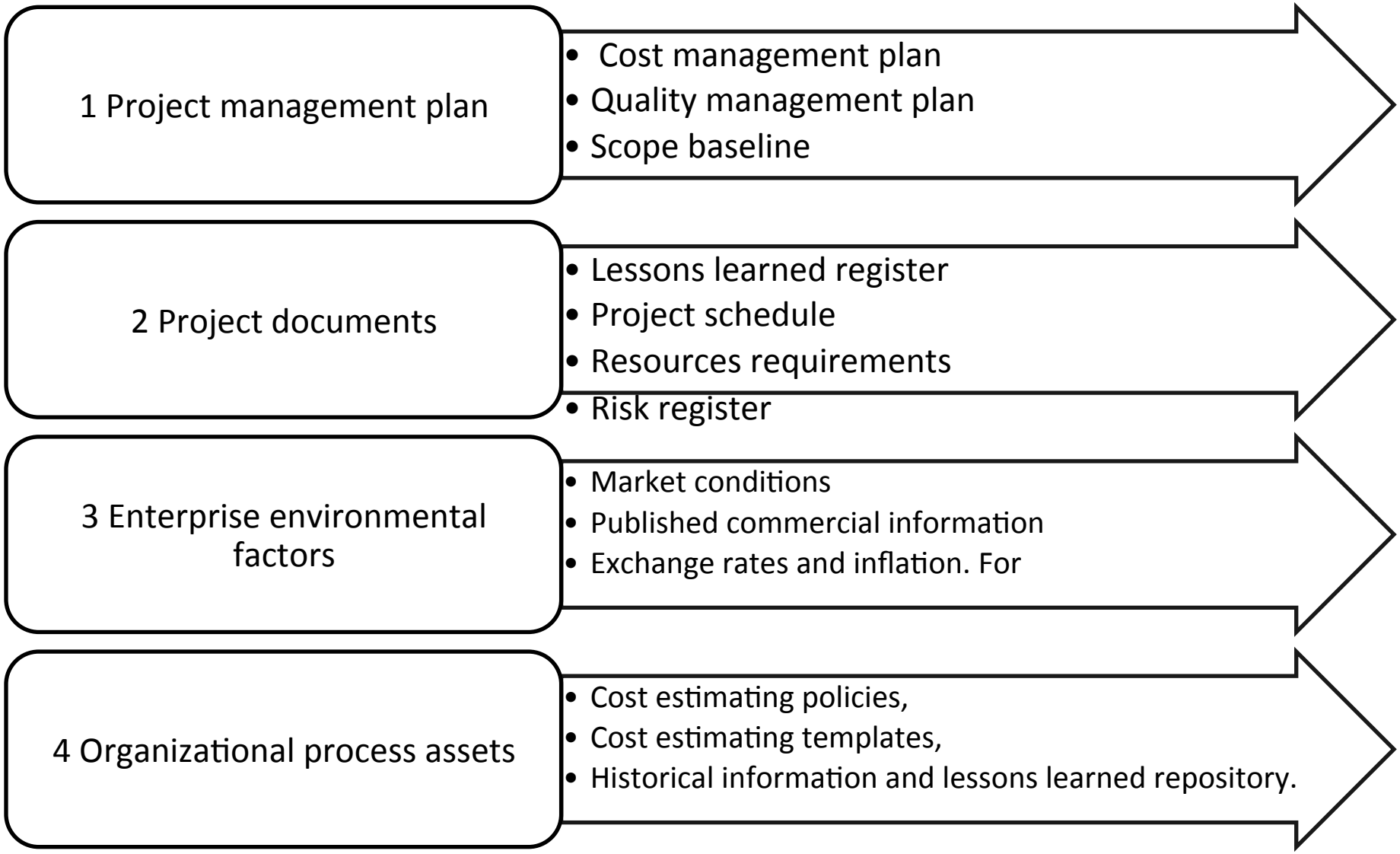
Estimate Cost

- Cost estimates
- Basis of estimates
- Project documents update

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Cost management plan • Quality management plan • Scope baseline .2 Project documents • Lessons learned register • Project schedule • Resources requirements • Risk register .3 Enterprise environmental factors .4 Organizational process assets	.1 Expert judgment .2 Analogous estimating .3 Parametric estimating .4 Bottom-up estimating .5 Three-point estimating .6 Data analysis • Alternatives analysis • Reserve analysis • Cost of quality .7 Project management information system .8 Decision making • Voting	.1 Cost estimates .2 Basis of estimates .3 Project documents updates • Assumption log • Lessons learned register • Risk register

Figure 7-4. Estimate Costs: Inputs, Tools & Techniques, and Outputs

Input to Estimate Cost



Copyright © Strategic Transformation Consultants Ltd.

Estimate Cost-TT

- .1 Expert judgment
- .2 Analogous estimating
- .3 Parametric estimating
- .4 Bottom-up estimating
- .5 Three-point estimating
- .6 Data analysis
- .7 PMIS
- .8 Decision making

Copyright © Strategic Transformation Consultants Ltd.

Estimate Cost-TT

1 Expert judgment

- Expertise should be considered from individuals or groups with specialized knowledge or training in the following topics:
  - Previous similar projects;
  - Information in the industry, discipline, and application area; and
  - Cost estimating methods.

2 Analogous estimating

- Analogous cost estimating uses values, or attributes, of a previous project that are similar to the current project. Values and attributes of the projects may include but are not limited to: scope, cost, budget, duration, and measures of scale (e.g., size, weight). Comparison of these project values, or attributes, becomes the basis for estimating the same parameter or measurement for the current project.

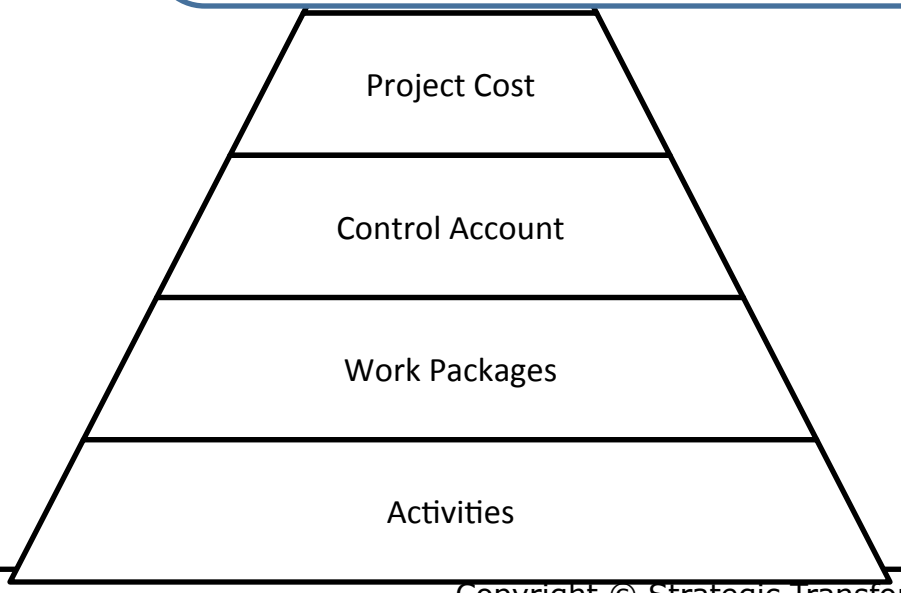
3 Parametric estimating

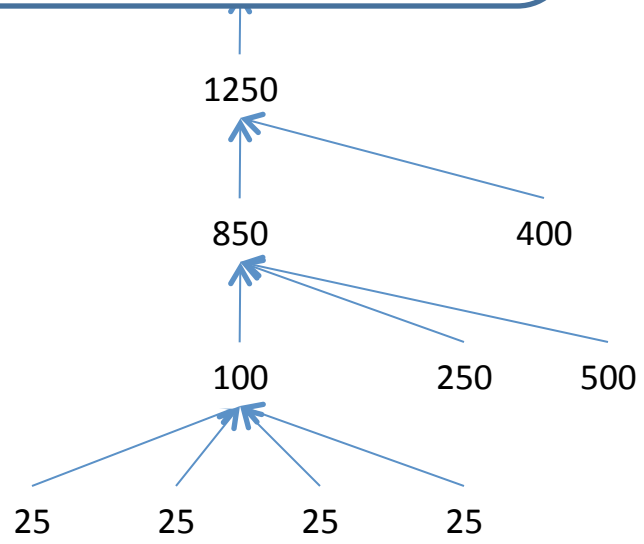
- Parametric estimating uses a statistical relationship between relevant historical data and other variables (e.g., square footage in construction
- Parametric cost estimates can be applied to a total project or to segments of a project, in conjunction with other estimating methods.

Estimate Cost-TT

4. Bottom up estimates

Before it is baselined, project team has to do some other analysis





Copyright © Strategic Transformation Consultants Ltd.

Estimate Cost-TT

5. Three point estimates

- Weighted average of three estimates
  - Most likely
  - Optimistic
  - Pessimistic

- **Triangular distribution.** $cE = (cO + cM + cP) / 3$
- **Beta distribution.** $cE = (cO + 4cM + cP) / 6$

6. Data Analysis

- Alternatives analysis. : An example would be evaluating the cost, schedule, resource, and quality impacts of buying versus making a deliverable.
- Reserve analysis.
  - Cost estimates may include contingency reserves (sometimes called contingency allowances) to account for cost uncertainty.
  - to address the known-unknowns risks
  - Contingency reserves can be provided at any level from the specific activity to the entire project.
  - May be a percentage of the estimated cost, a fixed number, or may be developed by using quantitative analysis methods
  - Contingency reserves are part of cost baseline and the overall funding requirements for the project.
- Cost of quality. This includes evaluating the cost impact of additional investment in conformance versus the cost of nonconformance.

Copyright © Strategic Transformation Consultants Ltd.

Estimate Cost-TT

7 Project management information system

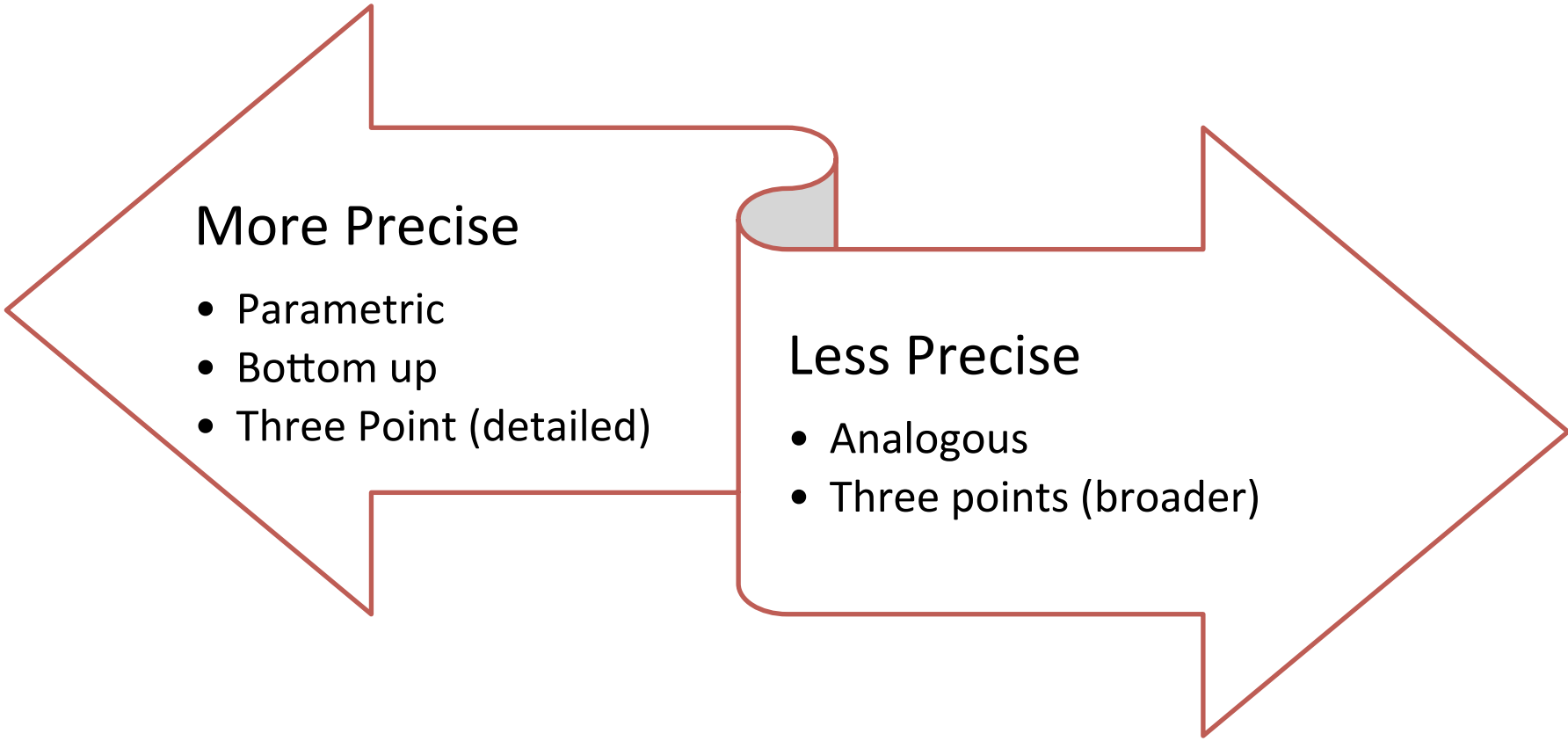
- The project management information system can include spreadsheets, simulation software, and statistical analysis tools to assist with cost estimating. Such tools simplify the use of some cost-estimating techniques and thereby facilitate rapid consideration of cost estimate alternatives.

8 Decision making

- Voting: These techniques are useful for engaging team members to improve estimate accuracy and commitment to the emerging estimates.

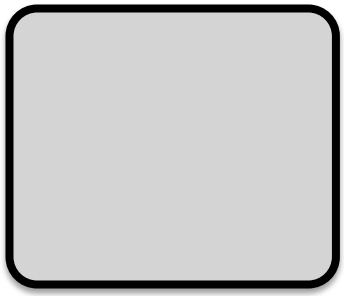
Copyright © Strategic Transformation Consultants Ltd.

Level of accuracy



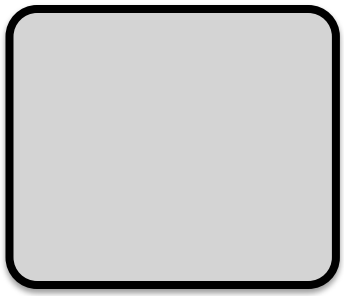
Copyright © Strategic Transformation Consultants Ltd.

Estimate Cost-output



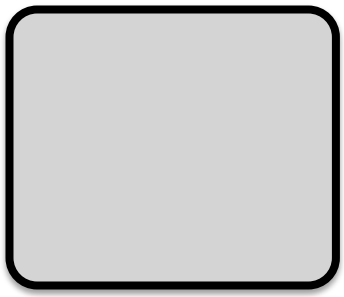
Activity Cost Estimates

- Quantitative assessment of cost required to complete project work



Basis of estimates

How it was developed, assumption, constraints, confidence level, range etc



Project documents update

- Assumption log, LL register, Risk register

Determine budget-ITTO

The process of aggregating the estimated cost of individual activities or work packages to establish an authorized cost baseline.

Determine Budget

- Cost baseline
- Project funding requirements
- Project documents update

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Cost management plan • Resource management plan • Scope baseline .2 Project documents • Basis of estimates • Cost estimates • Project schedule • Risk register .3 Business documents • Business case • Benefits management plan .4 Agreements .5 Enterprise environmental factors .6 Organizational process assets	.1 Expert judgment .2 Cost aggregation .3 Data analysis • Reserve analysis .4 Historical information review .5 Funding limit reconciliation .6 Financing	.1 Cost baseline .2 Project funding requirements .3 Project documents updates • Cost estimates • Project schedule • Risk register

Figure 7-6. Determine Budget: Inputs, Tools & Techniques, and Outputs

Input to Determine Budget

.1 Project management plan	• Cost management plan • Resource management plan • Scope baseline
.2 Project documents	• Basis of estimates • Cost estimates • Project schedule • Risk register
.3 Business documents	• Business case • Benefits management plan
.4 Agreements	• Applicable agreement information and costs relating to products, services, or results that have been or will be purchased are included when determining the budget.
.5 Enterprise environmental factors	• The enterprise environmental factors that can influence the Estimate Costs process include but are not limited to exchange rates.
.6 Organizational process assets	• Existing formal and informal cost budgeting-related policies, procedures, and guidelines; • Historical information and lessons learned repository. • Cost budgeting tools; and • Reporting methods.

Copyright © Strategic Transformation Consultants Ltd.

Determine Budget-TT

Copyright © Strategic Transformation Consultants Ltd.

Determine Budget-TT

1. Expert Judgment

- Sources might be- other units within org, consultant, stakeholder professional and technical associates, industry groups.

2. Cost aggregation

- Cost estimates are aggregated according to WBS

3. Data Analysis

- Management reserve: are budgets reserved for unplanned changes to project scope or cost.
  - PM usually obtains approval before spending management reserve
  - Management reserve are not in the project cost baseline, but may be included in the total budget for the project
  - Management reserves are not part of the earned value measurement calculations.
  - When an amount of management reserves is used to fund unforeseen work, the amount of management

    reserve used is added to the cost baseline, thus requiring an approved change to the cost baseline.

Copyright © Strategic Transformation Consultants Ltd.

Determine Budget-TT

4. Historical Relationship

- Both the cost and accuracy of analogous and parametric models can vary widely. They are most likely to be reliable when:
  - Historical information used to develop the model is accurate,
  - Parameters used in the model are readily quantifiable, and
  - Models are scalable, such that they work for large projects, small projects, and phases of a project.

5. Fund limit reconciliation

- The expenditure of funds should be reconciled with any funding limits on the commitment of funds for the project.
- A variance between the funding limits and the planned expenditures will sometimes necessitate the rescheduling of work to level out the rate of expenditures.

6. Financing

- Financing entails acquiring funding for projects. It is common for long-term infrastructure, industrial, and public services projects to seek external sources of funds. If a project is funded externally, the funding entity may have certain requirements that are required to be met.

Copyright © Strategic Transformation Consultants Ltd.

Determine Budget-output

Cost baseline

The cost baseline is the approved version of the time-phased project budget, excluding any management reserves, which can only be changed through formal change control procedures. It is used as a basis for comparison to actual results. The cost baseline is developed as a summation of the approved budgets for the different schedule activities.

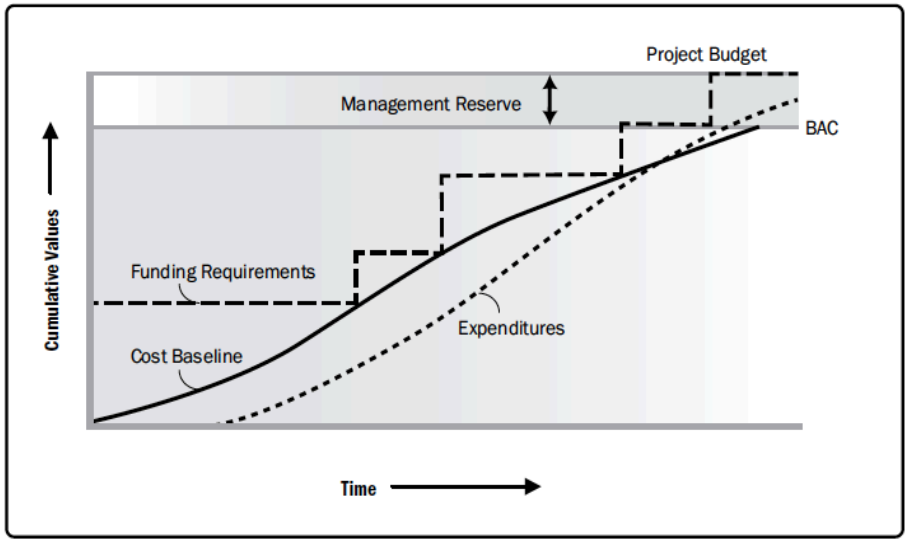
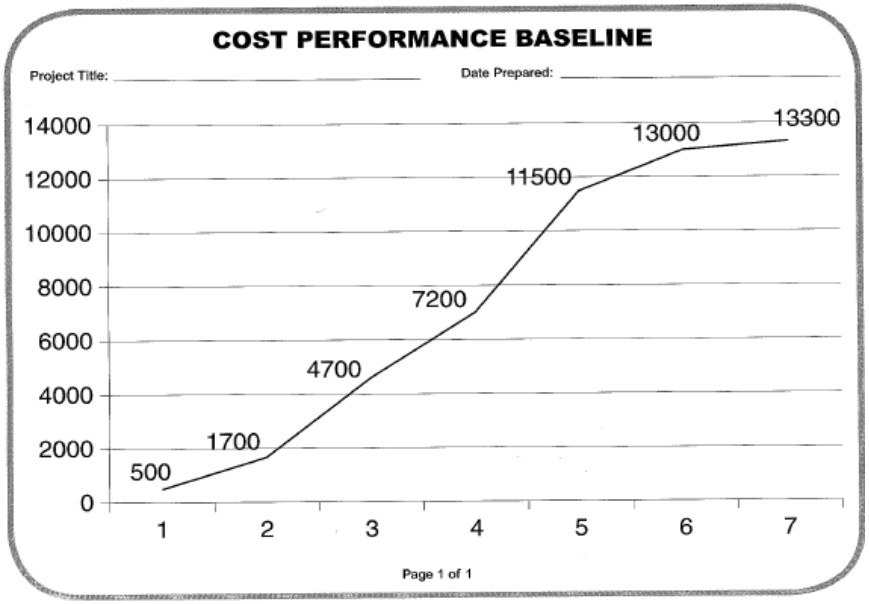
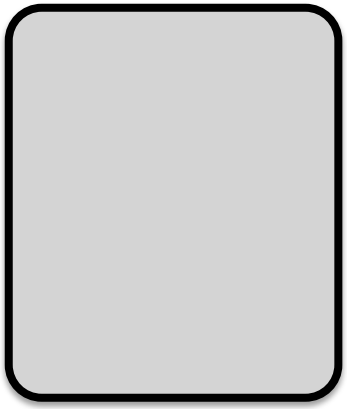


Figure 7-9. Cost Baseline, Expenditures, and Funding Requirements



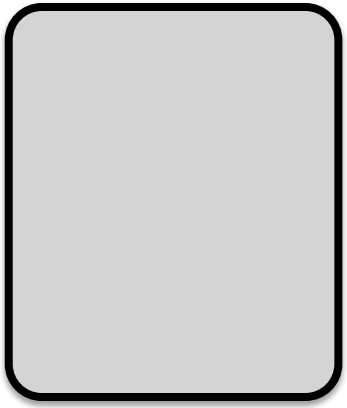
Copyright © Strategic Transformation Consultants Ltd.

Determine Budget-output



Project funding requirements

- Total funding requirements and periodic funding requirements (e.g., quarterly, annually) are derived from the cost baseline.



Project documents updates

- Cost estimates
- Project schedule
- Risk register

Copyright © Strategic Transformation Consultants Ltd.

Quality management

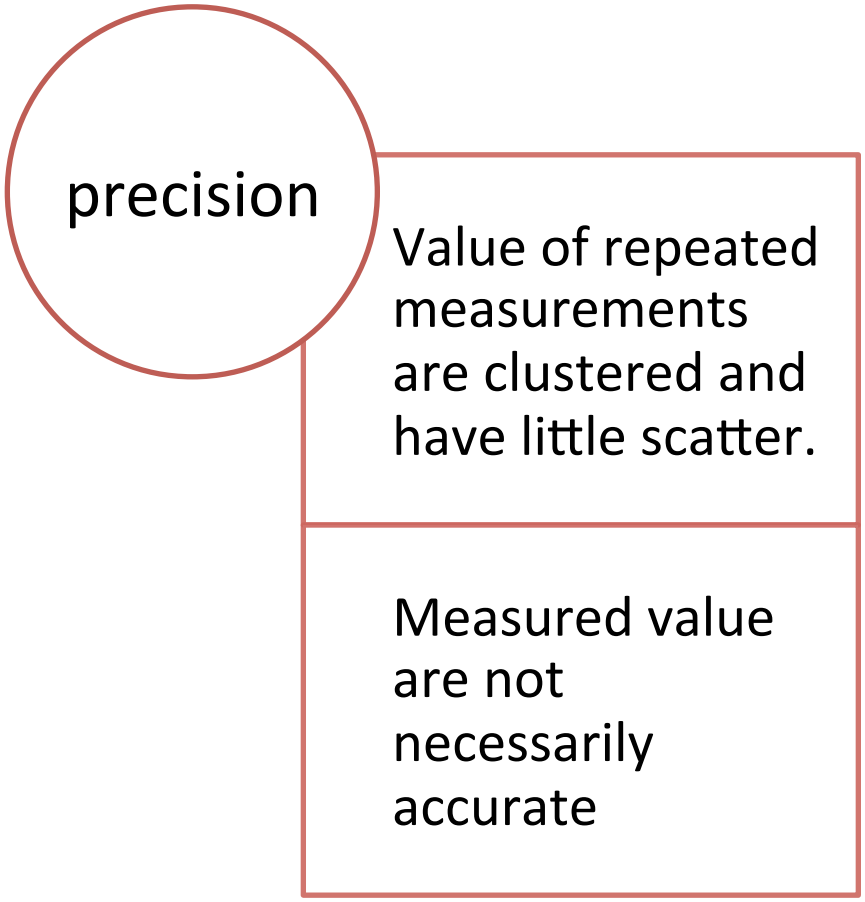
Project quality management includes the processes and activities that determine quality policies, objectives, and responsibilities so that the project will satisfy the need for which it was undertaken.

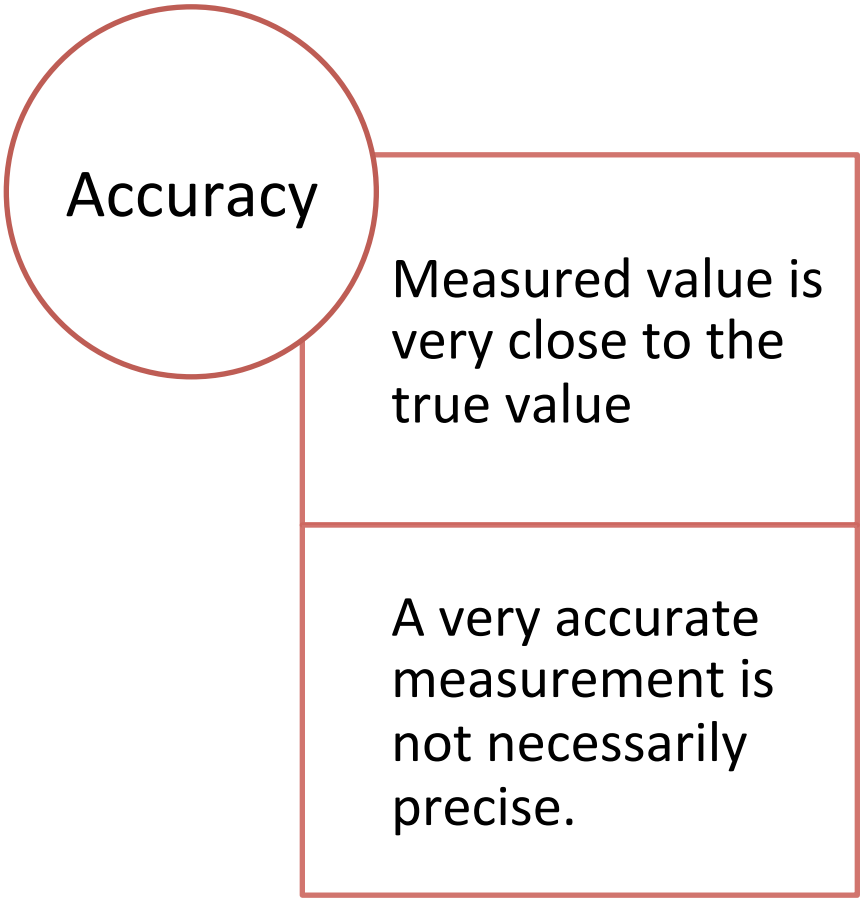
Quality vs. Grade

Quality	Grade
The degree to which a set of inherent characteristics fulfill requirement	Category assigned to products or services having the same functional use but different technical characteristics
Quality level that fails to meet quality requirements is always a problem	Low grade may not be a problem

Copyright © Strategic Transformation Consultants Ltd.

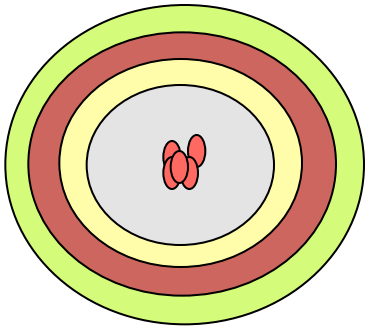
Precision vs. Accuracy



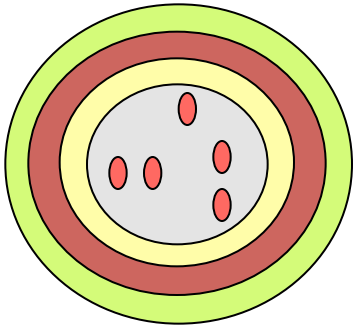


Copyright © Strategic Transformation Consultants Ltd.

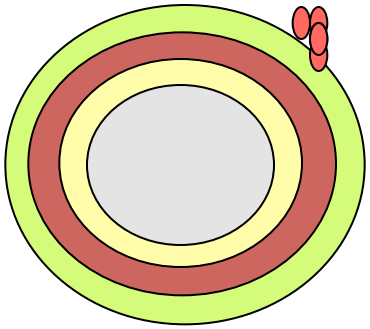
Accuracy & Precision



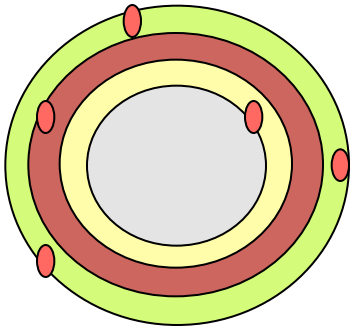
Accurate & Precise



Accurate, but not Precise



Precise, but not Accurate



Not Accurate, not Precise

Copyright © Strategic Transformation Consultants Ltd.

Basic ideas

Customer Satisfaction	Prevention over inspection	Continuous improvement	Management responsibility
Conformance to requirements	Quality is planned ,designed and built in	Plan-do-check-act cycle by shewhart (modified by deming)	Support by providing resources
Fitness for use	Not inspected in	TQM & Six sigma	Approving quality improvement idea's

Copyright © Strategic Transformation Consultants Ltd.

Project Quality Management

8.1 Plan Quality Management—

- The process of identifying quality requirements and/or standards for the project and its deliverables, and documenting how the project will demonstrate compliance with quality requirements and/ or standards.

8.2 Manage Quality—

The process of translating the quality management plan into executable quality activities that incorporate the organization's quality policies into the project.

8.3 Control Quality—

The process of monitoring and recording the results of executing the quality management activities to assess performance and ensure the project outputs are complete, correct, and meet customer expectations.

Copyright © Strategic Transformation Consultants Ltd.

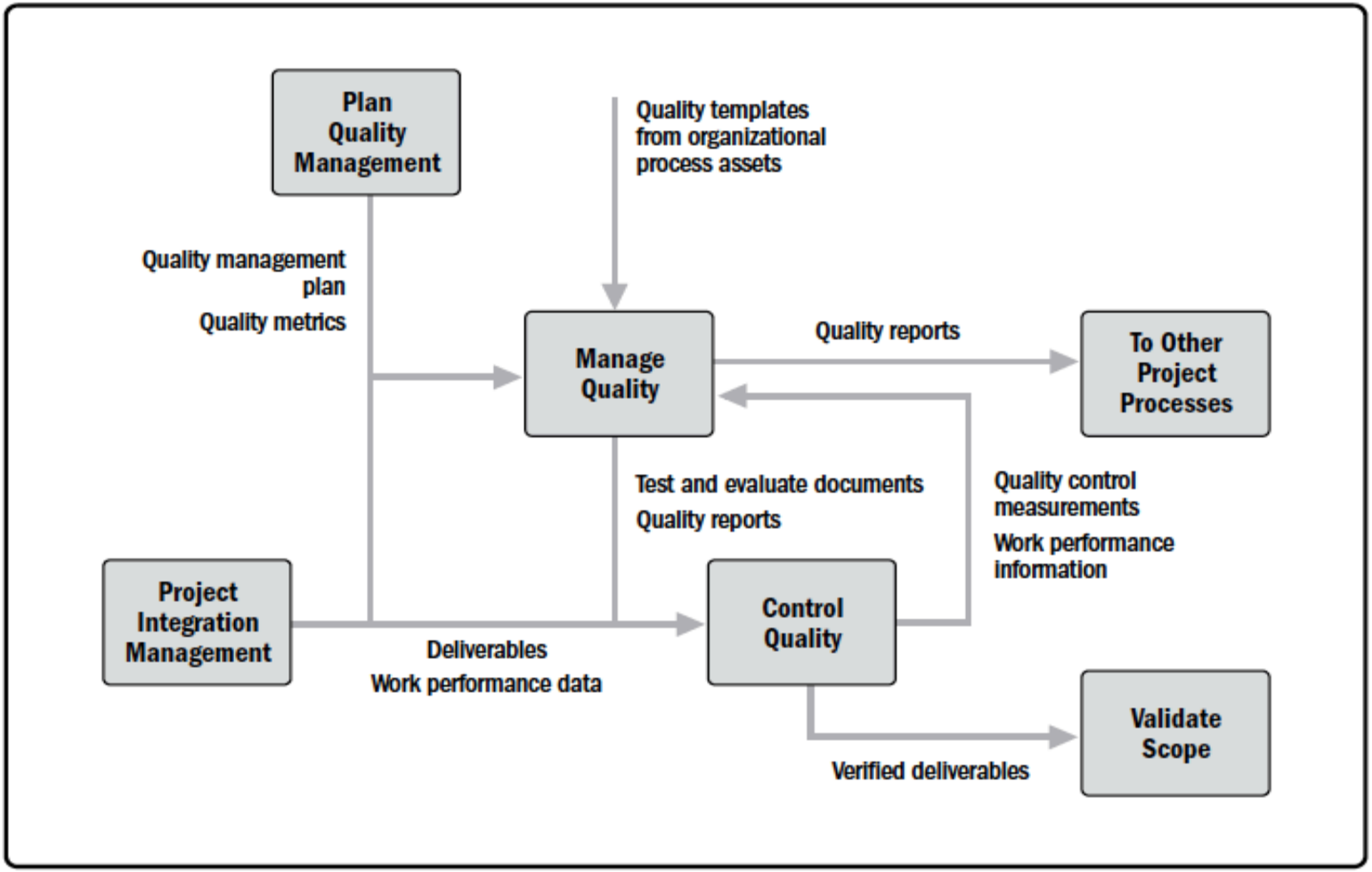


Figure 8-2. Major Project Quality Management Process Interrelations

Copyright © Strategic Transformation Consultants Ltd.

Plan Quality-ITTO

The process of identifying quality requirements and/or standards for the project and product, and documenting how the project will demonstrate compliance

Plan Quality

- Quality management plan
- Process improvement plan
- Quality metrics
- Quality checklist
- Project document update

Inputs	Tools & Techniques	Outputs
.1 Project charter .2 Project management plan • Requirements management plan • Risk management plan • Stakeholder engagement plan • Scope baseline .3 Project documents • Assumption log • Requirements documentation • Requirements traceability matrix • Risk register • Stakeholder register .4 Enterprise environmental factors .5 Organizational process assets	.1 Expert judgment .2 Data gathering • Benchmarking • Brainstorming • Interviews .3 Data analysis • Cost-benefit analysis • Cost of quality .4 Decision making • Multicriteria decision analysis .5 Data representation • Flowcharts • Logical data model • Matrix diagrams • Mind mapping .6 Test and inspection planning .7 Meetings	.1 Quality management plan .2 Quality metrics .3 Project management plan updates • Risk management plan • Scope baseline .4 Project documents updates • Lessons learned register • Requirements traceability matrix • Risk register • Stakeholder register

Figure 8-3. Plan Quality Management: Inputs, Tools & Techniques, and Outputs

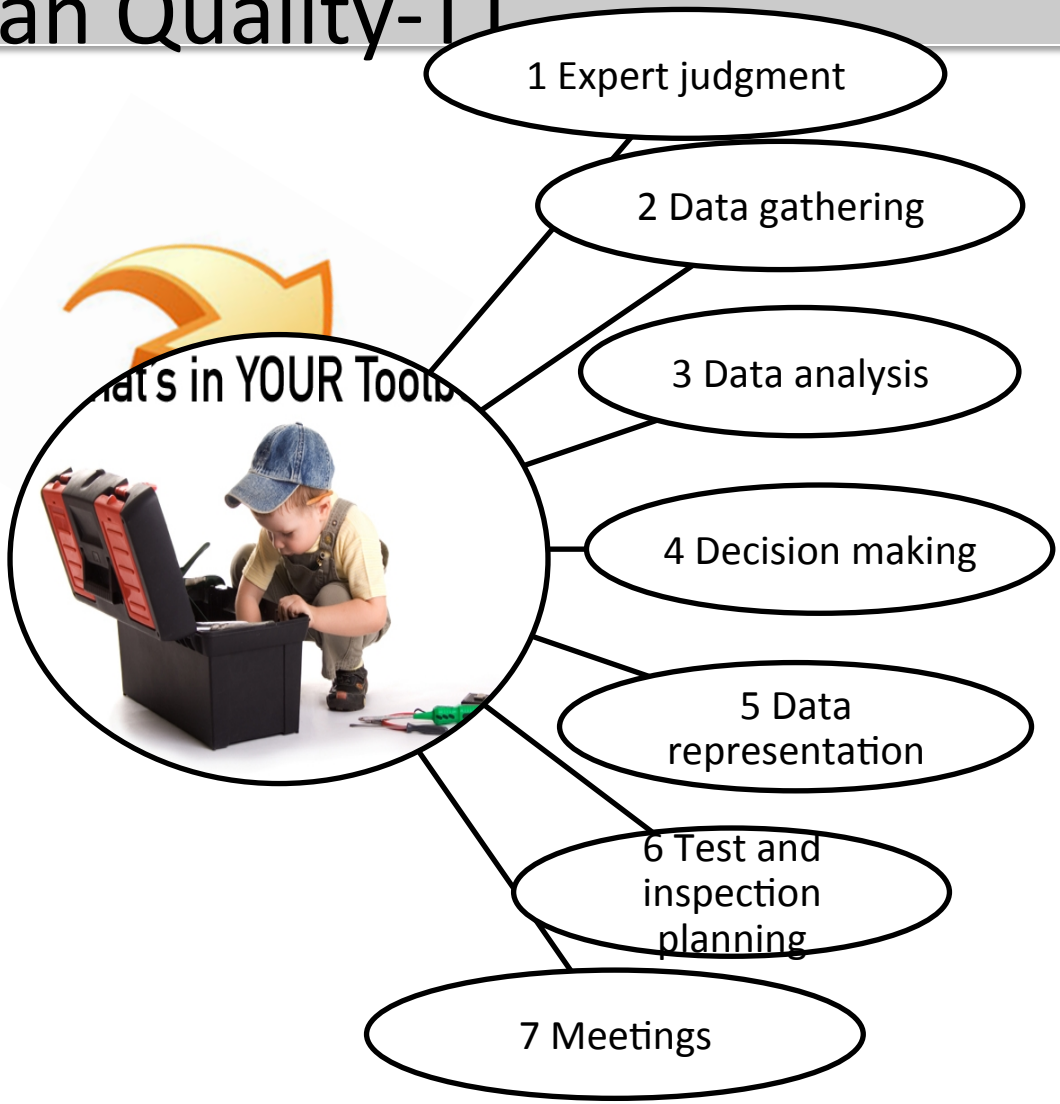
Copyright © Strategic Transformation Consultants Ltd.

Input to Plan Quality

1 Project charter	• The project charter provides the high-level project description and product characteristics.
2 Project management plan	• Requirements management plan, Risk management plan, Stakeholder engagement plan, Scope baseline
3 Project documents	• Assumption log, Requirements, documentation, Requirements traceability Matrix, Risk register, Stakeholder register
4 Enterprise environmental factors	• Governmental agency regulations; Rules, standards, and guidelines specific to the application area; Geographic distribution; Organizational structure; Marketplace conditions; Working or operating conditions of the project or its deliverables; and Cultural perceptions
5 Organizational process assets	• Organizational quality management system including policies, procedures, and guidelines; Quality templates such as check sheets, traceability matrix, and others; and Historical databases and lessons learned repository.

Copyright © Strategic Transformation Consultants Ltd.

Plan Quality-TT



Copyright © Strategic Transformation Consultants Ltd.

Plan Quality-TT

1 Expert judgment

- Expertise should be considered from individuals or groups with specialized knowledge or training in the following topics:
  - Quality assurance,
  - Quality control,
  - Quality measurements,
  - Quality improvements, and
  - Quality systems.

2 Data gathering

- Benchmarking: Benchmarking involves comparing actual or planned project practices or the project's quality standards to those of comparable projects to identify best practices, generate ideas for improvement, and provide a basis for measuring performance.
- Brainstorming: Brainstorming can be used to gather data creatively from a group of team members or subject matter experts to develop the quality management plan that best fits the upcoming project
- Interviews: Project and product quality needs and expectations, implicit and explicit, formal and informal, can be identified by interviewing experienced project participants, stakeholders, and subject matter experts.

Copyright © Strategic Transformation Consultants Ltd.

Plan Quality-TT

.3 Data analysis

- Cost-benefit analysis: A cost-benefit analysis is a financial analysis tool used to estimate the strengths and weaknesses of alternatives in order to determine the best alternative in terms of benefits provided.
- Cost of quality

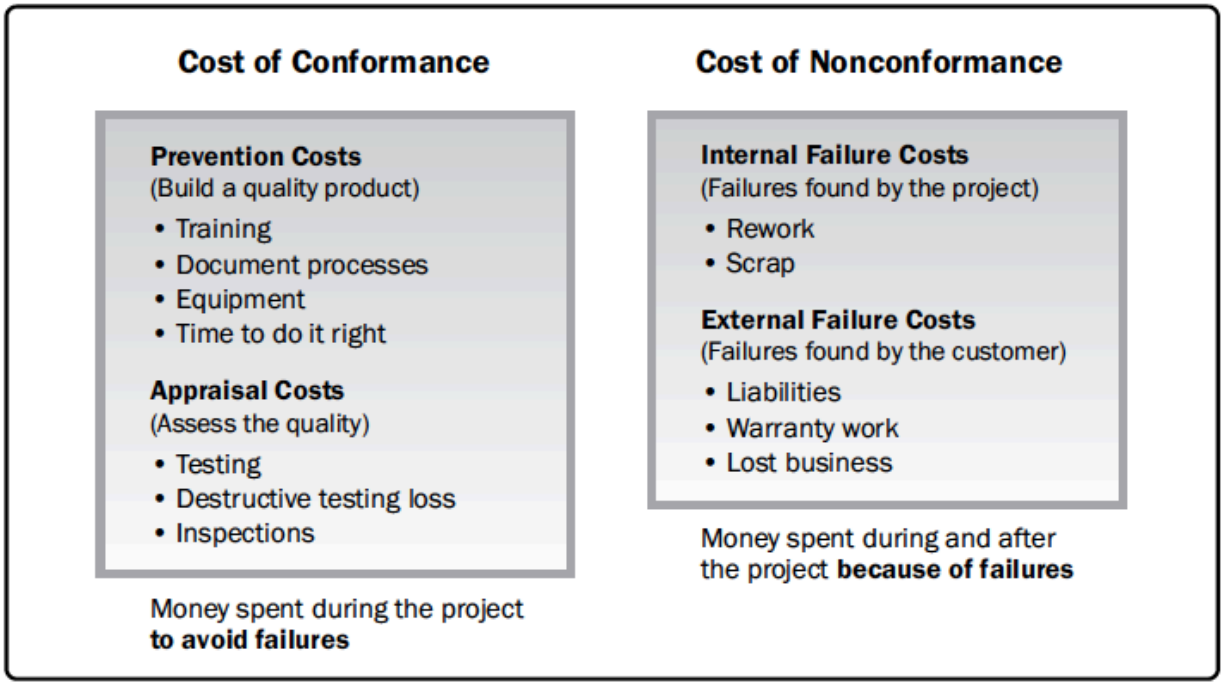


Figure 8-5. Cost of Quality

Copyright © Strategic Transformation Consultants Ltd.

Plan Quality-TT

4 Decision making

- Multicriteria decision analysis

5 Data representation

- Flowcharts
- Logical data model
- Matrix diagrams
- Mind mapping

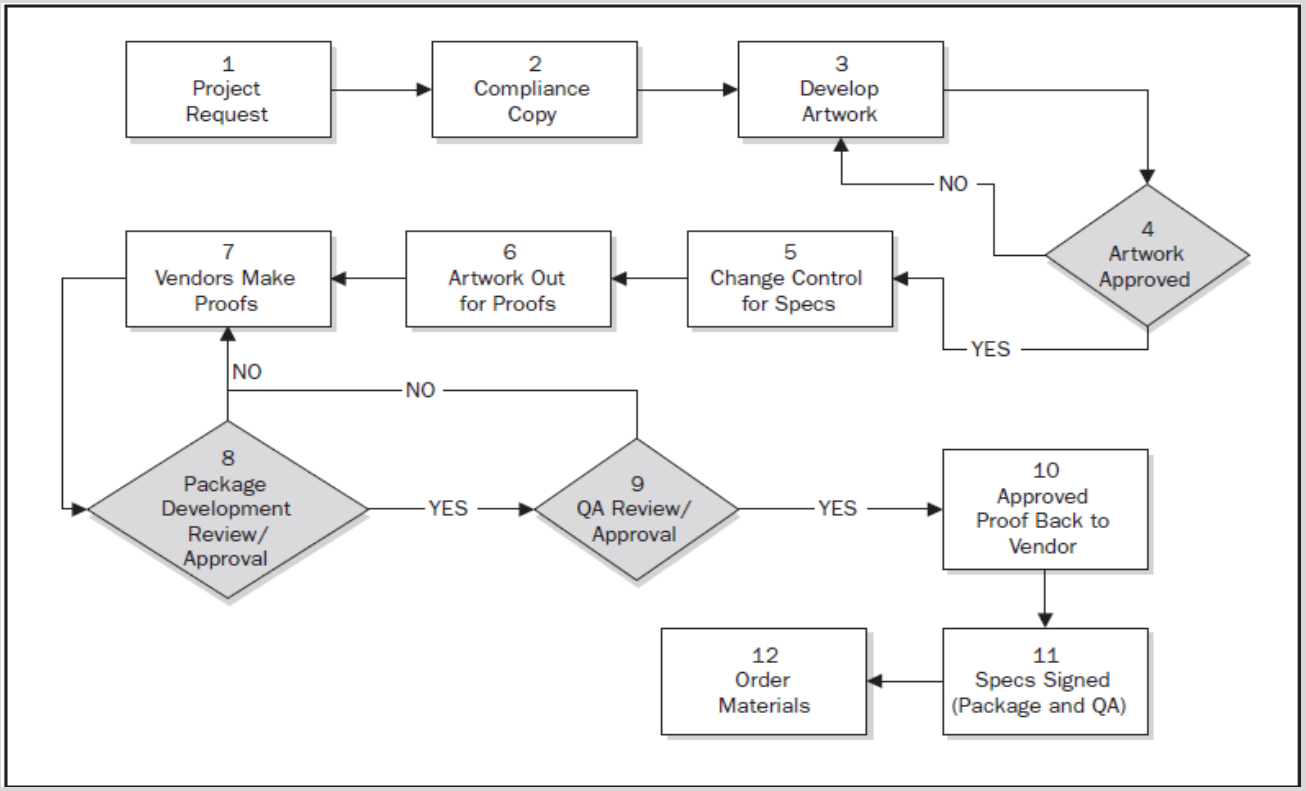
6 Test and inspection planning

7 Meetings

Copyright © Strategic Transformation Consultants Ltd.

Plan Quality-TT

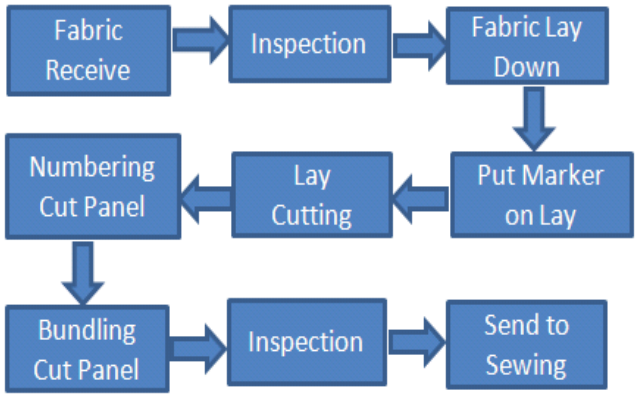
b. Flowcharting



- Also called process map
- Displays sequencing of steps
- Useful tool to find out cost of quality in the process and determine non - value added activities.

Copyright © Strategic Transformation Consultants Ltd.

SIPOC diagram:

SIPOC diagram for cutting process				
Suppliers	**Input**	**Process**	**Output**	**Customer**
Fabric Mill	Fabric		Cut Panel	Sewing Dept.
CAD Dept.	Marker			
HR	Labour			
	Cutting m/c			
	Cutting Table		Off Cut	
	Input Matric	**Process Matric**	**Output Matric**	
	Fabric width	9 steps	Fabric utilization is not less than 92%	
	Shrenkage	One Automated		
	FABRIC DEFECTS	Eight Manual		
	Marker efficiency	Lay time (25 sec)	Cutting acuracy 99%	
	Measurement of marker	Cutting time (30-45) sec		
	Accuracy of cutting m/c	Sequence error not more than 3%		
	Intensity of light(Lux)	Numbering correctness 100%		

Copyright © Strategic Transformation Consultants Ltd.

Plan Quality-output

PROJECT RESOURCE MANAGEMENT

Project Resource Management includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project.

Project Resource Management processes

9.1 Plan Resource Management—

- The process of defining how to estimate, acquire, manage, and utilize physical and team resources.

9.2 Estimate Activity Resources—

- The process of estimating team resources and the type and quantities of material, equipment, and supplies necessary to perform project work.

9.3 Acquire Resources—

- The process of obtaining team members, facilities, equipment, materials, supplies, and other resources necessary to complete project work.

9.4 Develop Team—

- The process of improving competencies, team member interaction, and the overall team environment to enhance project performance.

9.5 Manage Team—

- The process of tracking team member performance, providing feedback, resolving issues, and managing team changes to optimize project performance.

9.6 Control Resources—The process of ensuring that the physical resources assigned and allocated to the

Copyright © Strategic Transformation Consultants Ltd.

Plan Resource Management-ITTO

The process of defining how to estimate, acquire, manage, and utilize physical and team resources

Plan Resource Management

- Resource management plan
- Team Charter
- Project Documents update

Inputs	Tools & Techniques	Outputs
.1 Project charter .2 Project management plan • Quality management plan • Scope baseline .3 Project documents • Project schedule • Requirements documentation • Risk register • Stakeholder register .4 Enterprise environmental factors .5 Organizational process assets	.1 Expert judgment .2 Data representation • Hierarchical charts • Responsibility assignment matrix • Text-oriented formats .3 Organizational theory .4 Meetings	.1 Resource management plan .2 Team charter .3 Project documents updates • Assumption log • Risk register

Figure 9-2. Plan Resource Management: Inputs, Tools & Techniques, and Outputs

Copyright © Strategic Transformation Consultants Ltd.

Input to Plan Resource Management

1 Project charter	• The project charter provides the high-level project description and requirements. It also has the key stakeholder list, summary milestones, and preapproved financial resources that may influence the resource management of the project.
2 Project management plan	• Quality management plan • Scope baseline
3 Project documents	• Project schedule, Requirements Documentation, Risk register, Stakeholder register
4 Enterprise environmental Factors	• Organizational culture and structure, Geographic distribution of facilities and resources, Existing resources competencies and availability, and Marketplace conditions.
5 Organizational process assets	• Human resource policies and procedures, Physical resource management policies and procedures, Safety policies, Security policies, Templates for the resource management plan, and Historical information for similar projects.

Copyright © Strategic Transformation Consultants Ltd.

Plan Resource Management-TT

Copyright © Strategic Transformation Consultants Ltd.

Plan Resource Management-TT

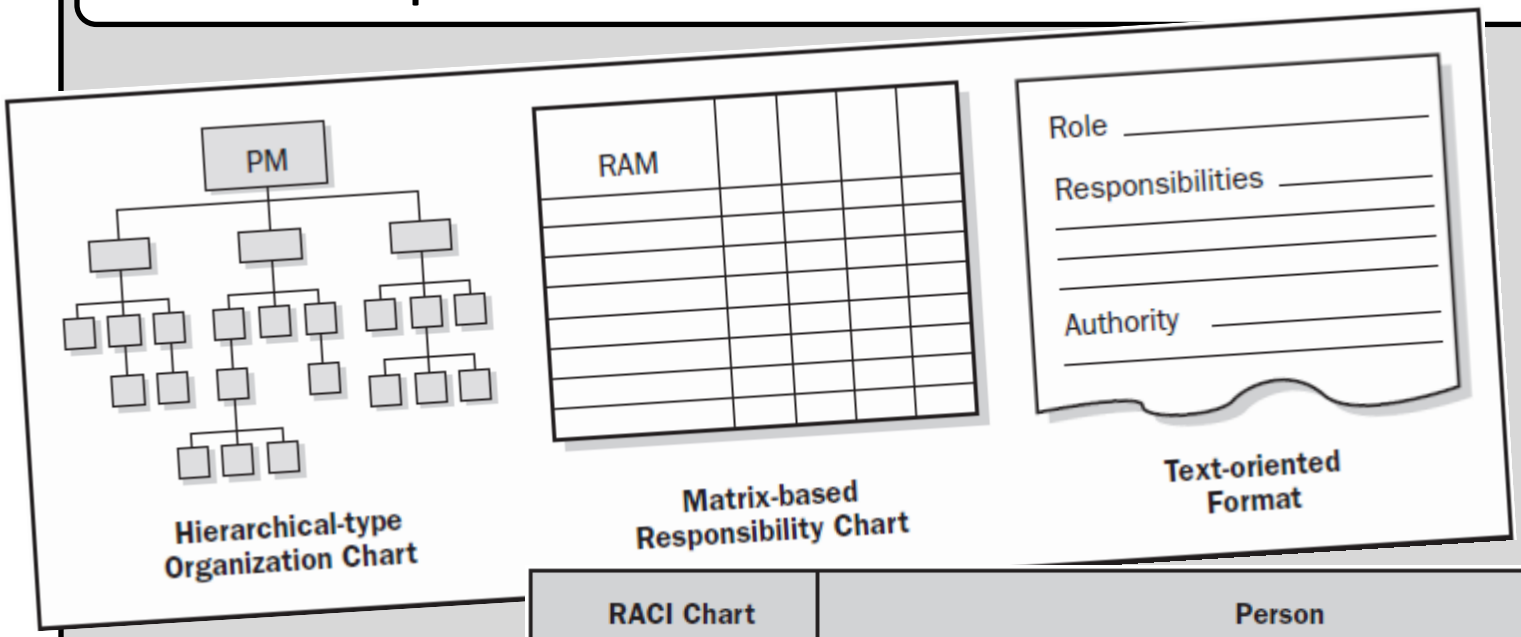
1. Expert Judgment

- Expertise should be considered from individuals or groups with specialized knowledge or training in the following topics:
- Negotiating for the best resources within the organization;
- Talent management and personnel development;
- Determining the preliminary effort level needed to meet project objectives;
- Determining reporting requirements based on the organizational culture;
- Estimating lead times required for acquisition, based on lessons learned and market conditions;
- Identifying risks associated with resource acquisition, retention, and release plans;
- Complying with applicable government and union regulations; and
- Managing sellers and the logistics effort to ensure materials and supplies are available when needed.

Copyright © Strategic Transformation Consultants Ltd.

Plan Resource Management-TT

2 Data representation



RACI Chart	Person				
Activity	Ann	Ben	Carlos	Dina	Ed
Define	A	R	I	I	I
Design	I	A	R	C	C
Develop	I	A	R	C	C
Test	A	I	I	R	I

R = Responsible A = Accountable C = Consult I = Inform

Plan Resource Management-TT

3. Organizational theory

- Provides information regarding the way in which people, teams and organizational units behave.

4. Meetings

- To reach consensus on project human resource plan.

Copyright © Strategic Transformation Consultants Ltd.

Plan Resource Management-output

RESOURCE MANAGEMENT PLAN

- Identification of resources- Methods for identifying and quantifying team and physical resources needed.
- Acquiring resources. Guidance on how to acquire team and physical resources for the project.
- Roles and responsibilities: Role, Authority, responsibility, competence
- Project organization charts.
- Project team resource management. Guidance on how project team resources should be defined, staffed, managed, and eventually released.
- Training. Training strategies for team members.
- Team development. Methods for developing the project team.
- Resource control. Methods for ensuring adequate physical resources are available as needed and that the acquisition of physical resources is optimized for project needs.

Copyright © Strategic Transformation Consultants Ltd.

Plan Resource Management-output

Team Charter

- The team charter is a document that establishes the team values, agreements, and operating guidelines for the team.

  The team charter may include but is not limited to:

  - Team values,
  - Communication guidelines,
  - Decision-making criteria and process,
  - Conflict resolution process,
  - Meeting guidelines, and
  - Team agreements.

PROJECT DOCUMENTS UPDATES

- Project documents that may be updated as a result of carrying out this process include but are not limited to:

  - Assumption log. The assumption log is updated with assumptions regarding the availability, logistics requirements, and location of physical resources as well as the skill sets and availability of team resources.
  - Risk register. The risk register is updated with risks associated with team and physical resource availability or other known resource-related risks.

Copyright © Strategic Transformation Consultants Ltd.

Estimate Activity Resources-ITTO

Estimate Activity Resources is the process of estimating team resources and the type and quantities of materials, equipment, and supplies necessary to perform project work. The key benefit of this process is that it identifies the type, quantity, and characteristics of resources required to complete the project.

Estimate Activity Resources

- Resource Requirements
- Basis of estimates
- Resource Breakdown Structure
- Project documents updates

Inputs

.1 Project management plan
- Resource management plan
- Scope baseline

.2 Project documents
- Activity attributes
- Activity list
- Assumption log
- Cost estimates
- Resource calendars
- Risk register

.3 Enterprise environmental factors

.4 Organizational process assets

Tools & Techniques

.1 Expert judgment
.2 Bottom-up estimating
.3 Analogous estimating
.4 Parametric estimating
.5 Data analysis
- Alternatives analysis

.6 Project management information system
.7 Meetings

Outputs

.1 Resource requirements
.2 Basis of estimates
.3 Resource breakdown structure
.4 Project documents updates
- Activity attributes
- Assumption log
- Lessons learned register

Figure 9-5. Estimate Activity Resources: Inputs, Tools & Techniques, and Outputs

Input to Estimate Activity Resources

1 Project management plan	• Resource management plan • Scope baseline
2 Project documents	• Activity attributes, Activity list, Assumption log, Cost estimates, Resource calendars, Risk register
3 Enterprise environmental factors	• Resource location, Resource availability, Team resource skills, Organizational culture, Published estimating data, and Marketplace conditions.
4 Organizational process assets	• Policies and procedures regarding staffing, • Policies and procedures relating to supplies and equipment, and • Historical information regarding types of resources used for similar work on previous projects

Copyright © Strategic Transformation Consultants Ltd.

Estimate Activity Resources-TT

1. Expert Judgment
2. Bottom-up Estimating
3. Analogous estimating
4. Parametric estimating
5. Data Analysis
PMIS
Meetings

Copyright © Strategic Transformation Consultants Ltd.

Estimate activity resources-TT

1 Expert judgment	• Expertise should be considered from individuals or groups with specialized knowledge or training in team and physical resource planning and estimating.
2 Bottom-up estimating	• Team and physical resources are estimated at the activity level and then aggregated to develop the estimates for work packages, control accounts, and summary project levels.
3 Analogous estimating	• Analogous estimating uses information regarding resources from a previous similar project as the basis for estimating a future project. It is used as quick estimating method and can be used when the project manager can only identify a few top levels of the WBS.

© Strategic Transformation Consultants Ltd.

Estimate activity resources-TT

4 Parametric estimating	• Parametric estimating uses an algorithm or a statistical relationship between historical data and other variables to calculate resource quantities needed for an activity, based on historical data and project parameters.
5 Data analysis	• Alternatives analysis: A data analysis technique used in this process includes but is not limited to alternatives analysis. Alternatives analysis is used to evaluate identified options in order to select the options or approaches to use to execute and perform the work of the project.
6 Project management information system	• Project management information systems can include resource management software that can help plan, organize, and manage resource pools and develop resource estimates.
7 Meetings	• The project manager may hold planning meetings with functional managers to estimate the resources needed per activity, level of effort (LoE), skill level of the team resources, and the quantity of the materials needed.

Output of Estimate activity resources

1. Resource Requirements

- The output of the Activity Resource Estimating process is an identification and description of the types and quantities of resources required for each schedule activity in a work package Serves as an extension to the WBS Detail description allows understanding of the work to be done

2. Basis of estimates

- Method used to develop the estimate, Resources used to develop the estimate (such as information from previous similar projects), Assumptions associated with the estimate, Known constraints, Range of estimates, Confidence level of the estimate, and Documentation of identified risks influencing the estimate.

Resource Breakdown Structure

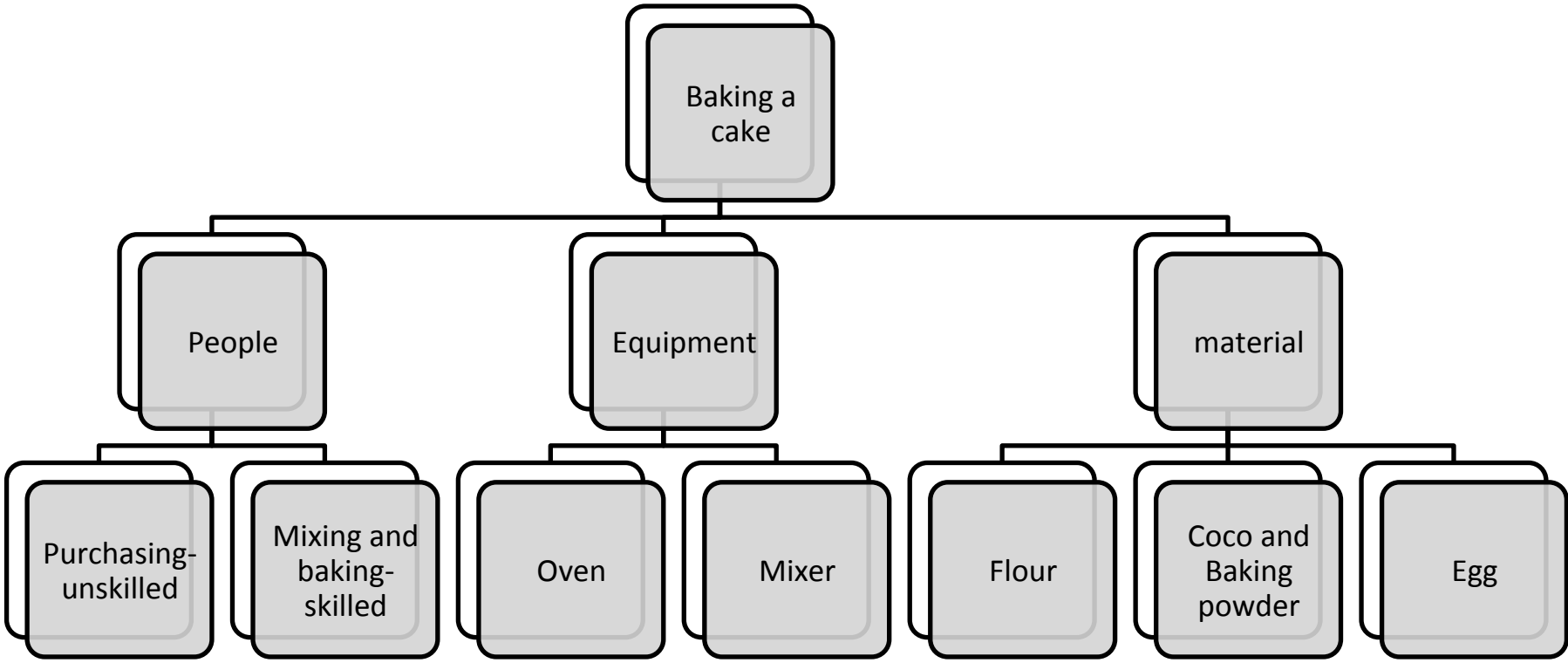
- A composite resource calendar for the project documents working days and nonworking days that determine those dates on which a specific resource, whether a person or materiel, can be active or is idle

Project Document Updates

- Activity Attributes, Assumption log, LL register

Copyright © Strategic Transformation Consultants Ltd.

Resource Breakdown Structure



Copyright © Strategic Transformation Consultants Ltd.

Communication management

Project Communications Management includes the processes necessary to ensure that the information needs of the project and its stakeholders are met through development of artifacts and implementation of activities designed to achieve effective information exchange.

Project Communication Management

Plan Communications Management—

- The process of developing an appropriate approach and plan for project communication activities based on the information needs of each stakeholder or group, available organizational assets, and the needs of the project.

10.2 Manage Communications—

- The process of ensuring timely and appropriate collection, creation, distribution, storage, retrieval, management, monitoring, and the ultimate disposition of project information.

10.3 Monitor Communications—

- The process of ensuring the information needs of the project and its stakeholders are met.

Copyright © Strategic Transformation Consultants Ltd.

Plan communication Management-ITTO

The process of developing an appropriate approach and plan for project communication activities based on the information needs of each stakeholder or group, available organizational assets, and the needs of the project.

Plan Communication Management

- Communication management plan
- Project documents updates

Inputs	Tools & Techniques	Outputs
.1 Project charter .2 Project management plan • Resource management plan • Stakeholder engagement plan .3 Project documents • Requirements documentation • Stakeholder register .4 Enterprise environmental factors .5 Organizational process assets	.1 Expert judgment .2 Communication requirements analysis .3 Communication technology .4 Communication models .5 Communication methods .6 Interpersonal and team skills • Communication styles assessment • Political awareness • Cultural awareness .7 Data representation • Stakeholder engagement assessment matrix .8 Meetings	.1 Communications management plan .2 Project management plan updates • Stakeholder engagement plan .3 Project documents updates • Project schedule • Stakeholder register

Figure 10-2. Plan Communications Management: Inputs, Tools & Techniques, and Outputs

Why plan communication Management

✓Determining the information needs of the stakeholders and defining the communication approach.

- Who
- What
- When
- How
- By whom

✓Effective communication means that the info is provided in the

right format, right time, right impact…

✓ Efficient communication means providing only the info that is needed

Copyright © Strategic Transformation Consultants Ltd.

Input to Plan communication Management

.1 Project charter	• The project charter identifies the key stakeholder list. It may also contain information about the roles and responsibilities of the stakeholders.
.2 Project management plan	• Resource management plan • Stakeholder engagement plan
.3 Project documents	• Requirements documentation • Stakeholder register
.4 Enterprise environmental factors	• Organizational culture, political climate, and governance framework; Personnel administration policies; Stakeholder risk thresholds; etc
.5 Organizational process assets	• Organizational policies and procedures for social media, ethics, and security; • Organizational communication requirements; etc

Copyright © Strategic Transformation Consultants Ltd.

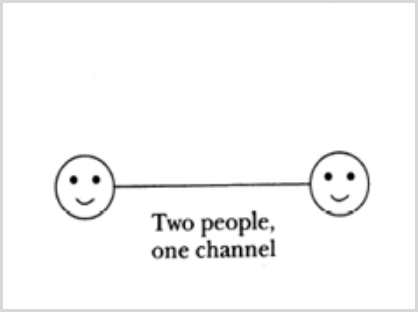
Plan communication Management-TT

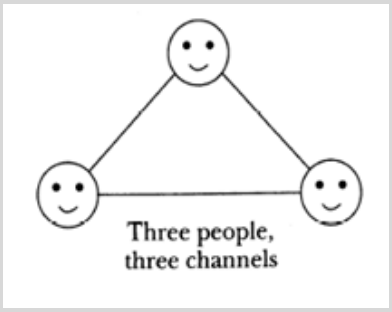
Copyright © Strategic Transformation Consultants Ltd.

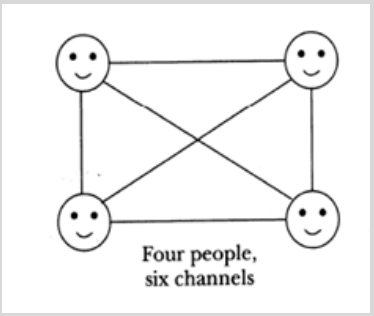
Plan communication Management-TT

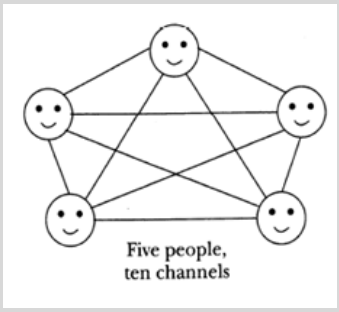
1. Expert Judgment

Communication requirement analysis









- **Number of Communication Channels = n(n-1)/2**

Copyright © Strategic Transformation Consultants Ltd.

Plan communication Management-TT

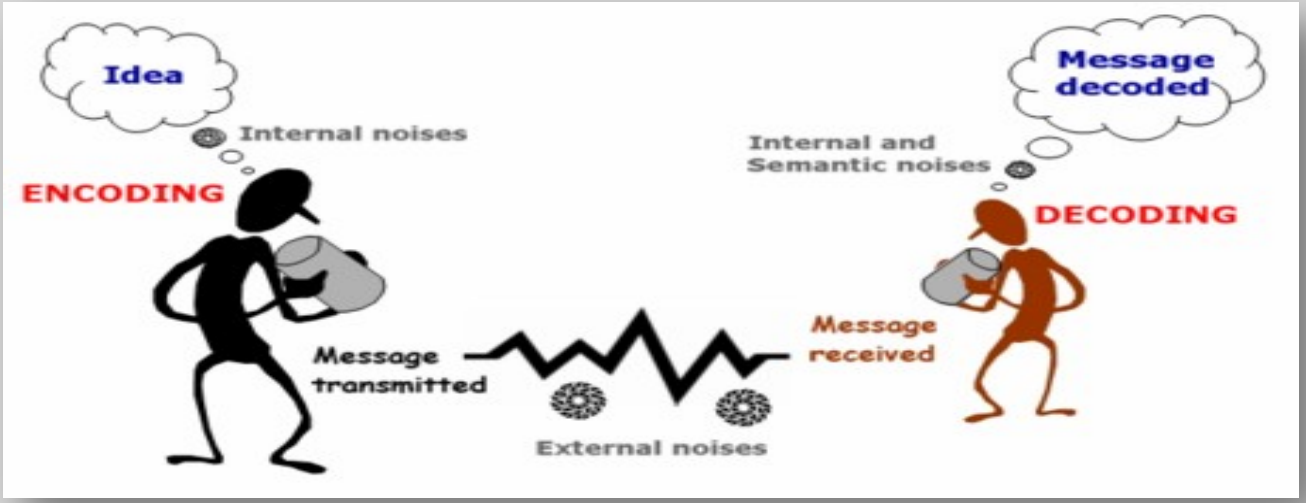
3. Communication technology

- Factors that affect communication technology selection
  - Urgency of need for information
  - Availability of technology
  - Ease of use
  - Project environment
  - Sensitivity of information

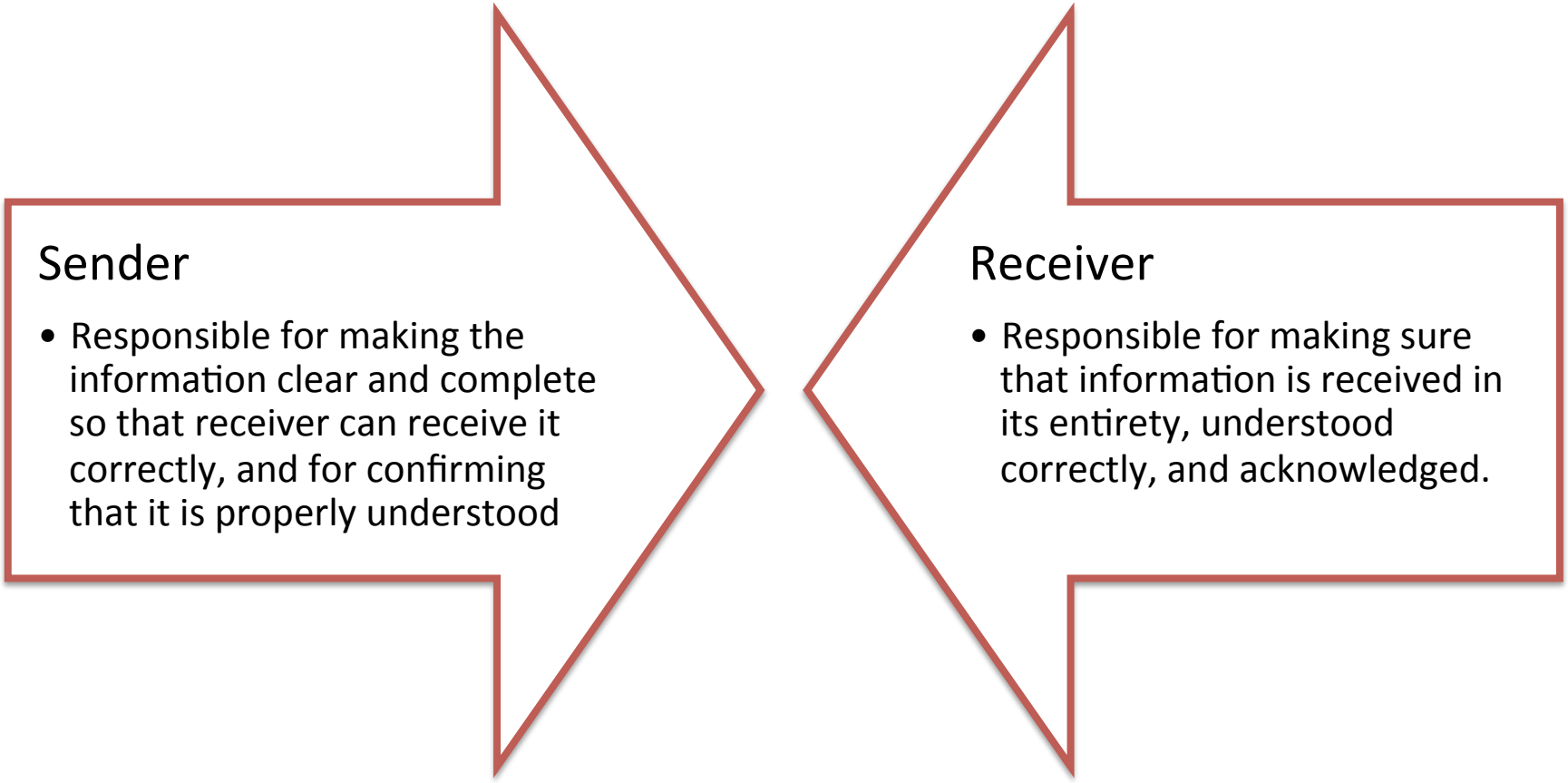
Copyright © Strategic Transformation Consultants Ltd.

Plan communication Management-TT

4. Communication model



Encode	Message	Acknowledge	Medium	Noise	Decode
• Ideas are translated into systematic set of symbol, signs etc	• Output of encoding	• Upon receipt , receiver may signal receipt. Does not mean agreement.	• The form of transmitting the message	• Unwanted/ unintended items added between transmission and reception	• Making out meaning of the message



Copyright © Strategic Transformation Consultants Ltd.

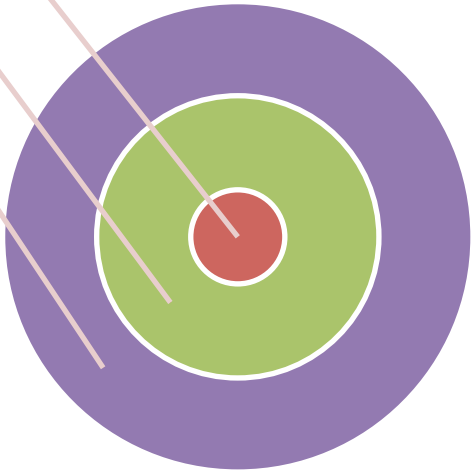
Plan communication Management-TT

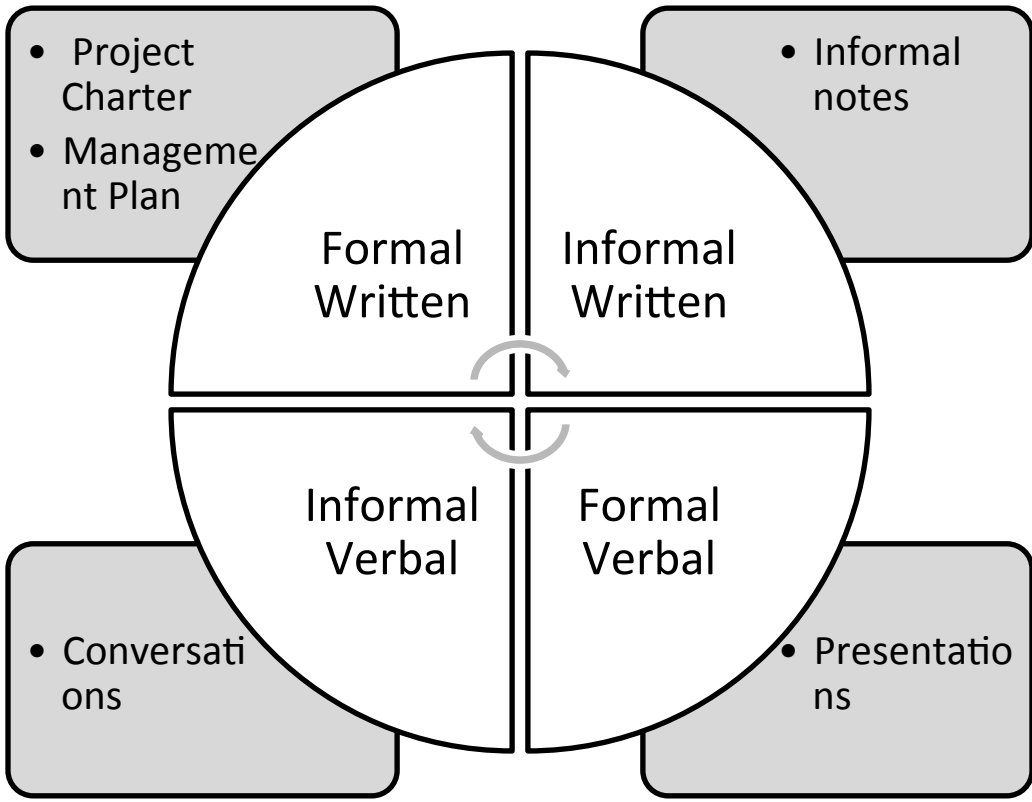
5. Communication methods

Interactive (meeting, phone call, video conferencing)

Push (Letter, memo, email, reports)

Pull (internet site, knowledge repository)





Copyright © Strategic Transformation Consultants Ltd.

Communication type

Communication	When used
Formal written	Complex problem, project management plans, charter, memos, communicating over long distances, 2nd and further warnings, Email
Formal verbal	Presentation, speeches
Informal written	Email, handwritten notes
Informal verbal	Meetings, conversation, 1st warning

Copyright © Strategic Transformation Consultants Ltd.

Plan communication Management-TT

6 Interpersonal and team skills

- Communication styles assessment
- Political and cultural awareness

.7 Data representation

- A data representation technique that can be used for this process includes but is not limited to a stakeholder engagement assessment matrix.

.8 Meetings

- Project meetings can include virtual (e-meetings) or face-to-face meetings, and can be supported with document collaboration technologies, including email messages and project websites.

Copyright © Strategic Transformation Consultants Ltd.

Plan communication Management-output

Communication management plan	• Stakeholder communication requirements, information to be communicated, reason of distribution, time frame and frequency, person responsible for communicating & authorizing,
Project Management Plan update	• The stakeholder engagement plan is updated to reflect any processes, procedures, tools, or techniques that affect the engagement of stakeholders in project decisions and execution.
Project documents update	• Project schedule, Stakeholder register

Copyright © Strategic Transformation Consultants Ltd.

Communication Type	Objective of Communication	Medium	Frequency	Audience	Owner	Deliverable
Kickoff Meeting	Introduce the project team and the project. Review project objectives and management approach.	• Face to Face	Once	• Project Sponsor • Project Team • Stakeholders	Project Manager	• Agenda • Meeting Minutes
Project Team Meetings	Review status of the project with the team.	• Face to Face • Conference Call	Twice a month	• Project Team	Project Manager	• Agenda • Meeting Minutes
Technical Design Meetings	Discuss and develop technical design solutions for the project.	• Face to Face	As Needed	• Project Technical Staff	Technical Lead	• Agenda • Meeting Minutes
Monthly Project Status Meetings	Report on the status of the project to management.	• Face to Face • Conference Call	Twice a month	• SLT • PMO	Project Manager	
Project Status Reports	Report the status of the project including activities, progress, costs and issues.	• Email	Monthly	• Project Sponsor • Project Team • Stakeholders • PMO	Project Manager	• Project Status Report

Risk management

Risk

- An uncertain event or condition that, if it occurs, has a **positive or negative** effect on at least one project objective – time, cost, scope or quality.

Copyright © Strategic Transformation Consultants Ltd.

Project Risk Management

11.1 Plan Risk Management

- The process of defining how to conduct risk management activities for a project.

11.2 Identify Risks—

- The process of identifying individual project risks as well as sources of overall project risk, and documenting their characteristics.

11.3 Perform Qualitative Risk Analysis—

- The process of prioritizing individual project risks for further analysis or action by assessing their probability of occurrence and impact as well as other characteristics.

11.4 Perform Quantitative Risk Analysis—

- The process of numerically analyzing the combined effect of identified individual project risks and other sources of uncertainty on overall project objectives.

11.5 Plan Risk Responses—

- The process of developing options, selecting strategies, and agreeing on actions to address overall project risk exposure, as well as to treat individual project risks.

11.6 Implement Risk Responses—

- The process of implementing agreed-upon risk response plans.

11.7 Monitor Risks—

- The process of monitoring the implementation of agreed-upon risk response plans, tracking identified risks, identifying and analyzing new risks, and evaluating risk process effectiveness throughout the project.

Copyright © Strategic Transformation Consultants Ltd.

Plan Risk Management-ITTO

The process of defining how to conduct risk management activities for the projects

Plan risk management

- Risk management plan

Inputs	Tools & Techniques	Outputs
.1 Project charter .2 Project management plan • All components .3 Project documents • Stakeholder register .4 Enterprise environmental factors .5 Organizational process assets	.1 Expert judgment .2 Data analysis • Stakeholder analysis .3 Meetings	.1 Risk management plan

Figure 11-2. Plan Risk Management: Inputs, Tools & Techniques, and Outputs

Copyright © Strategic Transformation Consultants Ltd.

Input to plan risk management

1 Project charter	• The project charter documents the high-level project description and boundaries, high level requirements, and risks.
2 Project management plan	• All components
3 Project documents	• Stakeholder register
4 Enterprise environmental factors	• The enterprise environmental factors that can influence the Plan Risk Management process include but are not limited to overall risk thresholds set by the organization or key stakeholders.
5 Organizational process assets	•The organizational process assets that can influence the Plan Risk Management process include but are not limited to: Organizational risk policy; Risk categories, possibly organized into a risk breakdown structure; Common definitions of risk concepts and terms, Risk statement formats; Templates for the risk management plan, risk register, and risk report; Roles and responsibilities; Authority levels for decision making; and Lessons learned repository from previous similar projects.

Copyright © Strategic Transformation Consultants Ltd.

Plan risk management-TT

- Expert Judgment
- Data Analysis (stakeholder analysis)
- Meetings

Project manager, selected project team members, stakeholders, any person who has risk responsibility

Copyright © Strategic Transformation Consultants Ltd.

Risk management plan-output

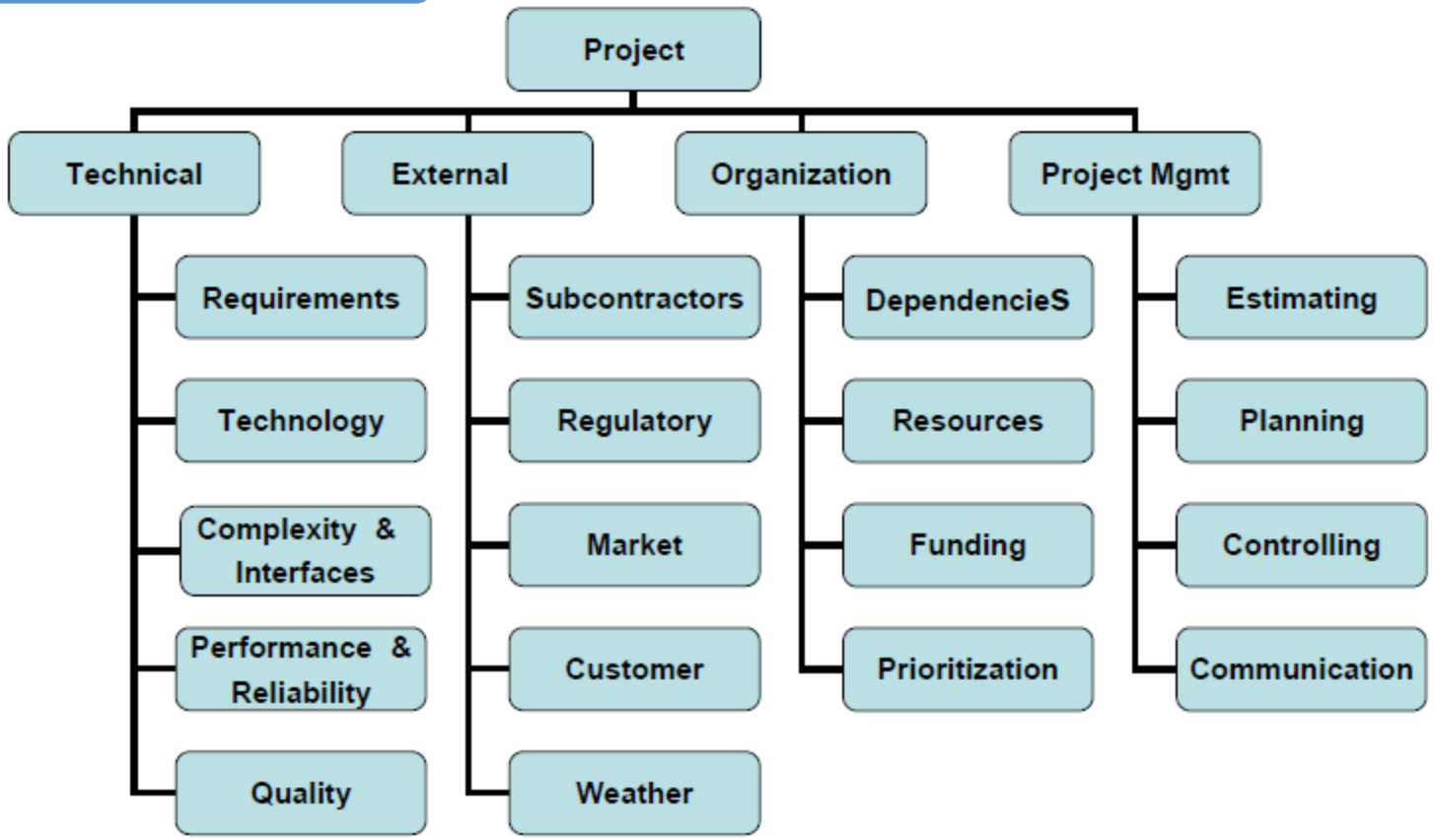
1.Risk Management Plan

Risk Strategy	• Describes the general approach to managing risk on this project.
a. Methodology	• Approach, tools, data sources
b. Roles & Responsibilities	• Lead, support and risk management team members
c. Funding	• Establishes protocol for the application of contingency reserve
d. Timing	• How often the risk management process will be performed throughout the project lifecycle

Copyright © Strategic Transformation Consultants Ltd.

RBS

e. Risk categories



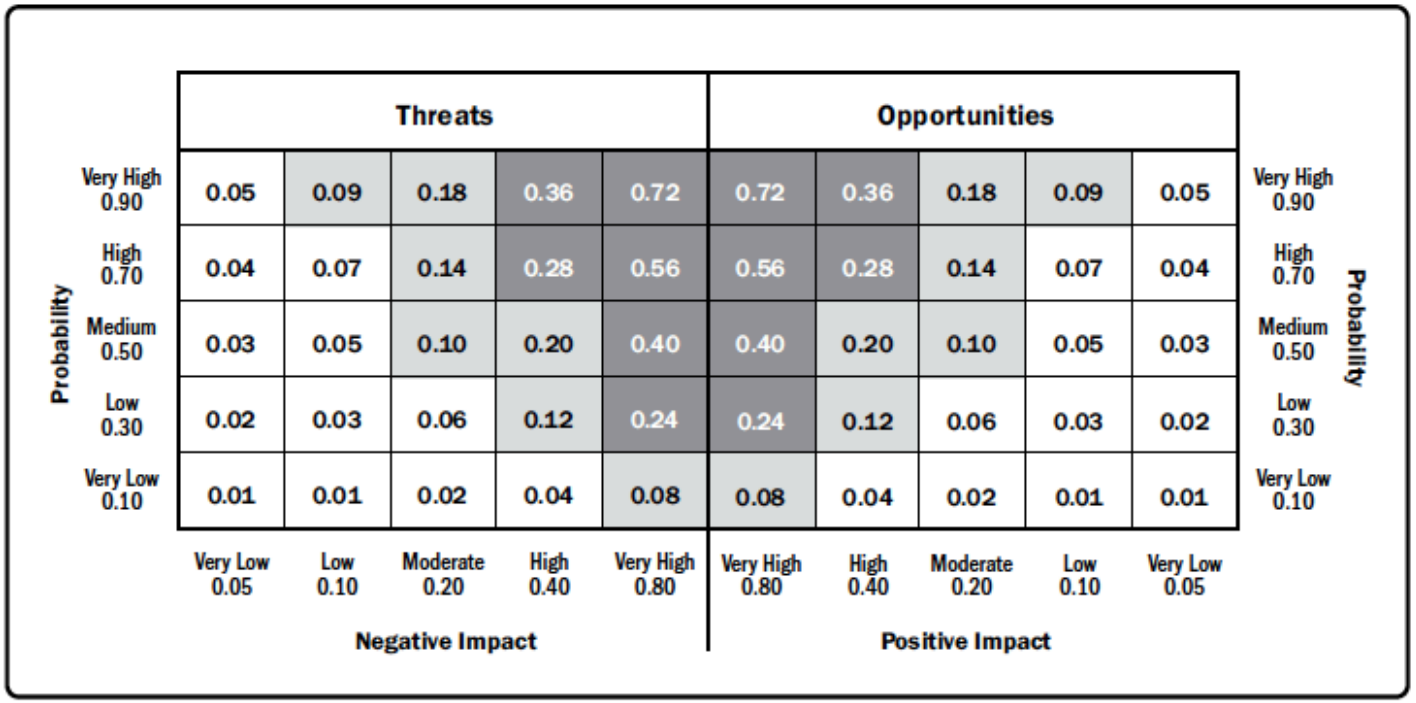
Copyright © Strategic Transformation Consultants Ltd.

6. Definitions of risk probabilities and impact

	Very Low	Low	Medium	High	Very High
Time	< 1 Week	1 to <3 Week	3 to <5 weeks	5 to <7 Weeks	8 weeks or more
Cost (BDT)	< 50k	50 to <150K	150 to <400K	400 to <1M	1M or more
Performance	A minor shortfall in a secondary aspect	Several shortfalls in a secondary aspect	Minor shortfalls in key aspect	Major shortfall in one key aspect	Major shortfall in two or more key aspects
Probability	< 5%	5 to <20%	20 to <40%	40 to <60%	60% or more

Copyright © Strategic Transformation Consultants Ltd.

7. probability and impact matrix



Probability	Threats					Opportunities					Probability
Very High 0.90	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05	Very High 0.90
High 0.70	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04	High 0.70
Medium 0.50	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03	Medium 0.50
Low 0.30	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02	Low 0.30
Very Low 0.10	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01	Very Low 0.10
	Very Low 0.05	Low 0.10	Moderate 0.20	High 0.40	Very High 0.80	Very High 0.80	High 0.40	Moderate 0.20	Low 0.10	Very Low 0.05	
	Negative Impact					Positive Impact					

Figure 11-5. Example Probability and Impact Matrix with Scoring Scheme

Copyright © Strategic Transformation Consultants Ltd.

Risk management plan-output

8. Stakeholder risk appetite	• Stakeholder's tolerance may be revised during this process
9. Reporting formats	• Defines how outcome of this processes will be documented, analyzed and communicated.
10. Tracking	• How risk activity will be recorded for current project, as well as for future need of LL.

Copyright © Strategic Transformation Consultants Ltd.

Identify risk-ITTO

The process of determining which risk may affect the project and documenting their characteristics

Identify risk

- Risk register

Inputs

.1 Project management plan
- Requirements management plan
- Schedule management plan
- Cost management plan
- Quality management plan
- Resource management plan
- Risk management plan
- Scope baseline
- Schedule baseline
- Cost baseline

.2 Project documents
- Assumption log
- Cost estimates
- Duration estimates
- Issue log
- Lessons learned register
- Requirements documentation
- Resource requirements
- Stakeholder register

.3 Agreements
.4 Procurement documentation
.5 Enterprise environmental factors
.6 Organizational process assets

Tools & Techniques

.1 Expert judgment
.2 Data gathering
- Brainstorming
- Checklists
- Interviews

.3 Data analysis
- Root cause analysis
- Assumption and constraint analysis
- SWOT analysis
- Document analysis

.4 Interpersonal and team skills
- Facilitation

.5 Prompt lists
.6 Meetings

Outputs

.1 Risk register
.2 Risk report
.3 Project documents updates
- Assumption log
- Issue log
- Lessons learned register

Figure 11-6. Identify Risks: Inputs, Tools & Techniques, and Outputs

Input to identify risk

1 Project management plan

- Requirements management plan
- Schedule management plan
- Cost management plan
- Quality management plan
- Resource management plan
- Risk management plan
- Scope baseline
- Schedule baseline
- Cost baseline

2 Project documents

- Assumption log
- Cost estimates
- Duration estimates
- Issue log
- Lessons learned register
- Requirements documentation
- Resource requirements
- Stakeholder register

Copyright © Strategic Transformation Consultants Ltd.

Input to identify risk

3 Agreements	• If the project requires external procurement of resources, the agreements may have information such as milestone dates, contract type, acceptance criteria, and awards and penalties that can present threats or opportunities.
4 Procurement documentation	• If the project requires external procurement of resources, the initial procurement documentation should be reviewed as procuring goods and services from outside the organization may increase or decrease overall project risk and may introduce additional individual project risks.
5 Enterprise environmental factors	• Published material, including commercial risk databases or checklists, • Academic studies, Benchmarking results, and • Industry studies of similar projects.
6 Organizational process assets	• Project files, including actual data, • Organizational and project process controls, • Risk statement formats, and • Checklists from previous similar projects.

Copyright © Strategic Transformation Consultants Ltd.

Identify risks-TT

Copyright © Strategic Transformation Consultants Ltd.

Identify risks-TT

1 Expert judgment

2 Data gathering

- Brainstorming
- Checklists
- Interviews

3 Data analysis

- Root cause analysis
- Assumption and constraint analysis
- SWOT analysis
- Document analysis

Copyright © Strategic Transformation Consultants Ltd.

Identify risks-TT

4 Interpersonal and team skills

- Facilitation

5 Prompt lists

- The risk categories in the lowest level of the risk breakdown structure can be used as a prompt list for individual project risks. Some common strategic frameworks are more suitable for identifying

  sources of overall project risk, for example
  - PESTLE (political, economic, social, technological, legal, environmental),
  - TECOP (technical, environmental, commercial, operational, political), or
  - VUCA (volatility, uncertainty, complexity, ambiguity).

6 Meetings

- To undertake risk identification, the project team may conduct a specialized meeting (often called a risk workshop).

Copyright © Strategic Transformation Consultants Ltd.

Output of identify risk process

Risk Register

- List of identified risks.
- Potential risk owners.
- List of potential risk responses.

Risk Report

- The risk report is developed progressively throughout the Project Risk Management process. On completion of the Identify Risks process, information in the risk report may include but is not limited to:
  - Sources of overall project risk, indicating which are the most important drivers of overall project risk exposure; and
  - Summary information on identified individual project risks, such as number of identified threats and opportunities, distribution of risks across risk categories, metrics and trends, etc.

Project Documents update

- Assumption log
- Issue log
- LL register

Copyright © Strategic Transformation Consultants Ltd.

Output of identify risk process

Sl	Risk description	Potential Risk Owner	Potential risk response
1	might not get available hall room for reception	Mukul Zamil, Head of event mgt	Assign two more person to search for a hall and use network to get one booked
2	might not get proper time to invite everyone in person	Nadia Mahbub, public relationship mgt	Send email invitation, SMS and use FB invitations
3	Price of Gold might raise within 2 months	Sultana Mahmood, SCM	Book for the gold now and get an installment.

Copyright © Strategic Transformation Consultants Ltd.

Perform qualitative risk analysis-ITTO

The process of prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact.

Perform qualitative risk analysis

- Risk register update

Perform Qualitative Risk Analysis

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Risk management plan .2 Project documents • Assumption log • Risk register • Stakeholder register .3 Enterprise environmental factors .4 Organizational process assets	.1 Expert judgment .2 Data gathering • Interviews .3 Data analysis • Risk data quality assessment • Risk probability and impact assessment • Assessment of other risk parameters .4 Interpersonal and team skills • Facilitation .5 Risk categorization .6 Data representation • Probability and impact matrix • Hierarchical charts .7 Meetings	.1 Project documents updates • Assumption log • Issue log • Risk register • Risk report

Figure 11-8. Perform Qualitative Risk Analysis: Inputs, Tools & Techniques, and Outputs

Input to Perform qualitative risk analysis

1 Project management plan	• Risk management plan
2 Project documents	• Assumption log • Risk register • Stakeholder register
3 Enterprise environmental factors	• Industry studies of similar projects, and • Published material, including commercial risk databases or checklists.
4 Organizational process assets	• The organizational process assets that can influence Perform Qualitative Risk Analysis include but are not limited to information from similar completed projects.

Copyright © Strategic Transformation Consultants Ltd.

Perform qualitative risk analysis-TT

Copyright © Strategic Transformation Consultants Ltd.

Perform qualitative risk analysis-TT

1 Expert judgment

2 Data gathering

- Interviews

3 Data analysis

- Risk data quality assessment
- Risk probability and impact assessment
- Assessment of other risk parameters

Copyright © Strategic Transformation Consultants Ltd.

Perform qualitative risk analysis-TT

4 Interpersonal and team skills

- Facilitation

5 Risk categorization

- Risks to the project can be categorized by sources of risk (e.g., using the risk breakdown structure (RBS); the area of the project affected (e.g., using the work breakdown structure (WBS); , or other useful categories (e.g., project phase, project budget, and roles and responsibilities) to determine the areas of the project most exposed to the effects of uncertainty. Risks can also be categorized by common root causes. Risk categories that may be used for the project are defined in the risk management plan.

.6 Data representation

- Probability and impact matrix
- Hierarchical charts

7 Meetings

Copyright © Strategic Transformation Consultants Ltd.
240

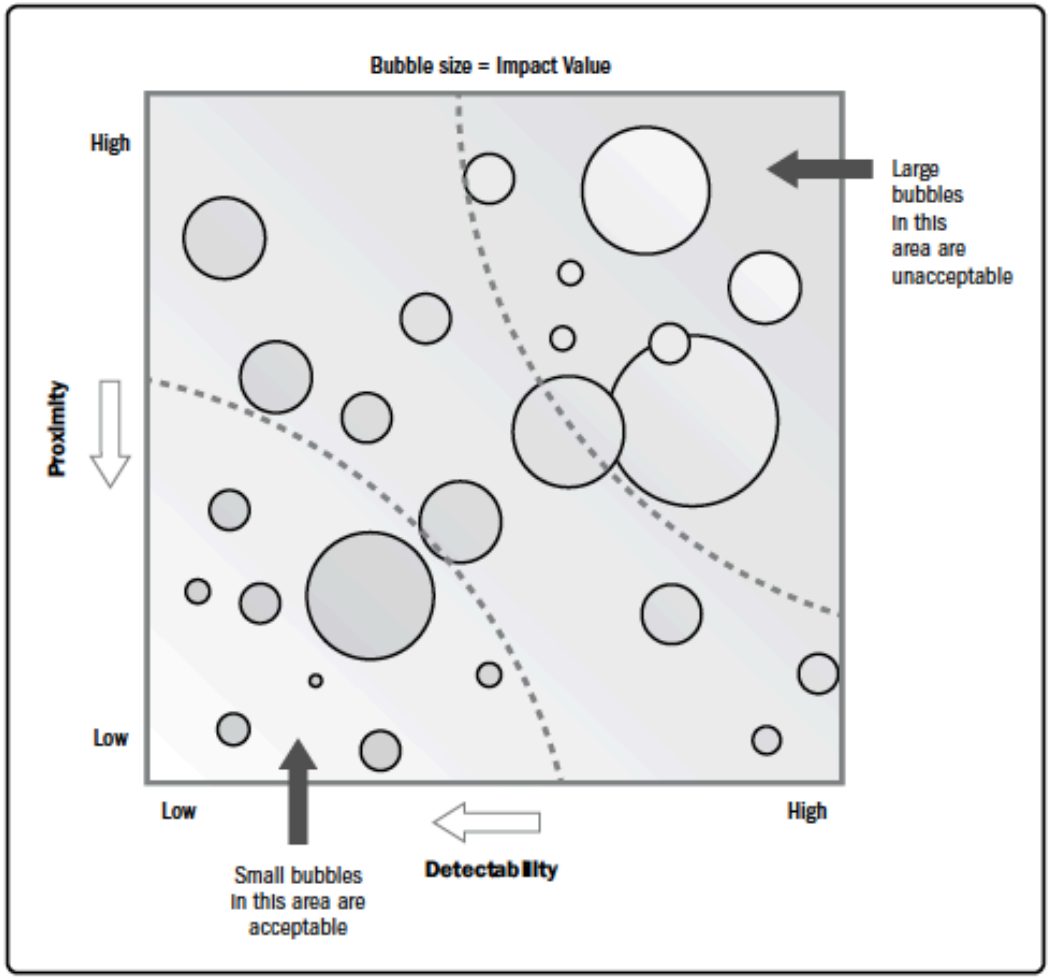
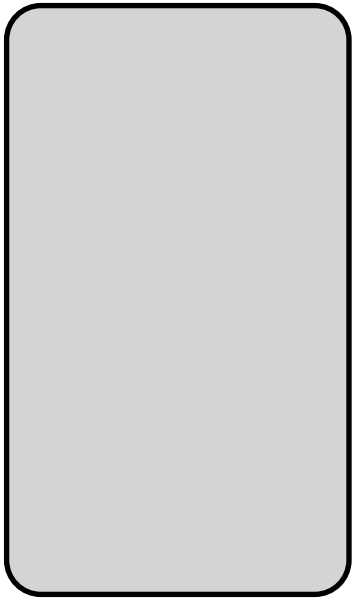


Figure 11-10. Example Bubble Chart Showing Detectability, Proximity, and Impact Value

Copyright © Strategic Transformation Consultants Ltd.

Output of Perform qualitative risk analysis



Project documents update

- Assumption log
- Issue log
- Risk register
- Risk report

Copyright © Strategic Transformation Consultants Ltd.

example

	Very Low (1)	Low (2)	Medium (3)	High (4)	Very High (5)
Probability	< 5%	5 to <20%	20 to <40%	40 to <60%	60% or more

	Very Low (1)	Low (2)	Medium (3)	High (4)	Very High (5)
Time	< 1 Week	1 to <3 Week	3 to <5 weeks	5 to <7 Weeks	8 weeks or more
Cost (BDT)	< 50k	50 to <150K	150 to <400K	400 to <1M	1M or more

Sl	Risk description	Category	Probability	Impact	Overall rating	Response to the potential risk
1	might not get available hall room for reception	event	4	5	20	Assign two more person to search for a hall and use network to get one booked
2	might not get proper time to invite everyone in person	Event	3	3	9	Send email invitation, SMS and use FB invitations

P/I	VL(1)	L(2)	M(3)	H(4)	VH(5)
VH (5)	5	10	15	20	25
H (4)	4	8	12	16	20
M (3)	3	6	9	12	15
L (2)	2	4	6	8	10
VL (1)	1	2	3	4	5

Perform quantitative risk analysis-ITTO

The process of numerically analyzing the effect of identified risks on overall project objectives.

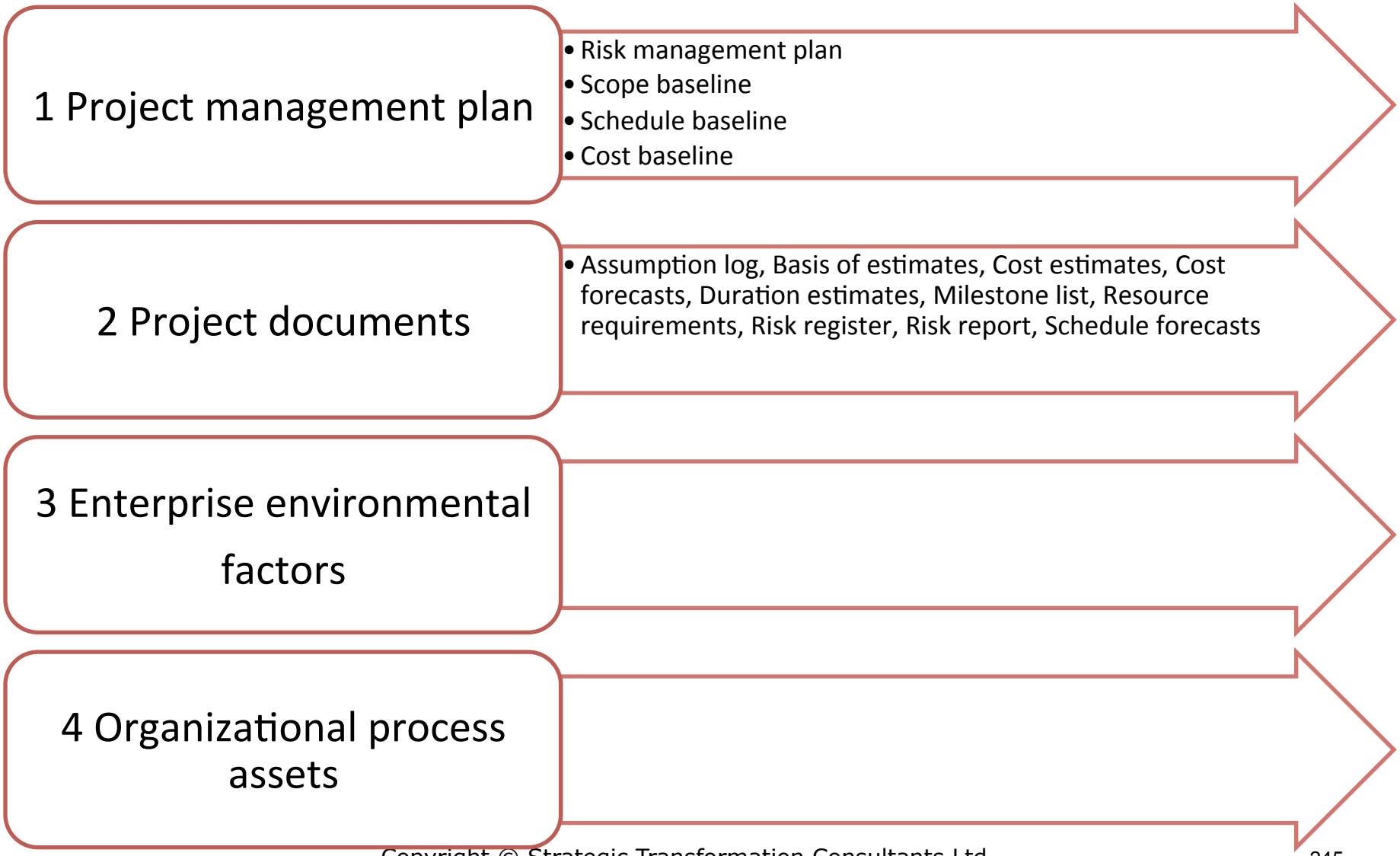
Perform quantitative risk analysis

- Risk register update

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Risk management plan • Scope baseline • Schedule baseline • Cost baseline .2 Project documents • Assumption log • Basis of estimates • Cost estimates • Cost forecasts • Duration estimates • Milestone list • Resource requirements • Risk register • Risk report • Schedule forecasts .3 Enterprise environmental factors .4 Organizational process assets	.1 Expert judgment .2 Data gathering • Interviews .3 Interpersonal and team skills • Facilitation .4 Representations of uncertainty .5 Data analysis • Simulations • Sensitivity analysis • Decision tree analysis • Influence diagrams	.1 Project documents updates • Risk report

Figure 11-11. Perform Quantitative Risk Analysis: Inputs, Tools & Techniques, and Outputs

Input to Perform quantitative risk analysis



Copyright © Strategic Transformation Consultants Ltd.

Perform quantitative risk analysis-TT

1 Expert judgment

2 Data gathering

3 Interpersonal and team skills

4 Representations of uncertainty

5 Data analysis

Copyright © Strategic Transformation Consultants Ltd.

Perform quantitative risk analysis-TT

1 Expert judgment

- It's always a good idea to contact the experts. People who have a good handle on statistics or risk analysis in general can be helpful when quantitative analysis are done.
- Expert judgment from anybody who has a lot of experience with the kind of project.

2 Data gathering

- This is particularly useful where information is required from experts. The interviewer should promote an environment of trust and confidentiality during the interview to encourage honest and unbiased contributions

Copyright © Strategic Transformation Consultants Ltd.

Perform quantitative risk analysis-TT

3. Interpersonal and team skills

- Interpersonal and team skills that can be used for this process include but are not limited to facilitation. A skilled facilitator is useful for gathering input data during a dedicated risk workshop involving project team members and other stakeholders

4. Representations Of Uncertainty

- The most commonly used are triangular, normal, lognormal, beta, uniform, or discrete distributions. Care should be taken when selecting an appropriate probability distribution to reflect the range of possible values for the planned activity.

Copyright © Strategic Transformation Consultants Ltd.

Perform quantitative risk analysis-TT

5. Data analysis

- techniques that can be used during this process include but are not limited to:

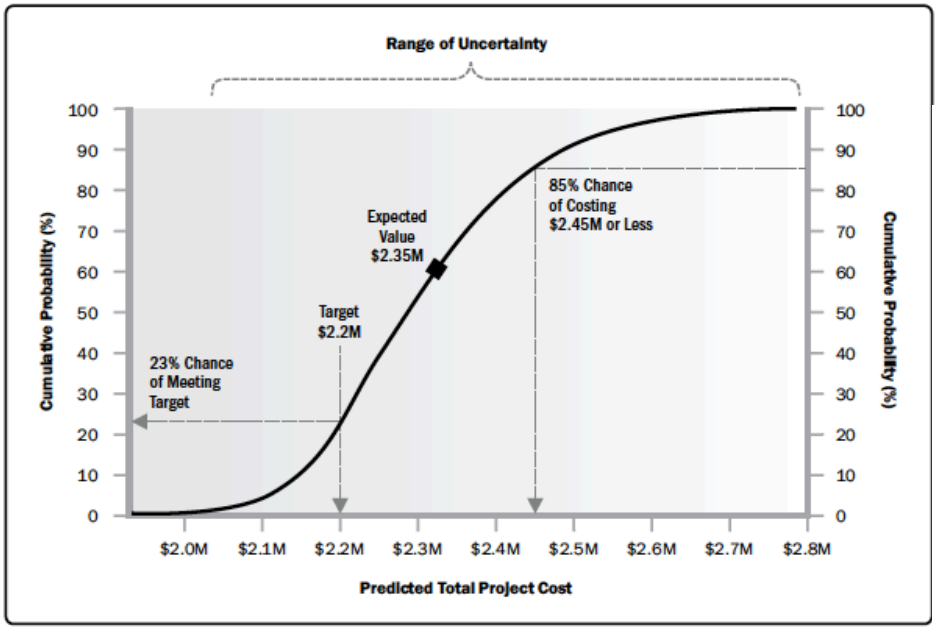


Figure 11-13. Example S-Curve from Quantitative Cost Risk Analysis

Sensitivity Analysis

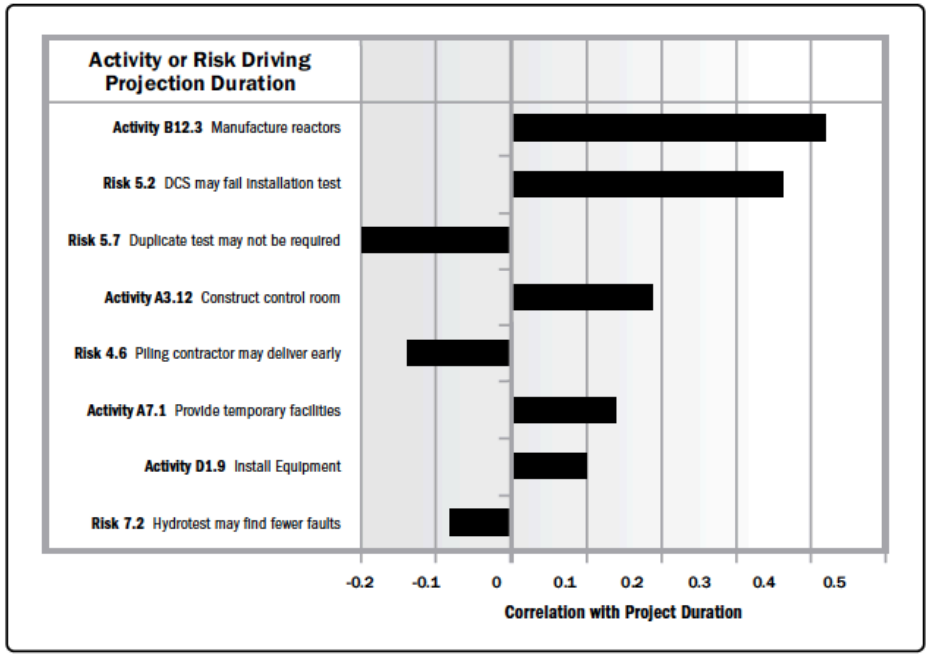


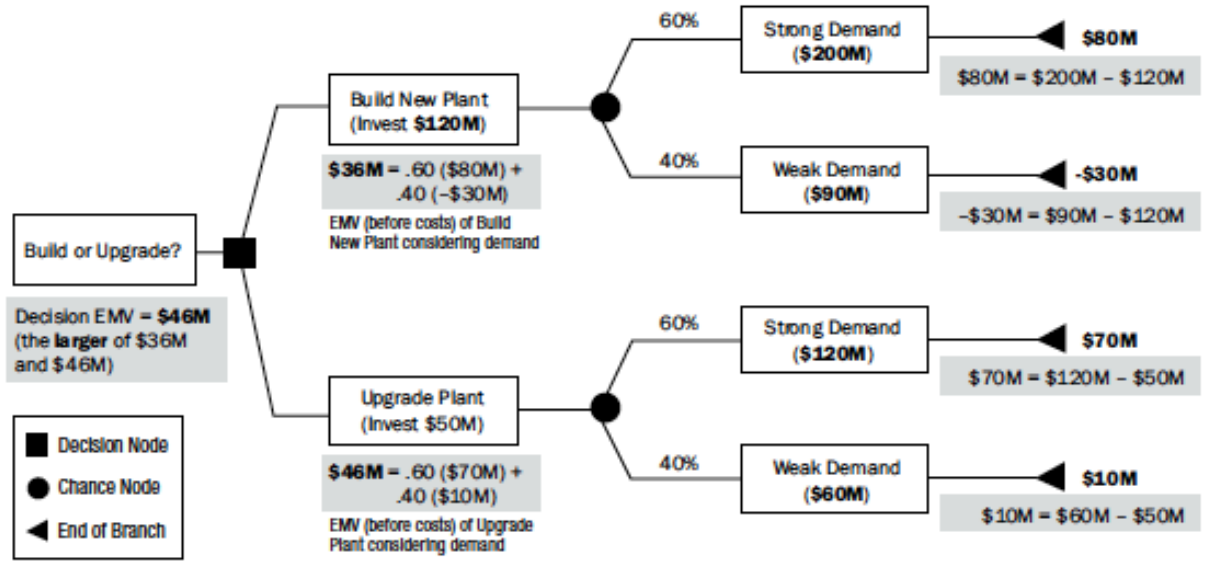
Figure 11-14. Example Tornado Diagram

Simulation

Copyright © Strategic Transformation Consultants Ltd.

Perform qualitative risk analysis-TT

Decision Definition	Decision Node	Chance Node	Net Path Value
Decision to be Made	**Input:** Cost of Each Decision **Output:** Decision Made	**Input:** Scenario Probability, Reward if it Occurs **Output:** Expected Monetary Value (EMV)	**Computed:** Payoffs minus Costs along Path



Note 1: The decision tree shows how to make a decision between alternative capital strategies (represented as "decision nodes") when the environment contains uncertain elements (represented as "chance nodes").

Note 2: Here, a decision is being made whether to invest $120M US to build a new plant or to instead invest only $50M US to upgrade the existing plant. For each decision, the demand (which is uncertain, and therefore represents a "chance node") must be accounted for. For example, strong demand leads to $200M revenue with the new plant but only $120M US for the upgraded plant, perhaps due to capacity limitations of the upgraded plant. The end of each branch shows the net effect of the payoffs minus costs. For each decision branch, all effects are added (see shaded areas) to determine the overall Expected Monetary Value (EMV) of the decision. Remember to account for the investment costs. From the calculations in the shaded areas, the upgraded plant has a higher EMV of $46M – also the EMV of the overall decision. (This choice also represents the lowest risk, avoiding the worst case possible outcome of a loss of $30M).

Figure 11-15. Example Decision Tree

Output of Perform quantitative risk analysis

Project documents update

- Assessment of overall project risk exposure.
- Probabilistic analysis of project
- Prioritized list of individual project risks.
- Trends in quantitative risk analysis results
- Recommended risk responses

Sl	Risk description	Probability	Impact	Overall rating	Quantitative impact	EMV	Response to the potential risk
1	might not get available hall room for reception	4 (55%)	5	20	50,000	27,500	Assign two more person to search for a hall and use network to get one booked
2	might not get proper time to invite everyone in person	3 (40%)	3	9	20000	8000	Send email invitation, SMS and use FB invitations

Copyright © Strategic Transformation Consultants Ltd.

Plan risk response-ITTO

The process of developing options and actions to enhance opportunities and to reduce threats to project objectives.

Plan risk response

- Change Request
- PM plan updates
- Project documents update

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Resource management plan • Risk management plan • Cost baseline .2 Project documents • Lessons learned register • Project schedule • Project team assignments • Resource calendars • Risk register • Risk report • Stakeholder register .3 Enterprise environmental factors .4 Organizational process assets	.1 Expert judgment .2 Data gathering • Interviews .3 Interpersonal and team skills • Facilitation .4 Strategies for threats .5 Strategies for opportunities .6 Contingent response strategies .7 Strategies for overall project risk .8 Data analysis • Alternatives analysis • Cost-benefit analysis .9 Decision making • Multicriteria decision analysis	.1 Change requests .2 Project management plan updates • Schedule management plan • Cost management plan • Quality management plan • Resource management plan • Procurement management plan • Scope baseline • Schedule baseline • Cost baseline .3 Project documents updates • Assumption log • Cost forecasts • Lessons learned register • Project schedule • Project team assignments • Risk register • Risk report

Figure 11-16. Plan Risk Responses: Inputs, Tools & Techniques, and Outputs

Input to Plan risk response

1. Project management plan

- Resource management plan
- Risk management plan
- Cost baseline

.2 Project documents

- Lessons learned register
- Project schedule
- Project team assignments
- Resource calendars
- Risk register
- Risk report
- Stakeholder register

.3 Enterprise environmental factors

.4 Organizational process assets

Copyright © Strategic Transformation Consultants Ltd.

Plan risk response-TT

Copyright © Strategic Transformation Consultants Ltd.

Plan risk response-TT

1 Expert judgment

2 Data gathering

- Interviews

3 Interpersonal and team skills

- Facilitation

Copyright © Strategic Transformation Consultants Ltd.

Plan risk response-TT

4. Strategies for threats

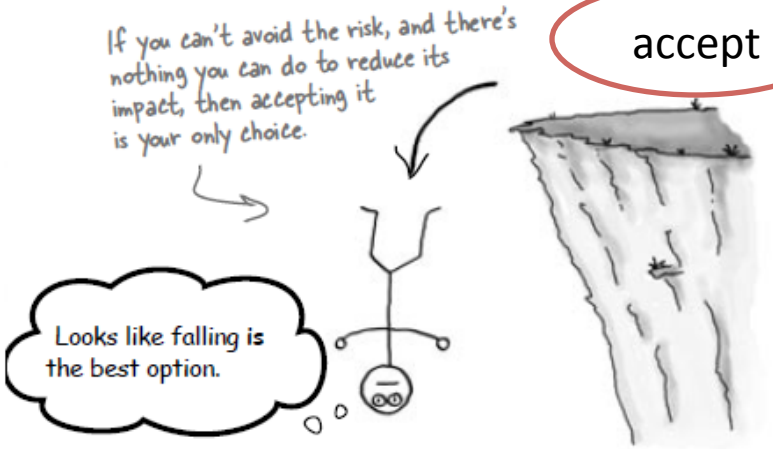
Escalate

avoid

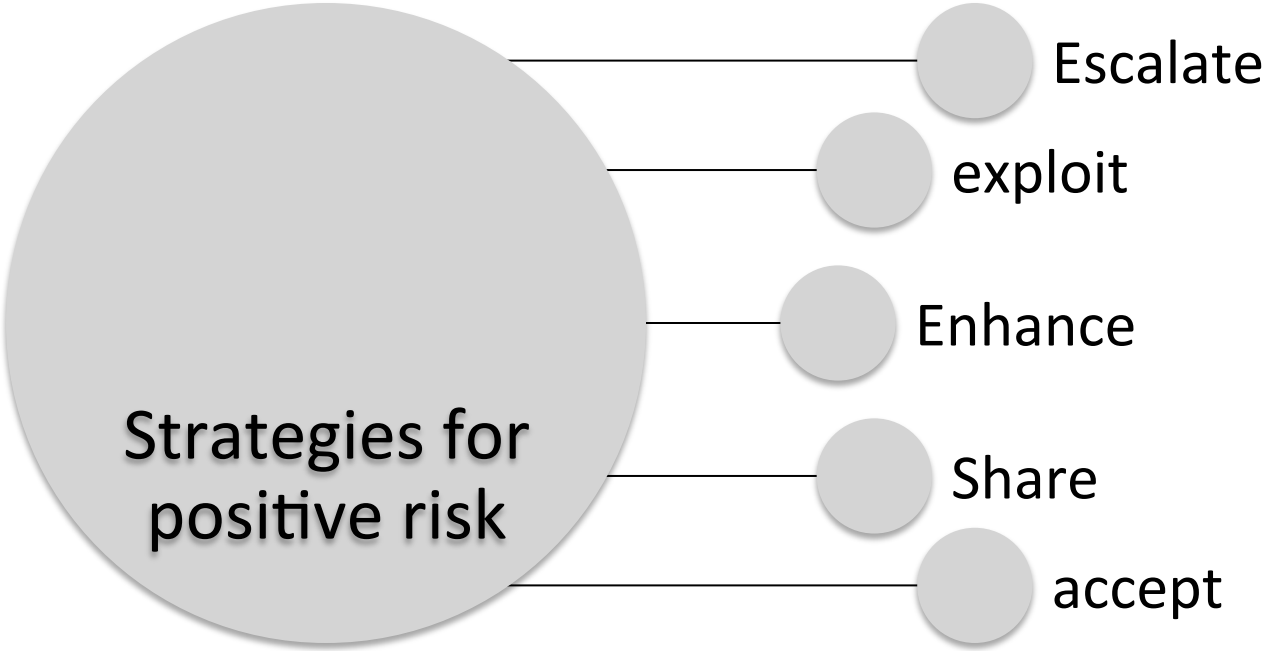
mitigate

transfer

accept



Plan risk response-TT



Copyright © Strategic Transformation Consultants Ltd.

- Secondary risk: risks comes out as a result of other risk's response.

- Residual risk: risks remains after taking response plan.

Copyright © Strategic Transformation Consultants Ltd.

Plan risk response-TT

6. Contingent response strategies

- some responses are designed for use only if certain event occurs.

7 Strategies for overall project risk

8 Data analysis

- Alternatives analysis
- Cost-benefit analysis

9 Decision making

10. Multicriteria decision analysis

Copyright © Strategic Transformation Consultants Ltd.

Output to plan risk response

Change Request

Project management plan updates

- Management plans and baselines

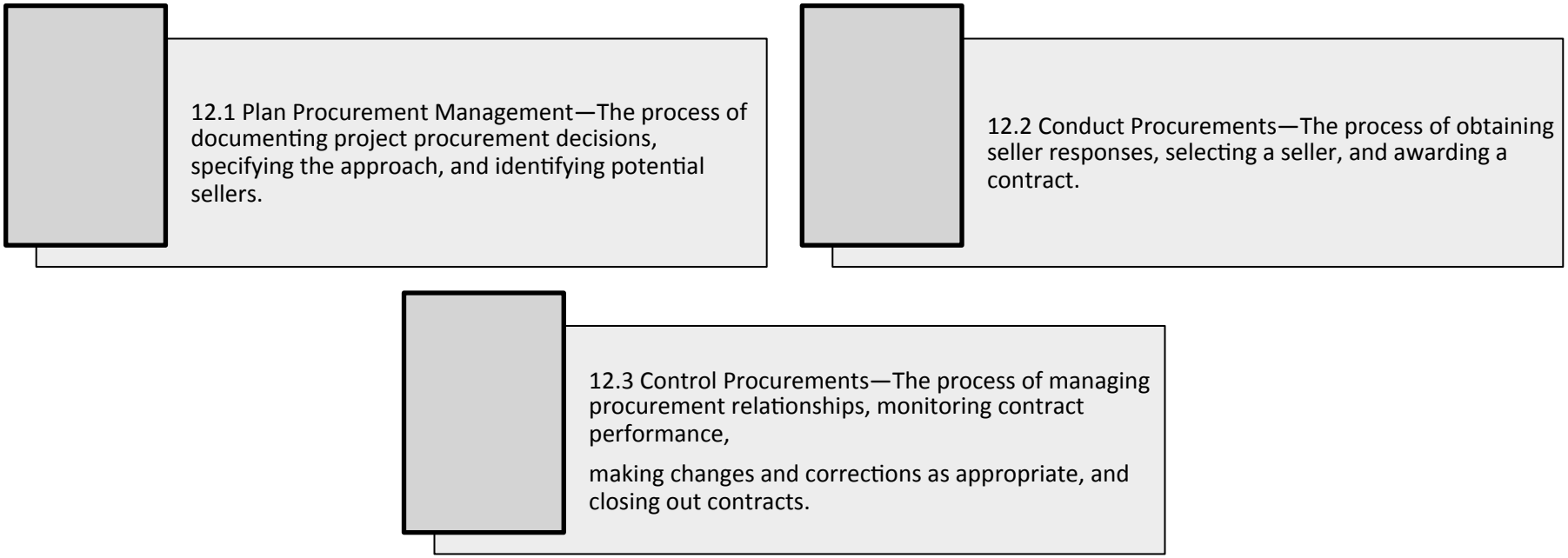
Project documents update

- Risk register
- Assumption log
- Technical documents
- Change requests

Copyright © Strategic Transformation Consultants Ltd.

Project procurement management

Project Procurement Management



Copyright © Strategic Transformation Consultants Ltd.

Plan procurement management -ITTO

The process of documenting project purchasing decisions, specifying approaches and identify potential sellers.

Plan procurement management

- procurement management plan
- Procurement statement of work
- Procurement documents
- Source selection criteria
- Make or buy decisions
- Change requests
- Project documents update

Inputs	Tools & Techniques	Outputs
.1 Project charter .2 Business documents • Business case • Benefits management plan .3 Project management plan • Scope management plan • Quality management plan • Resource management plan • Scope baseline .4 Project documents • Milestone list • Project team assignments • Requirements documentation • Requirements traceability matrix • Resource requirements • Risk register • Stakeholder register .5 Enterprise environmental factors .6 Organizational process assets	.1 Expert judgment .2 Data gathering • Market research .3 Data analysis • Make-or-buy analysis .4 Source selection analysis .5 Meetings	.1 Procurement management plan .2 Procurement strategy .3 Bid documents .4 Procurement statement of work .5 Source selection criteria .6 Make-or-buy decisions .7 Independent cost estimates .8 Change requests .9 Project documents updates • Lessons learned register • Milestone list • Requirements documentation • Requirements traceability matrix • Risk register • Stakeholder register .10 Organizational process assets updates

Copyright © Strategic Transformation Consultants Ltd.

Input to plan procurement management

1 Project charter	• The project charter contains the objectives, project description, summary milestones, and the preapproved financial resources.
2 Business documents	• Business case • Benefits management plan
3 Project management plan	• Scope management plan • Quality management plan • Resource management plan • Scope baseline

Copyright © Strategic Transformation Consultants Ltd.

Input to plan procurement management

4 Project documents	• Milestone list, Project team assignment, Requirements documentation, Requirements traceability matrix • Resource requirements, Risk register • Stakeholder register
5 Enterprise environmental factors	• Marketplace conditions; Products, services, and results that are available in the marketplace; Sellers, including their past performance or reputation;
6 Organizational process assets	• reapproved seller list, Contract type

Copyright © Strategic Transformation Consultants Ltd.

Plan procurement management - OPA

Contract types

Fixed Price

FFP: price is set. Does not change unless scope changes

(contract-2lakh)

FPIF: incentive tied to achieving agreed to metric

(2 lakh plus 20k more for each one months early finish)

FP-EPA: if the project spans a considerable amount of time

Cost reimbursement

CPFF: all costs are reimbursed plus fee initially fixed, a percentage of initially estimated project cost (cost plus a fee of 10,000)

CPIF: cost plus predetermined incentive fee based on performance (calculation)

CPAF: seller is reimbursed legitimate cost and majority of the fee is earned on the basis of satisfaction of subjective performance criteria defined in the contract.

Time & material

Hybrid

(cost of material plus 500/day

Copyright © Strategic Transformation Consultants Ltd.

CPIF calculations

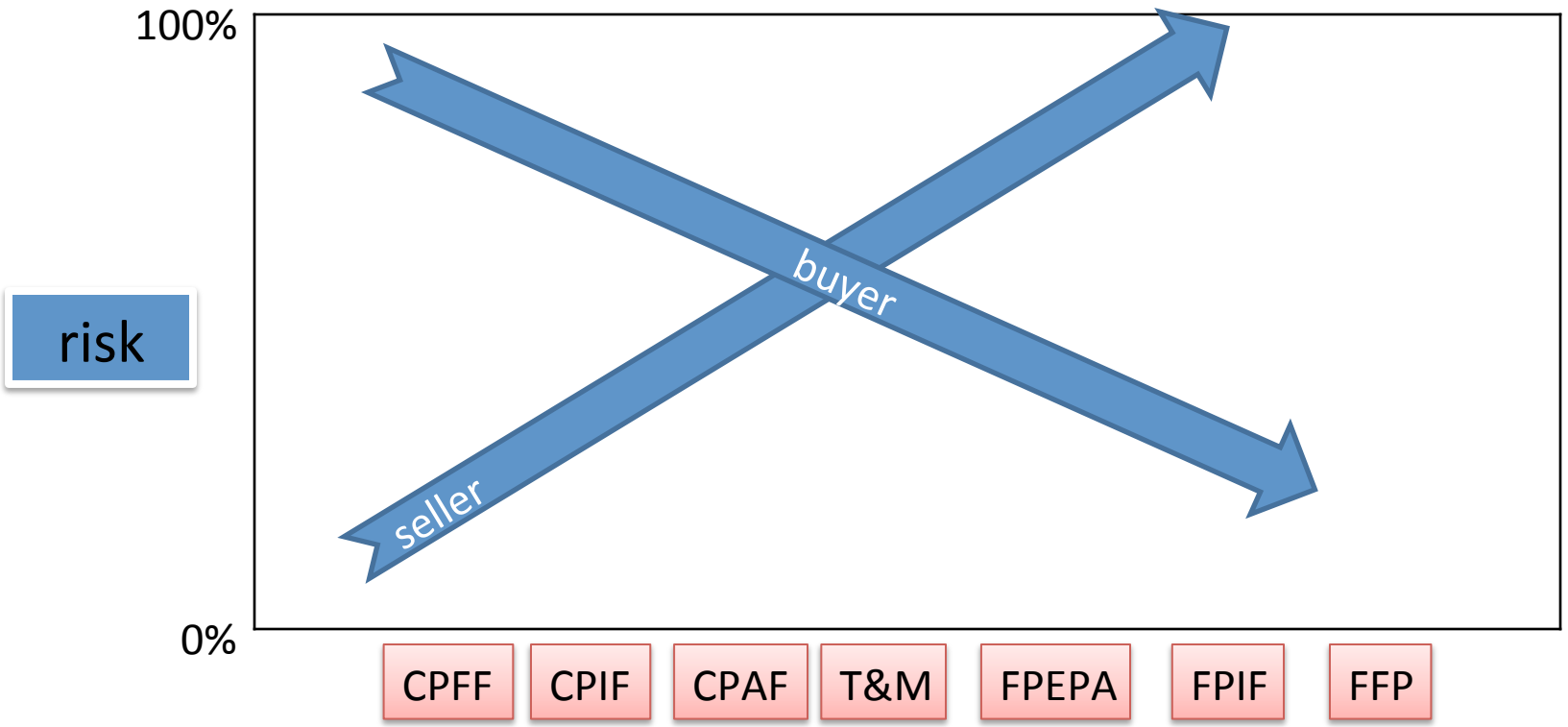
Concept	Formula	Result Interpretation
Point of Total Assumption (PTA) The point of total assumption (PTA) is a price determined by a fixed price plus incentive fee contract (FPIF) above which the seller pays the cost overrun. In addition, once the costs on an FPIF contract reach PTA, the maximum amount the buyer will pay is the ceiling price.	PTA = ((Ceiling Price - Target Price) / Buyer's Share Ratio) + Target Cost	The result is a monetary value. When reached then the seller covers all of the cost risk beyond.

Target cost	$ 9,000
Target fee	$ 850
Target price	$ 9,850
Share ratio (buyer/ seller)	70/30
Ceiling price	12,500
Actual cost	8,000

Final fee	(Target cost-Actual cost)* seller ratio ($ 9000-8000)* 30%=300. original fee $ 850+300=1150
Final price	$ 8000+1150=9150
PTA	[(Ceiling price-target price)/buyer share ratio]+target cost [($12,500-9,850)/70%]+9000 =12,785

Copyright © Strategic Transformation Consultants Ltd.

Contract type vs. risk



Copyright © Strategic Transformation Consultants Ltd.

Plan procurement management -TT

Copyright © Strategic Transformation Consultants Ltd.

Plan procurement management -TT

1 Expert judgment

- Expertise should be considered from individuals or groups with specialized knowledge or training in the following topics:
  - Procurement and purchasing,
  - Contract types and contract documents, and
  - Regulations and compliance topics.

2 Data gathering

- Market research

3. Data analysis

- Make-or-buy analysis

4 Source selection analysis

- Least cost, quality only, Quality-based/highest technical proposal score ,Quality and cost-based, Sole source, fixed budget.

5 Meetings

- By collaborating with potential bidders, the organization purchasing the material or service may benefit while the seller can influence a mutually beneficial approach or product.

Copyright © Strategic Transformation Consultants Ltd.

Plan procurement management - output

1. Procurement management plan

- Provides guidance for -
  - Types of contract
  - risk management issues
  - Independent estimates to be used
  - Standard procurement document
  - Managing multiple supplier
  - Coordinating procurement with other project aspects
  - Format of SOW
  - WBS for contractor
  - Metric to evaluate seller

2. Procurement Strategy

- Delivery methods, Contract payment types, Procurement phases

Copyright © Strategic Transformation Consultants Ltd.

Plan procurement output

3. Bid documents	• RFI, RFB, RFP, RFQ, tender notice, invitation for negotiation
4 Procurement statement of work	• The statement of work (SOW) for each procurement is developed from the project scope baseline and defines only that portion of the project scope that is to be included within the related contract.
5. Source selection criteria	• Criteria for scoring seller proposal. Understanding of needs, overall or life cycle cost, technical capacity, risk, management approach, technical approach, warranty, financial capacity etc
6. Make-or-buy decisions	• Documents regarding the conclusion reached

© Strategic Transformation Consultants Ltd.

Plan procurement output

.7 Independent cost estimates	• For large procurements, the procuring organization may elect to either prepare its own independent estimate or have a cost estimate prepared by an outside professional estimator to serve as a benchmark on proposed responses.
8. Change request	• To PM plan, subsidiary plan or other component
7. Project Documents updates	• Requirement documents, requirement tractability matrix , risk register
10. OPA updates	• Organizational process assets that are updated as a result of the Plan Procurement Management process include but are not limited to information on qualified sellers.

© Strategic Transformation Consultants Ltd.

Project Stakeholder management

Project Stakeholder Management

13.1 Identify Stakeholder

- The process of identifying project stakeholders regularly and analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence, and potential impact on project success.

13.2 Plan Stakeholder Engagement—The process of developing approaches to involve project stakeholders based on their needs, expectation, interests, and potential impact on the project.

13.3 Manage Stakeholder Engagement—The process of communicating and working with stakeholders to meet

their needs and expectations, address issues, and foster appropriate stakeholder engagement involvement.

13.4 Monitor Stakeholder Engagement—The process of monitoring project stakeholder relationships and tailoring

strategies for engaging stakeholders through the modification of engagement strategies and plans.

Copyright © Strategic Transformation Consultants Ltd.

Plan stakeholder engagement-ITTO

The process of developing appropriate management strategies to effectively engage stakeholders throughout the project lifecycle.

Plan stakeholder management

- Stakeholder management plan
- Project documents updates

Inputs

.1 Project charter
.2 Project management plan
- Resource management plan
- Communications management plan
- Risk management plan

.3 Project documents
- Assumption log
- Change log
- Issue log
- Project schedule
- Risk register
- Stakeholder register

.4 Agreements
.5 Enterprise environmental factors
.6 Organizational process assets

Tools & Techniques

.1 Expert judgment
.2 Data gathering
- Benchmarking

.3 Data analysis
- Assumption and constraint analysis
- Root cause analysis

.4 Decision making
- Prioritization/ranking

.5 Data representation
- Mind mapping
- Stakeholder engagement assessment matrix

.6 Meetings

Outputs

.1 Stakeholder engagement plan

Copyright © Strategic Transformation Consultants Ltd.

Input to Plan stakeholder engagement

1 Project charter

- The project charter contains information on the project purpose, objectives, and success criteria that can be taken into consideration when planning how to engage stakeholders.

2 Project management plan

- Resource management plan
- Communications management plan
- Risk management plan

3 Project documents

- Assumption log
- Change log
- Issue log
- Project schedule
- Risk register
- Stakeholder register

Copyright © Strategic Transformation Consultants Ltd.

Input to Plan stakeholder engagement

4. Agreements

- When planning for the engagement of contractors and suppliers, coordination usually involves working with the procurement/contracting group in the organization to ensure contractors and suppliers are effectively managed.

5 Enterprise environmental factors

- Organizational culture, political climate, and governance framework;
  - Personnel administration policies;
  - Stakeholder risk appetites;
  - Established communication channels;
  - Global regional or local trends, practices, or habits; and
  - Geographic distribution of facilities and resources.

6 Organizational process assets

- Corporate policies and procedures for social media, ethics, and security;
  - Corporate policies and procedures for issue, risk, change, and data management;
  - Organizational communication requirements;
  - Standardized guidelines for development, exchange, storage, and retrieval of information;
  - Lessons learned repository with information about the preferences, actions, and involvement of stakeholders; and
  - Software tools needed to support effective stakeholder engagement.

Copyright © Strategic Transformation Consultants Ltd.

Plan stakeholder engagement-TT

Copyright © Strategic Transformation Consultants Ltd.

Plan stakeholder engagement-TT

1 Expert judgment

- Expertise should be considered from individuals or groups with specialized knowledge or training in the following topics:
  - Politics and power structures in the organization and outside the organization,
  - Environment and culture of the organization and outside the organization,
  - Analytical and assessment techniques to be used for stakeholder engagement processes,
  - Communication means and strategies, and
  - Knowledge from previous projects of the characteristics of stakeholders and stakeholder groups and organizations involved in the current project that may have been involved in previous similar projects.

2 Data gathering

- Benchmarking

3 Data analysis

- Assumption and constraint analysis
- Root cause analysis

4 Decision making

- Prioritization/ranking

Copyright © Strategic Transformation Consultants Ltd.

Plan stakeholder engagement-TT

.5 Data representation

- Mind mapping
- Stakeholder engagement assessment matrix
- that the project is successful

Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
Stakeholder 1	C			D	
Stakeholder 2			C	D	
Stakeholder 3				D C	

Figure 13-7. Stakeholders Engagement Assessment Matrix

.6 Meetings

- Meetings are used to discuss and analyze the input data of the stakeholder engagement planning process and to develop a sound stakeholder engagement plan.

Copyright © Strategic Transformation Consultants Ltd.

Plan stakeholder engagement-output

Stakeholder management plan	• Desired and current engagement level, Stakeholder communication requirements, information to be communicated, reason of distribution, time frame and frequency, person responsible for communicating & authorizing,
Project documents update	• Project schedule, Stakeholder register

Copyright © Strategic Transformation Consultants Ltd.

Develop Project Management Plan

Process

Develop Project Management Plan

Output

- Project Management Plan

Inputs	Tools & Techniques	Outputs
.1 Project charter .2 Outputs from other processes .3 Enterprise environmental factors .4 Organizational process assets	.1 Expert judgment .2 Facilitation techniques	.1 Project management plan

Figure 4-3. Develop Project Charter Data Flow Diagram

Copyright © Strategic Transformation Consultants Ltd.

What does it contain

Project management processes selected by team

The description of tools and techniques to be used

How the selected processes will be used to manage the project

How work will be executed

How changes will be monitored and controlled

How configuration Management will be performed

All subsidiary plans from other process group

Copyright © Strategic Transformation Consultants Ltd.

inputs of Developing PM Plan

Project Charter

- Project managers get high level guideline from the charter

Output from other processes

- Output discussed throughout chapter 5 to 12 are integrated to project management plan
- Includes baseline and subsidiary management plan

EEF

- Govt or industry standard
- PMIS
- Organizational Culture
- Personnel Administration
- Infrastructure

OPA

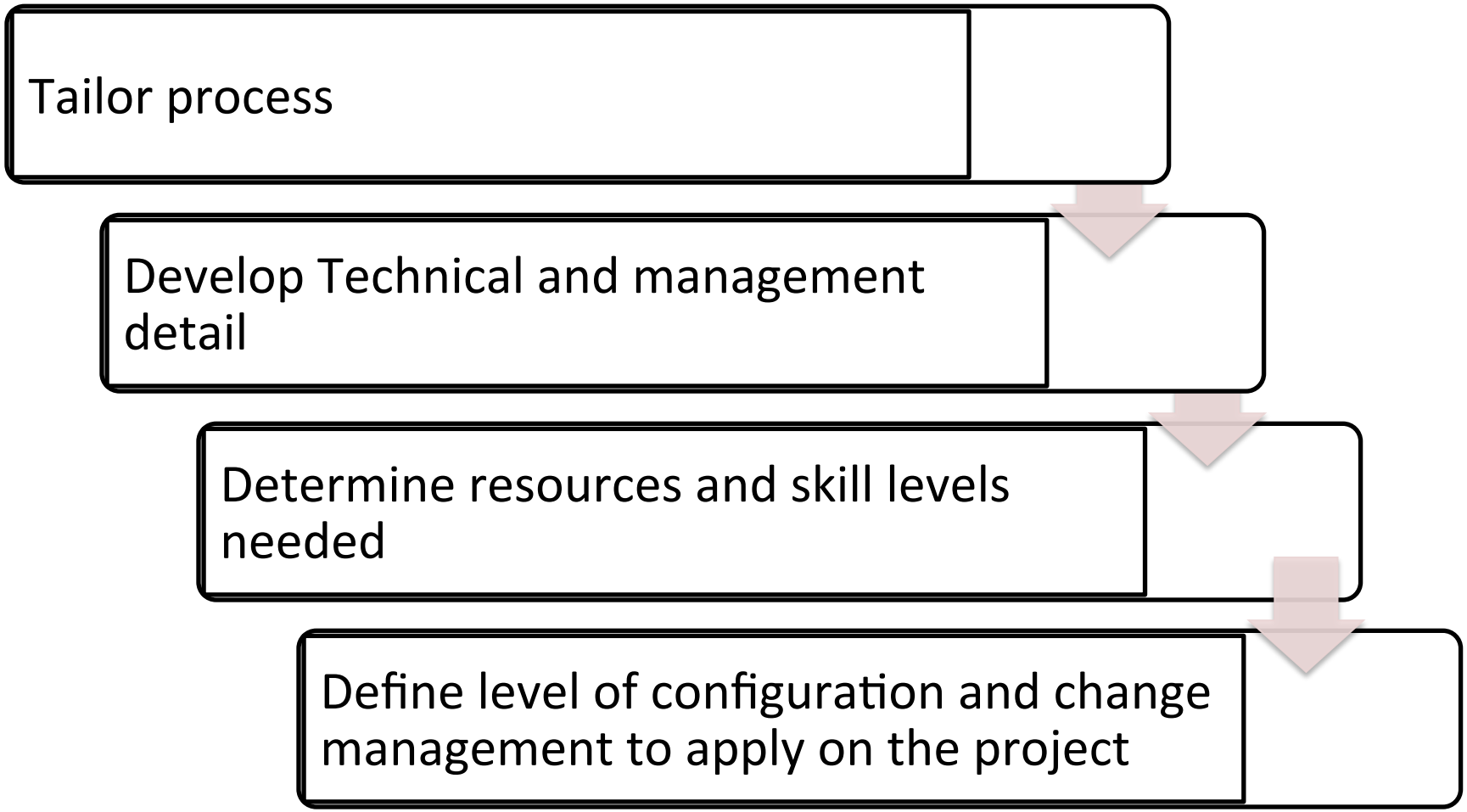
- Standard guidelines, work instruction, proposal evalution criteria and performance measurement criteria
- PM template
- Change control procedure
- Project file from past projects

Copyright © Strategic Transformation Consultants Ltd.

Tool for Develop Project Management Plan

Copyright © Strategic Transformation Consultants Ltd.

Expert judgment- is utilized to



Copyright © Strategic Transformation Consultants Ltd.

Facilitation Techniques

Key techniques:

- Brainstorming
- Conflict resolution
- Problem solving
- Meeting management

Copyright © Strategic Transformation Consultants Ltd.

What a PM Plan contains

- How work will be implemented
- Change and configuration management plan
- How the performance will be measured
- Baselines
  - Scope
  - Schedule
  - Cost
- Subsidiary Plans
  - Scope, Requirement, schedule, cost, Quality, process improvement, HR, Communication, risk and procurement management plan.

Copyright © Strategic Transformation Consultants Ltd.

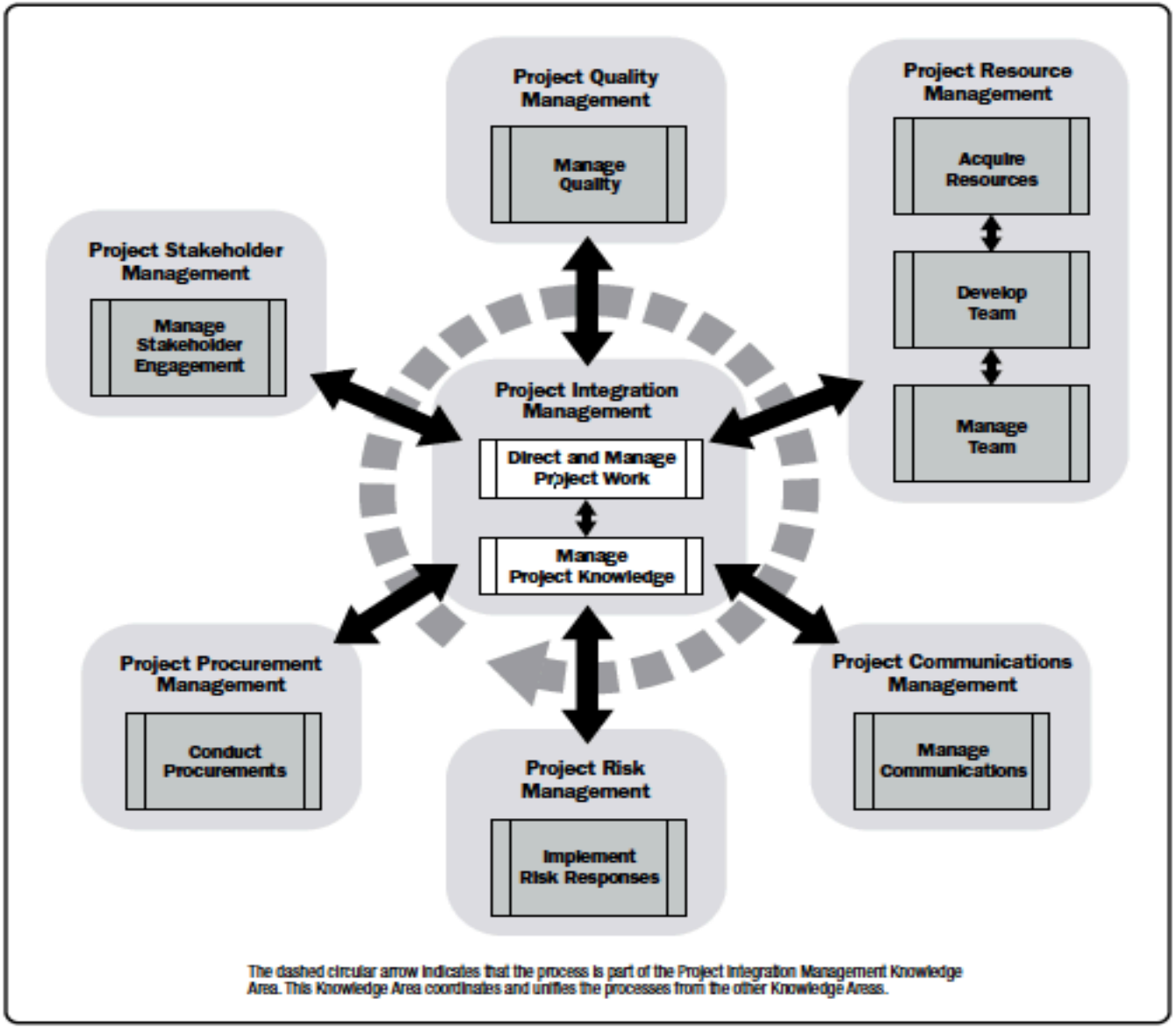
End of Planning Process Group

Copyright © Strategic Transformation Consultants Ltd.

Executing Process Group

Copyright © Strategic Transformation Consultants Ltd.

Executing Process Group



Project Quality Management

8.1 Plan Quality Management—

- The process of identifying quality requirements and/or standards for the project and its deliverables, and documenting how the project will demonstrate compliance with quality requirements and/ or standards.

8.2 Manage Quality—

The process of translating the quality management plan into executable quality activities that incorporate the organization's quality policies into the project.

8.3 Control Quality—

The process of monitoring and recording the results of executing the quality management activities to assess performance and ensure the project outputs are complete, correct, and meet customer expectations.

Copyright © Strategic Transformation Consultants Ltd.

Manage Quality -ITTO

The process of translating the quality management plan into executable quality activities that incorporate the organization's quality policies into the project.

Manage Quality

- Change requests
- PM plan updates
- Project documents update
- OPA updates

Inputs

.1 Project management plan
- Quality management plan

.2 Project documents
- Lessons learned register
- Quality control measurements
- Quality metrics
- Risk report

.3 Organizational process assets

Tools & Techniques

.1 Data gathering
- Checklists

.2 Data analysis
- Alternatives analysis
- Document analysis
- Process analysis
- Root cause analysis

.3 Decision making
- Multicriteria decision analysis

.4 Data representation
- Affinity diagrams
- Cause-and-effect diagrams
- Flowcharts
- Histograms
- Matrix diagrams
- Scatter diagrams

.5 Audits

.6 Design for X

.7 Problem solving

.8 Quality improvement methods

Outputs

.1 Quality reports

.2 Test and evaluation documents

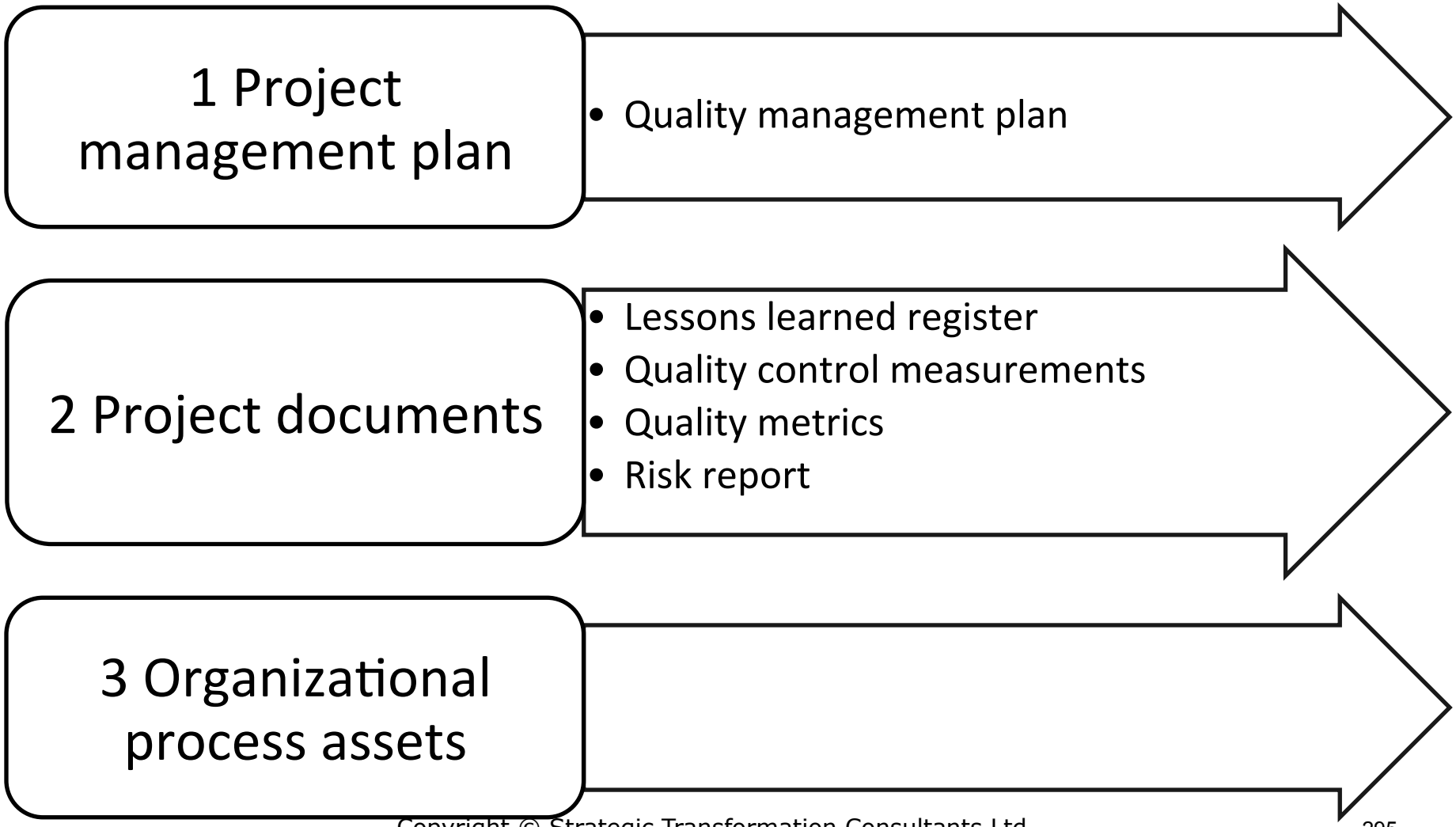
.3 Change requests

.4 Project management plan updates
- Quality management plan
- Scope baseline
- Schedule baseline
- Cost baseline

.5 Project documents updates
- Issue log
- Lessons learned register
- Risk register

Figure 8-7. Manage Quality: Inputs, Tools & Techniques, and Outputs

Input to Manage Quality



Copyright © Strategic Transformation Consultants Ltd.

Manage Quality -TT

1 Data gathering

2 Data analysis

3 Decision making

4 Data representation

5 Audits

6 Design for X

7 Problem solving

8 Quality improvement methods

Copyright © Strategic Transformation

Manage Quality -TT

1 Data gathering

- Checklists

2 Data analysis

- Alternatives analysis
- Document analysis
- Process analysis
- Root cause analysis

3. Decision making

- Multicriteria decision analysis

4 Data representation

- Affinity diagrams
- Cause-and-effect diagrams
- Flowcharts
- Histograms
- Matrix diagrams
- Scatter diagrams

Copyright © Strategic Transformation Consultants Ltd.

Data Representation-Affinity Diagram

Affinity diagram for difficulties in TQM promotion

1. TQM culture is not communicated down

1.1 Benefit of TQM not communicated properly

1. Lack of awareness of benefit of TQM implementation
2. Measurement of outcome is sometimes so vague that team don't become motivated to participate
3. Lack of effort to communicate success story of TCM effort

1.2 There is not TQM promotion culture

1. There is no TQM culture in organization
2. TQM promotion cell is not there
3. People do not understand the concept

2. Proper training is not in place

2.1 proper training is not provided

1. There is lack of training program for functional organization
2. Lack of training program for functional department
3. Lack of technical training effect t he employees skill

2.2 people are overloaded with their day to day work

1. People think implementation of ISO and TQM activities are overburden to them

3. TQM promotion to management is insufficient

3.1 Budgetary allocation is insufficient

1. Budget allocation for TQM is less than required
2. Need additional resource to meet TQM requirement
3. Required budget for TQM is higher
4. Reward and recognition is not in place

3.2 management respond regarding TQM is slow

1. Previous employee who attended such type of training, does not encourage CEO to implement to implement TQM
2. Company CEO not enough educated about TQM
3. Lack of management time to review TQM activity progress

4. Insufficient problem solving capability

4.1 Analytical effort to solve problem is missing

1. Route cause analysis is not done properly
2. Some problems are repeating
3. A lot of batch of product has to be produced in one machine which lead product defect

4.2 QC effort is not in place

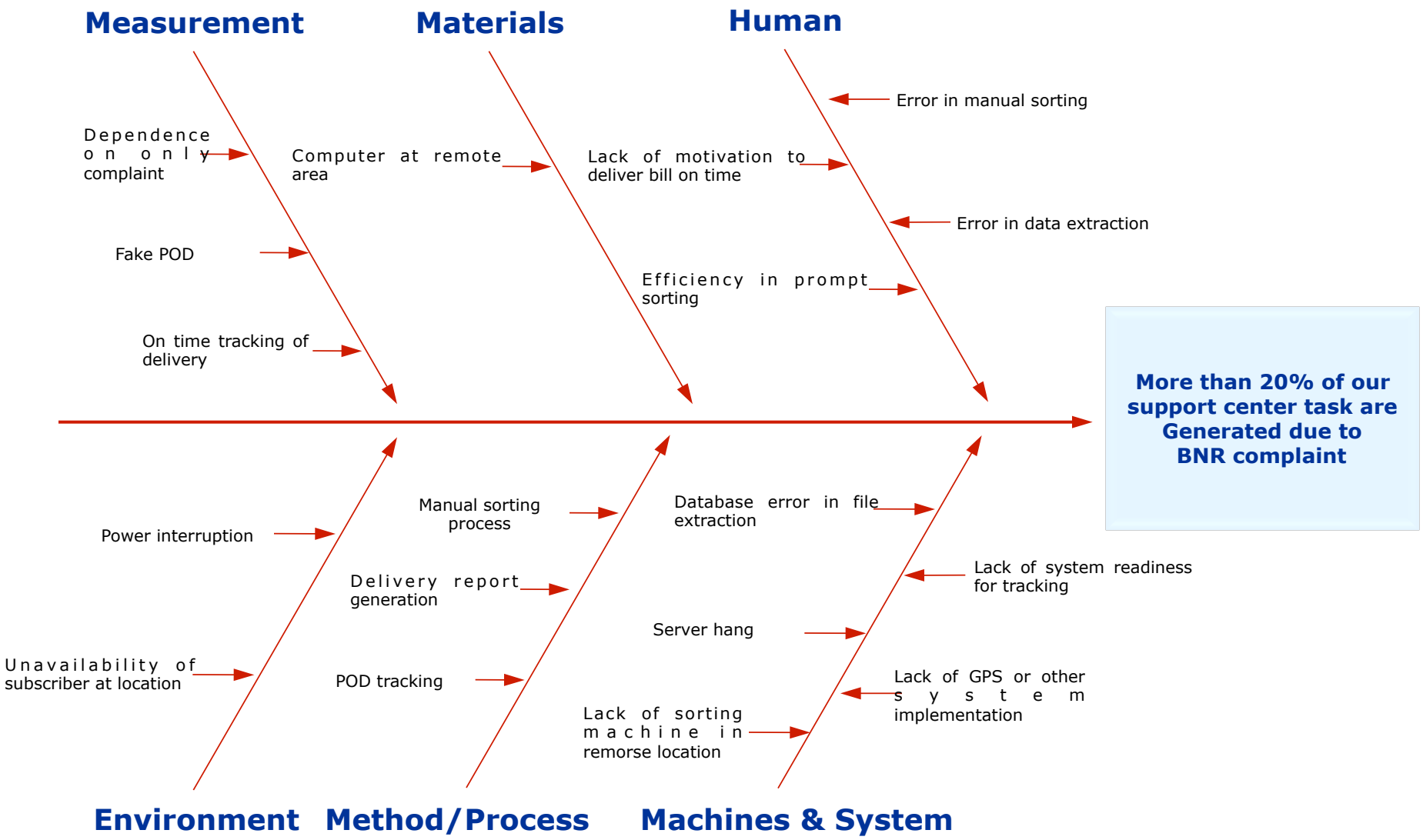
1. There is no measurement platform that capture process capability and tie it with company policy and objective
2. Variation in process due to machine limitations
3. Crack problem during manufacturing process

Incoming material quality is not good enough

1. Lack of good practice to control outsourced.
2. There is a weak relation with supplier
3. Inconsistent quality of raw material

Copyright © Strategic Transformation Consultants Ltd.

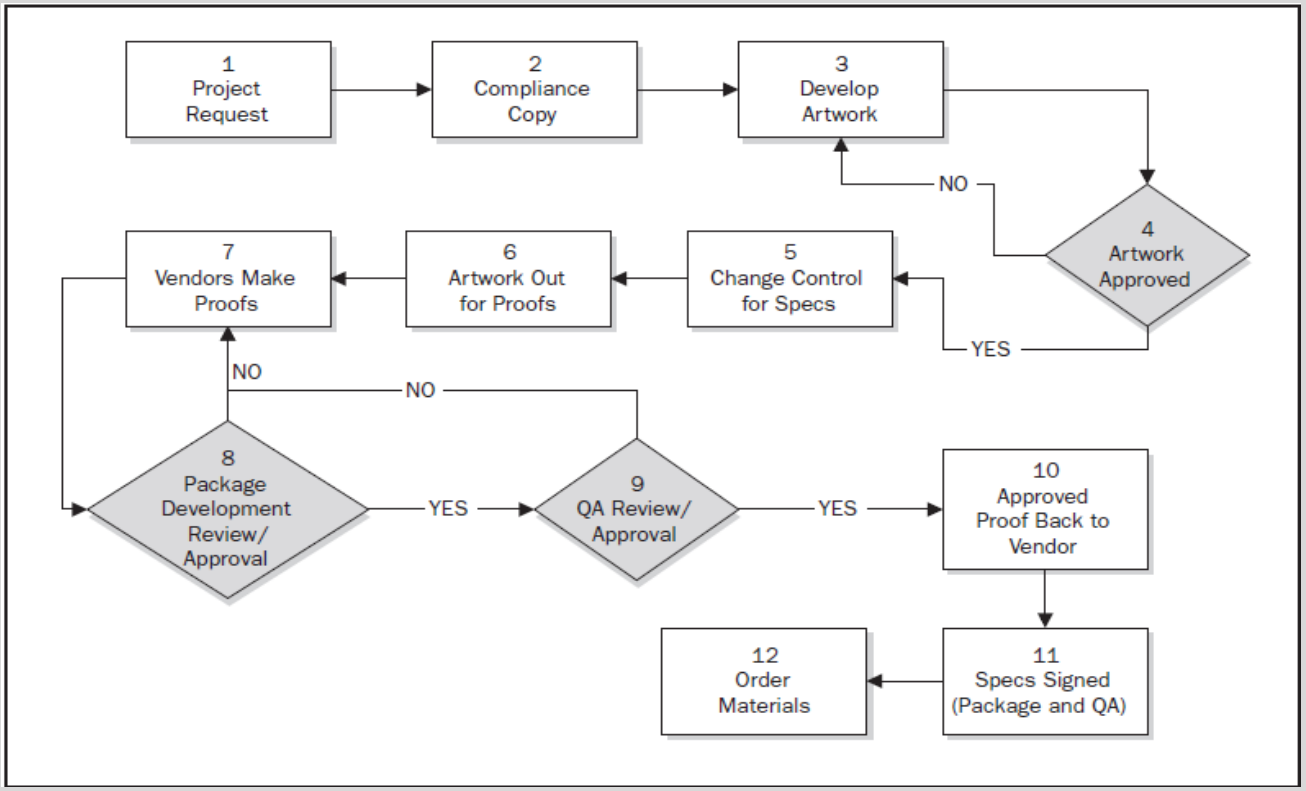
Cause & Effect Analysis



Copyright © Strategic Transformation Consultants Ltd.

Data Representation-Flowchart

Flowcharting

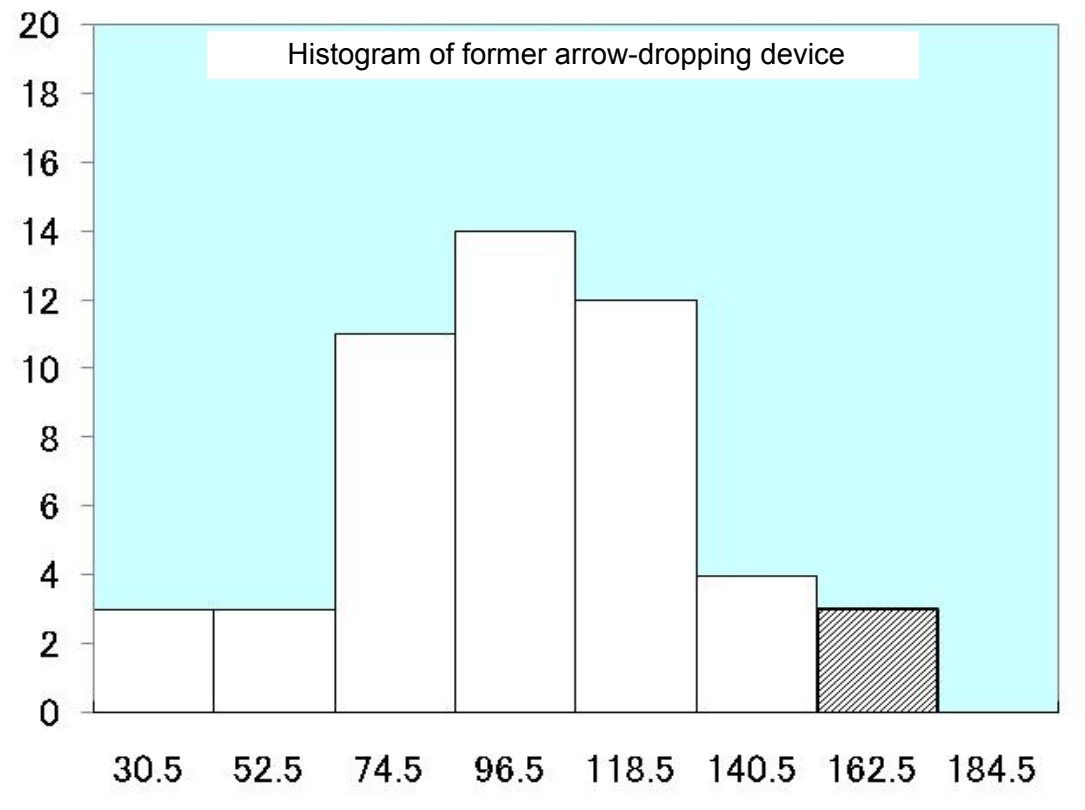


- Also called process map
- Displays sequencing of steps
- Useful tool to find out cost of quality in the process and determine non - value added activities.

Copyright © Strategic Transformation Consultants Ltd.

Data Representation-Histogram

Histogram



- Special form of bar chart
- Used to describe central tendency, dispersion etc.
- Does not consider influence of time

Copyright © Strategic Transformation Consultants Ltd.

Data Representation-Matrix Diagram

The matrix diagram seeks to show the strength of relationships among factors, causes, and objectives that exist between the rows and columns that form the matrix.

Action Item (what)	Ranking (why)				
Means to enance problem solving Capacity	Importance	Expected Effect	Possibility	Evaluation	Rank/Priority
Develop training module/sylabus	◎	◎	○	13	1
Arrange in-house Knowledge Sharing Program	◎	○	○	11	2
Hire the Trainer and conduct training	◎	○	○	11	2
To review and evaluate the Training	◎	○	△	9	3
To do Gap analysis for each employee	◎	○	○	11	2
explain cases studies with factual data for clear understanding	○	△	○	7	3
Show the success of other companies	○	△	△	5	3
to arrange promotion program by external expert	◎	○	◎	13	1
show the benefits of QC tool by success stories	○	△	○	7	3
Explain the benefits of QC tool by case study	◎	○	○	11	2
arrange visiting of leading company	○	△	△	5	3
Using dashboards in workshop floor for awareness	◎	○	◎	13	1

			how we serve the output (imput variable)						
	◎ = Strong (9) ○ = Medium (3) △ = Low (1)		Database file	System to run extraction	Power supply	Human resources (design and extraction	Human Resource (delivery)	printer& scanner	POD tracking
What the customer wants (output)	Accurate billing	5	◎	◎	○	△			
	On time billing	4		△			◎	△	◎
	Understandable invoice amount	4	○	○	○				
	email bill notification	2				○	○		○
	Product knowledge through bill	1				◎		△	
	Delivery of bill	5	○	○	△		◎	○	◎
	Key input variable		**72**	**76**	**32**	**20**	**87**	**20**	**87**

Symbol	Point
◎	5
○	3
△	1

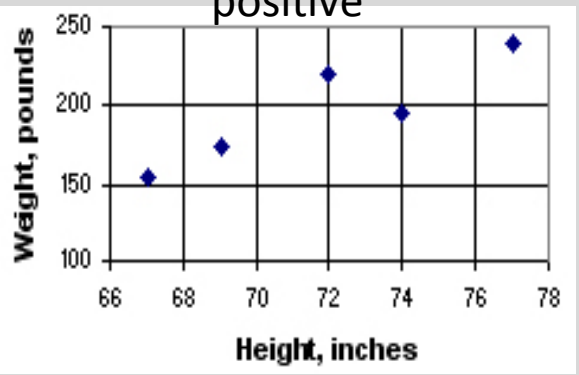
Copyright © Strategic Transformation Consultants Ltd.

Data Representation-Scatter Diagram

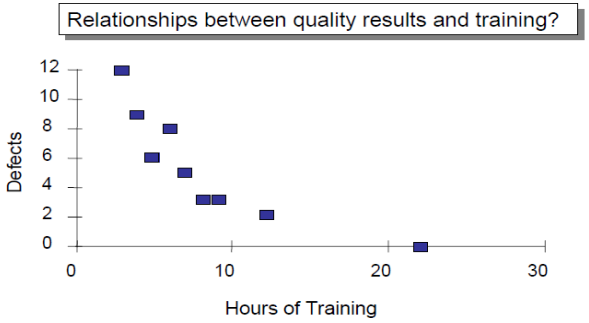
Scatter diagram

Height, inches	Weight, pounds
67	155
72	220
77	240
74	195
69	175

positive



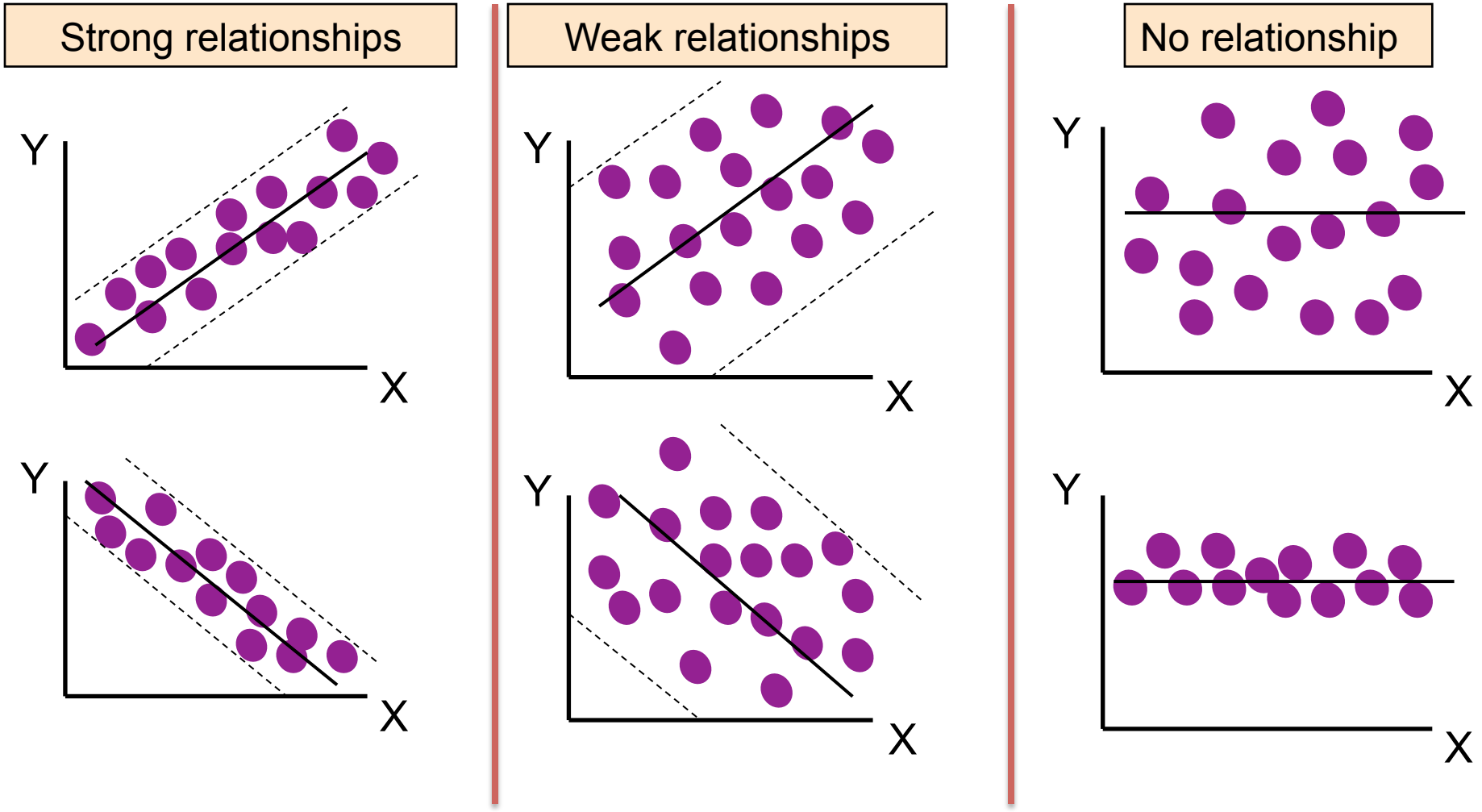
negative



- Also called Correlation chart
- When correlation are found, a regression line can be calculated to determine how dependent variable might influence independent variable.

Copyright © Strategic Transformation Consultants Ltd.

Linear Correlation



Copyright © Strategic Transformation Consultants Ltd.

Manage Quality -TT

5 Audits

- Quality audit is a structured, independent review to determine whether project activities comply with organizational and project policies, process and procedure.

6 Design for X

- Design for X (DfX) is a set of technical guidelines that may be applied during the design of a product for the optimization of a specific aspect of the design. DfX can control or even improve the product's final characteristics. The X in DfX can be different aspects of product development, such as reliability, deployment, assembly, manufacturing, cost, service, usability, safety, and quality. Using the DfX may result in cost reduction, quality improvement, better performance, and customer satisfaction.

7 Problem solving

- This analysis examines problem & constrained experienced, non-value added activities
- also uses root cause analysis – a technique to identify problem and underlying cause and develop preventive actions

8 Quality improvement methods

- Quality improvements can occur based on findings and recommendations from quality control processes, the findings of the quality audits, or problem solving in the Manage Quality process. Plan-do-check-act and Six Sigma are two of the most common quality improvement tools used to analyze and evaluate opportunities for improvement.

Copyright © Strategic Transformation Consultants Ltd.

Manage Quality -output

1. Quality reports

- The quality reports can be graphical, numerical, or qualitative. The information provided can be used by other processes and departments to take corrective actions in order to achieve the project quality expectations

2. Test and evaluation documents

- Test and evaluation documents can be created based on industry needs and the organization's templates. They are inputs to the Control Quality process and are used to evaluate the achievement of quality objectives.

Copyright © Strategic Transformation Consultants Ltd.

Manage Quality -output

3 Change requests	• If changes occur during the Manage Quality process that impact any of the components of the project management plan, project documents, or project or product management processes, the project manager should submit a change request and follow the Perform Integrated Change Control process
4 Project management plan updates	• Quality management plan, Scope baseline, Schedule baseline, Cost baseline
5 Project documents updates	• Issue log, Lessons learned register, Risk register

Copyright © Strategic Transformation Consultants Ltd.

Project Resource Management processes

9.1 Plan Resource Management—

- The process of defining how to estimate, acquire, manage, and utilize physical and team resources.

9.2 Estimate Activity Resources—

- The process of estimating team resources and the type and quantities of material, equipment, and supplies necessary to perform project work.

9.3 Acquire Resources—

- The process of obtaining team members, facilities, equipment, materials, supplies, and other resources necessary to complete project work.

9.4 Develop Team—

- The process of improving competencies, team member interaction, and the overall team environment to enhance project performance.

9.5 Manage Team—

- The process of tracking team member performance, providing feedback, resolving issues, and managing team changes to optimize project performance.

9.6 Control Resources—The process of ensuring that the physical resources assigned and allocated to the

Copyright © Strategic Transformation Consultants Ltd.

Acquire Resources-ITTO

The process of obtaining team members, facilities, equipment, materials, supplies, and other resources necessary to complete project work.

Acquire Resources

- Project staff assignment
- Resource Calendars
- Project management plan updates

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Resource management plan • Procurement management plan • Cost baseline .2 Project documents • Project schedule • Resource calendars • Resource requirements • Stakeholder register .3 Enterprise environmental factors .4 Organizational process assets	.1 Decision making • Multicriteria decision analysis .2 Interpersonal and team skills • Negotiation .3 Pre-assignment .4 Virtual teams	.1 Physical resource assignments .2 Project team assignments .3 Resource calendars .4 Change requests .5 Project management plan updates • Resource management plan • Cost baseline .6 Project documents updates • Lessons learned register • Project schedule • Resource breakdown structure • Resource requirements • Risk register • Stakeholder register .7 Enterprise environmental factors updates .8 Organizational process assets updates

Figure 9-8. Acquire Resources: Inputs, Tools & Techniques, and Outputs

Factors to be considered

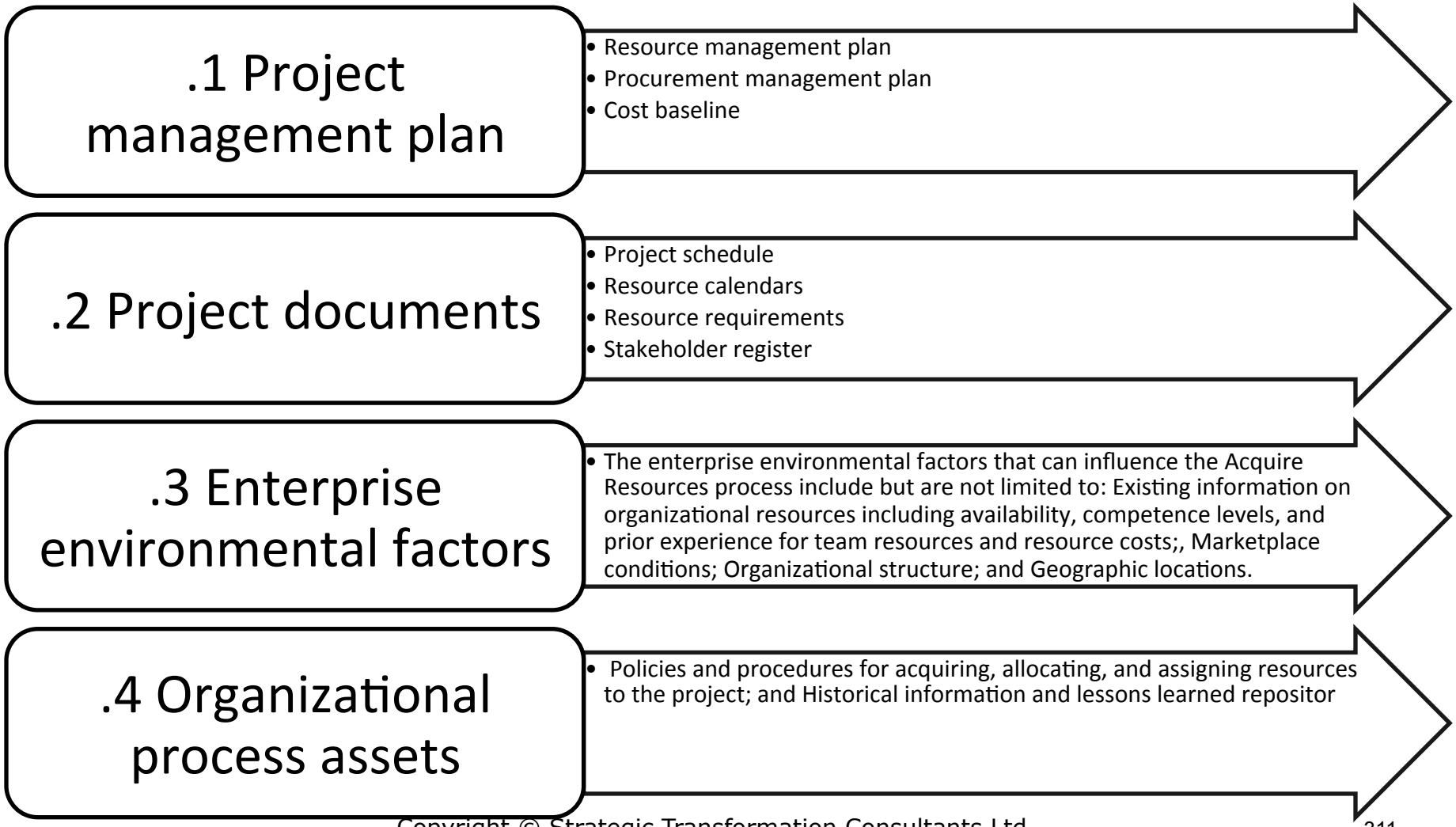
The project manager of project management team should effectively negotiate and influence others to acquire required team

Failure to acquire hr for the project may affect project schedule, budgets customer satisfaction , quality, risk etc

Alternative resources might not have required competencies,

Copyright © Strategic Transformation Consultants Ltd.

Input to Acquire Resources



Copyright © Strategic Transformation Consultants Ltd.

Acquire Resources-TT

.1 Decision making

.2 Interpersonal and team skills

.3 Pre-assignment

.4 Virtual teams

Copyright © Strategic Transformation Consultants Ltd.

Acquire Resources-TT

Multi-criteria decision analysis

- Selection criteria might be
  - Availability, cost, experience , knowledge, skill attitude, ability etc

Inter personal and Team Skill

- Negotiation- Project management team may need to negotiate with- functional manager, other project team external organization, supplier, vendor, contractors

Pre-assignment

- Project team members selected in advance

Virtual teams

- Group of people with shared goal who fulfill their role without meeting face to face

Copyright © Strategic Transformation Consultants Ltd

Acquire Resources-output

1 Physical resource assignments	•Documentation of the physical resource assignments records the material, equipment, supplies, locations, and other physical resources that will be used during the project.
2 Project team assignments	•Documentation of team assignments records the team members and their roles and responsibilities for the project.
3 Resource calendars	•A resource calendar identifies the working days, shifts, start and end of normal business hours, weekends, and public holidays when each specific resource is available
4 Change requests	•When changes occur as a result of carrying out the Acquire Resources process (for example, impacts to the schedule) or when recommended corrective or preventive actions impact any of the components of the project management plan or project documents, the project manager needs to submit a change request.
5 Project management plan updates	•Resource management plan •Cost baseline
6 Project documents updates	•Lessons learned register, Project schedule, Resource breakdown structure, Resource requirements, Risk register, Stakeholder register
7 Enterprise environmental factors updates	•Enterprise environmental factors that are updated include but are not limited to: - Resource availability within the organization, and - Amount of the organization's consumable resources that have been used.
8 Organizational process assets Updates	•documentation related to acquiring, assigning and allocating resources.

Copyright © Strategic Transformation Consultants Ltd.

Develop project team-ITTO

Develop project team

- The process of improving competencies, team member interaction, and the overall team environment to enhance project performance.

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Resource management plan .2 Project documents • Lessons learned register • Project schedule • Project team assignments • Resource calendars • Team charter .3 Enterprise environmental factors .4 Organizational process assets	.1 Colocation .2 Virtual teams .3 Communication technology .4 Interpersonal and team skills • Conflict management • Influencing • Motivation • Negotiation • Team building .5 Recognition and rewards .6 Training .7 Individual and team assessments .8 Meetings	1. Team performance assessments .2 Change requests .3 Project management plan updates • Resource management plan .4 Project documents updates • Lessons learned register • Project schedule • Project team assignments • Resource calendars • Team charter .5 Enterprise environmental factors updates .6 Organizational process assets updates

Figure 9-10. Develop Team: Inputs, Tools & Techniques, and Outputs

Copyright © Strategic Transformation Consultants Ltd.

Input to Develop Project Team

1 Project management plan	• Resource management plan
2 Project documents	• Lessons learned register • Project schedule • Project team assignments, Resource calendars, Team charter
3 Enterprise environmental factors	• - Human resource management policies regarding hiring and termination, employee performance reviews, employee development and training records, and recognition and rewards; - Team member skills, competencies, and specialized knowledge; and - Geographic distribution of team members.
4 Organizational process assets	• The organizational process assets that can influence the Develop Team process include but are not limited to historical information and the lessons learned repository.

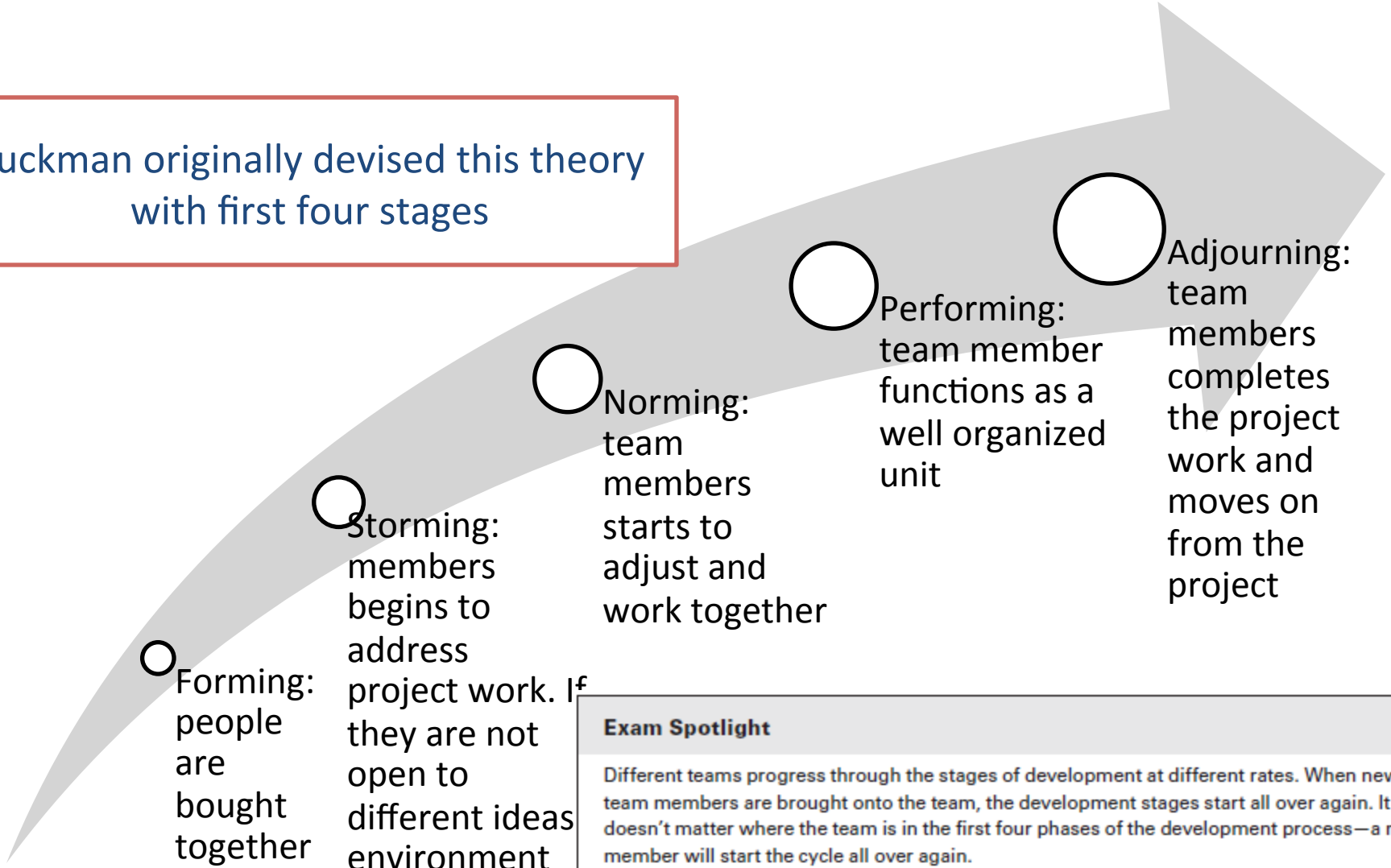
Copyright © Strategic Transformation Consultants Ltd.

Develop Project Team -TT

Copyright © Strategic Transformation Consultants Ltd.

Team building stages

Tuckman originally devised this theory with first four stages



Exam Spotlight

Different teams progress through the stages of development at different rates. When new team members are brought onto the team, the development stages start all over again. It doesn't matter where the team is in the first four phases of the development process—a new member will start the cycle all over again.

Copyright © Strategic Transformation Consultants Ltd.

Develop project team-TT

1. Co-location

- Opposite to virtual team. Referred to as ‘tight matrix’
- All of team members are located in the same room to help them build sense of community.
- Sometimes the room is called ‘war room’.

2 Virtual teams

3 Communication technology

4 Interpersonal and team skills

- Conflict management
- Influencing
- Motivation
- Negotiation
- Team building

Copyright © Strategic Transformation Consultants Ltd.

Develop project team-TT

5. Recognition and reward

- Best way to keep your team motivated.
- Only desirable behavior should be rewarded
- 'Win-lose'(zero sum) reward is not desirable. Reward criteria should be what all can achieve.

6 Training

- If the team has a member who does not have the skills to do the job, project manager needs to get them trained
- Classroom, online, computer based, on the job

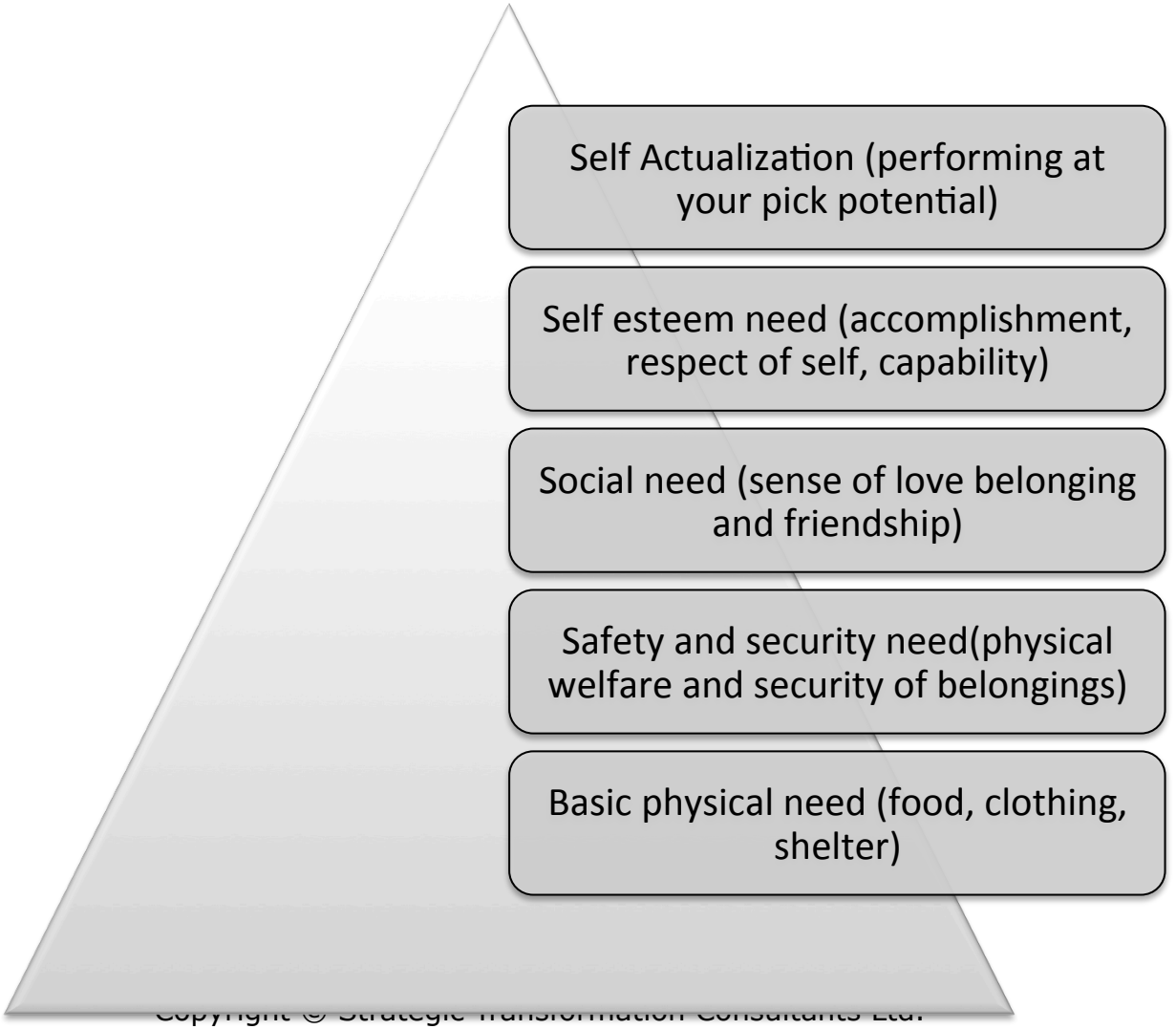
7. Individual and Team Assessment

- To assess team preferences, aspirations, how they process and organize information, how they tend to make decision and how they prefer to interact with people
- Attitudinal surveys, specific assessments, structured interviews, ability test, focus group. These tools can provide improved understanding, trust, commitment and communication

8. Meetings

Copyright © Strategic Transformation Consultants Ltd.

Maslow's hierarchy of need



Copyright © Strategic Transformation Consultants Ltd.

Hygiene theory

Hygiene theory

Exam Spotlight

For the exam, remember that Herzberg was the inventor of the Hygiene Theory and that this theory claims that hygiene factors (pay, benefits, and working conditions) prevent dissatisfaction while motivators (challenging work, opportunities to learn, and advancement) lead to satisfaction.

Copyright © Strategic Transformation Consultants Ltd.

Motivation Theory

Exam Spotlight

Make certain you understand the theories of motivation and their premises for the exam. Here's a summary to help you memorize them.

Maslow's hierarchy of needs Abraham Maslow. Needs must be satisfied in a hierarchical order.

Hygiene Theory Frederick Herzberg. Work environment (pay, benefits, and working conditions) prevents dissatisfaction.

Expectancy Theory Victor Vroom. Expectation of positive outcomes drives motivation.

Achievement Theory David McClelland. People are motivated by achievement, power, and affiliation.

Copyright © Strategic Transformation Consultants Ltd.

Power of a project manager

Reward power You reward desirable behavior with incentives or bonuses.

Punishment power You threaten team members with consequences if expectations are not met (also known as *penalty power*).

Expert power The person doing the influencing has significant knowledge or skills regarding the subject.

Legitimate power This is the power of the position held by the influencer (the president or vice president, for example).

Referent power This is power that's inferred to the influencer.

Copyright © Strategic Transformation Consultants Ltd.

Theory X and Theory Y

Theory X

Theory X manager believe, most of the people do not like to work. They believe in constant supervision.

Theory Y

Managers believe, people are interested to work their best if they are given right motivation

Copyright © Strategic Transformation Consultants Ltd.

Develop project team-output

1. Team performance assessments	•Improvement in skill that allow individuals to perform assignments more effectively •Improvement in competencies •Reduced staff turnover rate •Increased team cohesiveness where team members share information and experience openly
2 Change requests	•Change might be required during performing this process
3 Project management plan Updates	•Resource management plan
4 Project documents updates	•Lessons learned register, Project schedule, Project team assignments, Resource calendars • Team charter
5 Enterprise environmental factors updates	•Updates for employee training records and skills assessments
6 Organizational process assets Updates	

Copyright © Strategic Transformation Consultants Ltd.

Manage team-ITTO

Manage team

- The process of tracking team member performance, providing feedback, resolving issues, and managing team changes to optimize project performance.

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Resource management plan .2 Project documents • Issue log • Lessons learned register • Project team assignments • Team charter .3 Work performance reports .4 Team performance assessments .5 Enterprise environmental factors .6 Organizational process assets	.1 Interpersonal and team skills • Conflict management • Decision making • Emotional intelligence • Influencing • Leadership .2 Project management information system	.1 Change requests .2 Project management plan updates • Resource management plan • Schedule baseline • Cost baseline .3 Project documents updates • Issue log • Lessons learned register • Project team assignments .4 Enterprise environmental factors updates

Figure 9-12. Manage Team: Inputs, Tools & Techniques, and Outputs

Copyright © Strategic Transformation Consultants Ltd.

Input to Manage Team

1 Project management plan	• Resource management plan
2 Project documents	• Issue log, Lessons learned register, Project team assignments, Team charter
3 Work performance reports	• Work performance reports are the physical or electronic representation of work performance information intended to generate decisions, actions, or awareness.
4 Team performance assessments	•The project management team makes ongoing formal or informal assessments of the project team's performance. By continually assessing the project team's performance, actions can be taken to resolve issues, modify communication, address conflict, and improve team interaction.
5 Enterprise environmental factors	• The enterprise environmental factors that can influence the Manage Team process include but are not limited to human resource management policies.
6 Organizational process assets	•The organizational process assets that can influence the Manage Team process include but are not limited to: - Certificates of appreciation, - Corporate apparel, and Other organizational perquisites.

Copyright © Strategic Transformation Consultants Ltd.

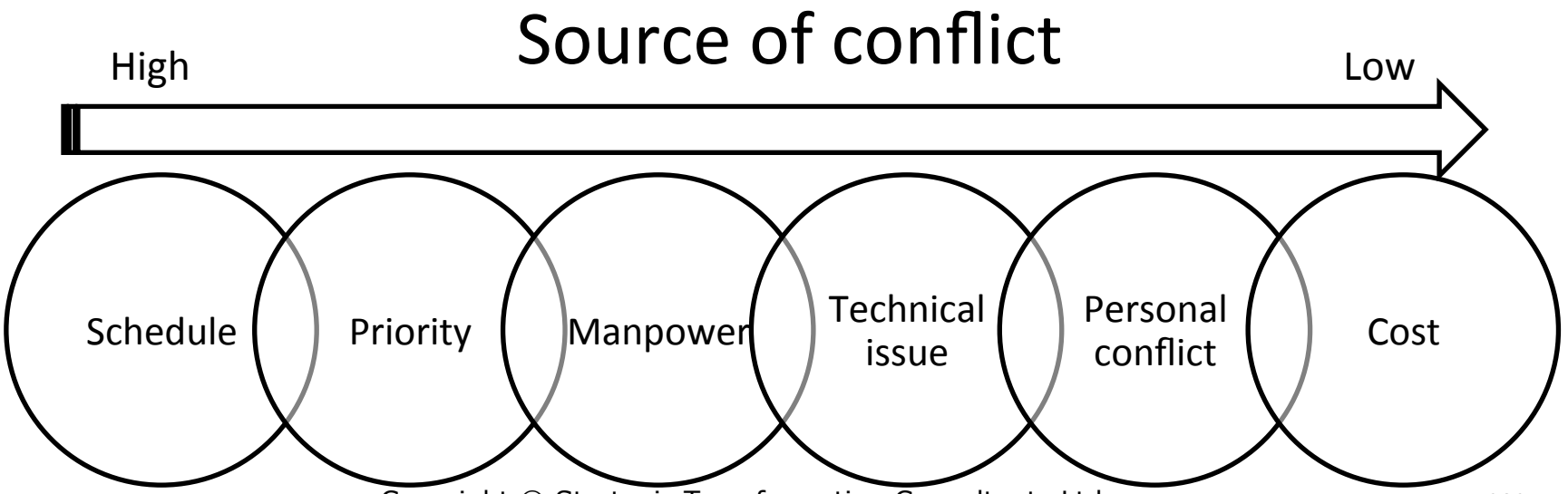
Manage project team-TT

1 Interpersonal and team skills

- Conflict management
- Decision making
- Emotional intelligence
- Influencing
- Leadership

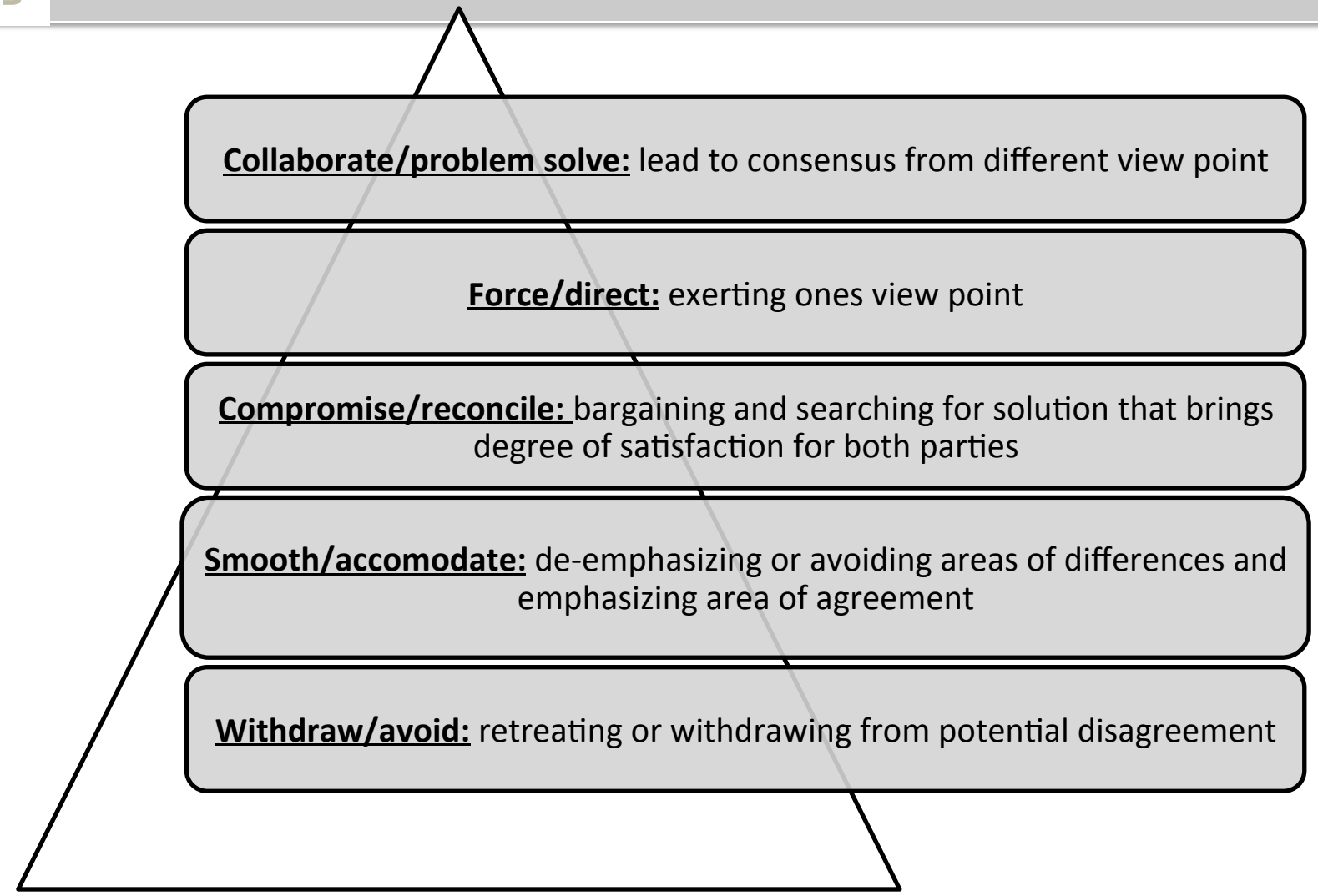
2 Project management

- information system



Copyright © Strategic Transformation Consultants Ltd.

Source of conflict



Copyright © Strategic Transformation Consultants Ltd.

Manage project team-output

1 Change requests	• When change requests occur as a result of carrying out the Manage Team process or when recommended corrective or preventive actions impact any of the components of the project management plan or project documents, the project manager needs to submit a change request.
2 Project management plan Updates	• Resource management plan • Schedule baseline • Cost baseline
3 Project documents updates	• Issue log • Lessons learned register • Project team assignments
4 Enterprise environmental factors updates	• Enterprise environmental factors that are updated as a result of the Manage Team process include but are not limited to: - Input to organizational performance appraisals, and - Personnel skill.

Copyright © Strategic Transformation Consultants Ltd.

Manage Communications-ITTO

Manage Communications

- The process of ensuring timely and appropriate collection, creation, distribution, storage, retrieval, management, monitoring, and the ultimate disposition of project information.

Inputs

.1 Project management plan
- Resource management plan
- Communications management plan
- Stakeholder engagement plan

.2 Project documents
- Change log
- Issue log
- Lessons learned register
- Quality report
- Risk report
- Stakeholder register

.3 Work performance reports
.4 Enterprise environmental factors
.5 Organizational process assets

Tools & Techniques

.1 Communication technology
.2 Communication methods
.3 Communication skills
- Communication competence
- Feedback
- Nonverbal
- Presentations

.4 Project management information system
.5 Project reporting
.6 Interpersonal and team skills
- Active listening
- Conflict management
- Cultural awareness
- Meeting management
- Networking
- Political awareness

.7 Meetings

Outputs

.1 Project communications
.2 Project management plan updates
- Communications management plan
- Stakeholder engagement plan

.3 Project documents updates
- Issue log
- Lessons learned register
- Project schedule
- Risk register
- Stakeholder register

.4 Organizational process assets updates

Figure 10-5. Manage Communications: Inputs, Tools & Techniques, and Outputs

Different techniques

Sender receiver model

- Feedback loop and barrier of communication

Choice of media

- Written vs oral, memo vs formal reports, face to face vs. email

Writing style

- Active vs. passive voice, sentence structure and work choice

Meeting management technique

- Agenda preparation before meeting

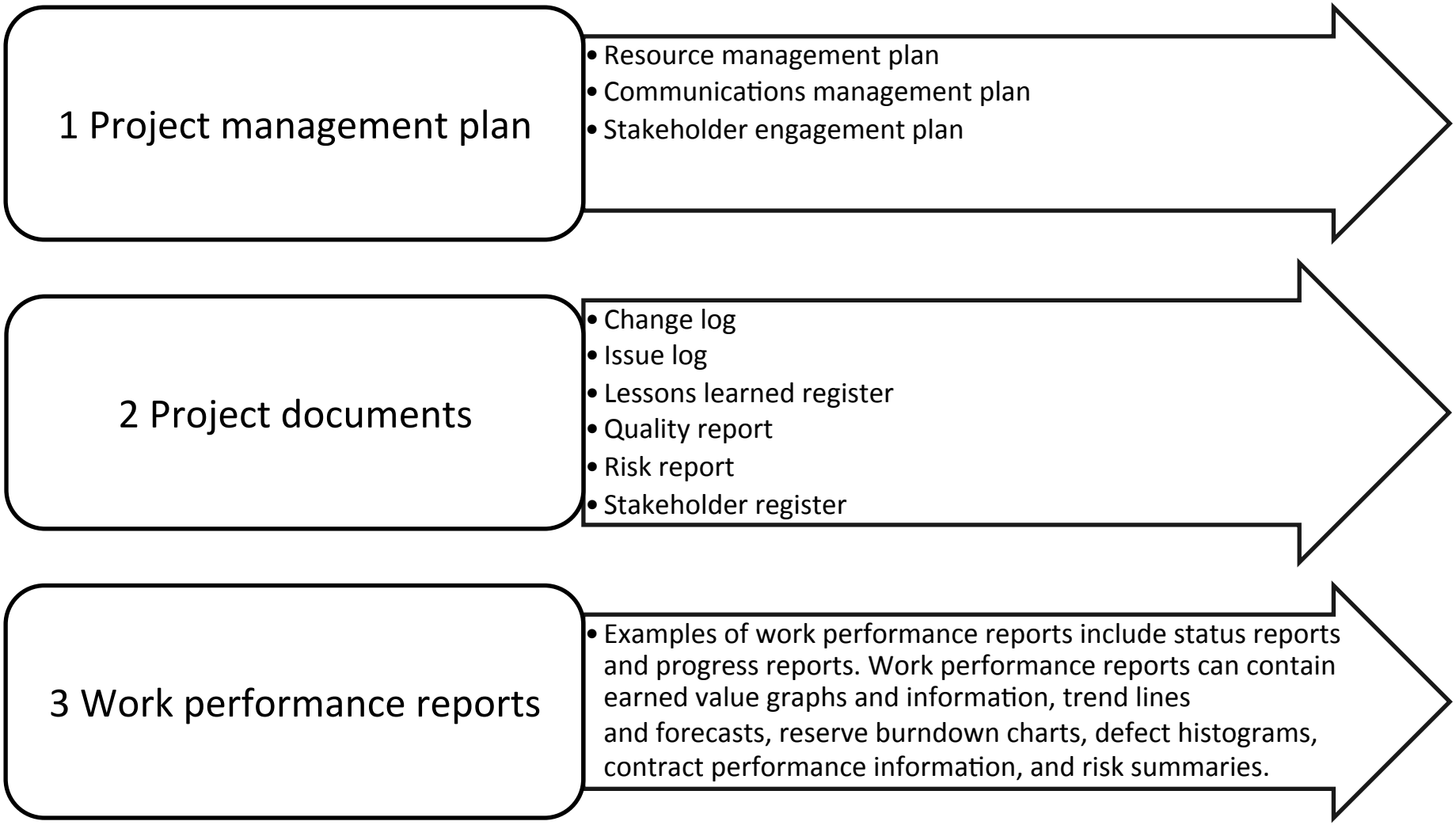
Presentation technique

- Body language

Facilitation

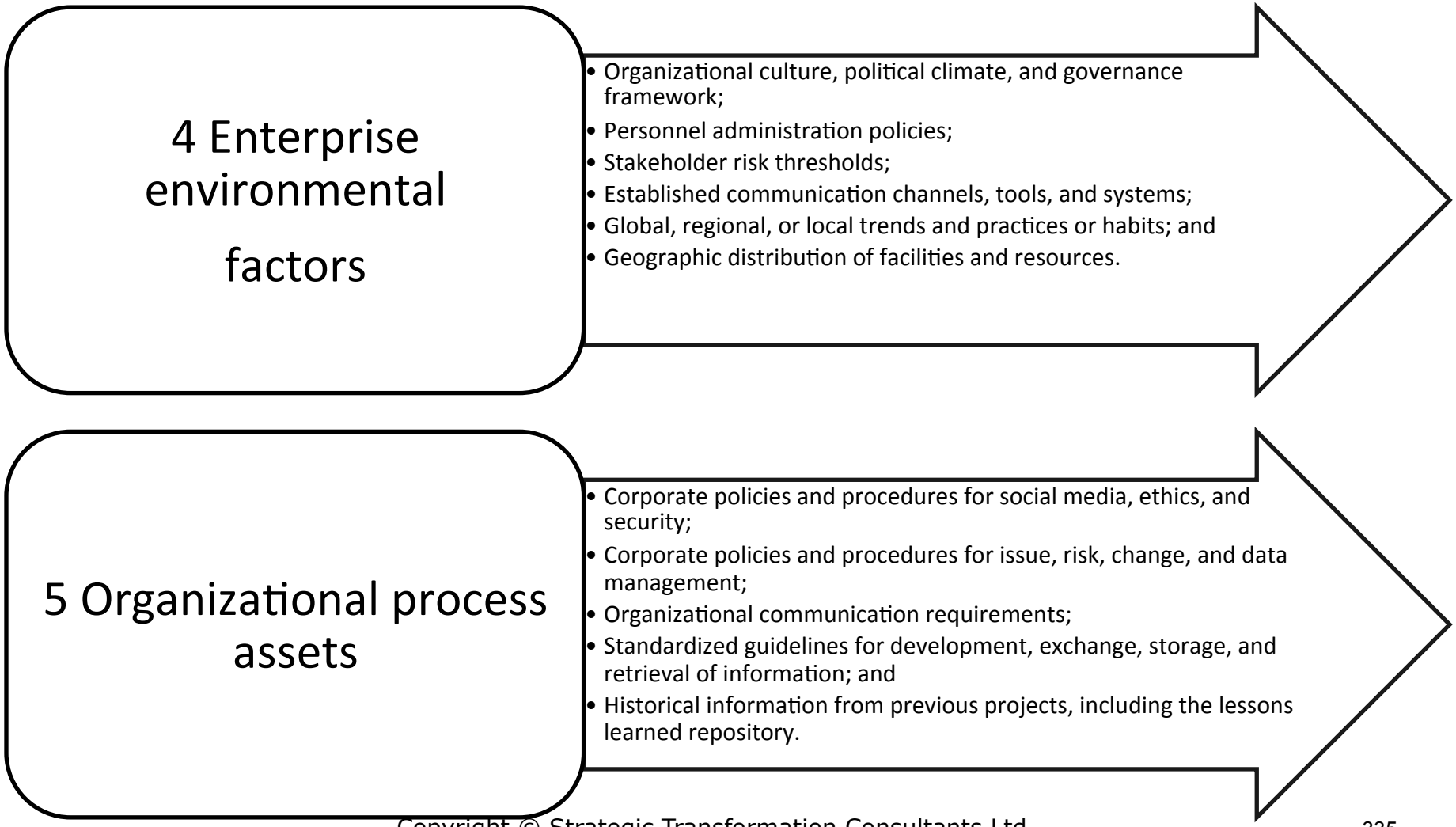
- Building consensus and overcoming obstacles

Input to Manage Communications



Copyright © Strategic Transformation Consultants Ltd.

Input to Manage Communications



Copyright © Strategic Transformation Consultants Ltd.

Manage Communications-TT

Copyright © Strategic Transformation Consultants Ltd.

Manage Communications-TT

1 Communication technology

- whether the team is collocated, the confidentiality, resources available to the team members, and how the organization's culture influences the way in which meetings and discussions are normally conducted.

2 Communication methods

- The choice of communication methods should allow flexibility in the event that the membership of the stakeholder community changes or their needs and expectations change.

3 Communication skills

- Communication competence
- Feedback
- Nonverbal
- Presentations

4 Project management

- information system

5 Project reporting

6 Interpersonal and team skills

- Active listening
- Conflict management
- Cultural awareness
- Meeting management
- Networking
- Political awareness

7 Meetings

Project Name: my sister's marriage

- Wedding dala completed
- Convention center booked

Accomplishment since last report

- Room might not be available
- Guest might not come

Current Risks

On Time

Late

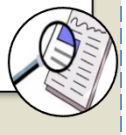
On hold

Parameters

invitation		
Target Achievement: 100%	Achieved: 100%	On time
Decoration		
Target Achievement: 91%	Achieved: 89%	2% behind the schedule
Food arrangement		
Target Achievement: 53%	Achieved: 23%	30% behind the schedule
gifts		
Target Achievement: 70%	Achieved: 70%	On time

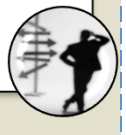
On track

Overall Program Status



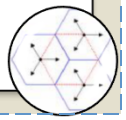
- Decide on decorator

Upcoming Milestones



- Jewelry has to be from XX jewelers

Change approved



Copyright © Strategic Transformation Consultants Ltd.

Output of Manage Communications

1 Project communications	• Project communications artifacts may include but are not limited to: performance reports, deliverable status, schedule progress, cost incurred, presentations, and other information required by stakeholders.
2 Project management plan updates	• Communications management plan • Stakeholder engagement plan
3 Project documents updates	• Issue log • Lessons learned register • Project schedule • Risk register • Stakeholder register
4 Organizational process assets updates	• Project records such as correspondence, memos, meeting minutes and other documents used on the project; and • Planned and ad hoc project reports and presentations.

Copyright © Strategic Transformation Consultants Ltd.

OPA updates

Stakeholder notifications

- Resolved issues
- Approved Changes
- General project status

Project Reports

- Formal & informal
- Project status
- Issue logs
- Project Closure reports

Project Presentations

- Formal or informal
- To project stakeholders
- Information relevant to needs
- Appropriate method of presentation

Project Records

- Correspondence , memos, meeting minutes
- Stored in an organized fashion
- Project Notebook (where team members can maintain records)

Feedback from stakeholders

- Concerning project operations
- Distributed & used
- Modify & improve project performance

Lessons Learned Documentation

- Causes of issues
- Reasons for corrective action chosen
- Documented to be part of the historical database for this & other projects of the organization

Implement Risk Responses-ITTO

Implement Risk Responses

- The process of implementing agreed-upon risk response plans.

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Risk management plan .2 Project documents • Lessons learned register • Risk register • Risk report .3 Organizational process assets	.1 Expert judgment .2 Interpersonal and team skills • Influencing .3 Project management information system	.1 Change requests .2 Project documents updates • Issue log • Lessons learned register • Project team assignments • Risk register • Risk report

Figure 11-18. Implement Risk Responses: Inputs, Tools & Techniques, and Outputs

Copyright © Strategic Transformation Consultants Ltd.

Input to Implement Risk Responses

1 Project management plan

- Risk management plan

2 Project documents

- Lessons learned register
- Risk register
- Risk report

3 Organizational process assets

- The organizational process assets that can influence the Implement Risk Responses process include but are not limited to the lessons learned repository from similar completed projects that indicate the effectiveness of particular risk responses.

Copyright © Strategic Transformation Consultants Ltd.

Implement Risk Responses-TT

1 Expert judgment

2 Interpersonal and team skills

3 PMIS

Copyright © Strategic Transformation Consultants Ltd.

Implement Risk Responses-TT

EXPERT JUDGMENT

- Expertise should be considered from individuals or groups with specialized knowledge to validate or modify risk responses if necessary, and decide how to implement them in the most efficient and effective manner.

INTERPERSONAL AND TEAM SKILLS

- Interpersonal and team skills that can be used for this process include but are not limited to influencing. Some risk response actions may be owned by people outside the immediate project team or who have other competing demands.

PROJECT MANAGEMENT INFORMATION SYSTEM (PMIS)

- Project management information systems can include schedule, resource, and cost software to ensure that agreed-upon risk response plans and their associated activities are integrated into the project alongside other project activities

Copyright © Strategic Transformation Consultants Ltd.

Implement Risk Responses- output

1 Change requests

- Implementation of risk responses may result in a change request to the cost and schedule baselines or other components of the project management plan. Change requests are processed for review and disposition through the Perform Integrated Change Control process.

2 Project documents updates

- Issue log
- Lessons learned register
- Project team assignments
- Risk register
- Risk report

Copyright © Strategic Transformation Consultants Ltd.

Conduct procurement -ITTO

Conduct procurement

- Conduct Procurements is the process of obtaining seller responses, selecting a seller, and awarding a contract. The key benefit of this process is that it selects a qualified seller and implements the legal agreement for delivery.

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Scope management plan • Requirements management plan • Communications management plan • Risk management plan • Procurement management plan • Configuration management plan • Cost baseline .2 Project documents • Lessons learned register • Project schedule • Requirements documentation • Risk register • Stakeholder register .3 Procurement documentation .4 Seller proposals .5 Enterprise environmental factors .6 Organizational process assets	.1 Expert judgment .2 Advertising .3 Bidder conferences .4 Data analysis • Proposal evaluation .5 Interpersonal and team skills • Negotiation	.1 Selected sellers .2 Agreements .3 Change requests .4 Project management plan updates • Requirements management plan • Quality management plan • Communications management plan • Risk management plan • Procurement management plan • Scope baseline • Schedule baseline • Cost baseline .5 Project documents updates • Lessons learned register • Requirements documentation • Requirements traceability matrix • Resource calendars • Risk register • Stakeholder register .6 Organizational process assets updates

Figure 12-4. Conduct Procurements: Inputs, Tools & Techniques, and Outputs

Input to conduct procurement

1 Project management plan	• Scope management plan, Requirements management plan, Communications management plan, Risk management plan, Procurement management Plan, Configuration management plan, Cost baseline
2 Project documents	• Lessons learned register, Project schedule, Requirements documentation, Risk register, Stakeholder register
3 Procurement documentation	• Bid document, Procurement SOW, Independent cost estimates
4 Seller proposals	• Seller proposals, prepared in response to a procurement document package, form the basic information that will be used by an evaluation body to select one or more successful bidders (sellers).
5 Enterprise environmental factors	• Local laws and regulations regarding procurements;, Local laws and regulations ensuring that the major procurements involve local sellers etc.
6 Organizational process assets	• List of preferred sellers that have been prequalified, Organizational policies that influence the selection of a seller etc.

Copyright © Strategic Transformation Consultants Ltd.

Conduct procurement-TT

Copyright © Strategic Transformation Consultants Ltd.

Conduct procurement-TT

1. Expert judgment

- Someone with lots of specific expertise can help make sure the seller is up to the job.
- Might be from functional area-Legal, finance, engineering, research, sales ets

2. Advertising

- Advertisement in newspaper or other media. Sometimes govt has to advertise for specific items.

3. Bidding conference

- Sometimes contractor conference, vendor conference and pre-bid conference
- To ensure that all prospective sellers have common and clear understanding of the procurement

Copyright © Strategic Transformation Consultants Ltd.

Conduct procurement-TT

4. Data Analysis

- In complex procurement defined weighted criteria, formal evaluation review process will be defined by the buyer's procurement policy

5. Interpersonal and Team skills

- Negotiation conclude with a contract document that can be executed

Copyright © Strategic Transformation Consultants Ltd.

Conduct procurement- output

1. Selected sellers

- Selected sellers are those sellers who have been judged upon in evaluation, negotiated a draft contract.
- high value and critical award might need senior management approval

2. Agreements

- Can be simple form of purchase order of complex document.
- Regardless of document complexity, the contract document is legally binding.
- This is legal relationship subject to remedy in courts
- Component (SOW, schedule baseline, performance reporting, period of performance, roles and responsibilities, seller's place of performance, pricing etc…)

Copyright © Strategic Transformation Consultants Ltd.

Contract

Contract

- Contract is legal document between buyer and seller. A contract represents a mutually binding agreement that obligates the seller to provide the specific product, service or result, and obligates the buyer to provide monetary or other valuable consideration.

Contract change

- Subject to more extensive approval process. By actively managing the contract and wording the contract, some risks can be avoided, mitigated or transferred to seller

Professional help

- Project manager might seek help from professional from purchasing, law, technical department. Might be obligatory in some organization

Copyright © Strategic Transformation Consultants Ltd.

Conduct procurement- output

3 Change requests	• Change requests to the project management plan, its subsidiary plans, and other components are processed for review and disposition through the Perform Integrated Change Control process
4 Project management plan Updates	• Requirements management Plan, • Quality management plan, • Communications management plan, • Risk management plan, • Procurement management Plan, • Scope baseline, • Schedule baseline, • Cost baseline
5 Project documents updates	• Lessons learned register • Requirements documentation, • Requirements traceability Matrix, • Resource calendars, • Risk register, • Stakeholder register
6 Organizational process assets Updates	• Listings of prospective and prequalified sellers; and • Information on relevant experience with sellers, both good and bad.

Copyright © Strategic Transformation Consultants Ltd.

Manage stakeholder engagement -ITTO

Manage stakeholder engagement

Manage Stakeholder Engagement is the process of communicating and working with stakeholders to meet their needs and expectations, address issues, and foster appropriate stakeholder involvement. The key benefit of this process is that it allows the project manager to increase support and minimize resistance from stakeholders.

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Communications management plan • Risk management plan • Stakeholder engagement plan • Change management plan .2 Project documents • Change log • Issue log • Lessons learned register • Stakeholder register .3 Enterprise environmental factors .4 Organizational process assets	.1 Expert judgment .2 Communication skills • Feedback .3 Interpersonal and team skills • Conflict management • Cultural awareness • Negotiation • Observation/conversation • Political awareness .4 Ground rules .5 Meetings	.1 Change requests .2 Project management plan updates • Communications management plan • Stakeholder engagement plan .3 Project documents updates • Change log • Issue log • Lessons learned register • Stakeholder register

Figure 13-7. Manage Stakeholder Engagement: Inputs, Tools & Techniques, and Outputs

Copyright © Strategic Transformation Consultants Ltd.

Input to Manage stakeholder engagement

1 Project management plan	• Communications management plan • Risk management plan • Stakeholder engagement plan • Change management plan
2 Project documents	• Change log • Issue log • Lessons learned register • Stakeholder register
3 Enterprise environmental factors	• Organizational culture, political climate, and governance structure of the organization;, Personnel administration policies; Stakeholder risk thresholds; , Established communication channels;, Global, regional, or local trends, practices, or habits; and Geographic distribution of facilities and resources.
4 Organizational process assets	• Corporate policies and procedures for social media, ethics, and security; Corporate policies and procedures for issue, risk, change, and data management; Organizational communication requirements, Standardized guidelines for development, exchange, storage, and retrieval of information; and Historical information from previous similar projects.

Copyright © Strategic Transformation Consultants Ltd.

Change Log

Change Number	Raised BY	Chage Description	Committed Date	Resp.	Status

Copyright © Strategic Transformation Consultants Ltd.

Manage stakeholder engagement-TT

Copyright © Strategic Transformation Consultants Ltd.

Manage stakeholder engagement-TT

1 Expert Judgement

- Politics and power structures in the organization and outside the organization;
  - Environment and culture of the organization and outside the organization;
  - Analytical and assessment techniques to be used for stakeholder engagement processes;
  - Communication methods and strategies;

2 Communication skills

- Feedback

3 Interpersonal and team skills

- Conflict management • Cultural awareness • Negotiation • Observation/conversation • Political awareness

4 Ground rules

- Ground rules, defined in the team charter set the expected behavior for project team members, as well as other stakeholders, with regard to stakeholder engagement.

5 Meetings

- Meetings are used to discuss and address any issue or concern regarding stakeholder engagement

Copyright © Strategic Transformation Consultants Ltd.

Manage stakeholder engagement-output

1 Change requests	• As a result of managing stakeholder engagement, changes to the project scope or product scope may emerge. All change requests are processed for review and disposition through the Perform Integrated Change Control process
2 Project management plan updates	• Communications management plan • Stakeholder engagement plan
3 Project documents updates	• Change log • Issue log • Lessons learned register • Stakeholder register

Copyright © Strategic Transformation Consultants Ltd.

Direct and manage Project Work-ITTO

Direct and manage project work

- is the process of leading and performing the work defined in the project management plan and implementing approved changes to achieve the project's objectives. The key benefit of this process is that it provides overall management of the project work and deliverables, thus improving the probability of project success.

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Any component .2 Project documents • Change log • Lessons learned register • Milestone list • Project communications • Project schedule • Requirements traceability matrix • Risk register • Risk report .3 Approved change requests .4 Enterprise environmental factors .5 Organizational process assets	.1 Expert judgment .2 Project management information system .3 Meetings	.1 Deliverables .2 Work performance data .3 Issue log .4 Change requests .5 Project management plan updates • Any component .6 Project documents updates • Activity list • Assumption log • Lessons learned register • Requirements documentation • Risk register • Stakeholder register .7 Organizational process assets updates

Figure 4-6. Direct and Manage Project Work: Inputs, Tools & Techniques, and Outputs

Direct and Manage project work

1 Project management plan	•Any component
2 Project documents	•Change log • Lessons learned register • Milestone list • Project communications • Project schedule • Requirements traceability matrix • Risk register • Risk report
3 Approved change requests	•Approved change requests are an output of the Perform Integrated Change Control process, and include those requests reviewed and approved for implementation by the project manager or by the change control board (CCB) when applicable.
4 Enterprise environmental factors	•The enterprise environmental factors that can influence the Direct and Manage Project Work process include but are not limited to :a. Organizational structure, culture, management practices, and sustainability; b. Infrastructure (e.g., existing facilities and capital equipment); and c,. Stakeholder risk thresholds (e.g., allowable cost overrun percentage).
5 Organizational process assets	•Organizational standard policies, processes, and procedures; Issue and defect management procedures defining issue and defect controls, issue and defect identification and resolution, and action item tracking; Issue and defect management database(s) containing historical issue and defect status, issue and defect resolution, and action item results; Performance measurement database used to collect and make available measurement data on processes and products; Change control and risk control procedures; and Project information from previous projects (e.g., scope, cost, schedule, performance measurement baselines, project calendars, project schedule network diagrams, risk registers, risk reports, and lessons learned repository).

tegic Transformation Consultants Ltd.

Direct and Manage Project Work-TT

1 Expert judgment

2 PMIS

5 Meetings

Copyright © Strategic Transformation Consultants Ltd.

Tools

1. Expert judgment

- Is used to assess the input needed to direct and manage project execution

2. PMIS

- Scheduling software,
- configuration management system
- Information collection and distribution system
- Web interface to other online system

3.Meetings

- Information exchange
- Brainstorming, option evaluation or design
- Decision Making

Copyright © Strategic Transformation Consultants Ltd.

Output

1 Deliverables

- A deliverable is any unique and verifiable product, result, or capability to perform a service that is required to be produced to complete a process, phase, or project. Deliverables are typically the outcomes of the project and can include components of the project management plan.

2 Work performance data

- Work performance data are the raw observations and measurements identified during activities being performed to carry out the project work

3 Issue log

- Throughout the life cycle of a project, the project manager will normally face problems, gaps, inconsistencies, or conflicts that occur unexpectedly and that require some action so they do not impact the project performance.

Copyright © Strategic Transformation Consultants Ltd.

Output

4 Change requests	• Corrective action. An intentional activity that realigns the performance of the project work with the project management plan. • Preventive action. An intentional activity that ensures the future performance of the project work is aligned with the project management plan. • Defect repair. An intentional activity to modify a nonconforming product or product component. • Updates. Changes to formally controlled project documents, plans, etc., to reflect modified or additional ideas or content.
5 PM plan Updates	• Any component
6 Project documents updates	• Activity list • Assumption log • Lessons learned register • Requirements documentation • Risk register • Stakeholder register
7 Organizational process assets Updates	• Any organizational process asset can be updated as a result of this process.

Copyright © Strategic Transformation Consultants Ltd.

Manage Project Knowledge -ITTO

Manage Project Knowledge

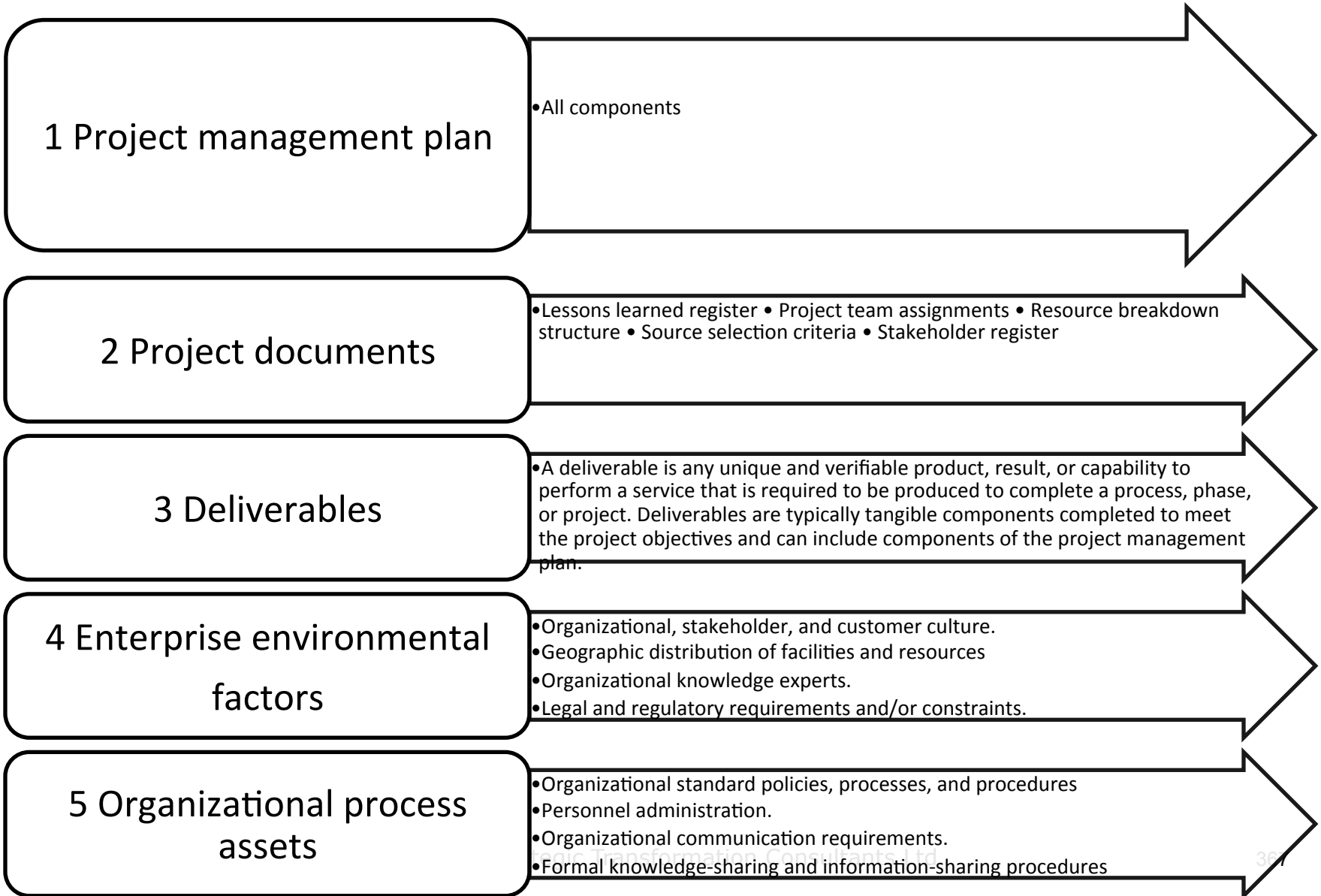
- is the process of using existing knowledge and creating new knowledge to achieve the project's objectives and contribute to organizational learning.

Inputs	Tools & Techniques	Outputs
.1 Project management plan • All components .2 Project documents • Lessons learned register • Project team assignments • Resource breakdown structure • Source selection criteria • Stakeholder register .3 Deliverables .4 Enterprise environmental factors .5 Organizational process assets	.1 Expert judgment .2 Knowledge management .3 Information management .4 Interpersonal and team skills • Active listening • Facilitation • Leadership • Networking • Political awareness	.1 Lessons learned register .2 Project management plan updates • Any component .3 Organizational process assets updates

Figure 4-8. Manage Project Knowledge: Inputs, Tools & Techniques, and Outputs

Copyright © Strategic Transformation Consultants Ltd.

Input: Manage Project Knowledge



Manage Project Knowledge-TT

Copyright © Strategic Transformation Consultants Ltd.

Manage Project Knowledge

1 Expert judgment

- Expertise should be considered from individuals or groups with specialized knowledge or training in the following topics:
  - Knowledge management,
  - Information management,
  - Organizational learning,
  - Knowledge and information management tools, and
  - Relevant information from other projects.

2 Knowledge management

- Knowledge management tools and techniques connect people so they can work together to create new knowledge, share tacit knowledge, and integrate the knowledge of diverse team members. Tools and techniques include but are not limited to: Workshop, events, story telling

3 Information management

- Information management tools and techniques are used to create and connect people to information. They are effective for sharing simple, unambiguous, codified explicit knowledge.

4 Interpersonal and team skills

- Active listening
- Facilitation
- Leadership
- Networking
- Political awareness

Copyright © Strategic Transformation Consultants Ltd.

Output- Manage Project Knowledge

1 Lessons learned register	• The lessons learned register can include the category and description of the situation. The lessons learned register may also include the impact, recommendations, and proposed actions associated with the situation. The lessons learned register may record challenges, problems, realized risks and opportunities, or other content as appropriate.
2 Project management plan Updates	• Any change to the project management plan goes through the organization's change control process via a change request. Any component of the project management plan may be updated as a result of this process.
3 Organizational process assets Updates	• Any organizational process asset can be updated as a result of this process.

Copyright © Strategic Transformation Consultants Ltd.

End of Executing Process Group

Copyright © Strategic Transformation Consultants Ltd.

Monitoring and Controlling Process Group

Copyright © Strategic Transformation Consultants Ltd.

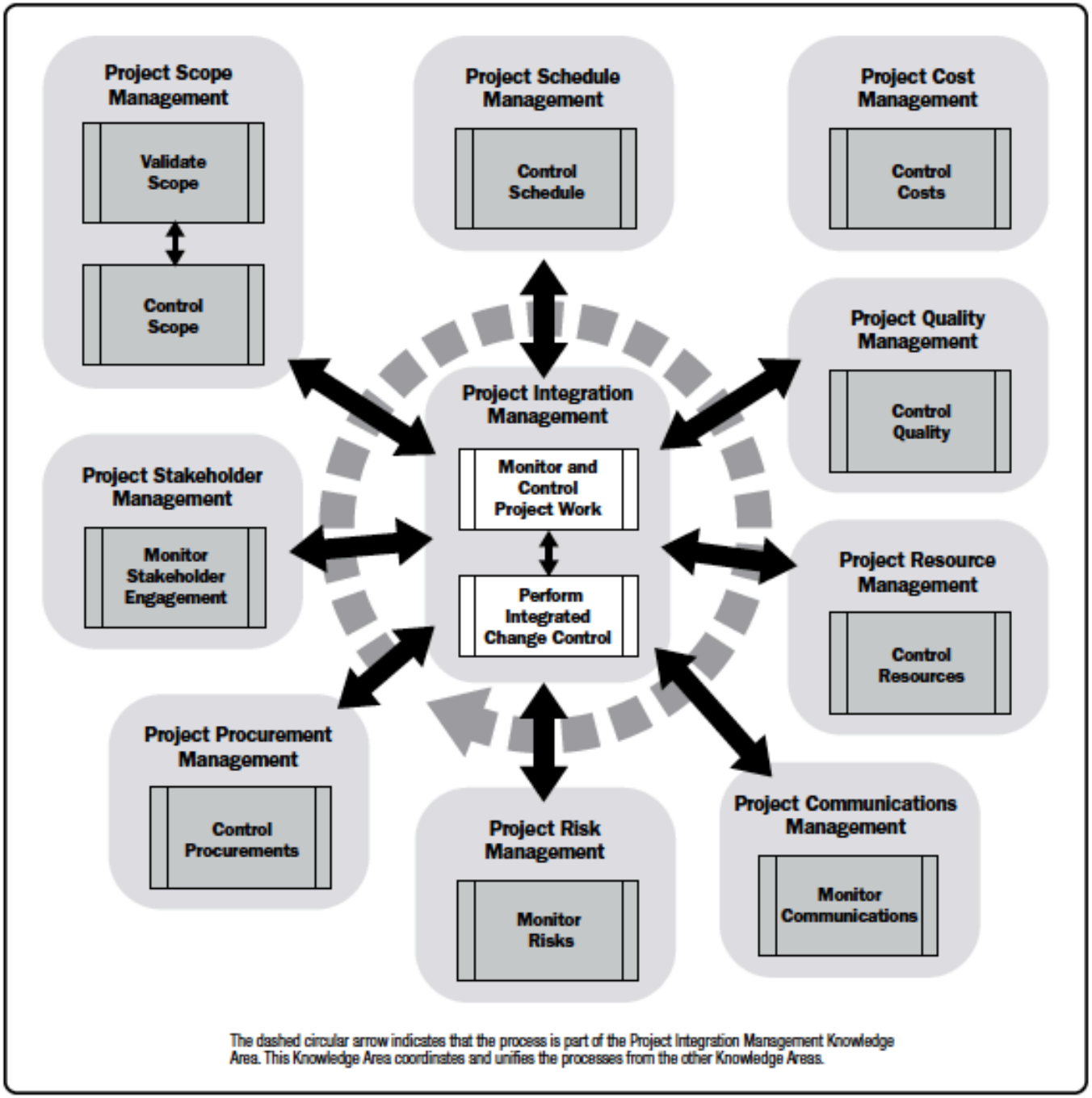


Figure 5-1. Monitoring and Controlling Process Group

Validate Scope ITTO

validate Scope

- Validate Scope is the process of formalizing acceptance of the completed project deliverables. The key benefit of this process is that it brings objectivity to the acceptance process and increases the probability of final product, service, or result acceptance by validating each deliverable.

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Scope management plan • Requirements management plan • Scope baseline .2 Project documents • Lessons learned register • Quality reports • Requirements documentation • Requirements traceability matrix .3 Verified deliverables .4 Work performance data	.1 Inspection .2 Decision making • Voting	.1 Accepted deliverables .2 Work performance information .3 Change requests .4 Project document updates • Lessons learned register • Requirements documentation • Requirements traceability matrix

Figure 5-15. Validate Scope: Inputs, Tools & Techniques, and Outputs

Input to Validate Scope

1.Project management plan	• Scope management plan • Requirements management Plan • Scope baseline
2.Project documents	• Lessons learned register • Quality reports • Requirements Documentation • Requirements traceability matrix
3.Verified deliverables	• Verified deliverables are project deliverables that are completed and checked for correctness through the Control Quality process.
4.Work performance data	• Work performance data can include the degree of compliance with requirements, number of nonconformities, severity of the nonconformities, or the number of validation cycles performed in a period of time.

Copyright © Strategic Transformation Consultants Ltd.

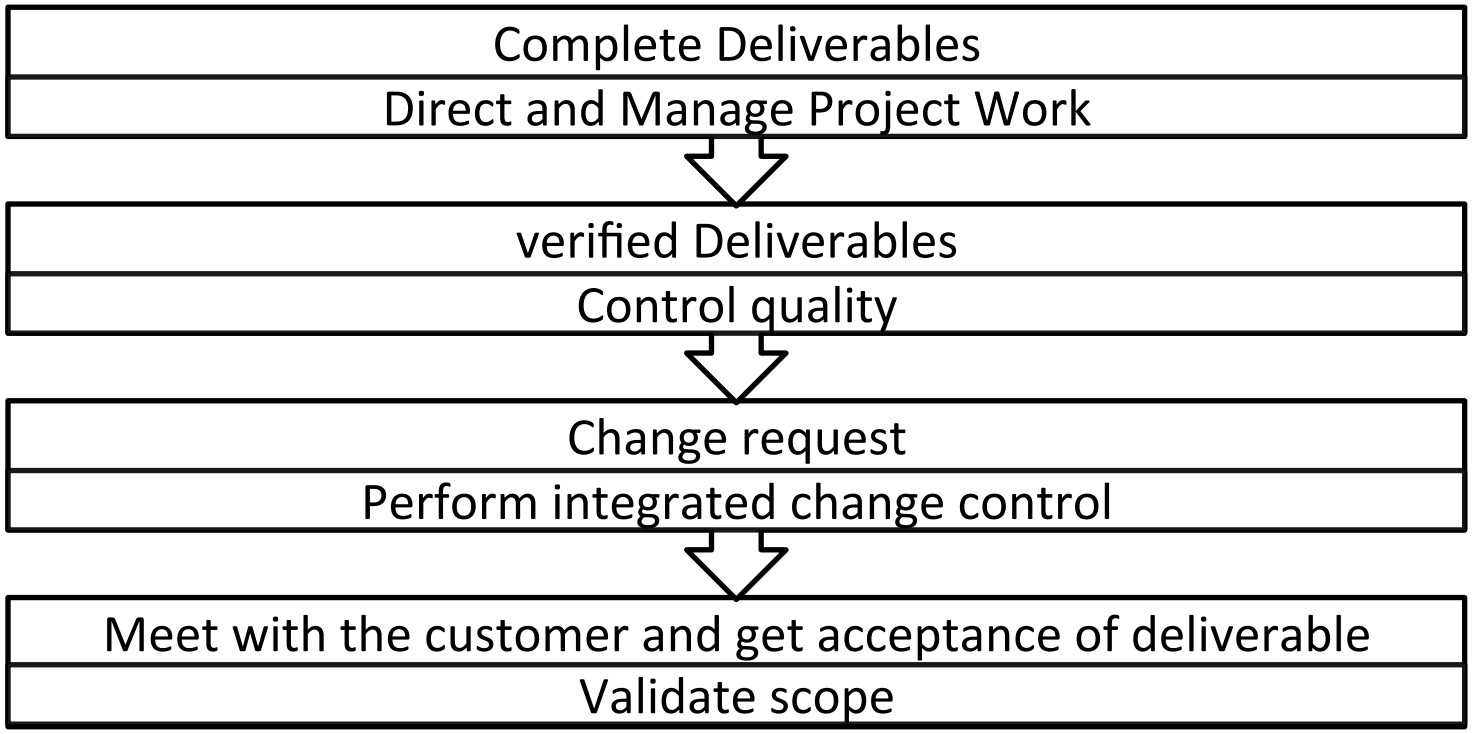
Validate Scope-TT

Sometimes called Review, product review, Audit, Walkthrough

Copyright © Strategic Transformation Consultants Ltd.

Deliverables

Journey of deliverables throughout the process



Output of VS process

Copyright © Strategic Transformation Consultants Ltd.

Control Scope ITTO

Control Scope

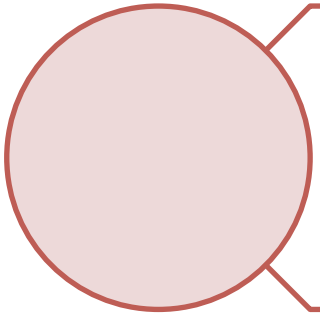
- Control Scope is the process of monitoring the status of the project and product scope and managing changes to the scope baseline. The key benefit of this process is that the scope baseline is maintained throughout the project. This

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Scope management plan • Requirements management plan • Change management plan • Configuration management plan • Scope baseline • Performance measurement baseline .2 Project documents • Lessons learned register • Requirements documentation • Requirements traceability matrix .3 Work performance data .4 Organizational process assets	.1 Data analysis • Variance analysis • Trend analysis	.1 Work performance information .2 Change requests .3 Project management plan updates • Scope management plan • Scope baseline • Schedule baseline • Cost baseline • Performance measurement baseline .4 Project documents updates • Lessons learned register • Requirements documentation • Requirements traceability matrix

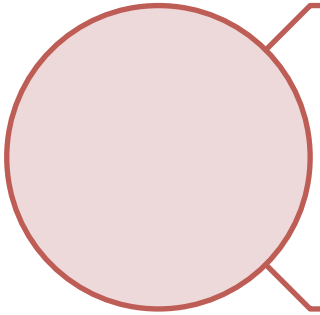
Figure 5-17. Control Scope: Inputs, Tools & Techniques, and Outputs

Main idea

PMI does not allow gold plating (additional work)

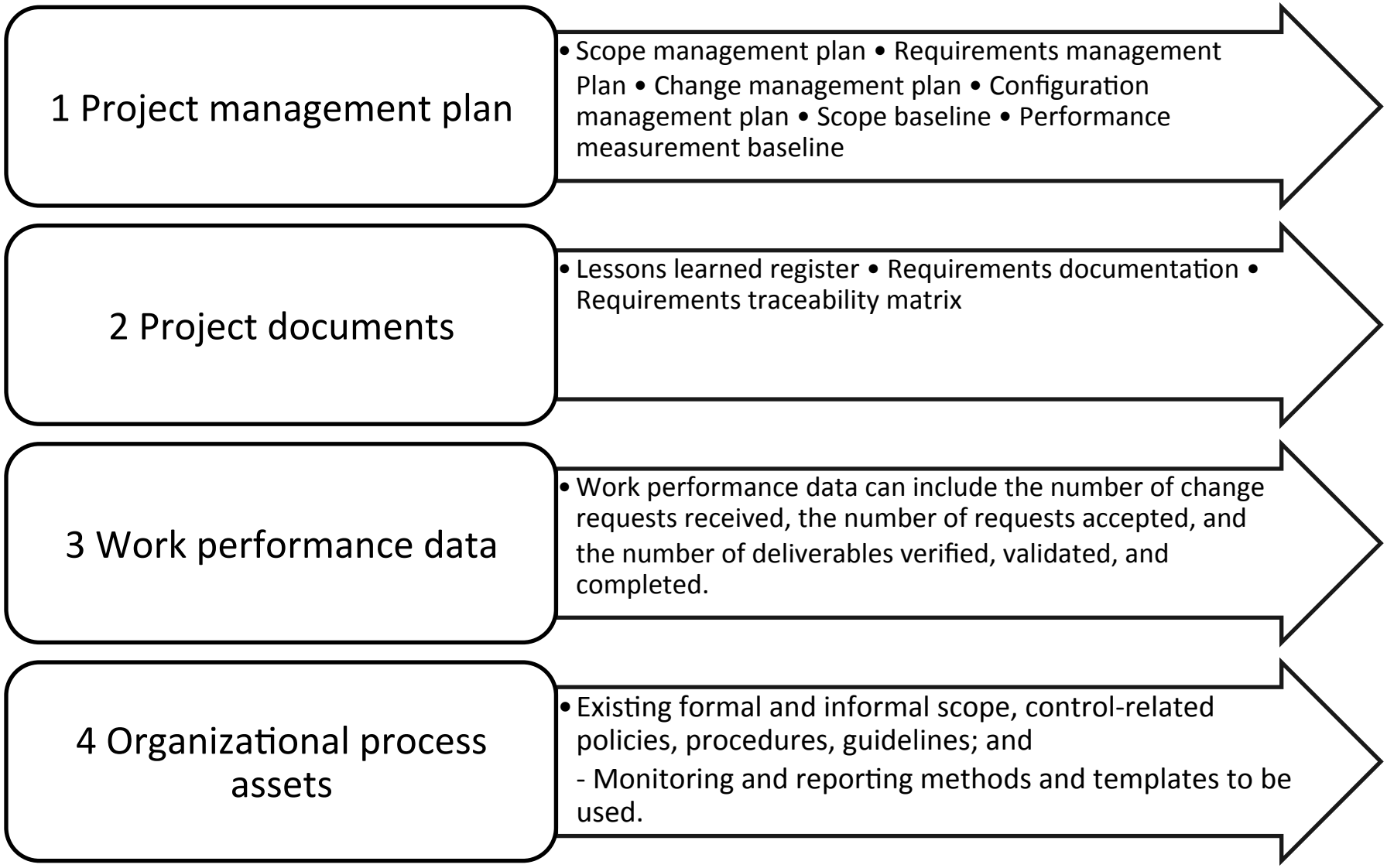


Ensure requested changes, corrective and preventive actions are processed through integrated change control Process



There is not uncontrolled scope change. (Scope Creep)

Input to Control Scope process



Copyright © Strategic Transformation Consultants Ltd.

Control Scope-TT

Copyright © Strategic Transformation Consultants Ltd.

Output of control scope

Work Performance information

- Planned Vs. Actual

Change request

- Variance analysis can result in changes

Management

- Scope management plan
- Scope baseline
- Schedule baseline
- Cost baseline
- Performance measurement baseline

Project Document update

Lessons learned register • Requirements
Documentation • Requirements traceability matrix

Copyright © Strategic Transformation Consultants Ltd.

Control Schedule-ITTO

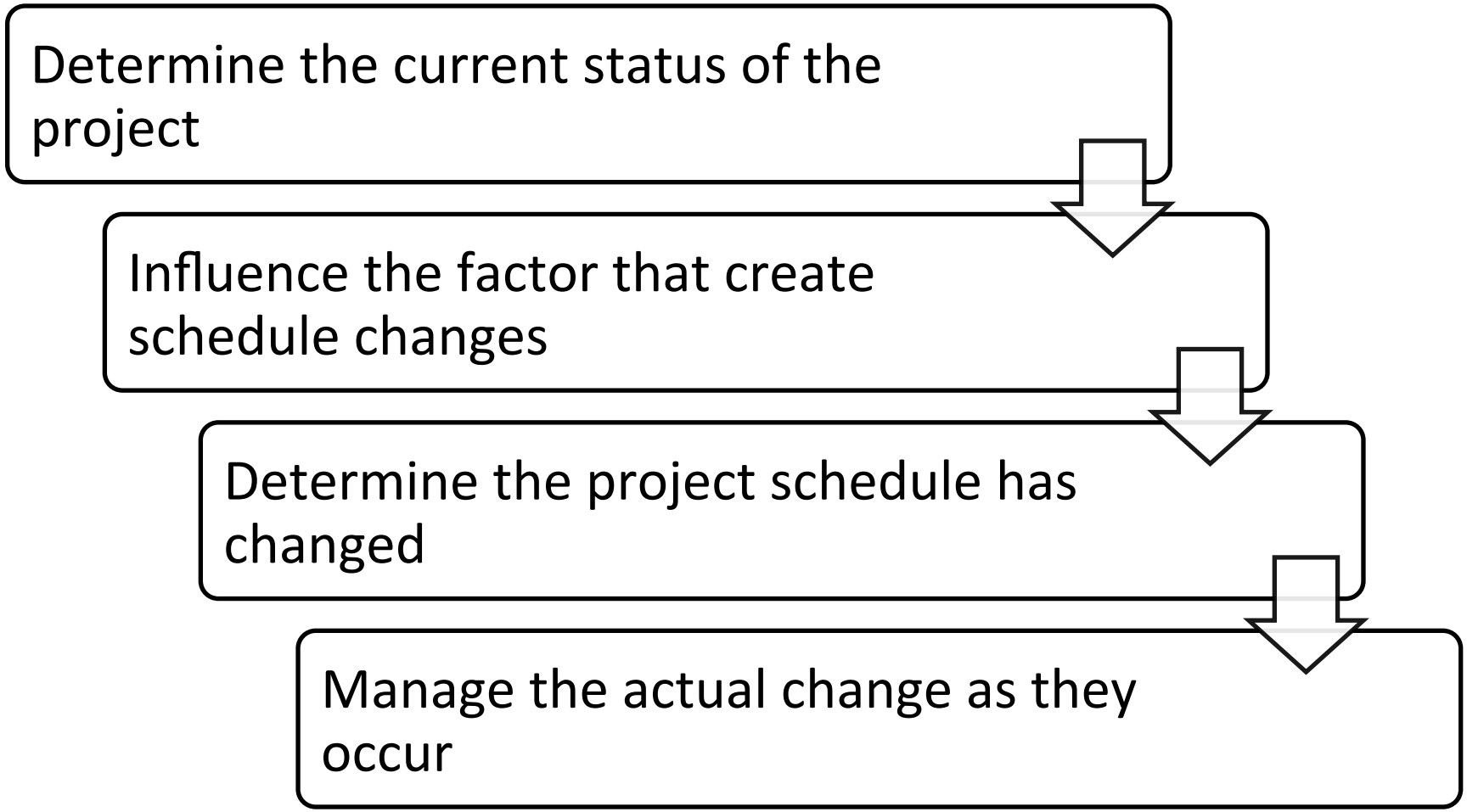
Control Schedule

- Control Schedule is the process of monitoring the status of the project to update the project schedule and managing changes to the schedule baseline. The key benefit of this process is that the schedule baseline is maintained throughout the project.

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Schedule management plan • Schedule baseline • Scope baseline • Performance measurement baseline .2 Project documents • Lessons learned register • Project calendars • Project schedule • Resource calendars • Schedule data .3 Work performance data .4 Organizational process assets	.1 Data analysis • Earned value analysis • Iteration burndown chart • Performance reviews • Trend analysis • Variance analysis • What-if scenario analysis .2 Critical path method .3 Project management information system .4 Resource optimization .6 Leads and lags .7 Schedule compression	.1 Work performance information .2 Schedule forecasts .3 Change requests .4 Project management plan updates • Schedule management plan • Schedule baseline • Cost baseline • Performance measurement baseline .5 Project documents updates • Assumption log • Basis of estimates • Lessons learned register • Project schedule • Resource calendars • Risk register • Schedule data

Figure 6-22. Control Schedule: Inputs, Tools & Techniques, and Outputs

Main idea



Copyright © Strategic Transformation Consultants Ltd.

Input to Control Schedule

.1 Project management plan	• Schedule management plan • Schedule baseline • Scope baseline • Performance measurement baseline
.2 Project documents	• Lessons learned register • Project calendars • Project schedule • Resource calendars • Schedule data
.3 Work performance data	• Work performance data contains data on project status such as which activities have started, their progress (e.g., actual duration, remaining duration, and physical percent complete), and which activities have finished.
.4 Organizational process assets	• Existing formal and informal schedule control-related policies, procedures, and guidelines; - Schedule control tools; and - Monitoring and reporting methods to be used.

Copyright © Strategic Transformation Consultants Ltd.

Control Schedule- TT

Copyright © Strategic Transformation Consultants Ltd.

Control Schedule- TT

1 Data analysis

- Earned value analysis • Iteration burndown chart • Performance reviews • Trend analysis • Variance analysis • What-if scenario analysis

2 Critical path method

3 Project management information system

4 Resource optimization

5 Leads and lags

6 Schedule compression

Copyright © Strategic Transformation Consultants Ltd.

Burndown chart

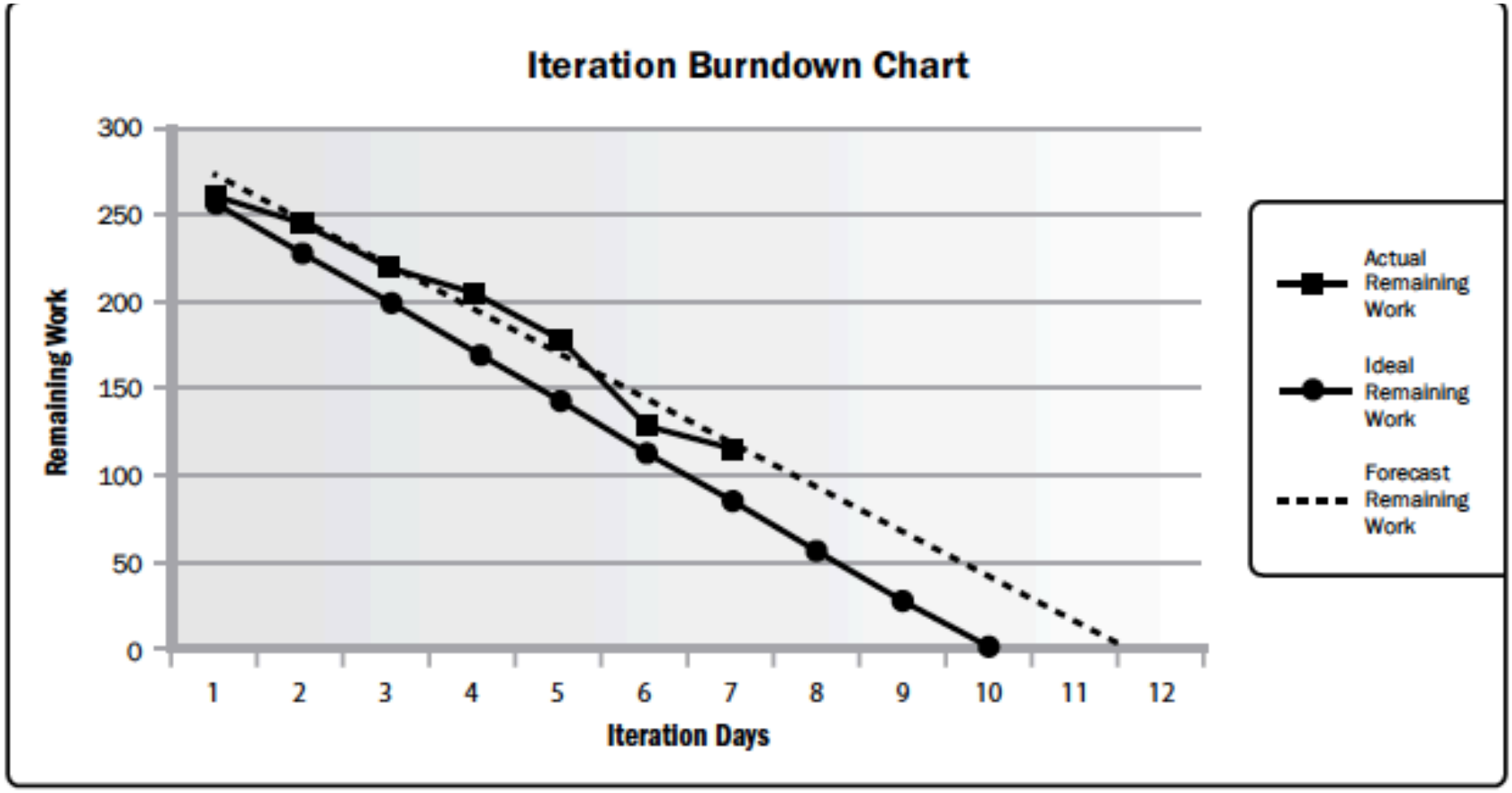


Figure 6-24. Iteration Burndown Chart

Copyright © Strategic Transformation Consultants Ltd.

Control Schedule-Output

Work performance information

- SV, SPI

Schedule forecasts

Change request

- Analysis can result into change request

Project management plan update

- 1. Schedule baseline 2. Schedule management plan 3. Cost baseline

Project Document update

- Project data 2. Project schedule

Copyright © Strategic Transformation Consultants Ltd.

Control Cost-ITTO

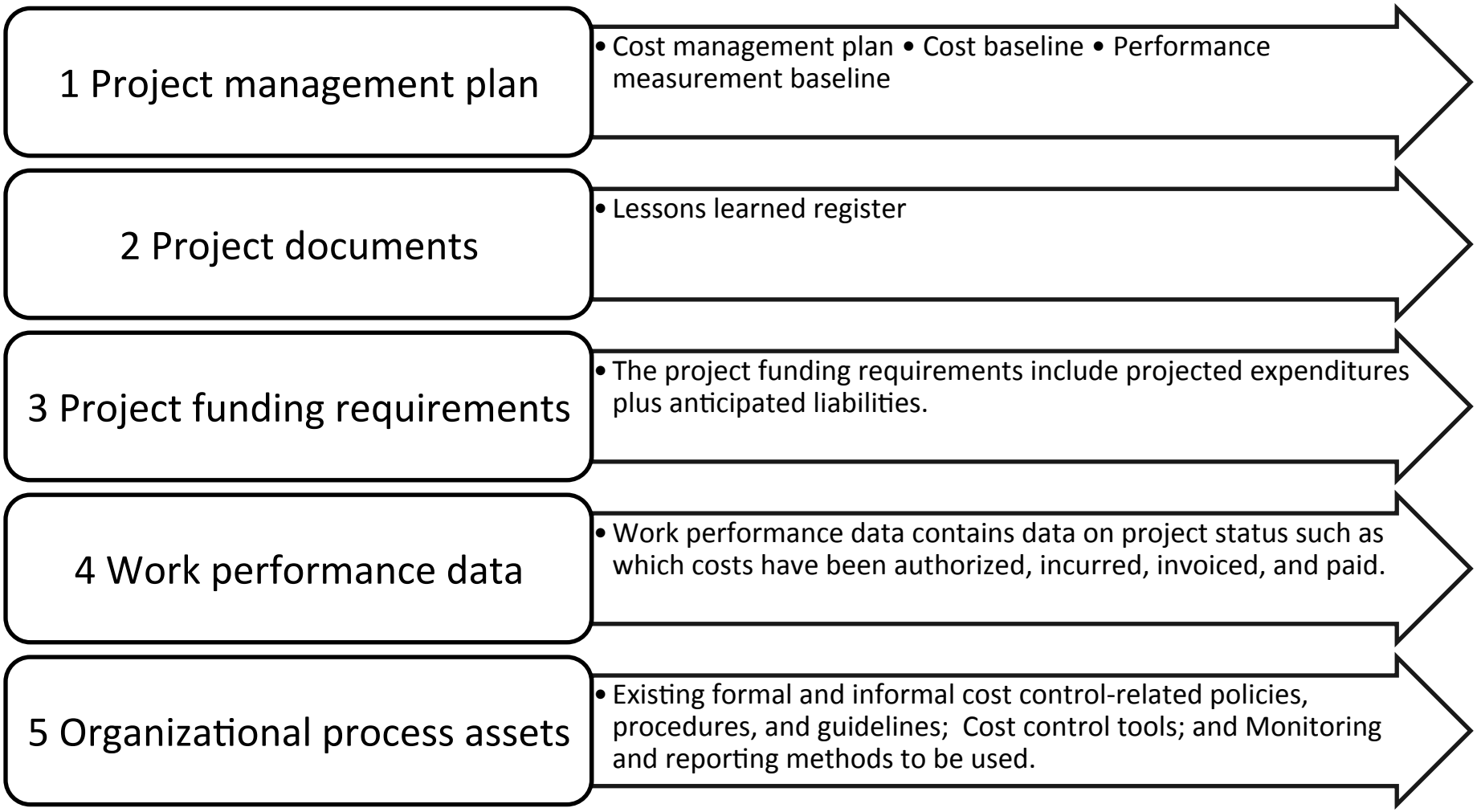
Control Cost

- Control Costs—The process of monitoring the status of the project to update the project costs and manage changes to the cost baseline.

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Cost management plan • Cost baseline • Performance measurement baseline .2 Project documents • Lessons learned register .3 Project funding requirements .4 Work performance data .5 Organizational process assets	.1 Expert judgment .2 Data analysis • Earned value analysis • Variance analysis • Trend analysis • Reserve analysis .3 To-complete performance index .4 Project management information system	.1 Work performance information .2 Cost forecasts .3 Change requests .4 Project management plan updates • Cost management plan • Cost baseline • Performance measurement baseline .5 Project documents updates • Assumption log • Basis of estimates • Cost estimates • Lessons learned register • Risk register

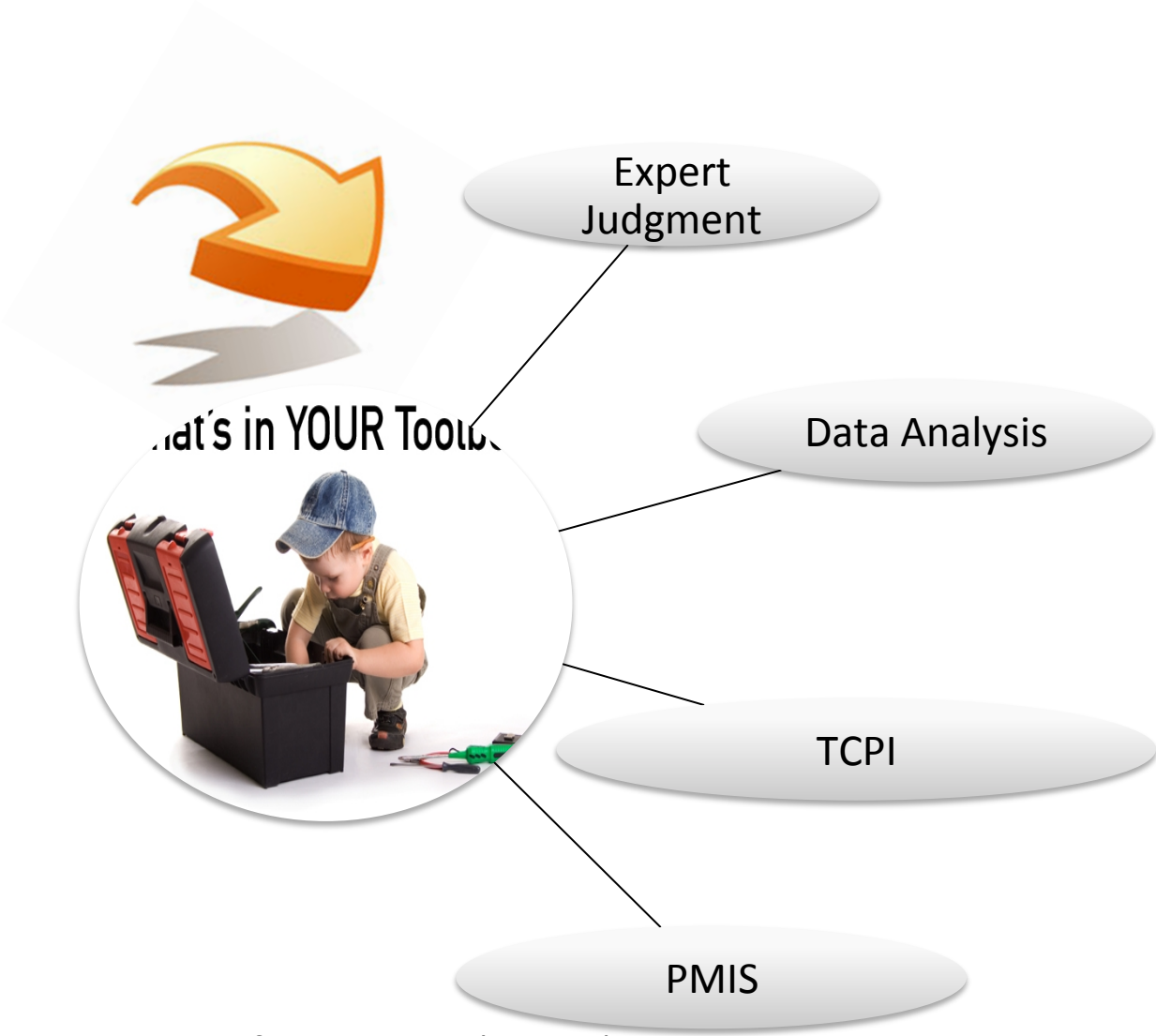
Figure 7-10. Control Costs: Inputs, Tools & Techniques, and Outputs

Input to Control Cost



Copyright © Strategic Transformation Consultants Ltd.

Control Cost-TT



Copyright © Strategic Transformation Consultants Ltd.

Control Cost -TT

Data Analysis- Earned Value Analysis

Planned Value: total planned value is BAC (budgeted at completion)

- PV=BAC*planned % complete
- You are installing total 100 window for a building for BDT. 10,000. On 4th week you are supposed to complete installing 60 window. What is planned value
- PV=10000*60%
  =6000

Earned Value: actual scheduled work done

- EV=BAC*actual % complete
- You are installing total 100 window for a building for BDT. 10,000. On 4th week you are supposed to complete installing 60 window. But you saw that only 50 window have been installed. What is earned value
- EV=10000*50%
  =5000

Copyright © Strategic Transformation Consultants Ltd.

Control Cost -TT

1. EVA-Variance Analysis

Actual Cost= actual cost
you calculated that on 4th week your total cost is 4500

Schedule Variance (SV)=EV-PV
Cost Variance (CV)=EV-AC

According to the example
SV= 5000-6000=-1000 (negative value is bad. Means you are behind schedule)
CV=5000-4500=500 (positive value is good, for both of the cases

SPI= EV/PV=5000/6000=.83 (less than 1, bad)
CPI=EV/AC=5000/4500=1.11 (more than 1, good)

Copyright © Strategic Transformation Consultants Ltd.

Earned value, planned value, actual cost

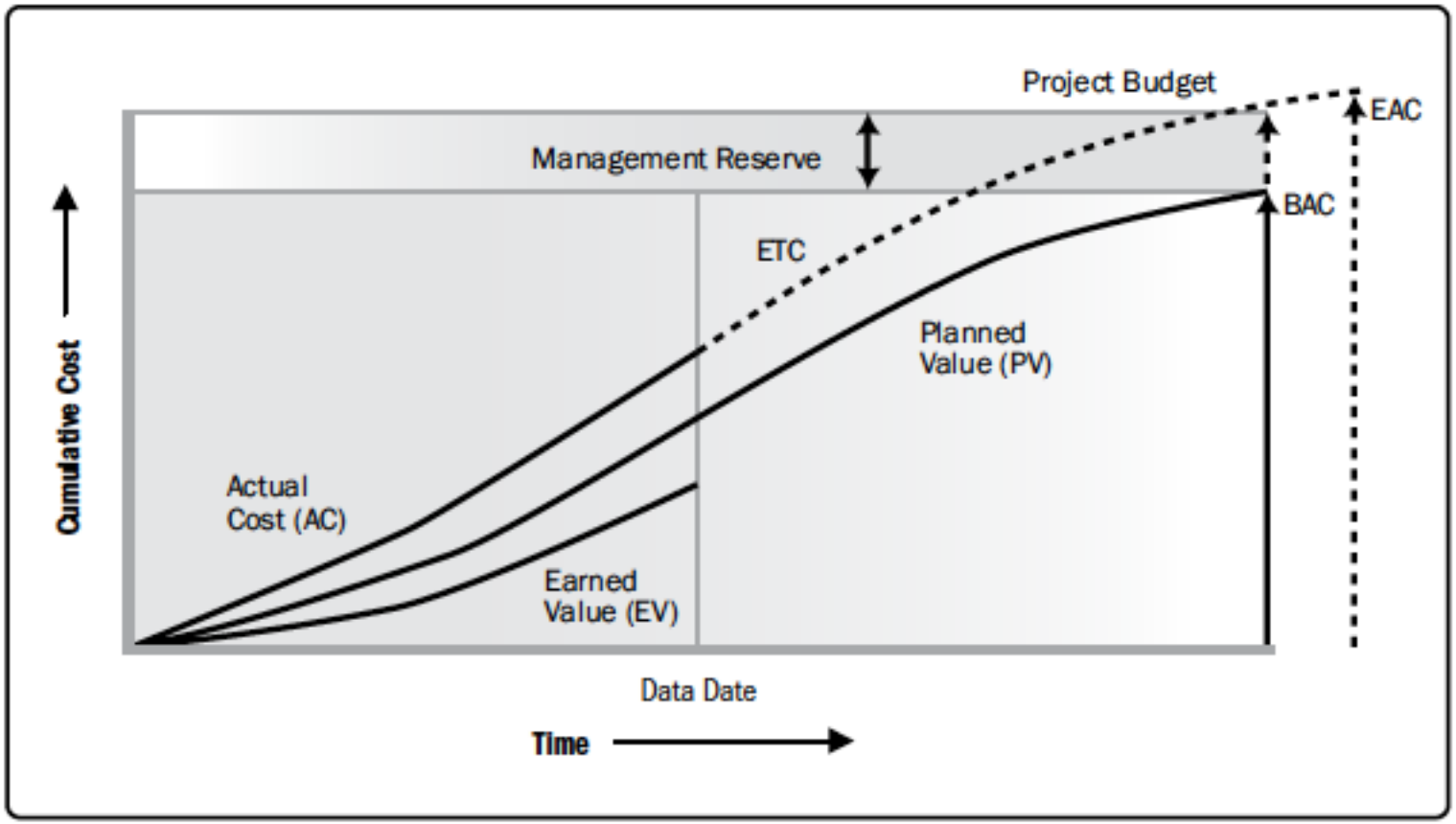
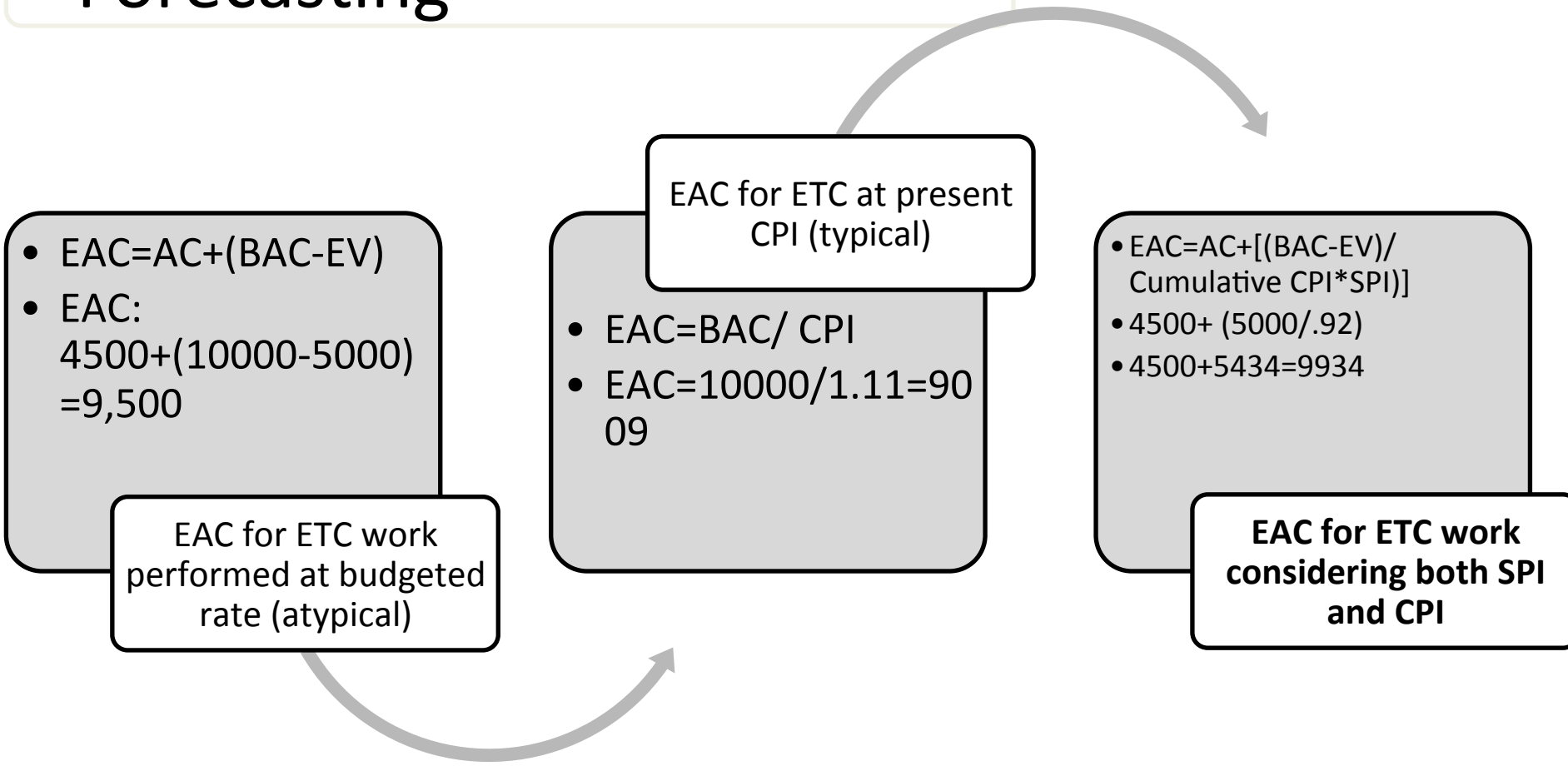


Figure 7-12. Earned Value, Planned Value, and Actual Costs

Copyright © Strategic Transformation Consultants Ltd.

Control Cost-TT

Forecasting



Copyright © Strategic Transformation Consultants Ltd.

Control Cost -TT

3. TCPI

- TCPI=(BAC-EV)/(BAC-AC)
- =(10000-5000)/(10000-4500) (work remaining/fund remaining)
- =.90

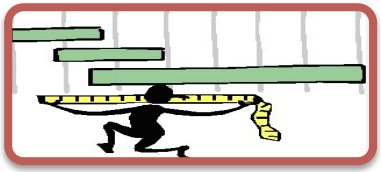
- Once EAC is approved
- TCPI=(BAC-EV)/(EAC-AC)
- =5000/(9500-4500)
- = 1

4. PMIS

- Software used to Calculate EVM, generate graphs etc

Copyright © Strategic Transformation Consultants Ltd.

Cost control-output



Work performance information

- SV, SPI, CV, CPI of WBS element

Cost forecasts

- EAC, calculated or bottom up

Change Request

- Analysis of project performance can result in change request

Project Management Plan update

- Cost performance baseline, Cost management plan

Project documents update

- Cost estimates, basis of estimates

Copyright © Strategic Transformation Consultants Ltd.

Control quality-ITTO

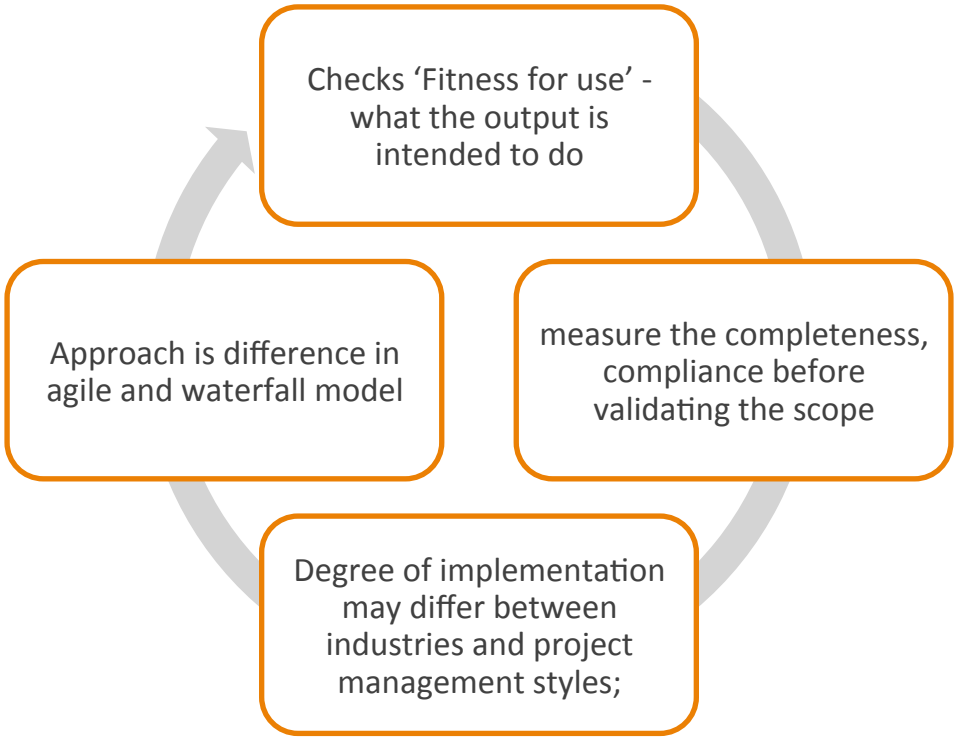
Control Quality

- Quality—The process of monitoring and recording the results of executing the quality management activities to assess performance and ensure the project outputs are complete, correct, and meet customer expectations.

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Quality management plan .2 Project documents • Lessons learned register • Quality metrics • Test and evaluation documents .3 Approved change requests .4 Deliverables .5 Work performance data .6 Enterprise environmental factors .7 Organizational process assets	.1 Data gathering • Checklists • Check sheets • Statistical sampling • Questionnaires and surveys .2 Data analysis • Performance reviews • Root cause analysis .3 Inspection .4 Testing/product evaluations .5 Data representation • Cause-and-effect diagrams • Control charts • Histogram • Scatter diagrams .6 Meetings	.1 Quality control measurements .2 Verified deliverables .3 Work performance information .4 Change requests .5 Project management plan updates • Quality management plan .6 Project documents updates • Issue log • Lessons learned register • Risk register • Test and evaluation documents

Figure 8-10. Control Quality: Inputs, Tools & Techniques, and Outputs

Purpose of ‘Control quality’ process



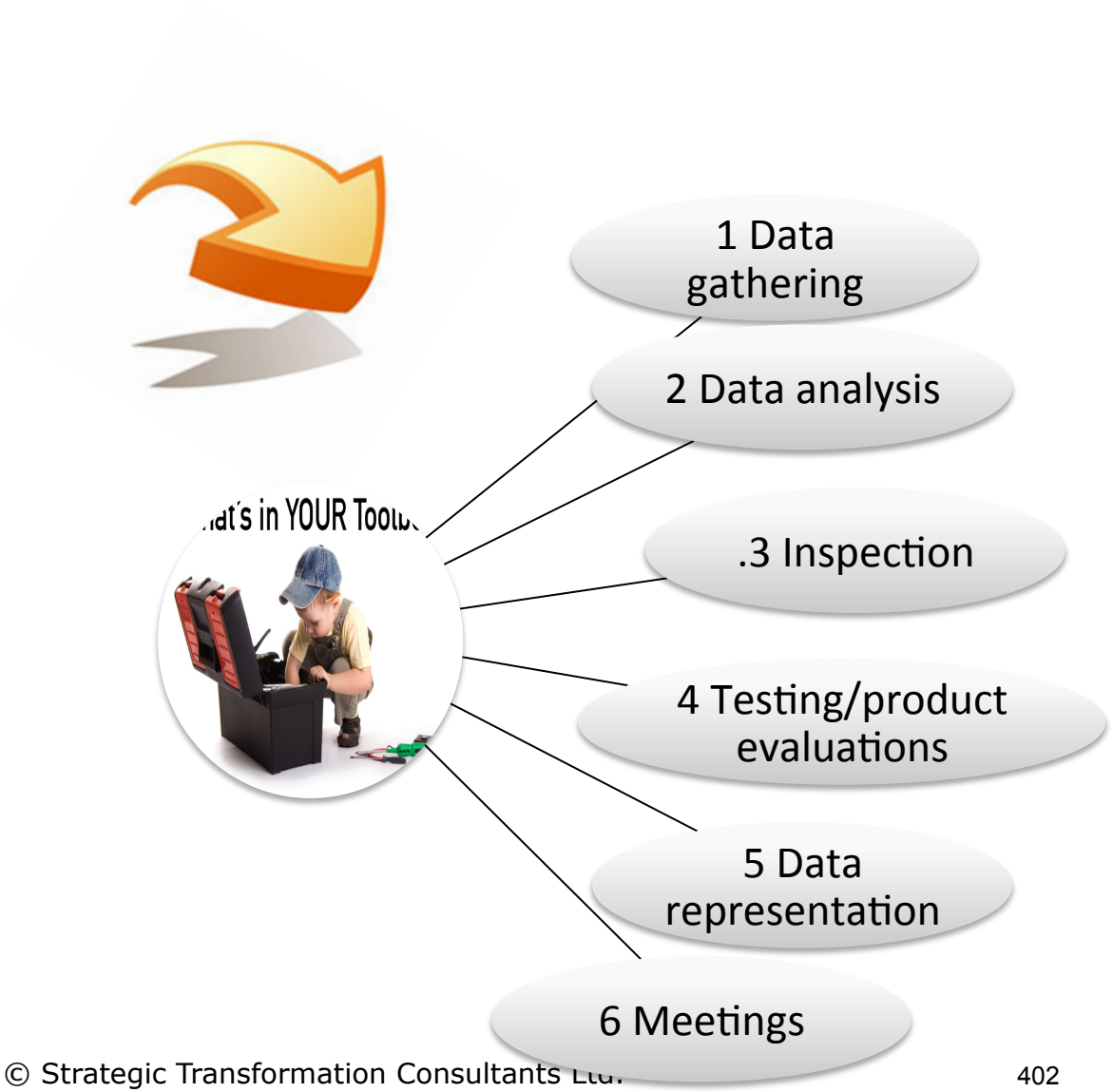
Copyright © Strategic Transformation Consultants Ltd.

Input to Control quality

1 Project management plan	•Quality management plan
2 Project documents	•Lessons learned register • Quality metrics • Test and evaluation documents
3 Approved change requests	•As part of the Perform Integrated Change Control process, a change log update indicates that some changes are approved and some are not. Approved change requests may include modifications such as defect repairs, revised work methods, and revised schedules
4 Deliverables	•A deliverable is any unique and verifiable product, result, or capability to perform a service that is required to be produced to complete a process, phase, or project.
5 Work performance data	•Work performance data contains data on product status such as observations, quality metrics, and measurements for technical performance, as well as project quality information on schedule performance and cost performance.
6 Enterprise environmental factors	•The enterprise environmental factors that can influence the Control Quality process include but are not limited to:; Project management information system; quality management software can be used to track errors and variations in processes or deliverables;- Governmental agency regulations; and- Rules, standards, and guidelines specific to the application area.
7 Organizational process assets	•The organizational process assets that can influence the Control Quality process include but are not limited to: * Quality standards and policies; * Quality templates, for example, check sheets, checklists, etc. and; * Issue and defect reporting procedures and communication policies.

Copyright © Strategic Transformation Consultants Ltd.

Control quality-TT



Copyright © Strategic Transformation Consultants Ltd.

Control quality-TT

1 Data gathering

- Checklists • Check sheets • Statistical sampling
  • Questionnaires and surveys

Date	Hole	Spot	Oval	Down	Hardness	Thickness	Cone problem	T. P. P	Cutout	Copper Out
1-Apr		5		2	1		2	2		
2-Apr	1	6		1					2	
3-Apr		15							4	
4-Apr		1								
5-Apr	2	4		1				1		
6-Apr		7								

Copyright © Strategic Transformation Consultants Ltd.

Control quality-TT

2 Data analysis

- Performance reviews • Root cause analysis

3 Inspection

- An inspection is the examination of a work product to determine if it conforms to documented standards. The results of inspections generally include measurements and may be conducted at any level.

4 Testing/product evaluations

- Testing is an organized and constructed investigation conducted to provide objective information about the quality of the product or service under test in accordance with the project requirements.

5 Data representation

- Cause-and-effect diagrams
- Control charts
- Histogram
- Scatter diagrams

6 Meetings

- Approved change request review
- Lesson Learned

Copyright © Strategic Transformation Consultants Ltd.

Control chart

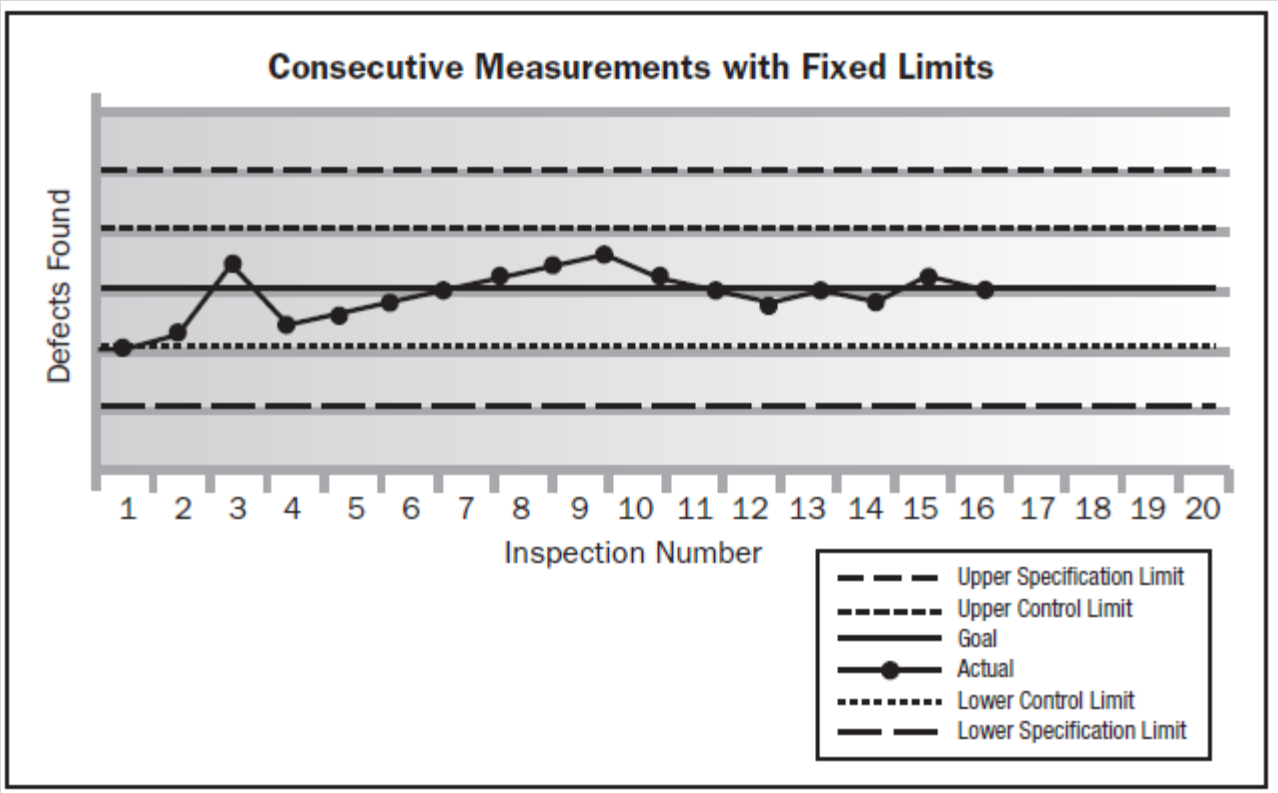
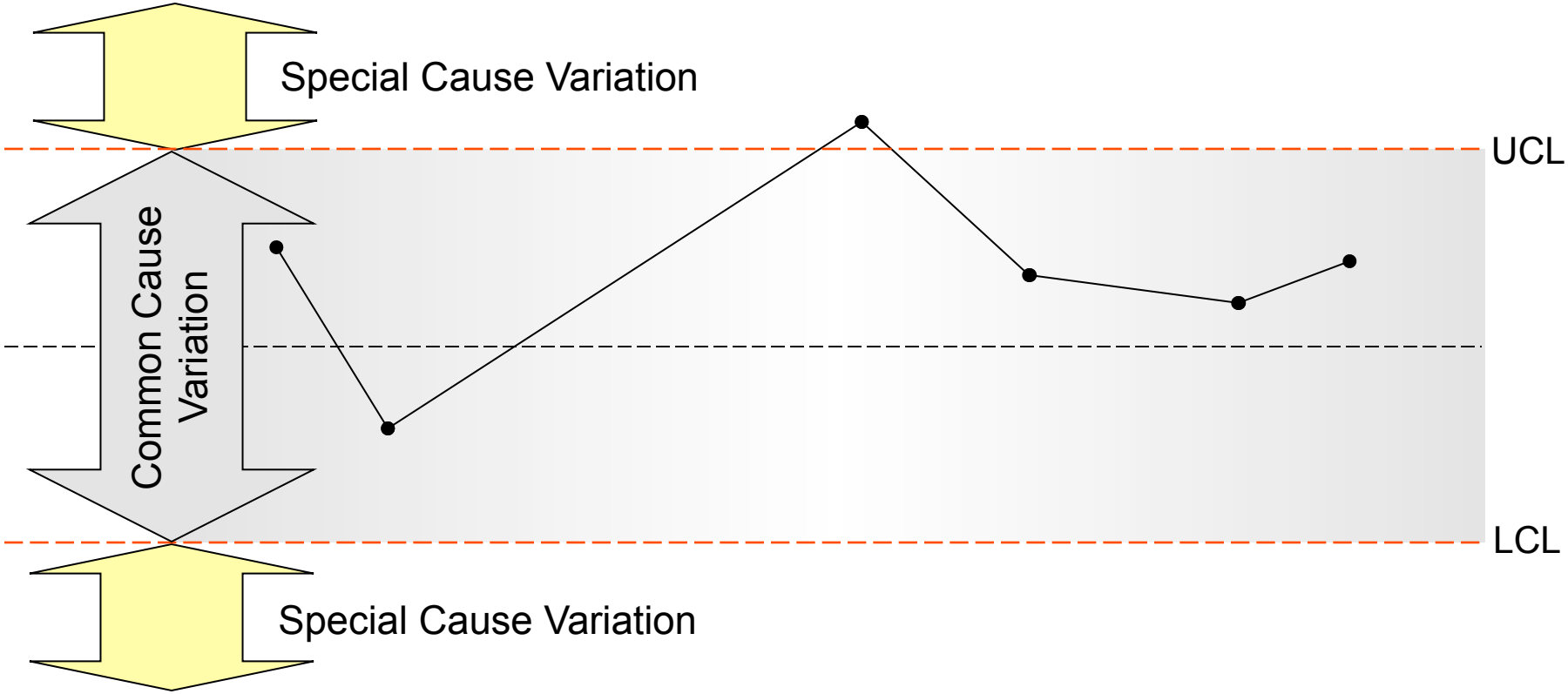


Figure 8-6. Control Chart of Consecutive Measurements with Fixed Limits

- Control limit are set by project manager and appropriate stakeholders to reflect point where corrective action will be taken to avoid exceeding specification limit
- Usually control limit is $\pm 3\sigma$.

Copyright © Strategic Transformation Consultants Ltd.

Common cause and special cause



Copyright © Strategic Transformation Consultants Ltd.

Control quality-output

Quality control measurements	• Documented results of quality control activities in the format specified during quality planning
Varified deliverables	• Results of quality control are validated deliverables
Work Performance Information	• Work performance information includes information on project requirements fulfillment, causes for rejections, rework required, recommendations for corrective actions.
Change request	• If changes occur during the Control Quality process that may impact any of the components of the project management plan or project documents, the project manager should submit a change request.
PM plan update	• Quality management plan • Process Improvement Plan
Project documents update	• Issue log, LL register, risk register

© Strategic Transformation Consultants Ltd.

Quality guru's and some initiatives

Exam Spotlight

Understand each of these theories on the cost of quality for the exam. Here's a key to help you remember:

- Crosby = Zero defects and prevention or rework results.
- Juran = Fitness for use, conformance. Quality by design.
- Deming = Quality is a management problem.
- Feigenbaum = Founder of TQM.
- Shewhart = Plan-Do-Check-Act cycle.
- TQM = Quality must be managed in and must be a continuous process.
- Six Sigma = Six Sigma is a measurement-based strategy; no more than 3.4 defects per million opportunities.
- Kaizen = Continuous improvement; improve quality of people first.
- Continuous improvement = Watch continuously for ways to improve quality.

Copyright © Strategic Transformation Consultants Ltd.

Control Resources -ITTO

Control Resources

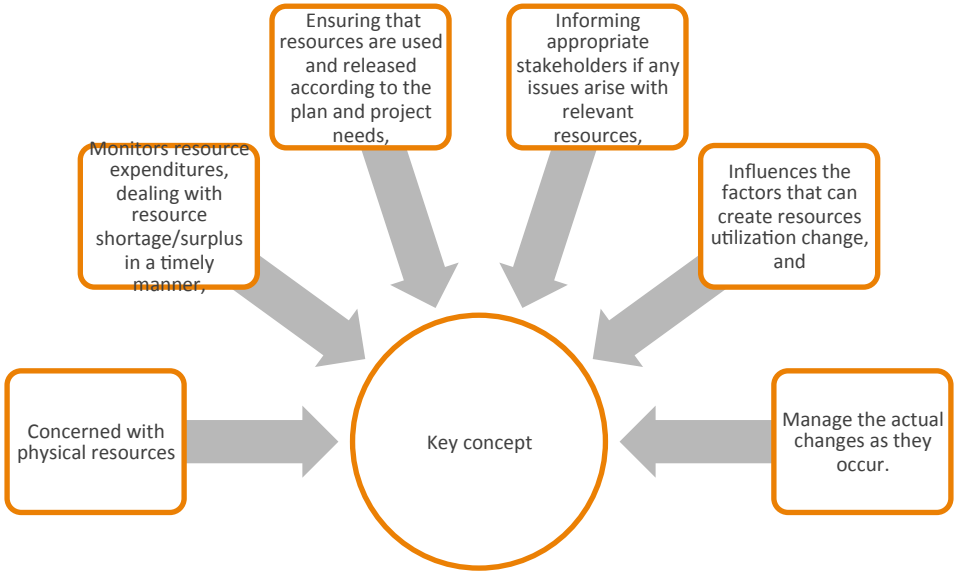
The process of ensuring that the physical resources assigned and allocated to the project are available as planned, as well as monitoring the planned versus actual use of resources, and performing corrective action as necessary.

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Resource management plan .2 Project documents • Issue log • Lessons learned register • Physical resource assignments • Project schedule • Resource breakdown structure • Resource requirements • Risk register .3 Work performance data .4 Agreements .5 Organizational process assets	.1 Data analysis • Alternatives analysis • Cost-benefit analysis • Performance reviews • Trend analysis .2 Problem solving .3 Interpersonal and team skills • Negotiation • Influencing .4 Project management information system	.1 Work performance information .2 Change requests .3 Project management plan updates • Resource management plan • Schedule baseline • Cost baseline .4 Project documents updates • Assumption log • Issue log • Lessons learned register • Physical resource assignments • Resource breakdown structure • Risk register

Figure 9-14. Control Resources: Inputs, Tools & Techniques, and Outputs

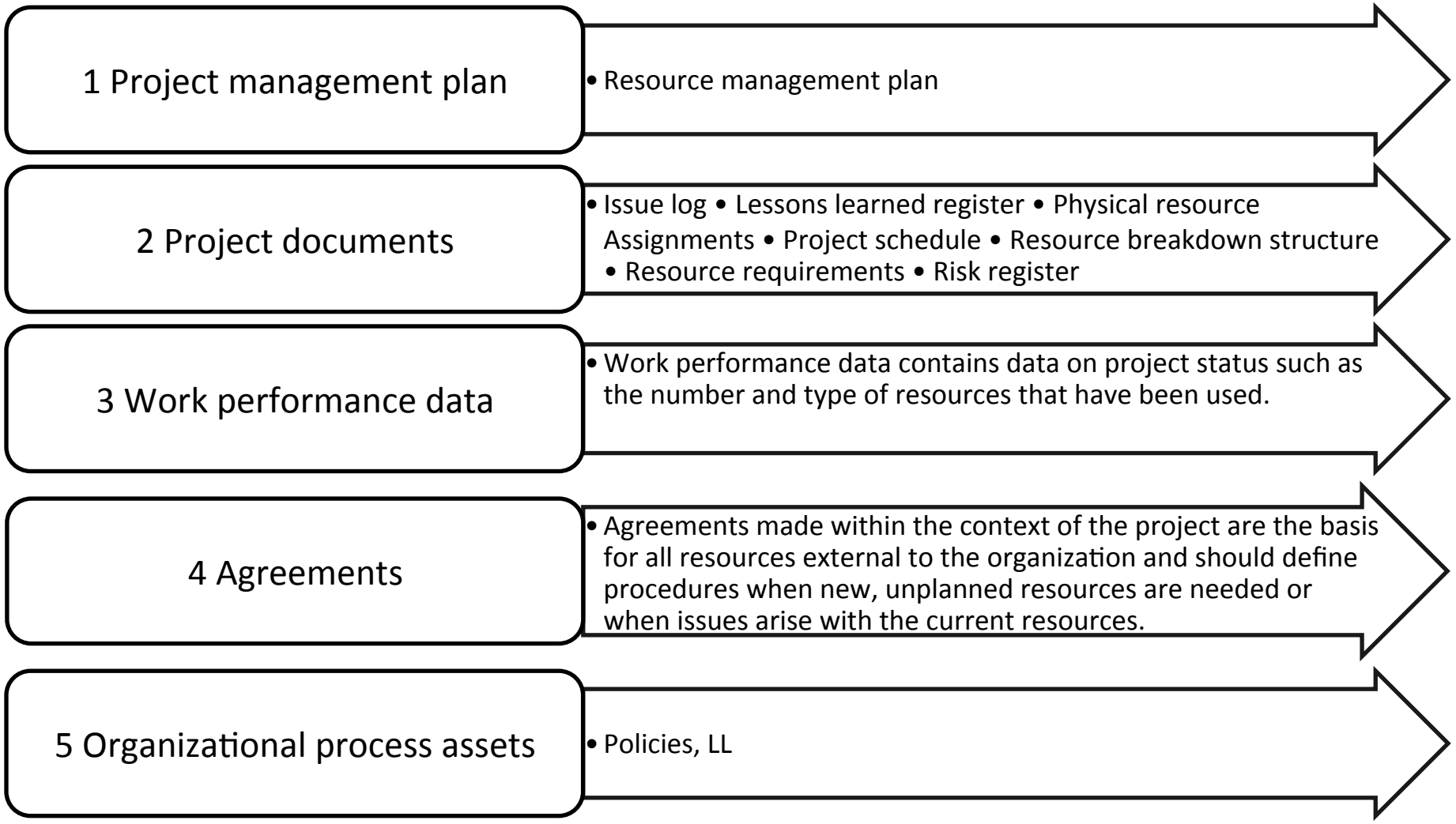
Purpose of ‘Control Resources’ process

Control Resources process ensures resources are available to the project at the right time and in the right place and are released when no longer needed.



Copyright © Strategic Transformation Consultants Ltd.

Input to Control Resources



Copyright © Strategic Transformation Consultants Ltd.

Control Resources -TT

Copyright © Strategic Transformation Consultants Ltd.

Control Resources -TT

1 Data analysis

- Alternatives analysis • Cost-benefit analysis • Performance reviews • Trend analysis

2 Problem solving

- Problem solving may use a set of tools that helps the project manager to solve problems that arise during the control resource process

3 Interpersonal and team skills

- Negotiation • Influencing

4 Project management information system

Copyright © Strategic Transformation Consultants Ltd.

Control Resources -output

1 Work performance information	• Work performance information includes information on how the project work is progressing by comparing resource requirements and resource allocation to resource utilization across the project activities.
2 Change requests	• When change requests occur as a result of carrying out the Control Resources process or when recommended, corrective, or preventive actions impact any of the components of the project management plan or project documents, the project manager needs to submit a change request.
3 Project management plan Updates	• Resource management plan • Schedule baseline • Cost baseline
4 Project documents updates	• Assumption log • Issue log • Lessons learned register • Physical resource assignments • Resource breakdown structure • Risk register

Copyright © Strategic Transformation Consultants Ltd.

Monitor Communications -ITTO

Monitor Communications

- Monitor Communications is the process of ensuring the information needs of the project and its stakeholders are met.

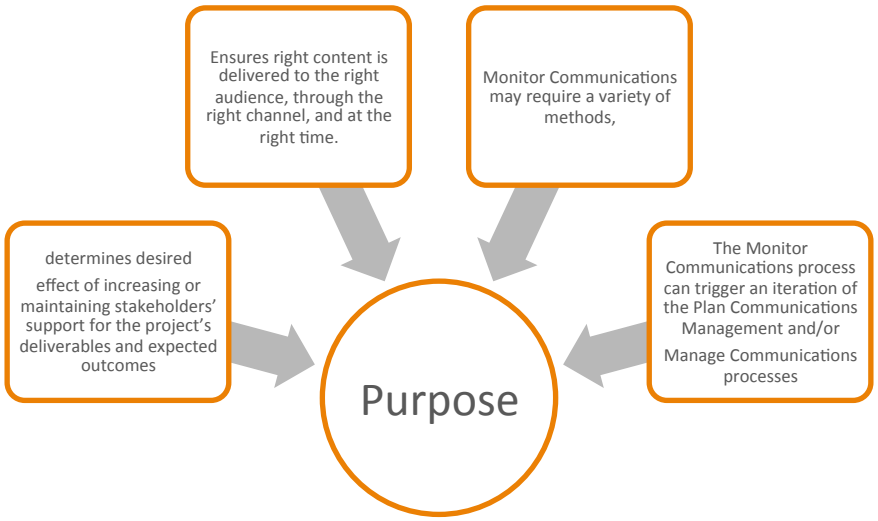
Inputs	Tools & Techniques	Outputs
.1 Project management plan • Resource management plan • Communications management plan • Stakeholder engagement plan .2 Project documents • Issue log • Lessons learned register • Project communications .3 Work performance data .4 Enterprise environmental factors .5 Organizational process assets	.1 Expert judgment .2 Project management information system .3 Data analysis • Stakeholder engagement assessment matrix .4 Interpersonal and team skills • Observation/conversation .5 Meetings	.1 Work performance information .2 Change requests .3 Project management plan updates • Communications management plan • Stakeholder engagement plan .4 Project documents updates • Issue log • Lessons learned register • Stakeholder register

Figure 10-7. Monitor Communications: Inputs, Tools & Techniques, and Outputs

Copyright © Strategic Transformation Consultants Ltd.

Purpose of 'Monitor Communication' process

The key benefit of this process is the optimal information flow as defined in the communications management plan and the stakeholder engagement plan



Copyright © Strategic Transformation Consultants Ltd.

Input to Monitor Communications

1 Project management plan	• Resource management plan • Communications management plan • Stakeholder engagement plan
2 Project documents	• Issue log • Lessons learned register • Project communications
3 Work performance data	• Work performance data contains data on the types and quantities of communications that have actually been distributed
4 Enterprise environmental factors	•The enterprise environmental factors that can influence the Monitor Communications process include but are not limited to: * Organizational culture, political climate, and governance framework; * Established communication channels, tools, and systems; * Global, regional, or local trends, practices, or habits; and *Geographic distribution of facilities and resources.
5 Organizational process assets	•The organizational process assets that may influence the Monitor Communications process include but are not limited to:* Corporate policies and procedures for social media, ethics, and security; * Organizational communication requirements; * Standardized guidelines for development, exchange, storage, and retrieval of information; *Historical information and lessons learned repository from previous projects; and *Stakeholder and communications data and information from previous projects.

Copyright © Strategic Transformation Consultants Ltd.

Monitor Communications -TT

Copyright © Strategic Transformation Consultants Ltd.

Monitor Communications -TT

1 Expert judgment

2 Project management

- information system

3 Data analysis

- Stakeholder engagement assessment matrix

4 Interpersonal and team skills

- Observation/conversation

5 Meetings

Copyright © Strategic Transformation Consultants Ltd.

Monitor Communications -output

1 Work performance Information	•Work performance information includes information on how project communication is performing by comparing the communications that were implemented compared to those that were planned. It also considers feedback on communications, such as survey results on communication effectiveness.
2 Change requests	• The Monitor Communications process often results in the need for adjustment, action, and intervention on communications activities defined in the communications management plan.
3 Project management plan updates	• Communications management plan • Stakeholder engagement plan
4 Project documents updates	• Issue log • Lessons learned register • Stakeholder register

Copyright © Strategic Transformation Consultants Ltd.

Monitor risks -ITTO

Monitor risks

- Monitor Risks is the process of monitoring the implementation of agreed-upon risk response plans, tracking identified risks, identifying and analyzing new risks, and evaluating risk process effectiveness throughout the project.

Monitor Risks

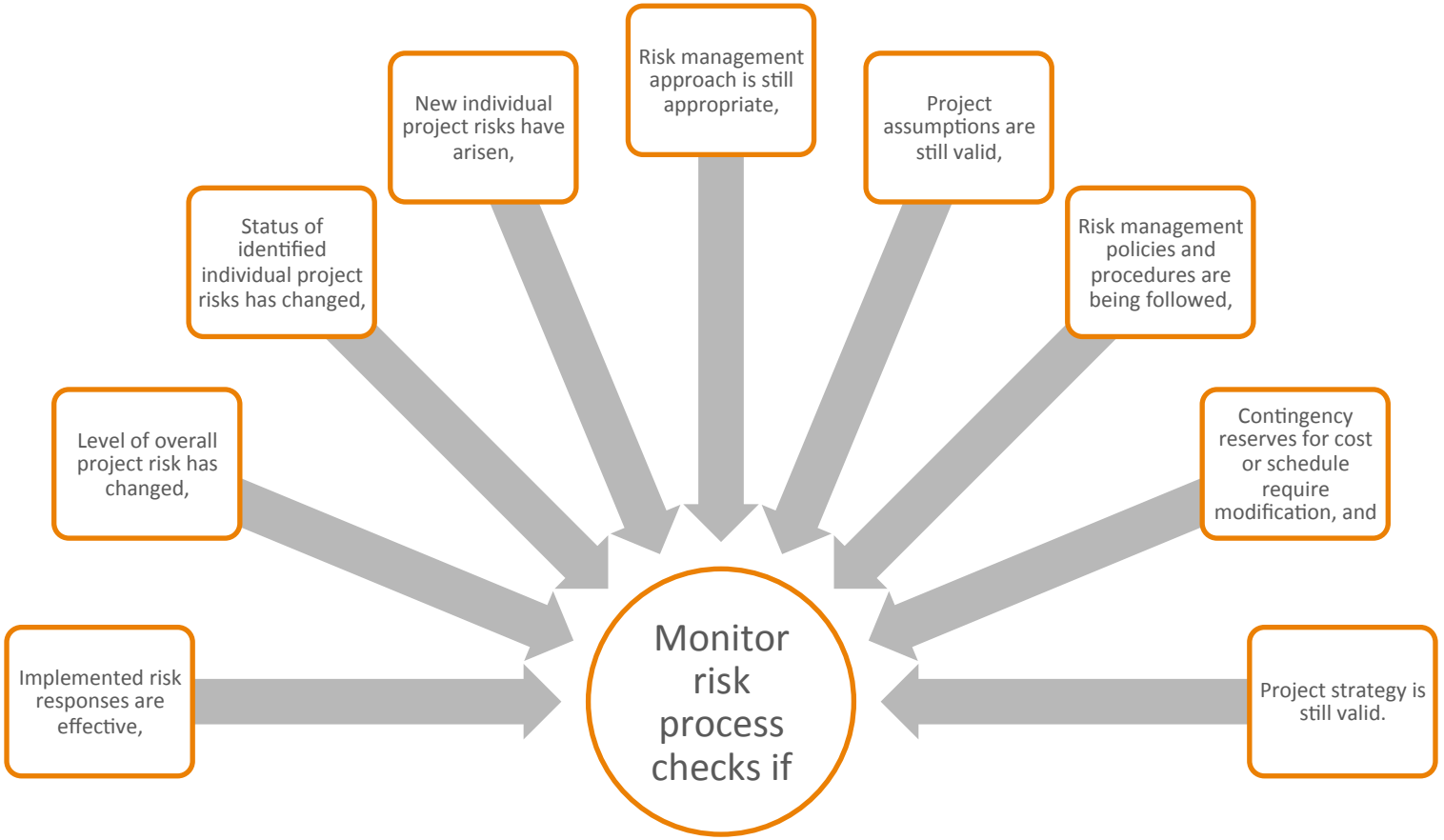
Inputs	Tools & Techniques	Outputs
.1 Project management plan • Risk management plan .2 Project documents • Issue log • Lessons learned register • Risk register • Risk report .3 Work performance data .4 Work performance reports	.1 Data analysis • Technical performance analysis • Reserve analysis .2 Audits .3 Meetings	.1 Work performance information .2 Change requests .3 Project management plan updates • Any component .4 Project documents updates • Assumption log • Issue log • Lessons learned register • Risk register • Risk report .5 Organizational process assets updates

Figure 11-20. Monitor Risks: Inputs, Tools & Techniques, and Outputs

Copyright © Strategic Transformation Consultants Ltd.

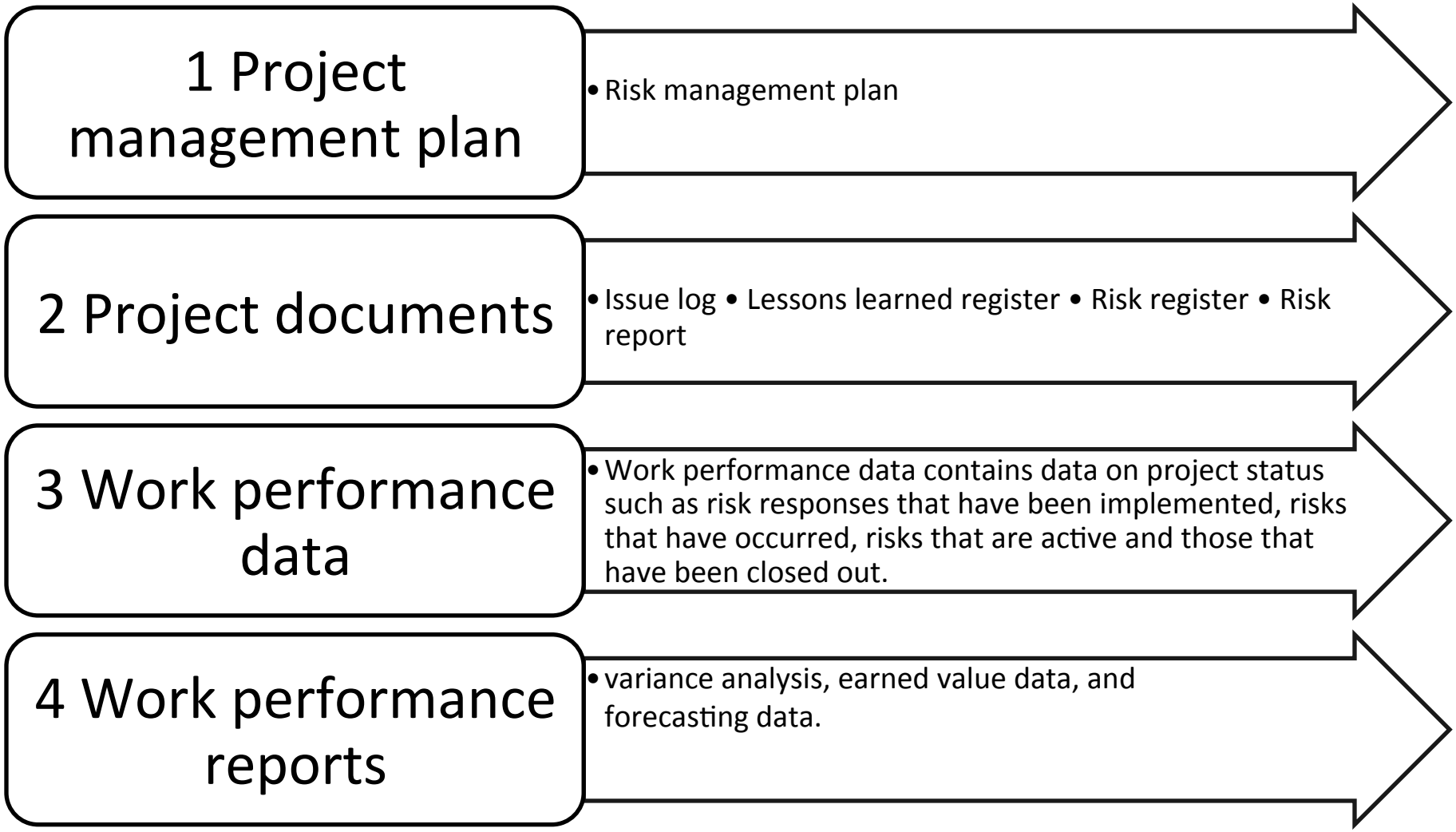
Purpose of 'Monitor Risk' process

The key benefit of this process is that it enables project decisions to be based on current information about overall project risk exposure and individual project risks



Copyright © Strategic Transformation Consultants Ltd.

Input to monitor risk



Copyright © Strategic Transformation Consultants Ltd.

Monitor risks-TT

Copyright © Strategic Transformation Consultants Ltd.

Monitor risks-TT

1 Data analysis

- Technical performance analysis
  - Reserve analysis

2 Audits

- Risk audits are a type of audit that may be used to consider the effectiveness of the risk management process.

3 Meetings

- Meetings that can be used during this process include but are not limited to risk reviews.

Copyright © Strategic Transformation Consultants Ltd.

Output of monitor risks

1 Work performance information

2 Change requests

3 Project management plan updates

- Any component

4 Project documents updates

Assumption log • Issue log

• Lessons learned register • Risk register • Risk report

5 Organizational process assets updates

Copyright © Strategic Transformation Consultants Ltd.

Control procurement -ITTO

Control procurements

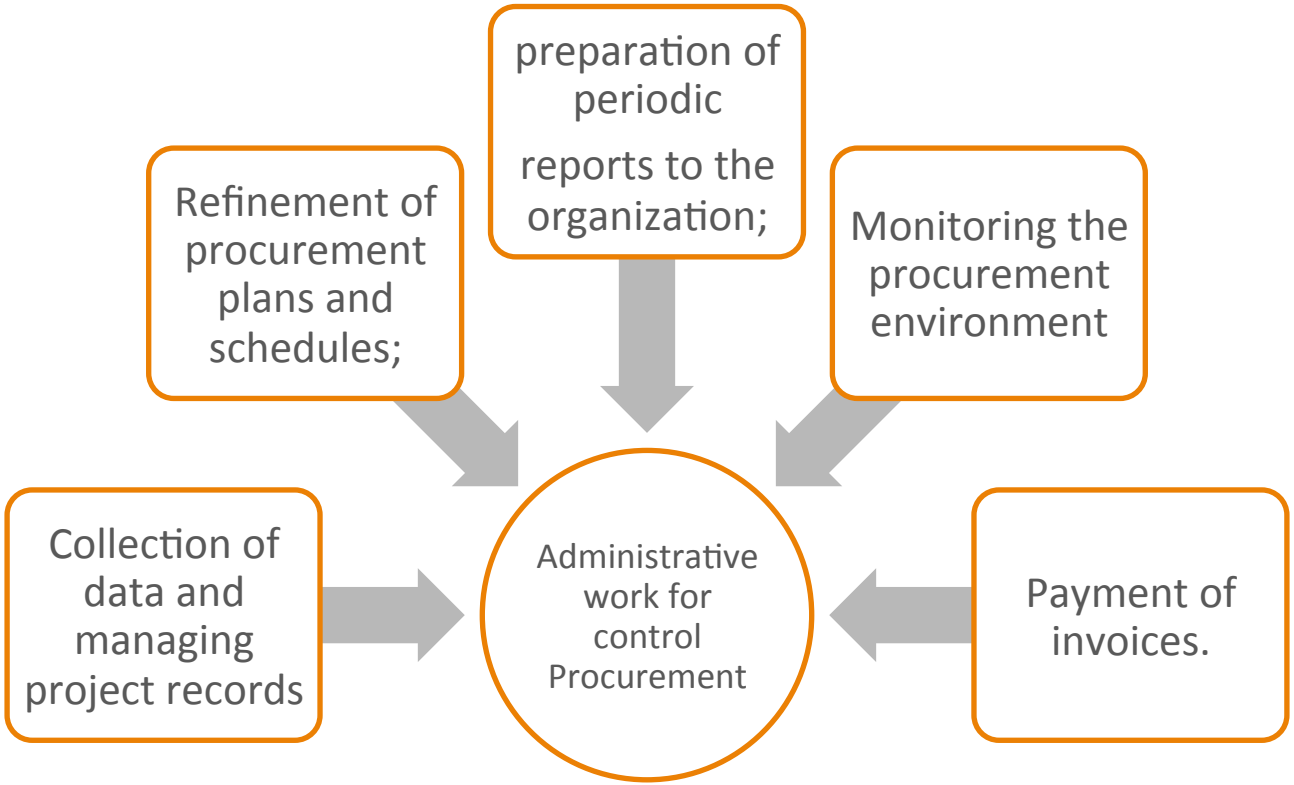
- Control Procurements is the process of managing procurement relationships; monitoring contract performance, and making changes and corrections as appropriate; and closing out contracts.

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Requirements management plan • Risk management plan • Procurement management plan • Change management plan • Schedule baseline .2 Project documents • Assumption log • Lessons learned register • Milestone list • Quality reports • Requirements documentation • Requirements traceability matrix • Risk register • Stakeholder register .3 Agreements .4 Procurement documentation .5 Approved change requests .6 Work performance data .7 Enterprise environmental factors .8 Organizational process assets	.1 Expert judgment .2 Claims administration .3 Data analysis • Performance reviews • Earned value analysis • Trend analysis .4 Inspection .5 Audits	.1 Closed procurements .2 Work performance information .3 Procurement documentation updates .4 Change requests .5 Project management plan updates • Risk management plan • Procurement management plan • Schedule baseline • Cost baseline .6 Project documents updates • Lessons learned register • Resource requirements • Requirements traceability matrix • Risk register • Stakeholder register .7 Organizational process assets updates

Figure 12-6. Control Procurements: Inputs, Tools & Techniques, and Outputs

Purpose of 'Control Procurement' process

The key benefit of this process is that it ensures that both the seller's and buyer's performance meet the project's requirements according to the terms of the legal agreement.



Copyright © Strategic Transformation Consultants Ltd.

Input to control procurements

1.Project management plan	• Requirements management Plan • Risk management plan • Procurement management Plan • Change management plan • Schedule baseline
2.Project documents	• Assumption log • Lessons learned register• Milestone list • Quality reports • Requirements Documentation • Requirements traceability matrix • Risk register • Stakeholder register
3.Agreements	• Agreements are understandings between parties, including understanding of the duties of each party. The relevant agreements are reviewed to verify terms and conditions are met.
4.Procurement documentation	• includes the statement of work, payment information, contractor work performance information, plans, drawings, and other correspondence.

Copyright © Strategic Transformation Consultants Ltd.

Input to control procurements

5.Approved change requests	• Approved change requests can include modifications to the terms and conditions of the contract, including the procurement statement of work (SOW), pricing, and descriptions of the products, services, or results to be provided
6.Work performance data	• seller data on project status such as technical performance; activities that have started, are in progress, or have completed; and costs that have been incurred or committed.
7.Enterprise environmental factors	• Contract change control system, • Marketplace conditions, • Financial management and accounts payable system, and • Buying organization's code of ethics.
8.Organizational process assets	• The organizational process assets that can influence the Control Procurements process include but are not limited to, procurement policies.

Control procurements-TT

Copyright © Strategic Transformation Consultants Ltd.

Control procurements-TT

1 Expert judgment

- Relevant functional areas such as finance, engineering, design, development, supply chain management, etc.;
- Laws, regulations, and compliance requirements; and
- Claims administration.

2 Claims administration

- Contested changes and potential constructive changes are those requested changes where the buyer and seller cannot reach an agreement on compensation for the change or cannot agree that a change has occurred

3 Data analysis

- Performance reviews • Earned value analysis • Trend analysis

4 Inspection

- An inspection is a structured review of the work being performed by the contractor.

5 Audits

- Audits are a structured review of the procurement process.

Copyright © Strategic Transformation Consultants Ltd.

Control procurement- output

1 Closed procurements	•The buyer, usually through its authorized procurement administrator, provides the seller with formal written notice that the contract has been completed.
2 Work performance information	• Work performance information includes information on how a seller is performing by comparing the deliverables received, the technical performance achieved, and the costs incurred and accepted against the SOW budget for the work performed.
3 Procurement documentation updates	•includes the contract with all supporting schedules, requested unapproved contract changes, and approved change requests.
4 Change requests	•Change requests are processed for review and disposition through the Perform Integrated Change Control process
5 Project management plan updates	•Risk management plan • Procurement management Plan • Schedule baseline • Cost baseline
6 Project documents updates	•Lessons learned register • Resource requirements • Requirements traceability matrix • Risk register • Stakeholder register
7 Organizational process assets Updates	•Payment schedules and requests, seller performance doc etc

© Strategic Transformation Consultants Ltd.

Monitor stakeholder engagement-ITTO

Monitor Stakeholder Engagement

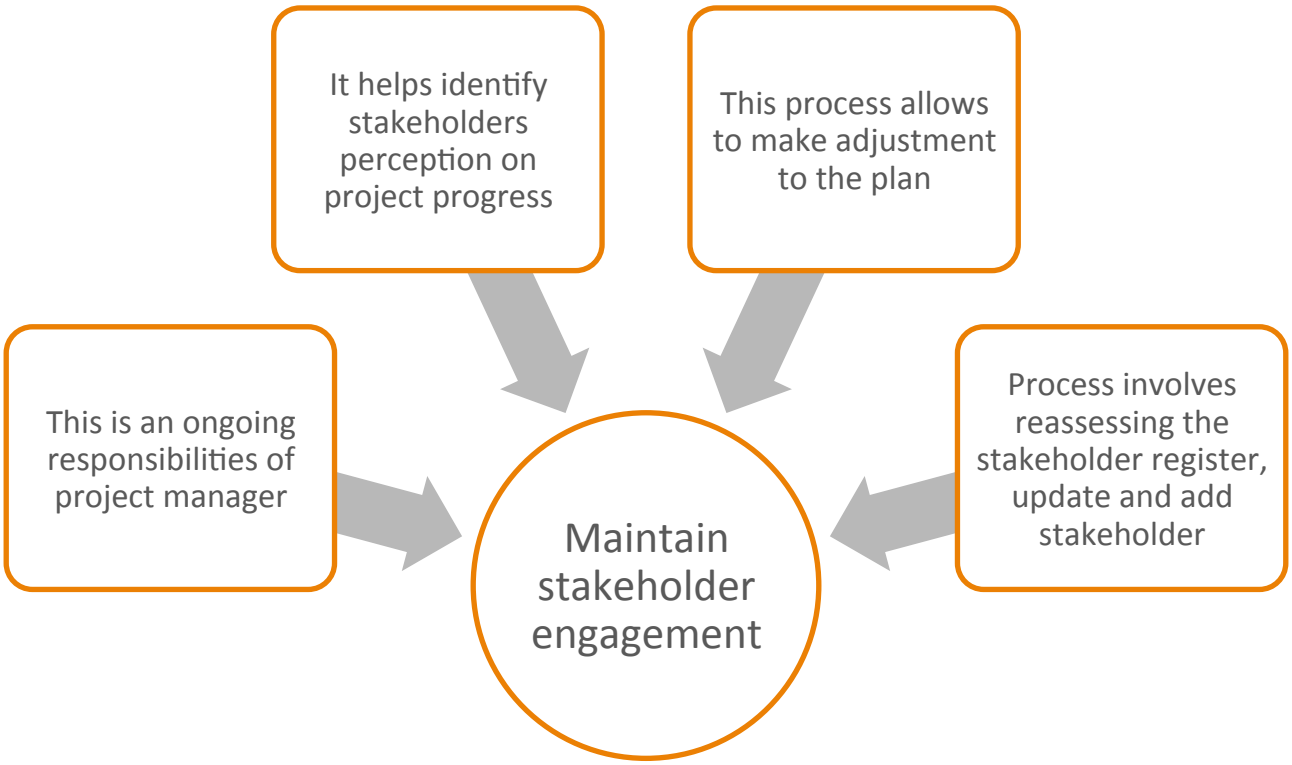
- is the process of monitoring project stakeholder relationships and tailoring strategies for engaging stakeholders through modification of engagement strategies and plans.

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Resource management plan • Communications management plan • Stakeholder engagement plan .2 Project documents • Issue log • Lessons learned register • Project communications • Risk register • Stakeholder register .3 Work performance data .4 Enterprise environmental factors .5 Organizational process assets	.1 Data analysis • Alternatives analysis • Root cause analysis • Stakeholder analysis .2 Decision making • Multicriteria decision analysis • Voting .3 Data representation • Stakeholder engagement assessment matrix .4 Communication skills • Feedback • Presentations .5 Interpersonal and team skills • Active listening • Cultural awareness • Leadership • Networking • Political awareness .6 Meetings	.1 Work performance information .2 Change requests .3 Project management plan updates • Resource management plan • Communications management plan • Stakeholder engagement plan .4 Project documents updates • Issue log • Lessons learned register • Risk register • Stakeholder register

Figure 13-9. Monitor Stakeholder Engagement: Inputs, Tools & Techniques, and Outputs

Purpose of 'Monitor Stakeholder Engagement' process

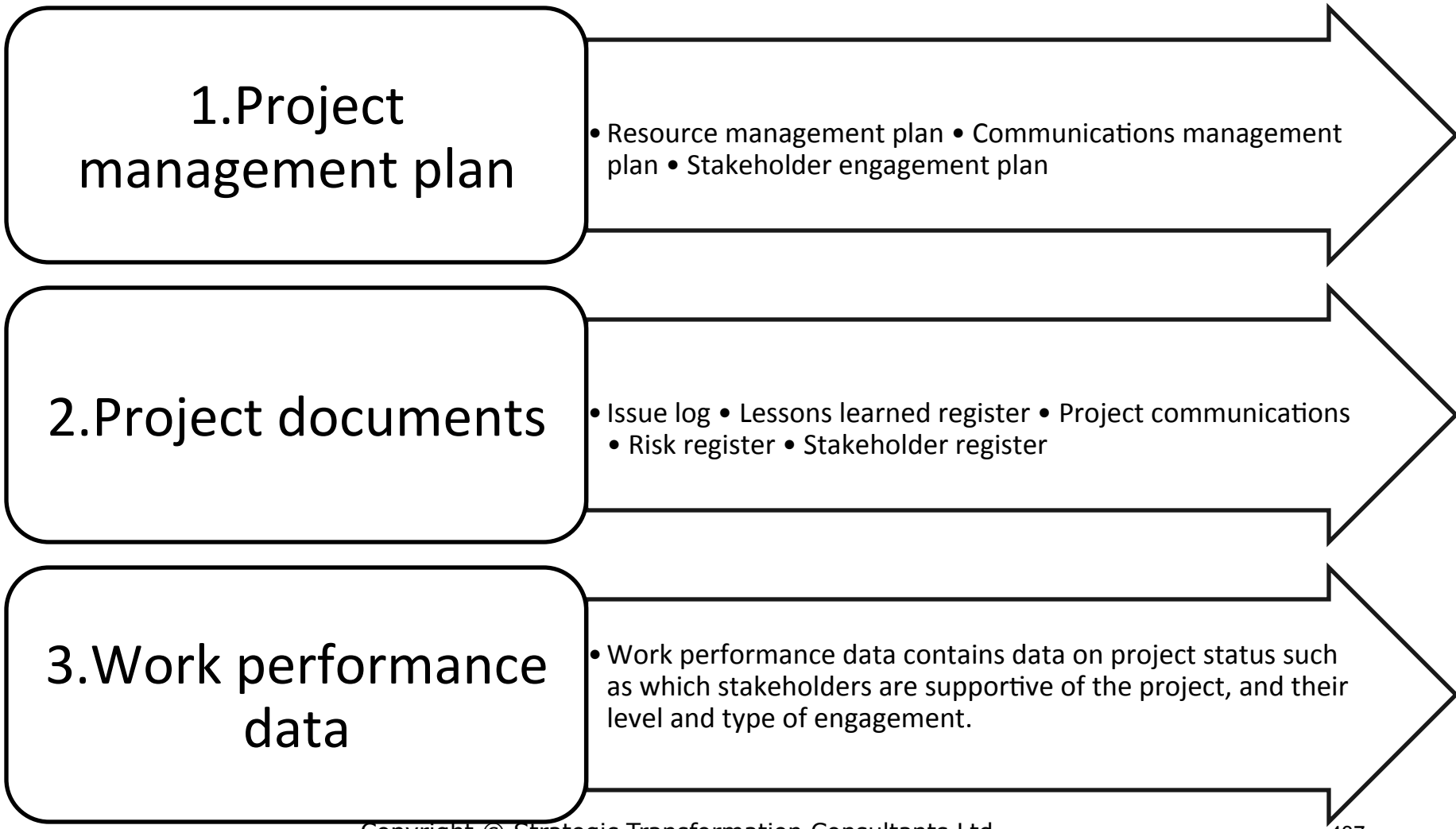
The key benefit of this process is that it maintains or increases the efficiency and effectiveness of stakeholder engagement activities as the project evolves and its environment changes.



Copyright © Strategic Transformation Consultants Ltd.

Copyright © Strategic Transformation Consultants Ltd.

Input to Monitor stakeholder engagement



Copyright © Strategic Transformation Consultants Ltd.

Input to Monitor stakeholder engagement

4.Enterprise environmental factors

- The enterprise environmental factors that can influence the Monitor Stakeholder Engagement process include but are not limited to: *Organizational culture, political climate, and governance framework; * Personnel administration policies; *Stakeholder risk thresholds; *Established communication channels; *Global, regional, or local trends, practices, or habits; and *Geographic distribution of facilities and resources.

5.Organizational process assets

- The organizational process assets that can influence the Monitor Stakeholder Engagement process include but are not limited to:* Corporate policies and procedures for social media, ethics, and security; * Corporate policies and procedures for issue, risk, change, and data management; * Organizational communication requirement; * Standardized guidelines for development, exchange, storage, and retrieval of information; and *Historical information from previous projects.

Copyright © Strategic Transformation Consultants Ltd.

Monitor stakeholder engagement-TT

1 Data analysis

2 Decision making

3 Data representation

4 Communication skills

5 Interpersonal and team skills

6 Meetings

Copyright © Strategic Transformation Consultants Ltd.

Monitor stakeholder engagement-TT

1 Data analysis

- Alternatives analysis • Root cause analysis • Stakeholder analysis

2 Decision making

- Multicriteria decision Analysis • Voting

3 Data representation

- Stakeholder engagement assessment matrix

.4 Communication skills

- Feedback • Presentations

5 Interpersonal and team skills

- Active listening • Cultural awareness • Leadership • Networking • Political awareness

6 Meetings

Copyright © Strategic Transformation Consultants Ltd.

Monitor stakeholder engagement-output

1 Work performance information	• Work performance information includes information about the status of stakeholder engagement, such as the level of current project support and compared to the desired levels of engagement as defined in the stakeholder engagement assessment matrix, stakeholder cube, or other tool.
2 Change requests	• A change request may include corrective and preventive actions to improve the current level of stakeholder engagement.
3 Project management plan updates	• Resource management plan • Communications management plan • Stakeholder engagement plan
4 Project documents updates	• Issue log • Lessons learned register • Risk register • Stakeholder register

Copyright © Strategic Transformation Consultants Ltd.

Monitor and control project work-ITTO

Monitor and control project work

- Monitor and Control Project Work is the process of tracking, reviewing, and reporting the overall progress to meet the performance objectives defined in the project management plan.

Monitor and Control Project Work

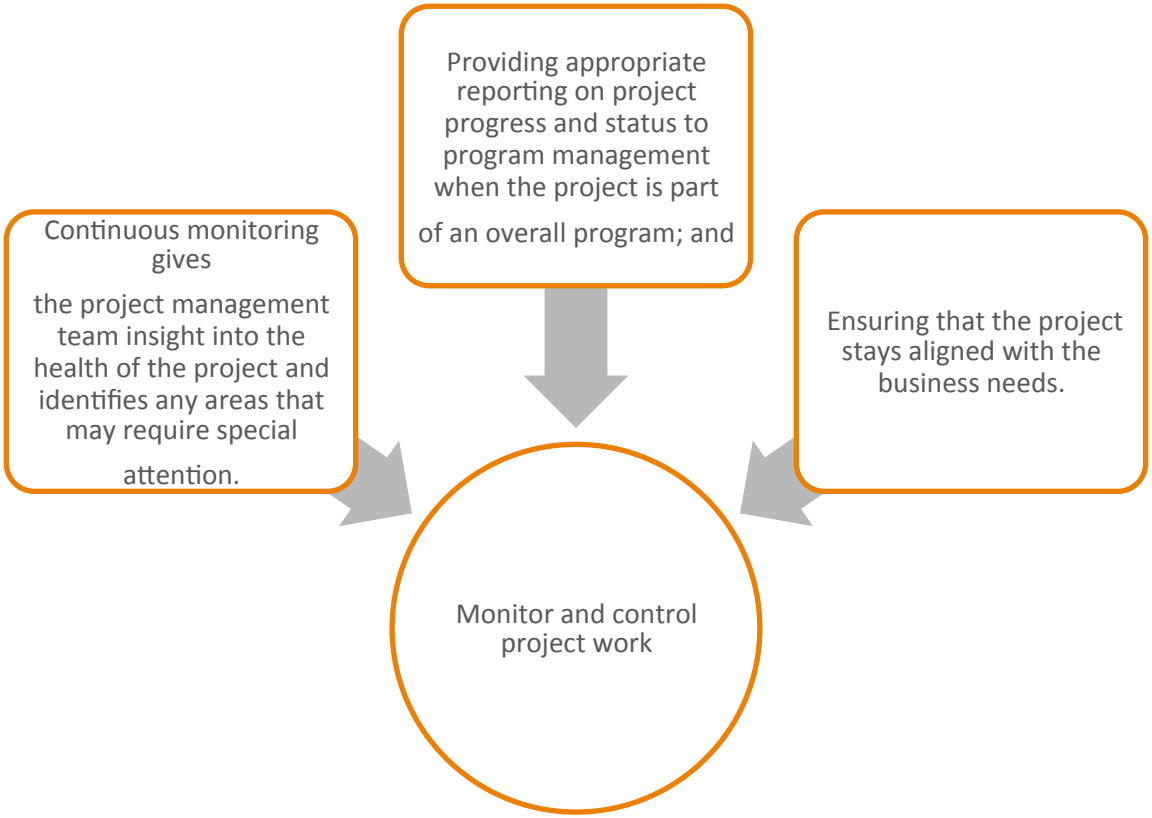
Inputs	Tools & Techniques	Outputs
.1 Project management plan • Any component .2 Project documents • Assumption log • Basis of estimates • Cost forecasts • Issue log • Lessons learned register • Milestone list • Quality reports • Risk register • Risk report • Schedule forecasts .3 Work performance information .4 Agreements .5 Enterprise environmental factors .6 Organizational process assets	.1 Expert judgment .2 Data analysis • Alternatives analysis • Cost-benefit analysis • Earned value analysis • Root cause analysis • Trend analysis • Variance analysis .3 Decision making .4 Meetings	.1 Work performance reports .2 Change requests .3 Project management plan updates • Any component .4 Project documents updates • Cost forecasts • Issue log • Lessons learned register • Risk register • Schedule forecasts

Figure 4-10. Monitor and Control Project Work: Inputs, Tools & Techniques, and Outputs

Copyright © Strategic Transformation Consultants Ltd.

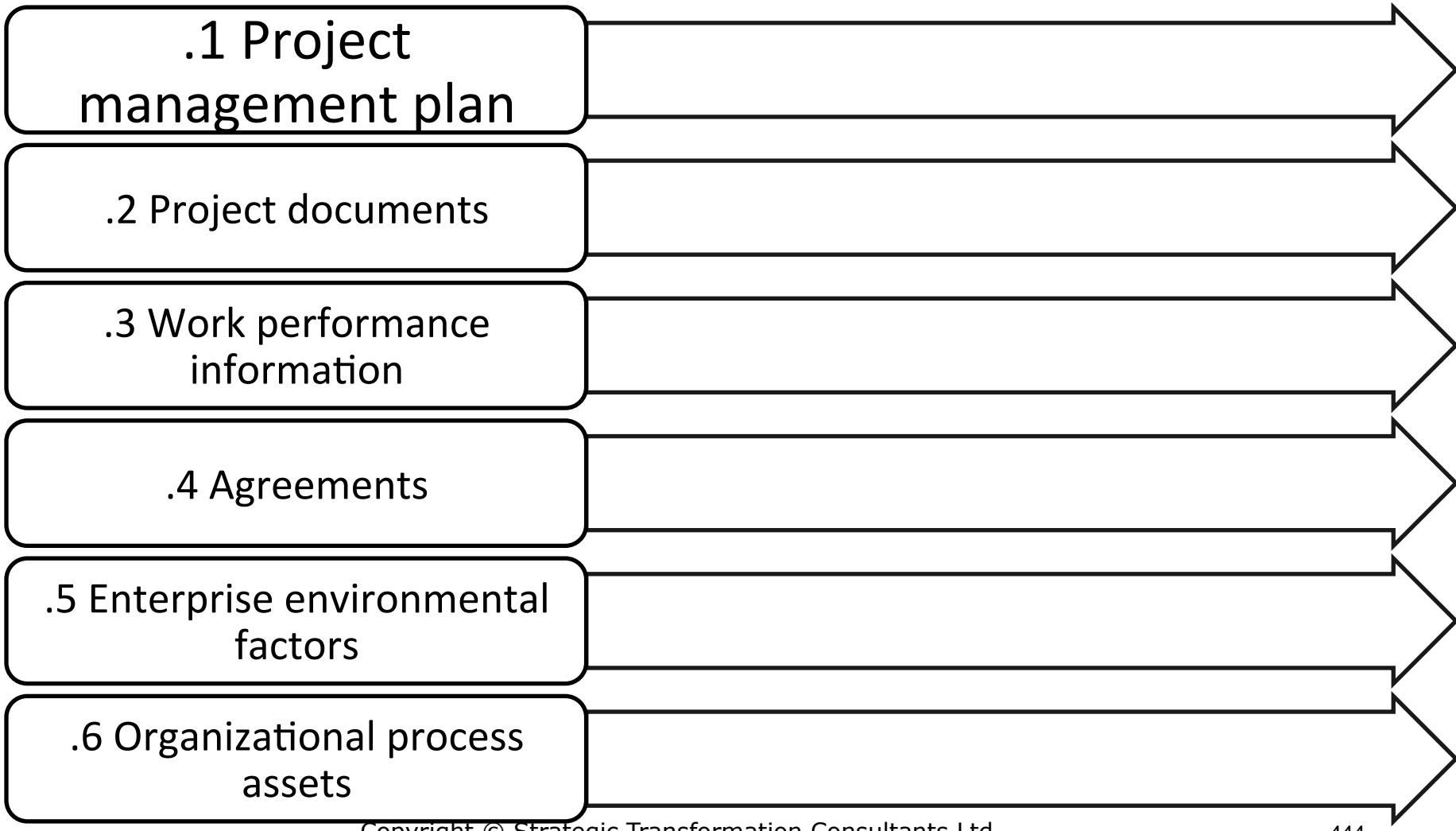
Purpose of ‘Monitor and control project work’ process

The key benefits of this process are that it allows stakeholders to understand the current state of the project, to recognize the actions taken to address any performance issues, and to have visibility into the future project status with cost and schedule forecasts



Copyright © Strategic Transformation Consultants Ltd.

Input to ‘Monitor and control project work’



Copyright © Strategic Transformation Consultants Ltd.

Monitor and control project work -TT

Copyright © Strategic Transformation Consultants Ltd.

Tools for Monitor and control Project works

1. Expert judgment

- By project management team to interpret the information provided by monitor and control processes

2. Data Analysis

- Alternatives analysis • Cost-benefit analysis • Earned value analysis • Root cause analysis • Trend analysis • Variance analysis

3. Decision Making

- A decision-making technique that can be used includes but is not limited to voting. Voting can include making decisions based on unanimity, majority, or plurality.

4. Meetings

- Information exchange
- Brainstorming, option evaluation or design
- Decision Making

Copyright © Strategic Transformation Consultants Ltd.

Output of monitor and control project work

Work performance reports	• Physical or electronic representation of work performance information compiled in project documents, intended to generate decision, action or awareness
Change Request	• Corrective actions • Preventive actions • Defect repair
PM plan update	• Any component
Project documents update	• Cost forecasts • Issue log • Lessons learned register • Risk register • Schedule forecasts

Copyright © Strategic Transformation Consultants Ltd.

Perform Integrated Change Control-ITTO

Perform Integrated Change Control

- Perform Integrated Change Control is the process of reviewing all change requests; approving changes and managing changes to deliverables, project documents, and the project management plan; and communicating the decisions.

Inputs

.1 Project management plan
- Change management plan
- Configuration management plan
- Scope baseline
- Schedule baseline
- Cost baseline

.2 Project documents
- Basis of estimates
- Requirements traceability matrix
- Risk report

.3 Work performance reports
.4 Change requests
.5 Enterprise environmental factors
.6 Organizational process assets

Tools & Techniques

.1 Expert judgment
.2 Change control tools
.3 Data analysis
- Alternatives analysis
- Cost-benefit analysis

.4 Decision making
- Voting
- Autocratic decision making
- Multicriteria decision analysis

.5 Meetings

Outputs

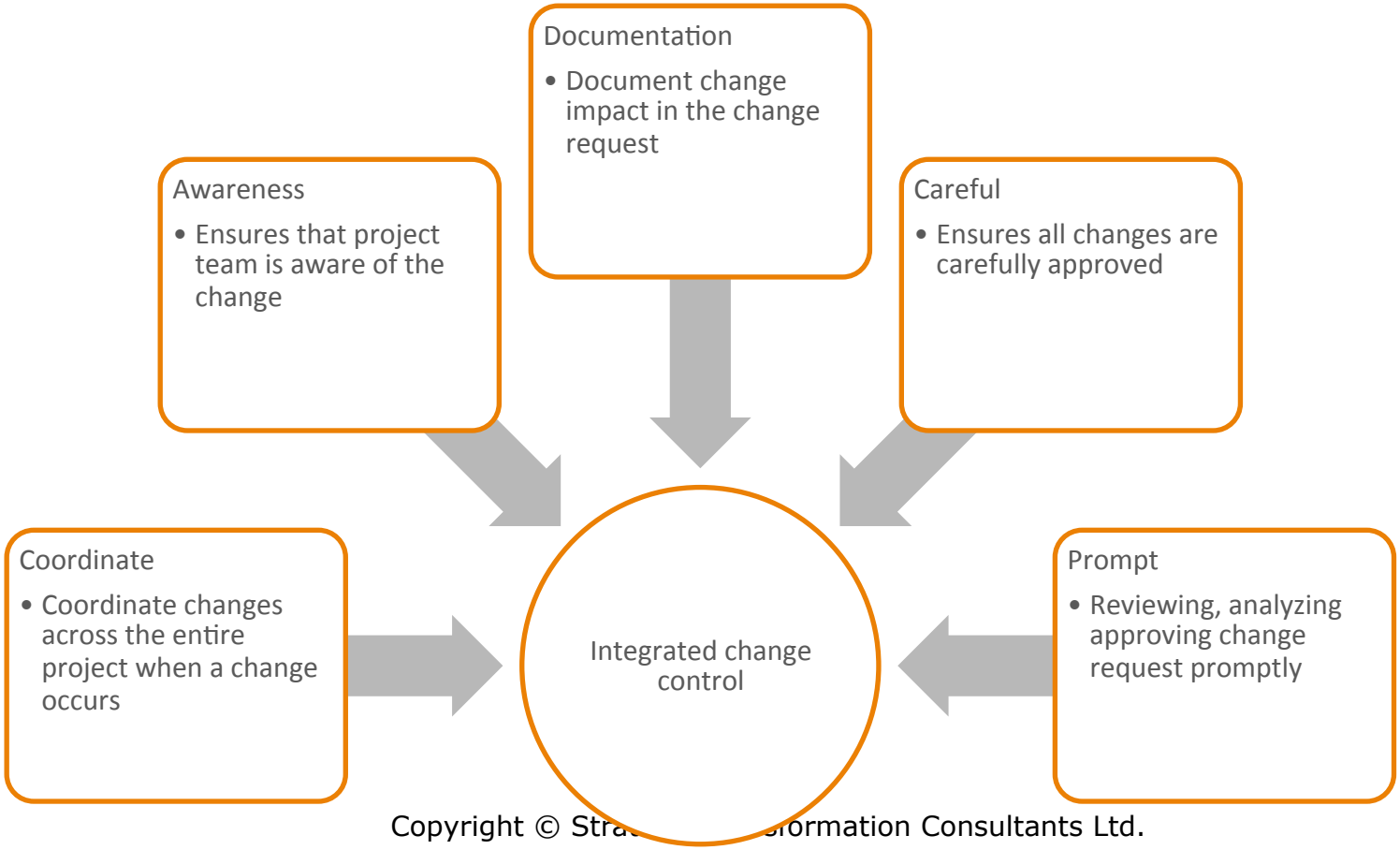
.1 Approved change requests
.2 Project management plan updates
- Any component

.3 Project documents updates
- Change log

Figure 4-12. Perform Integrated Change Control: Inputs, Tools & Techniques, and Outputs

Main concept

The key benefit of this process is that it maintains or increases the efficiency and effectiveness of stakeholder engagement activities as the project evolves and its environment changes.



Copyright © Stra[illegible]formation Consultants Ltd.

Process for change

Prevent the root cause of the change

Identify change

Look for impact of the change

Perform integrated change control

- Assess the change
- Look for options
- Change is approved or rejected
- Update change control system

Adjust the PM Plan, project documents and baselines

Some new terms

CCB

- Perform integrated change control process sometimes require to have Change Control Board which is responsible for approving or rejecting change request
- Roles and responsibility of CCB should be clearly defined in change control and configuration control procedure, as agreed by all stakeholder.
- Can be consisting internal stakeholders or external party

Change Control

- Focused on identifying, documenting and controlling changes to the project and product deliverable.

Configuration control

- Focused on specification of deliverables and process.
- Activities include
  - Configuration Identification
  - Configuration status accounting
  - Configuration verification and audit

Copyright © Strategic Transformation Consultants Ltd.

Input to Perform Integrated Change Control

1 Project management plan	• Change management plan, Configuration management plan, Scope baseline, Schedule baseline, Cost baseline
2 Project documents	• Basis of estimates, Requirements traceability matrix, Risk report
3 Work performance reports	• Work performance reports of particular interest to the Perform Integrated Change Control process include resource availability, schedule and cost data, earned value reports, and burnup or burndown charts.
4 Change requests	• Many processes produce change requests as an output. Change requests (described in Section 4.3.3.4) may include corrective action, preventive action, defect repairs

Copyright © Strategic Transformation Consultants Ltd.

Input to Perform Integrated Change Control

.5 Enterprise environmental Factors

- The enterprise environmental factors that can influence the Perform Integrated Change Control process include but are not limited to: *Legal restrictions, such as country or local regulations; *Government or industry standards (e.g., product standards, quality standards, safety standards, and workmanship standards); *Legal and regulatory requirements and/or constraints; *Organizational governance framework (a structured way to provide control, direction, and coordination through people, policies, and processes to meet organizational strategic and operational goals); and * Contracting and purchasing constraints.

.6 Organizational process assets

- The organizational process assets that can influence the Perform Integrated Change Control process include but are not limited to: *Change control procedures, including the steps by which organizational standards, policies, plans, procedures, or any project documents will be modified, and how any changes will be approved and validated; * Procedures for approving and issuing change authorizations; and * Configuration management knowledge base containing the versions and baselines of all official organizational standards, policies, procedures, and any project documents.

Copyright © Strategic Transformation Consultants Ltd.

Tools for Perform integrated change control

1 Expert judgment

.2 Change control tools

3 Data analysis

4 Decision making

5 Meetings

Copyright © Strategic Transformation Consultants Ltd.

Tools for Perform integrated change control

1 Expert judgment

2 Change control tools

3 Data analysis

- Alternatives analysis • Cost-benefit analysis

4 Decision making

- Voting • Autocratic decision making • Multicriteria decision analysis

5 Meetings

Copyright © Strategic Transformation Consultants Ltd.

Output to Perform Integrated Change Control

1 Approved change requests	• Change requests (described in Section 4.3.3.4) are processed according to the change management plan by the project manager, CCB, or an assigned team member. As a result, changes may be approved, deferred, or rejected. Approved change requests will be implemented through the Direct and Manage Project Work process. Deferred or rejected change requests are communicated to the person or group requesting the change
2 Project management plan updates	• Any formally controlled component of the project management plan may be changed as a result of this process.
3 Project documents updates	• A project document that is normally updated as a result of this process is the change log. The change log is used to document changes that occur during a project.

Copyright © Strategic Transformation Consultants Ltd.

End of Monitoring and Controlling Process Group

Copyright © Strategic Transformation Consultants Ltd.

Closing Process Groups

Copyright © Strategic Transformation Consultants Ltd.

Close project or phase-ITTO

Close Project or Phase

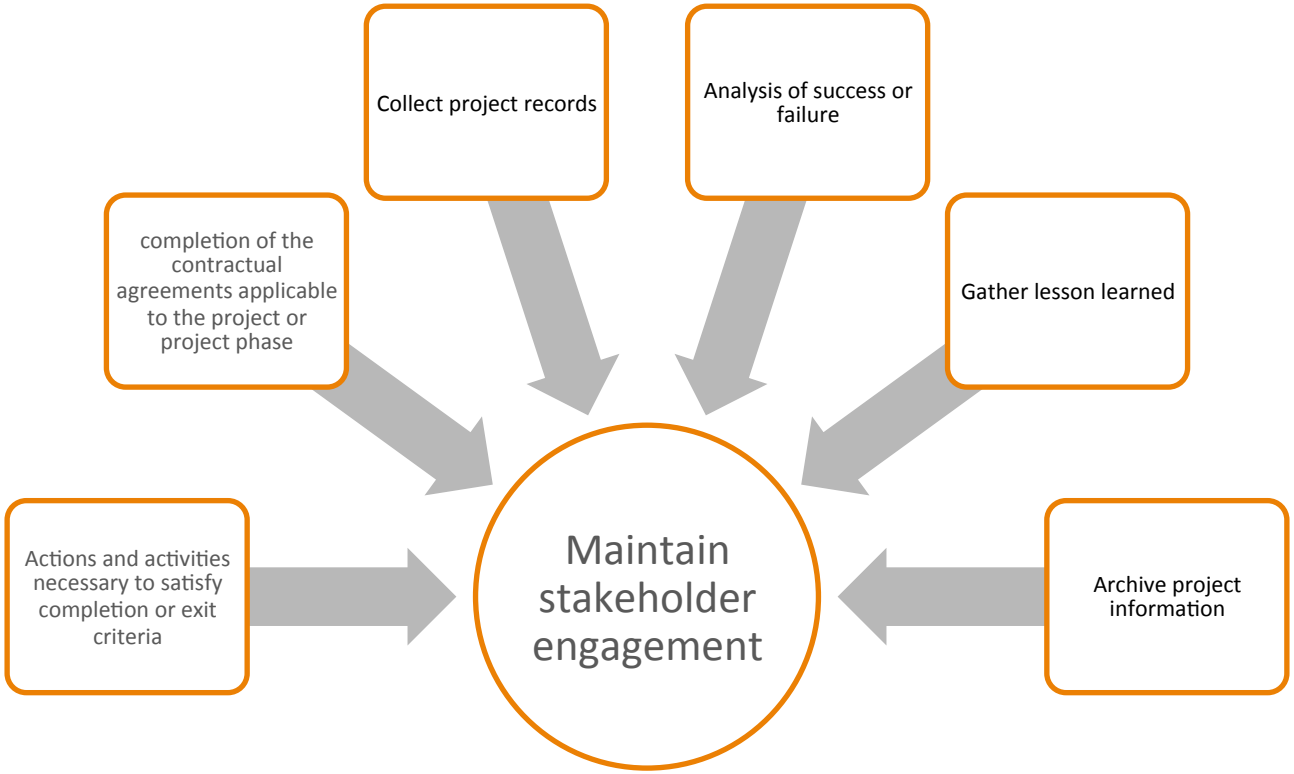
- Close Project or Phase is the process of finalizing all activities for the project, phase, or contract.

Inputs	Tools & Techniques	Outputs
.1 Project charter .2 Project management plan • All components .3 Project documents • Assumption log • Basis of estimates • Change log • Issue log • Lessons learned register • Milestone list • Project communications • Quality control measurements • Quality reports • Requirements documentation • Risk register • Risk report .4 Accepted deliverables .5 Business documents • Business case • Benefits management plan .6 Agreements .7 Procurement documentation .8 Organizational process assets	.1 Expert judgment .2 Data analysis • Document analysis • Regression analysis • Trend analysis • Variance analysis .3 Meetings	.1 Project documents updates • Lessons learned register .2 Final product, service, or result transition .3 Final report .4 Organizational process assets updates

Figure 4-14. Close Project or Phase: Inputs, Tools & Techniques, and Outputs

Purpose of ‘close project or phases’ process

The key benefits of this process are the project or phase information is archived, the planned work is completed, and organizational team resources are released to pursue new endeavors.



Copyright © Strategic Transformation Consultants Ltd.

Why project closes

Addition

- The project is evolved into ongoing operation

Starvation

- When resources are cut off from the project

Integration

- People, equipment and other resources are distributed to other area

Extinction

- Project has been completed and accepted by stakeholders.

Copyright © Strategic Transformation Consultants Ltd.

Input to Close project or phase

.1 Project charter	
.2 Project management plan	• All components
.3 Project documents	• Assumption log • Basis of estimates, Change log, Issue log, Lessons learned register, Milestone list Project communications, Quality control Measurements, Quality reports, Requirements documentation, ~~Risk register, Risk~~ report
4 Accepted deliverables	
.5 Business documents	• Business case • ~~Benefits management plan~~
.6 Agreements	
.7 Procurement documentation	
.8 Organizational process assets	

Copyright © Strategic Transformation Consultants Ltd.

Close project or phase -TT

Copyright © Strategic Transformation Consultants Ltd.

Close project or phase -TT

.1 Expert judgment

.2 Data analysis

- Document analysis, Regression analysis, Trend analysis, Variance analysis

.3 Meetings

Copyright © Strategic Transformation Consultants Ltd.

Monitor Communications -output

.1 Project documents updates	• Lessons learned register
.2 Final product, service, or result transition	
.3 Final report	
.4 Organizational process assets Updates	

Copyright © Strategic Transformation Consultants Ltd.

MANY THANKS

This is the beginning of the end,

Not the end of the Beginning

Copyright © Strategic Transformation Consultants Ltd.