SEN319 Software Project Management (Fall 2023)

Project Integration Management

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Agenda

- PM Knowledge Areas
- Project Integration Management
- Key Concepts for Project Integration Management
- Develop Project Charter
- Develop Project Management Plan
- Direct and Manage Project Work
- Manage Project Knowledge
- Monitor and Control Project Work
- Perform Integrated Change Control
- Close Project or Phase

PM Knowledge Areas

Integration	• Coordinate activities across all project management areas and process groups
Scope	• Ensure the project work includes all elements required to complete the work
Schedule	• Ensure the project work is completed in a timely way
Cost	• Plan, estimate, manage and control project finances
Quality	• Ensure the project delivers a quality output that is fit for purpose
Resource	• Secure, manage and monitor use of resources throughout the project
Communications	• Ensure communications on the project are planned and carried out appropriately
Risk	• Identify, assess and manage risk
Procurement	• Carry out purchasing and contracting as required
Stakeholder	• Identify and engage stakeholders throughout the project

Project Integration Management

- **Project integration management involves coordinating all of the other project management knowledge areas throughout a project's life cycle.**
- **This integration ensures that all the elements of a project come together at the right times to complete a project successfully.**
- **Project Integration Management includes making choices about:**
  - **Resource allocation,**
  - **Balancing competing demands,**
  - **Examining any alternative approaches,**
  - **Tailoring the processes to meet the project objectives, and**
  - **Managing the interdependencies among the Project Management Knowledge Areas.**

Project Integration Management

Processes

1. **Develop Project Charter**: Developing a document that formally authorizes the existence of a project to apply organizational resources to project activities.
2. **Develop Project Management Plan**: Defining, preparing, and coordinating all plan components and consolidating them into an integrated plan.
3. **Direct and Manage Project Work**: Performing the work defined in the project management plan and implementing approved changes.
4. **Manage Project Knowledge**: Using and creating knowledge to achieve the project's objectives and contribute to organizational learning.
5. **Monitor and Control Project Work**: Tracking overall progress to meet the performance objectives defined in the project management plan.
6. **Perform Integrated Change Control**: Reviewing all change requests; approving changes and managing changes to deliverables, organizational process assets, project documents, and the project management plan.
7. **Close Project or Phase**: Finalizing all activities for the project, phase, or contract.

Key Concepts for Project Integration Management

- **Project Integration Management is specific to project managers.**
- **Whereas other Knowledge Areas may be managed by specialists (e.g., cost analysis, scheduling specialists, risk management experts), the accountability of Project Integration Management cannot be delegated or transferred.**
- **The project manager is the one who combines the results in all the other Knowledge Areas and has the overall view of the project.**
- **The project manager is ultimately responsible for the project as a whole.**

Key Concepts for Project Integration Management

- **Project Integration Management is about:**
  - **Ensuring that the deliverable due dates of the product, service, or result; project life cycle; and the benefits management plan are aligned;**
  - **Ensuring the creation and the use of the appropriate knowledge to and from the project as necessary;**
  - **Managing the performance and changes of the activities in the project management plan;**
  - **Making integrated decisions regarding key changes impacting the project;**
  - **Measuring and monitoring the project's progress and taking appropriate action to meet project objectives;**
  - **Collecting data on the results achieved, analyzing the data to obtain information, and communicating this information to relevant stakeholders;**
  - **Completing all the work of the project and formally closing each phase, contract, and the project as a whole; and**
  - **Managing phase transitions when necessary.**

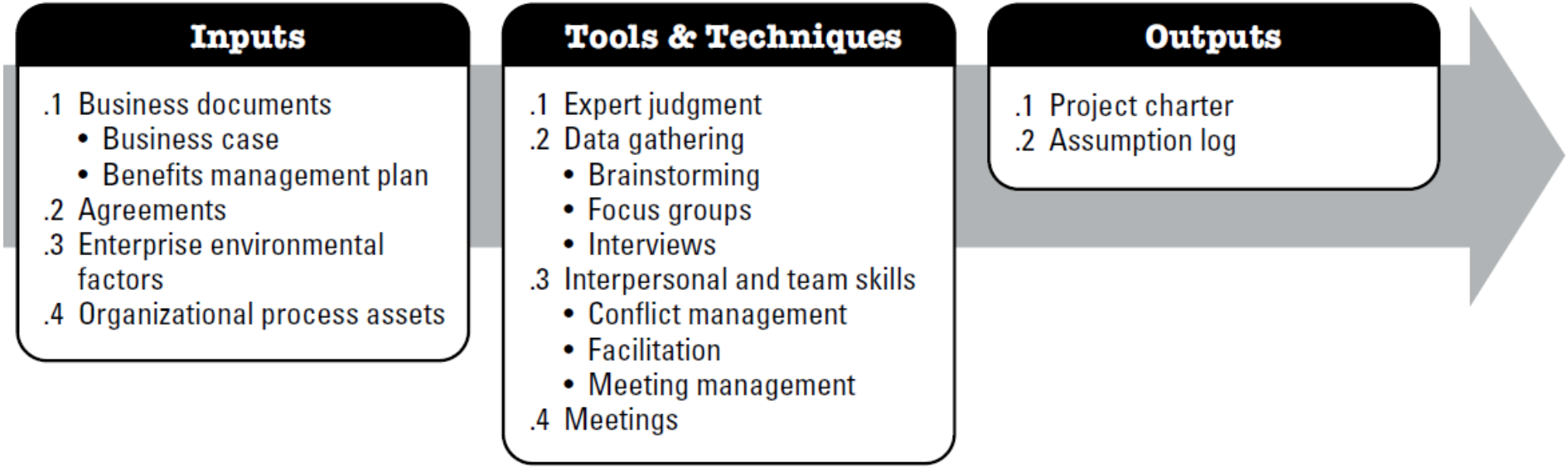
Project Integration Management

Project Integration Management				
Initiating	**Planning**	**Executing**	**Monitoring & Controlling**	**Closing**
1. Develop Project Charter	**2. Develop Project Management Plan**	**3. Direct and Manage Project Work** **4. Manage Project Knowledge**	**5. Monitor and Control Project Work** **6. Perform Integrated Change Control**	**7. Close Project or Phase**

Develop Project Charter

- After top management decides which projects to pursue, it is important to let the rest of the organization know about these projects.
- Management needs to create and distribute documentation to authorize project initiation. This documentation can take many different forms, but one common form is a project charter.
- A project charter is a document that formally recognizes the existence of a project and provides direction on the project's objectives and management.
- It authorizes the project manager to use organizational resources to complete the project. Ideally, the project manager plays a major role in developing the project charter.

Develop Project Charter



Develop Project Charter

Inputs

Business Case

- It is used to justify organization's investment.
- Information in the business case, such as the project objective, high-level requirements, and time and cost goals, is included in the project charter.

Benefits Management Plan

- This document describes how and when the projected benefits of the project will be delivered and how they will be managed.
- Topics covered can include the target benefits, strategic alignment, timeframe for realizing benefits, benefits owner, metrics, assumptions, and risks.

Agreements

- Agreements are used to define initial intentions for a project.
- Agreements may take the form of contracts, memorandums of understanding (MOUs), service level agreements (SLA), etc.

Develop Project Charter

Inputs

Enterprise Environmental Factors

- These factors include relevant government or industry standards, the organization's infrastructure, and marketplace conditions.

Organizational Process Assets

- Include formal and informal plans, policies, procedures, guidelines, information systems, financial systems, management systems, lessons learned, and historical information that can influence a project's success.

Develop Project Charter

Main Tools and Techniques

Expert Judgement

- Expert judgment is a technique in the project planning process that refers to making a judgment based on skill, expertise, or specialized knowledge in a particular area.
- The expertise can be based on an individual's training or educational background, career experience, or knowledge of the product/market.

Develop Project Charter

Main Tools and Techniques

Data-gathering Techniques

Brainstorming:

- **This technique is used to identify a list of ideas in a short period of time. It is conducted in a group environment and is led by a facilitator.**

Focus Groups:

- **Focus groups bring together stakeholders and subject matter experts to learn about the perceived project risk, success criteria, and other topics in a more conversational way than a one-on-one interview.**

Interviews:

- **Interviews are used to obtain information on high-level requirements, assumptions or constraints, approval criteria, and other information from stakeholders by talking directly to them.**

Develop Project Charter

Project Charter - Content

- The project's title and date of authorization
- The project manager's name and contact information
- A summary schedule, including the planned start and finish dates
- A summary of the project's budget or reference to budgetary documents
- A brief description of the project objectives, including the business need or other justification for authorizing the project
- Project success criteria, including project approval requirements and who signs off on the project
- A summary of the planned approach for managing the project, which should describe stakeholder needs and expectations, important assumptions, and constraints, and should refer to related documents, such as a communications management plan
- A roles and responsibilities matrix
- A sign-off section for signatures of key project stakeholders
- A comments section in which stakeholders can provide important comments related to the project

Develop Project Charter

Project Charter - Sample

Project Title: Project Management Intranet Site Project
Project Start Date: Nov 12, 2021 Projected Finish Date: May 12, 2021
Budget Information: The firm has allocated $150,000 for this project. Xxxx
Project Manager: Berna Boz, berna@abc.com
Project Objectives: Develop a new capability accessible on ABC's intranet site to help internal consultants and external customers manage projects more effectively. Xxxxxxxxxx
Main Project Success Criterion: The project should pay for itself within one year of completion.
Approach: • Develop a survey to determine critical features of the new intranet site. • Review internal and external templates and examples of project management documents. • Research software to provide security, manage user inputs, and other features. • Develop the intranet site using Waterfall approach. • Develop a way to measure the value of the intranet site in terms of reduced costs and new revenues, both during the project and one year after project completion.
Roles: Xxxx…
Signatures: Xxxxx

Project Integration Management

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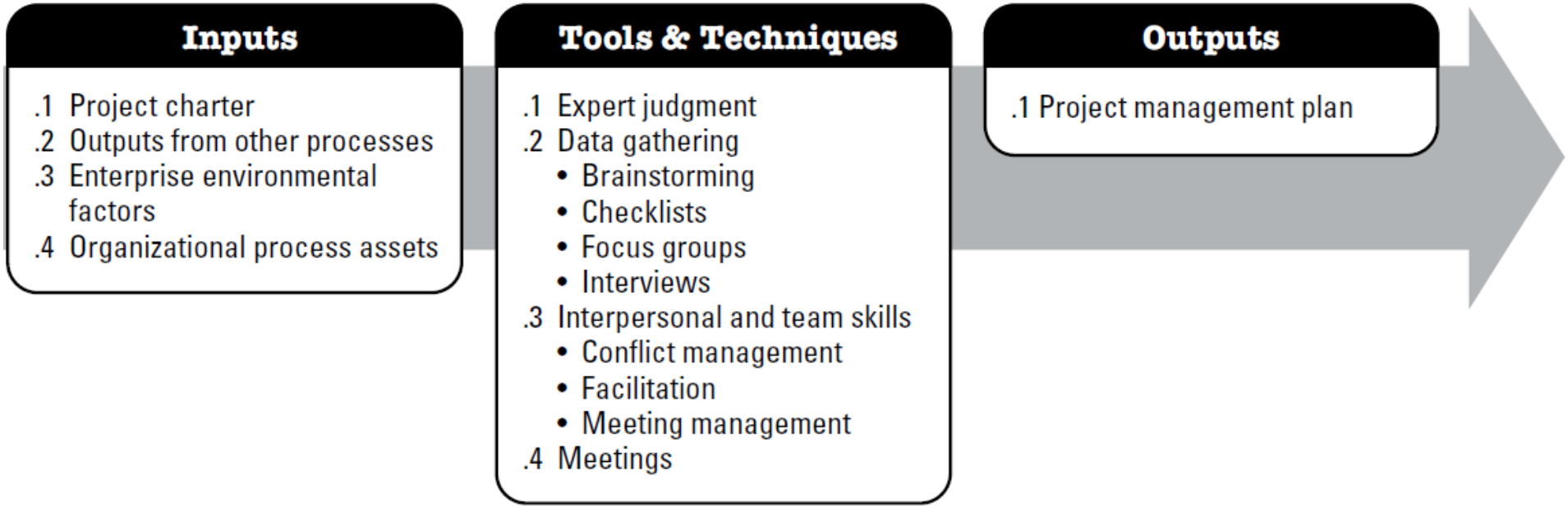
Develop Project Management Plan

- **A document used to coordinate all project planning documents and help guide a project's execution and control.**
- **Plans created in the other knowledge areas are considered subsidiary parts of the overall project management plan.**
- **Project management plans also document project planning assumptions and decisions regarding choices, facilitate communication among stakeholders, define the content, extent, and timing of key management reviews, and provide a baseline for progress measurement and project control.**
- **Project management plans should be dynamic, flexible, and subject to change when the environment or project changes.**
- **The project management plan defines how the project is executed, monitored and controlled, and closed.**
- **The project management plan's content varies depending on the application area and complexity of the project.**

Develop Project Management Plan



Develop Project Management Plan

Common Elements of Project Management Plans

- Introduction/overview of the project
- Project organization
- Management and technical processes (including project lifecycle description and development approach, as applicable)
- Work to be performed (scope)
- Schedule and budget information
- References to other project planning documents

Develop Project Management Plan

Project Management Plan	Project Documents	
1. Scope management plan	1. Activity attributes	19. Quality control measurements
2. Requirements management plan	2. Activity list	20. Quality metrics
3. Schedule management plan	3. Assumption log	21. Quality report
4. Cost management plan	4. Basis of estimates	22. Requirements documentation
5. Quality management plan	5. Change log	23. Requirements traceability matrix
6. Resource management plan	6. Cost estimates	24. Resource breakdown structure
7. Communications management plan	7. Cost forecasts	25. Resource calendars
8. Risk management plan	8. Duration estimates	26. Resource requirements
9. Procurement management plan	9. Issue log	27. Risk register
10. Stakeholder engagement plan	10. Lessons learned register	28. Risk report
11. Change management plan	11. Milestone list	29. Schedule data
12. Configuration management plan	12. Physical resource assignments	30. Schedule forecasts
13. Scope baseline	13. Project calendars	31. Stakeholder register
14. Schedule baseline	14. Project communications	32. Team charter
15. Cost baseline	15. Project schedule	33. Test and evaluation documents
16. Performance measurement baseline	16. Project schedule network diagram	
17. Project life cycle description	17. Project scope statement	
18. Development approach	18. Project team assignments	

Develop Project Management Plan

ISO Standard for Software Project Management Plan

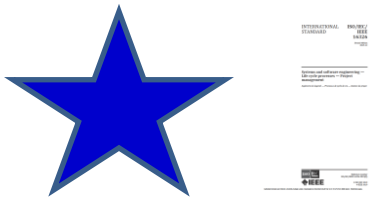
IEEE 1058 Standard for Software Project Management Plans

(1998)

Superseded by

ISO/IEC/IEEE 16326 International Standard - Systems and Software Engineering--Life Cycle Processes--Project Management

(2009)



Section 7
Elements of the project management plan

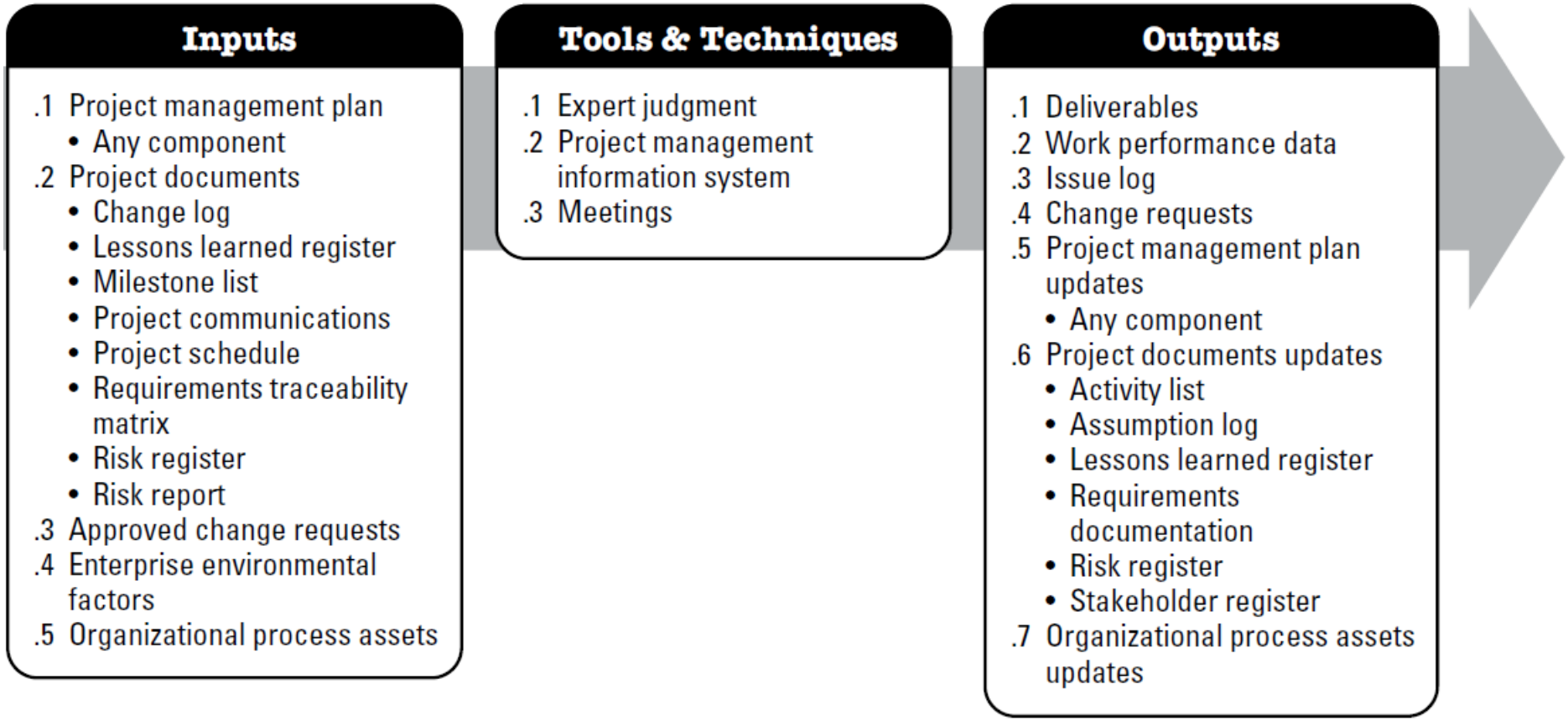
Project Integration Management

Project Integration Management				
Initiating	Planning	Executing	Monitoring & Controlling	Closing
1. Develop Project Charter	2. Develop Project Management Plan	3. Direct and Manage Project Work 4. Manage Project Knowledge	5. Monitor and Control Project Work 6. Perform Integrated Change Control	7. Close Project or Phase

Direct and Manage Project Work

- **Involves managing and performing the work described in the project management plan, one of the main inputs for this process.**
- **Other inputs include approved change requests, enterprise environmental factors, and organizational process assets.**
- **The majority of time on a project is usually spent on execution, as is most of the project's budget.**

Direct and Manage Project Work



Direct and Manage Project Work

- Although project managers are responsible for developing the overall project management plan, they must solicit input from project team members who are developing plans in each knowledge area.
- Simple rule: Those who will do the work should plan the work.
- All project personnel need to develop both planning and executing skills, and they need experience in these areas.
- In IT projects, programmers who have to write detailed specifications and then create the code from them become better at writing specifications.

Direct and Manage Project Work

- **Strong leadership and a supportive organizational culture are crucial during project execution.**
- **Project managers must lead by example to demonstrate the importance of creating good project plans and then following them in project execution.**

Direct and Manage Project Work

- **Good project execution also requires a supportive organizational culture.**
  - **For example, organizational procedures can help or hinder project execution.**
- **If an organization has useful guidelines and templates for project management that everyone in the organization follows, it will be easier for project managers and their teams to plan and do their work.**
- **Even with a supportive organizational culture, project managers may sometimes find it necessary to break the rules to produce project results in a timely manner.**

Direct and Manage Project Work

- **It is often helpful for IT project managers to have prior technical experience or at least a working knowledge of IT products.**
  - **For example, if the project manager were leading a team to help define user requirements, it would be helpful to understand the language of the business and technical experts on the team.**
- **On large projects the project manager must understand the business and application area of the project.**
  - **Many organizations have found that large IT projects require experienced general managers who understand the business and application area of the technology, not the technology itself.**

Direct and Manage Project Work

Main Tools and Techniques

- **Expert judgment**
- **Meetings**
- **Project management information systems (PMIS):**
  - **The PMIS provides access to information technology (IT) software tools, such as scheduling software tools, work authorization systems, configuration management systems, information collection and distribution systems, as well as interfaces to other online automated systems such as corporate knowledge base repositories.**
  - **Automated gathering and reporting on key performance indicators (KPI) can be part of this system.**

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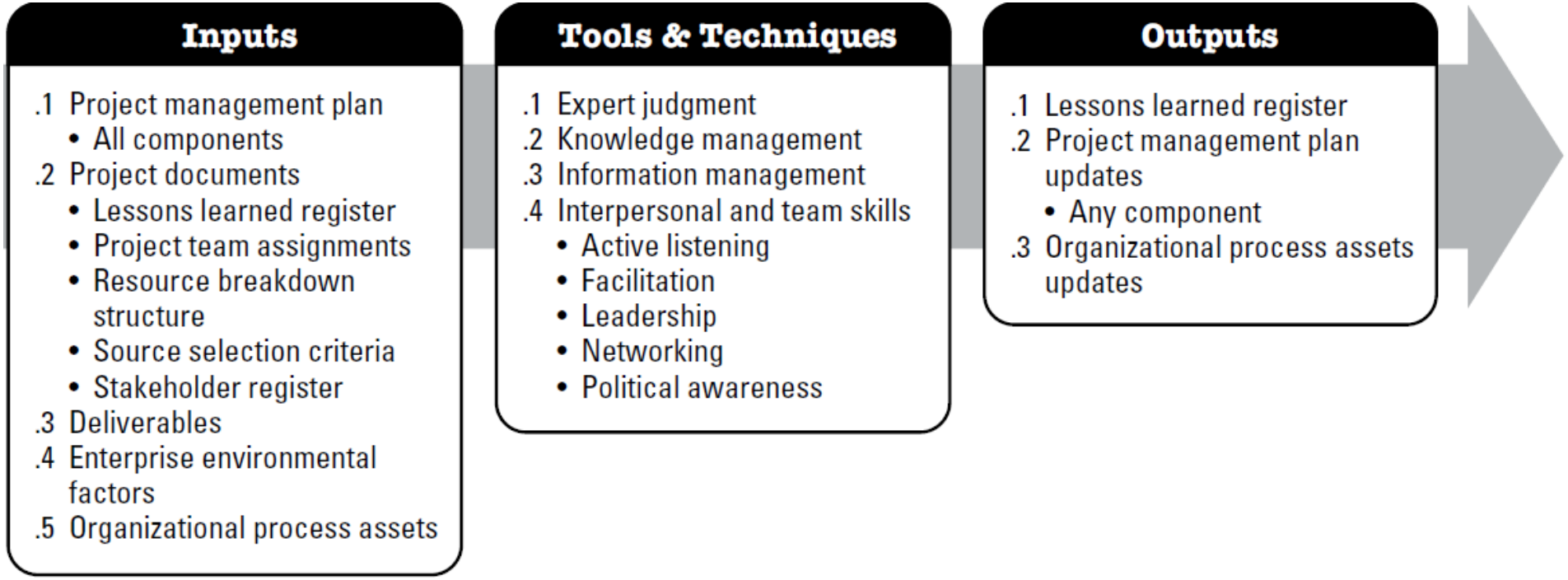
Manage Project Knowledge

- **The process of using existing knowledge and creating new knowledge to achieve the project's objectives and contribute to organizational learning.**
- **The key benefits of this process are that prior organizational knowledge is leveraged to produce or improve the project outcomes, and knowledge created by the project is available to support organizational operations and future projects or phases.**

Manage Project Knowledge



Manage Project Knowledge

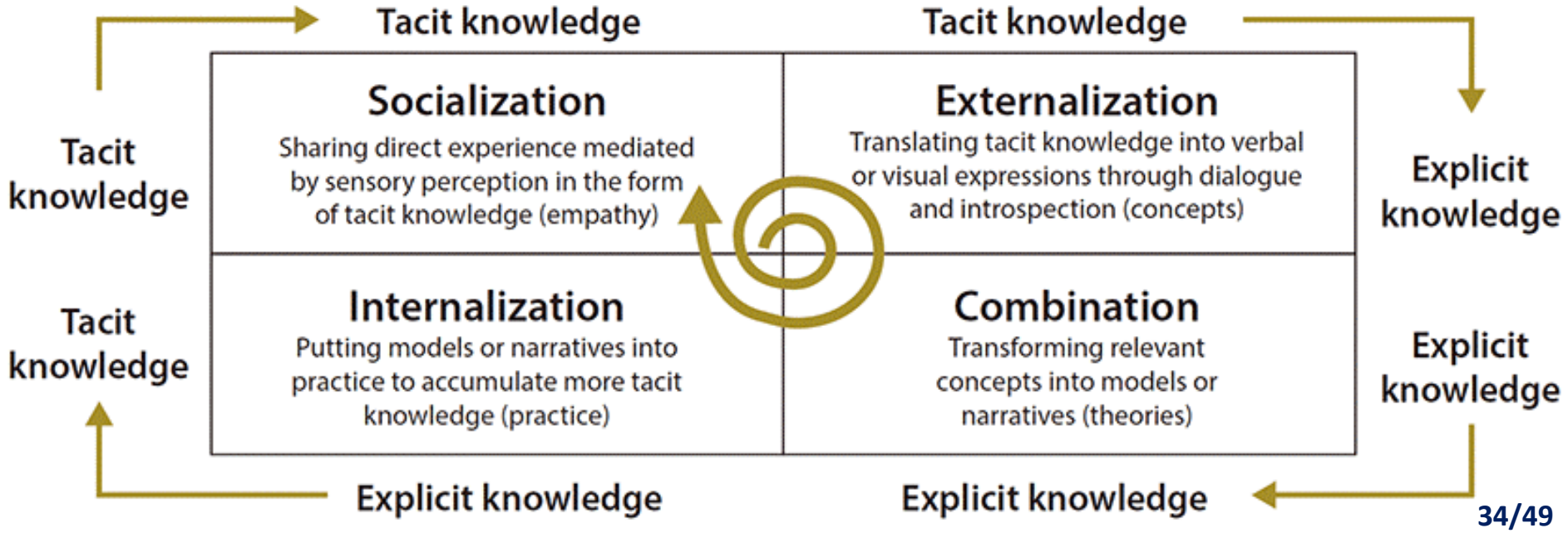
Explicit Knowledge

Knowledge that can be readily codified using words, pictures, and numbers.

Tacit Knowledge

Knowledge that is personal and difficult to express, such as beliefs, insights, experience, and "know-how"

SECI Model (Nonaka-Takeuchi Model)



Manage Project Knowledge

Common Misconceptions

- **It is a common misconception that managing knowledge involves just documenting it so it can be shared.**
  - **Only codified explicit knowledge can be shared in this way. But codified explicit knowledge lacks context and is open to different interpretations, so even though it can easily be shared, it isn't always understood or applied in the right way. Tacit knowledge has context built in but is very difficult to codify.**
- **Another common misconception is that managing knowledge involves just obtaining lessons learned at the end of the project, in order to use it in the future projects.**
  - **It is best if project team members document lessons learned throughout the life of the project.**

Project Integration Management

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Monitor and Control Project Work

- **Monitoring project work includes collecting, measuring, and disseminating performance information.**
- **It also involves assessing measurements and analyzing trends to determine what process improvements can be made.**
- **The project team should continuously monitor project performance to assess the overall health of the project and identify areas that require special attention.**
- **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.**

Monitor and Control Project Work

Inputs

.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

Tools & Techniques

.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

Outputs

.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

Monitor and Control Project Work

- **The project management plan provides the baseline for identifying and controlling project changes.**
- **A baseline is a starting point, a measurement, or an observation that is documented so that it can be used for future comparison.**

- **Monitoring includes collecting, measuring, and assessing measurements and trends to effect process improvements.**
- **Continuous monitoring gives the project management team insight into the health of the project and identifies any areas that may require special attention.**

- **Control includes determining corrective or preventive actions or re-planning and following up on action plans to determine whether the actions taken resolved the performance issue.**

Monitor and Control Project Work

- **Important outputs:**
  - **Work performance reports: Status reports, progress reports, memos, and other documents used to communicate.**
  - **Change requests: Change requests include recommended corrective and preventive actions and defect repairs.**

- **Corrective actions should result in improvements in project performance.**

- **Preventive actions reduce the probability of negative consequences associated with project risks.**

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Perform Integrated Change Control

- **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.**
- **This process reviews all requests for changes to project documents, deliverables, or the project management plan and determines the resolution of the change requests.**
- **The key benefit of this process is that it allows for documented changes within the project to be considered in an integrated manner while addressing overall project risk, which often arises from changes made without consideration of the overall project objectives or plans.**

Perform Integrated Change Control

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

Perform Integrated Change Control

- **Change control is important for IT projects because of the rapid developments in technology.**
- **Changes control should be attained through some formal organizational structures like Change Control Board which is a formally chartered group responsible for reviewing, evaluating, approving, deferring, or rejecting changes to the project and for recording and communicating such decisions.**
- **Decision can be taken through:**
  - **Voting: Can take the form of unanimity, majority, or plurality to decide on whether to accept, defer, or reject change requests.**
  - **Autocratic decision making: In this decision-making technique, one individual takes the responsibility for making the decision for the entire group.**
  - **Multicriteria decision analysis: This technique uses a decision matrix to provide a systematic analytical approach to evaluate the requested changes according to a set of predefined criteria.**

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Close Project or Phase

- **The process of finalizing all activities for the project, phase, or contract.**
- **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.**

Close Project or Phase

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

Close Project or Phase

Final Report

- Summary level description of the project or phase
- Scope objectives, the criteria used to evaluate the scope, and evidence that the completion criteria were met
- Quality objectives, the criteria used to evaluate the project and product quality, and the verification and validation information
- Schedule objectives, including planned and actual milestone delivery dates and reasons for variances
- Cost objectives, including the acceptable cost range, actual costs, and reasons for variances
- Summary of how the final project, service, or result achieved the benefits that the project was undertaken to address
- Summary of how the final project, service, or result achieved the business needs identified in the business plan
- Summary of any risks or issues encountered on the project and how they were addressed

Thank you…

Hasan ÇİFCİ