MONASH University

Information Technology

FIT2002
IT Project Management

Lecture 3
Project Integration Management

Video 1:
Learning Objectives

- Describe an overall framework for project integration management as it relates to the other project management knowledge areas and the project life cycle
- Discuss the strategic planning process and apply different project selection methods

The Key to Overall Project Success: Good Project Integration Management

- Project managers must coordinate all of the other knowledge areas throughout a project's life cycle
- Many new project managers have trouble looking at the "big picture" and want to focus on too many details
- Project integration management is *not* the same thing as software integration

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Project Integration Management Processes

1. **Developing the project charter** involves working with stakeholders to create the document that formally authorises a project —the charter.
2. **Developing the project management plan** involves coordinating all planning efforts to create a consistent, coherent document —the project management plan.
3. **Directing and managing project work** involves carrying out the project management plan by performing the activities included in it.

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Project Integration Management Processes (cont'd)

4. **Monitoring and controlling project work** involves overseeing activities to meet the performance objectives of the project
5. **Performing integrated change control** involves identifying, evaluating, and managing changes throughout the project life cycle.
6. **Closing the project or phase** involves finalising all activities to formally close the project or phase.

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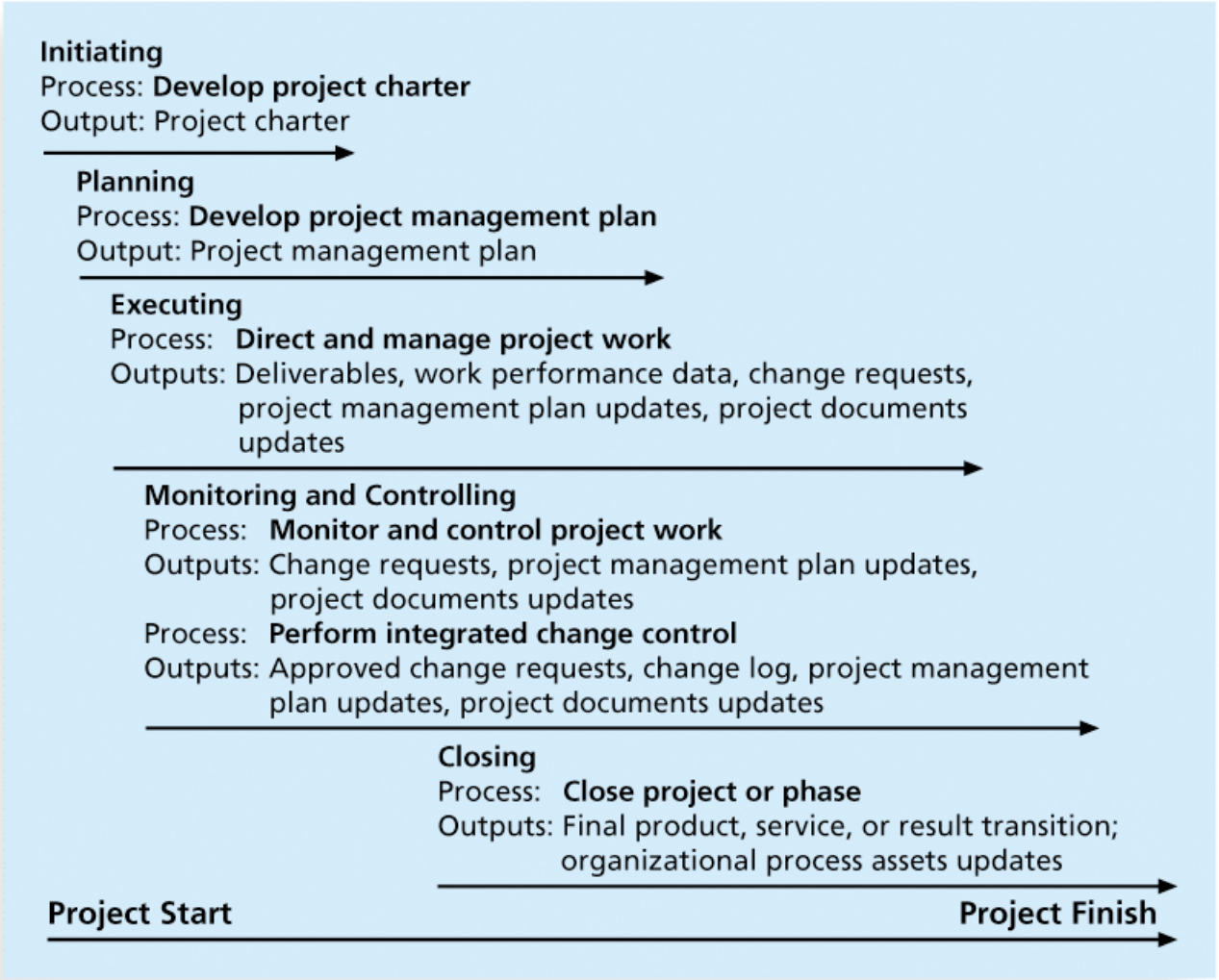
Project Integration Management Summary



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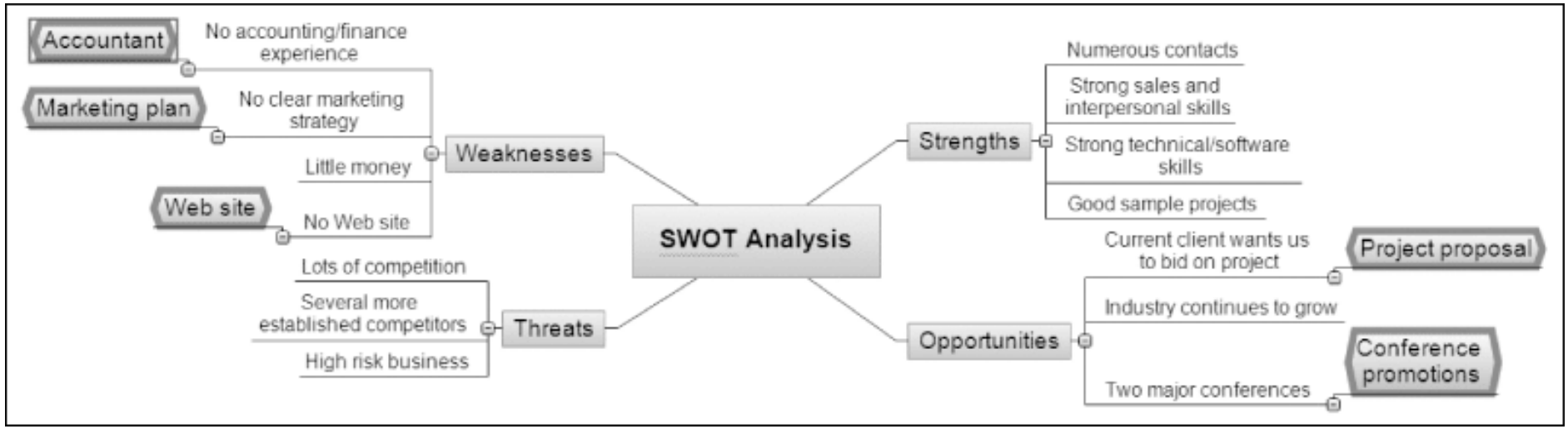
Strategic Planning and Project Selection

- **Strategic planning** involves determining long-term objectives, predicting future trends, and projecting the need for new products and services
- Organisations often perform a **SWOT analysis**
  - analyzing **S**trengths, **W**eaknesses, **O**pportunities, and **T**hreats
- As part of strategic planning, organisations
  - identify potential projects
  - use realistic methods to select which projects to work on
  - formalize project initiation by issuing a project charter

Mind Map of a SWOT Analysis to Help Identify Potential Projects



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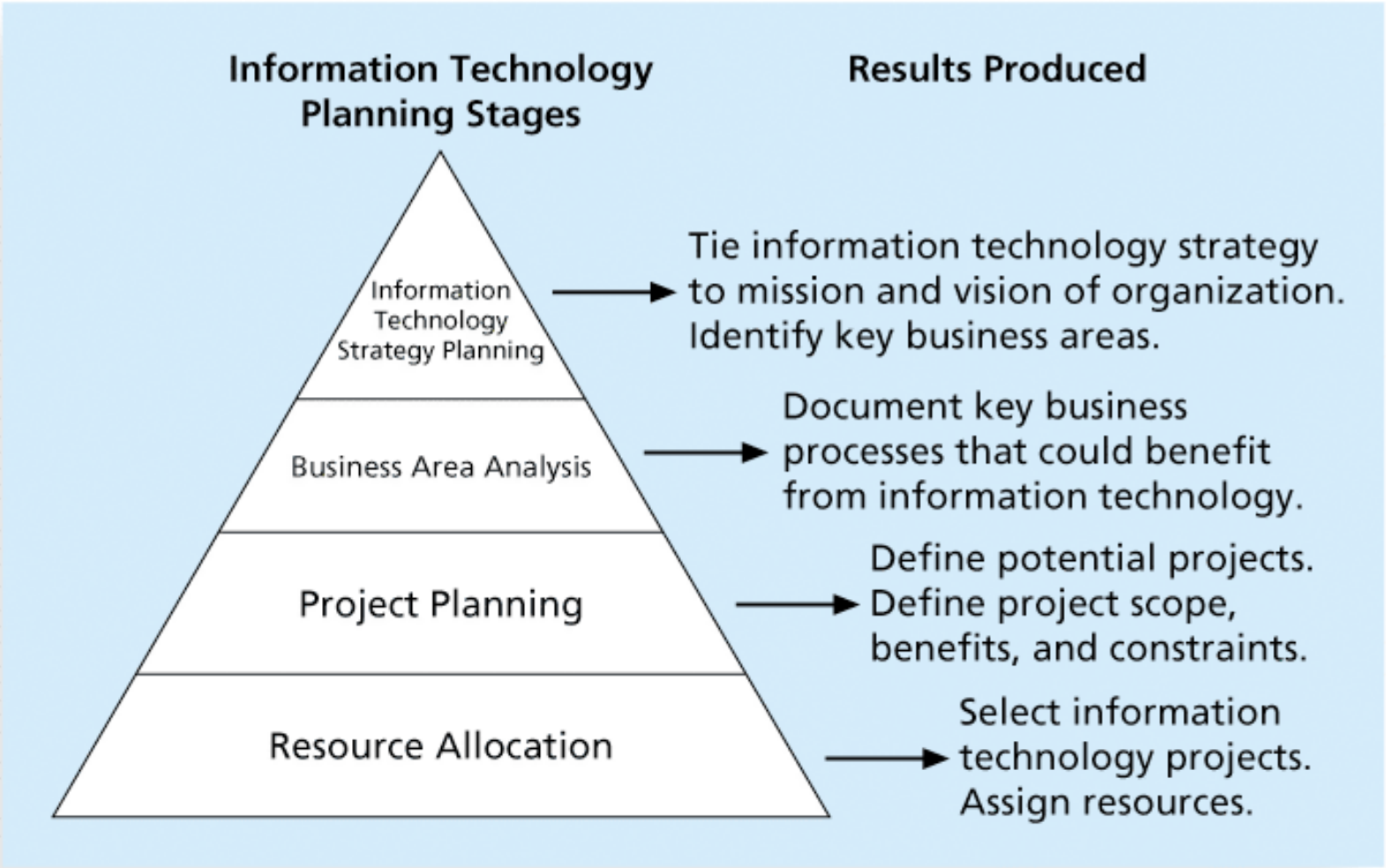
Information Technology Planning Process



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Best Practice

- A 2013 survey identified companies most admired for their ability to apply IT-related business capabilities for competitive advantage
- Many organisations rely on effective new product development (NPD) to increase growth and profitability.
- 4 important forces behind NPD's success include the following:
  1. A product innovation and technology strategy for the business
  2. Resource commitment and focusing on the right projects, or solid portfolio management
  3. An effective, flexible, and streamlined idea-to-launch process
  4. The right climate and culture for innovation, true cross-functional teams, and senior management commitment to NPD

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Video 2:
Learning Objective:

- Discuss the different methods for project selection

Methods for Selecting Projects

- There are usually more projects than available time and resources to implement them
- Methods for selecting projects include:
  - focusing on broad organisational needs
  - categorising information technology projects
  - performing net present value or other financial analyses
  - using a weighted scoring model
  - implementing a balanced scorecard

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Focusing on Broad Organisational Needs

- It is often difficult to provide strong justification for many IT projects, but everyone agrees they have a high value
- "It is better to measure gold roughly than to count pennies precisely"
- Three important criteria for projects:
  - There is a ***need*** for the project
  - There are ***funds*** available
  - There's a strong ***will*** to make the project succeed

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Categorising IT Projects

Selecting projects based on various categorisations:

- **project's impetus** – whether the project addresses:
  - a problem
  - an opportunity, or
  - a directive
- **time window**
  - some potential projects must be finished within a specific time window; otherwise, they are no longer valid
- **overall priority of the project**
  - higher priority projects should be completed first

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Financial Analysis of Projects

- Financial considerations are often an important consideration in selecting projects
- Three primary methods for determining the projected financial value of projects:
  - Net present value (NPV) analysis
  - Return on investment (ROI)
  - Payback analysis

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Net Present Value Analysis

- **Net present value** (NPV) analysis is a method of calculating the expected net monetary gain or loss from a project by discounting all expected future cash inflows and outflows to the present point in time
- Projects with a positive NPV should be considered if financial value is a key criterion
- The higher the NPV, the better

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Net Present Value Example

Discount rate	10%					
Discount factor	0.91	0.83	0.75	0.68	0.62	
PROJECT 1	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**TOTAL**
Benefits	$0	$2,000	$3,000	$4,000	$5,000	$14,000
Costs	$5,000	$1,000	$1,000	$1,000	$1,000	$9,000
Cash flow	($5,000)	$1,000	$2,000	$3,000	$4,000	$5,000
Discounted cash flow	($4,545)	$826	$1,503	$2,049	$2,484	
Cumulative disc cash flow	($4,545)	($3,719)	($2,216)	($167)	$2,316	
NPV	$2,316.35					
PROJECT 2	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**TOTAL**
Benefits	$1,000	$2,000	$4,000	$4,000	$4,000	$15,000
Costs	$2,000	$2,000	$2,000	$2,000	$2,000	$10,000
Cash flow	($1,000)	$0	$2,000	$2,000	$2,000	$5,000
NPV	$3,201.41					

Note that totals are equal but NPVs are not because of the time value of money

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NPV Calculation

$\frac{1}{(1+0.1)^0}$ $\frac{1}{(1+0.1)^1}$

Assuming cash flow starts at end of period 0 (= beginning of Period 1) , i.e. start from Year 0						
Discount rate	10%					
Discount factor	1.00	0.91	0.83	0.75	0.68	
Year	0	1	2	3	4	TOTAL
Benefits	$0	$2,000	$3,000	$4,000	$5,000	$14,000
Discounted benefit	$0	$1,818	$2,479	$3,005	$3,415	$10,718
Costs	$5,000	$1,000	$1,000	$1,000	$1,000	$9,000
Discounted costs	$5,000	$909	$826	$751	$683	$8,170
Cash flow	($5,000)	$1,000	$2,000	$3,000	$4,000	$5,000
Discounted cash flow	($5,000)	$909	$1,653	$2,254	$2,732	$2,548
Cumulative disc cash flow	($5,000)	($4,091)	($2,438)	($184)	$2,548	
NPV	$2,547.98					

$$NPV = \sum_{t=0\ldots n} A_t/(1+r)^t$$

Assuming cash flow starts at end of period 1 (= end of Period 1), i.e. start from Year 1						
Discount rate	10%					
Discount factor	0.91	0.83	0.75	0.68	0.62	
Year	1	2	3	4	5	TOTAL
Benefits	$0	$2,000	$3,000	$4,000	$5,000	$14,000
Discounted benefit	$0	$1,653	$2,254	$2,732	$3,105	$9,743
Costs	$5,000	$1,000	$1,000	$1,000	$1,000	$9,000
Discounted costs	$4,545	$826	$751	$683	$621	$7,427
Cash flow	($5,000)	$1,000	$2,000	$3,000	$4,000	$5,000
Discounted cash flow	($4,545)	$826	$1,503	$2,049	$2,484	$2,316
Cumulative disc cash flow	($4,545)	($3,719)	($2,216)	($167)	$2,316	
NPV	$2,316.35					
ROI	31.2%					

ROI = total discounted benefits - total discounted costs / discounted costs

Or

ROI = NPV / discounted costs

Return on Investment

- **Return on investment** (ROI) is calculated by subtracting the project costs from the benefits and then dividing by the costs

$$ROI = \frac{\text{(total discounted benefits - total discounted costs)}}{\text{discounted costs}}$$

$$= NPV / \text{discounted costs}$$

- The higher the ROI, the better
- Many organisations have a **required rate of return** or minimum acceptable rate of return on investment for projects
- **Internal rate of return** (IRR) can by calculated by finding the discount rate that makes the NPV equal to zero

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Payback Analysis

- Another important financial consideration is payback analysis
- The **payback period** is the amount of time it will take to recoup, in the form of net cash inflows, the total dollars invested in a project
- Payback occurs when the net cumulative discounted benefits equals the costs
- Many organisations want IT projects to have a fairly short payback period

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Weighted Scoring Model

- A weighted scoring model is a tool that provides a systematic process for selecting projects based on many criteria
  - Identify criteria important to the project selection process
  - Assign weights (percentages) to each criterion so they add up to 100%
  - Assign scores to each criterion for each project
  - Multiply the scores by the weights and get the total weighted scores
- The higher the weighted score, the better

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Sample Weighted Scoring Model for Project Selection

	A	B	C	D	E	F
1	**Criteria**	**Weight**	**Project 1**	**Project 2**	**Project 3**	**Project 4**
2	Supports key business objectives	25%	90	90	50	20
3	Has strong internal sponsor	15%	70	90	50	20
4	Has strong customer support	15%	50	90	50	20
5	Uses realistic level of technology	10%	25	90	50	70
6	Can be implemented in one year or less	5%	20	20	50	90
7	Provides positive NPV	20%	50	70	50	50
8	Has low risk in meeting scope, time, and cost goals	10%	20	50	50	90
9	**Weighted Project Scores**	**100%**	**56**	**78.5**	**50**	**41.5**
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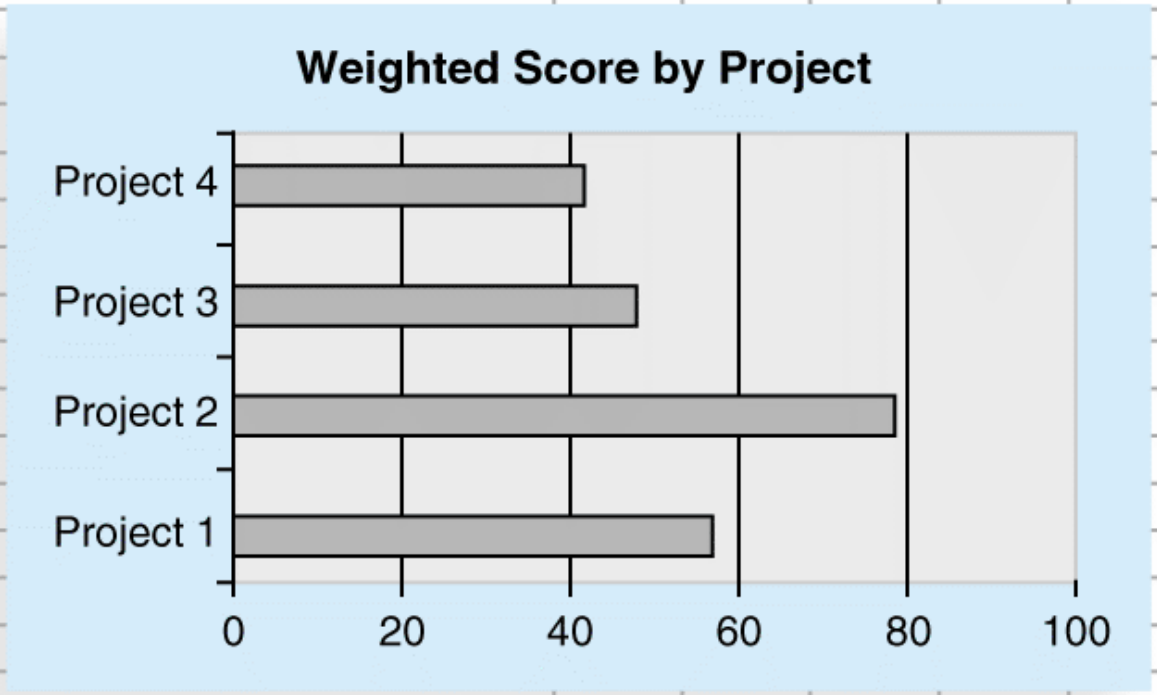

Implementing a Balanced Scorecard

- Drs. Robert Kaplan and David Norton developed this approach to help select and manage projects that align with business strategy
- A **balanced scorecard**
  - is a methodology that converts an organisation's value drivers, such as **customer service**, **innovation, operational efficiency**, and **financial performance**, to a series of defined metrics
- See www.balancedscorecard.org for more information

Video 3:
Learning Objectives

- Explain the importance of creating a project charter to formally initiate projects
- Describe project management plan development, understand the content of these plans, and review approaches for creating them
- Explain project execution, its relationship to project planning, the factors related to successful results, and tools and techniques to assist in directing and managing project work
- Describe the process of monitoring and controlling a project

1. Developing 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
- Key project stakeholders should sign a project charter to acknowledge agreement on the need and intent of the project; a **signed charter is a key output of project integration management**

Inputs, Tools and Techniques for Developing a Project Charter

- Inputs:
  - A project statement of work (SOW)
  - A business case
  - Agreements
  - Enterprise environmental factors
  - **Organisational process assets**, which include formal and informal plans, policies, procedures, guidelines, information systems, financial systems, management systems, lessons learned, and historical information
- Tools and Techniques:
  - Expert judgement
  - Facilitation techniques

Project Charter – An Example

Project Title: DNA-Sequencing Instrument Completion Project
Date of Authorization: February 1
Project Start Date: February 1 **Projected Finish Date:** November 1

Key Schedule Milestones:

- Complete first version of the software by June 1
- Complete production version of the software by November 1

Budget Information: The firm has allocated $1.5 million for this project, and more funds are available if needed. The majority of costs for this project will be internal labor. All hardware will be outsourced.

Project Manager: Nick Carson, (650) 949-0707, ncarson@dnaconsulting.com

Project Objectives: The DNA-sequencing instrument project has been underway for three years. It is a crucial project for our company. This is the first charter for the project, and the objective is to complete the first version of the software for the instrument in four months and a production version in nine months.

Main Project Success Criteria: The software must meet all written specifications, be thoroughly tested, and be completed on time. The CEO will formally approve the project with advice from other key stakeholders.

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Project Charter (cont.)

Approach:

- Hire a technical replacement for Nick Carson and a part-time assistant as soon as possible.
- Within one month, develop a clear work breakdown structure, scope statement, and Gantt chart detailing the work required to complete the DNA sequencing instrument.
- Purchase all required hardware upgrades within two months.
- Hold weekly progress review meetings with the core project team and the sponsor.
- Conduct thorough software testing per the approved test plans.

ROLES AND RESPONSIBILITIES

Name	Role	Position	Contact Information
Ahmed Abrams	Sponsor	CEO	aabrams@dnaconsulting.com
Nick Carson	Project Manager	Manager	ncarson@dnaconsulting.com
Susan Johnson	Team Member	DNA expert	sjohnson@dnaconsulting.com
Renyong Chi	Team Member	Testing expert	rchi@dnaconsulting.com
Erik Haus	Team Member	Programmer	ehaus@dnaconsulting.com
Bill Strom	Team Member	Programmer	bstrom@dnaconsulting.com
Maggie Elliot	Team Member	Programmer	melliot@dnaconsulting.com

Sign-off: (Signatures of all the above stakeholders)

Ahmed Abrams *Nick Carson*
Susan Johnson *Renyong Chi*
Erik Haus *Bill Strom*
Maggie Elliot

Comments: (Handwritten or typed comments from above stakeholders, if applicable)

"I want to be heavily involved in this project. It is crucial to our company's success, and I expect everyone to help make it succeed." —Ahmed Abrams

"The software test plans are complete and well documented. If anyone has questions, do not hesitate to contact me." —Renyong Chi

2. Developing a Project Management Plan

- A **project management plan** is 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 subsidiary parts of the overall project management plan
- It should be dynamic, flexible, and subject to change when the environment or project changes.
- Main inputs: project charter, outputs from planning processes, enterprise environment factors, and organisational process assets
- Main tool and technique: expert judgment
- Output: project management plan

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3. Directing and Managing Project Work

- Involves managing and performing the work described in the project management plan
- The majority of time and money is usually spent on execution
- The application area of the project directly affects project execution because the products of the project are produced during execution

Coordinating Planning and Execution

- Project planning and execution are intertwined and inseparable activities
- Those who will do the work should help to plan the work
- Project managers must solicit input from the team to develop realistic plans

Providing Leadership and a Supportive Culture

- Project managers must lead by example to demonstrate the importance of creating and then following good project plans
- Organisational culture can help project execution by
  - providing guidelines and templates
  - tracking performance based on plans
- Project managers may still need to break the rules to meet project goals, and senior managers must support those actions

4. Monitoring and Controlling Project Work

- Changes are inevitable on most projects, so it's important to develop and follow a process to monitor and control changes
- Monitoring project work includes collecting, measuring, and disseminating performance information
- Inputs: The project management plan, schedule and cost forecasts, validated changes, work performance information, enterprise environmental factors, and organizational process assets
- A **baseline** is the approved project management plan plus approved changes

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Video 4:
Learning Objectives

- Understand the integrated change control process, planning for and managing changes on information technology (IT) projects, and developing and using a change control system
- Explain the importance of developing and following good procedures for closing projects
- Describe how software can assist in project integration management

5. Performing Integrated Change Control

- Three main objectives are:
  - Influencing the factors that create changes to ensure that changes are beneficial
  - Determining that a change has occurred
  - Managing actual changes as they occur
- Inputs to the integrated change control process:
  - project management plan, work performance information, change requests, enterprise environmental factors, and organisational process assets
- Outputs from the integrated change control process:
  - project management plan, work performance information, change requests, enterprise environmental factors, and organisational process assets

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Change Control on Information Technology Projects

- Former view: The project team should strive to do exactly what was planned on time and within budget
- Problem: Stakeholders rarely agreed up-front on the project scope, and time and cost estimates were inaccurate
- Modern view: Project management is a process of constant communication and negotiation
- Solution: Changes are often beneficial, and the project team should plan for them

Change Control System

- A **change control system** is a formal, documented process that describes when and how official project documents and work may be changed
- Describes who is authorised to make changes and how to make them
- Includes:
  - a change control board,
  - configuration management, and
  - a process for communicating changes

Change Control Board (CCB)

- A **change control board** is a formal group of people responsible for approving or rejecting changes on a project
- CCBs provide guidelines for preparing change requests, evaluate change requests, and manage the implementation of approved changes
- Includes stakeholders from the entire organisation

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Making Timely Changes

- Some CCBs only meet occasionally, so it may take too long for changes to occur
- Some organisations have policies in place for time-sensitive changes
  - "48-hour policy" allows project team members to make decisions, then they have 48 hours to reverse the decision pending senior management approval
  - Delegate changes to the lowest level possible, but keep everyone informed of changes

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Configuration Management

- **Configuration management** ensures that the descriptions of the project's products are correct and complete
- Involves identifying and controlling the functional and physical design characteristics of products and their support documentation
- Configuration management specialists identify and document configuration requirements, control changes, record and report changes, and audit the products to verify conformance to requirements
- See www.icmhq.com for more information

Communicating changes

- Communication is an important factor in change control
- Could be formal or informal
  - Formal: written and oral performance reports
  - Informal: Phone or “Stand-up” meetings
- Why is good communication so critical to success?
  - Everyone is coordinated and informed
  - Easier to integrate all project changes so that the project stays on track

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6. Closing Projects or Phases

- To close a project or phase, you must finalize all activities and transfer the completed or cancelled work to the appropriate people
- Main inputs to this process:
  - project management plan, accepted deliverables, and organisational process assets.
- The main tool and technique is expert judgment.
- Main outputs include
  - Final product, service, or result transition
  - Organisational process asset updates

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Using Software to Assist in Project Integration Management

Several types of software can be used to assist in project integration management

- Documents can be created with word processing software
- Presentations are created with presentation software
- Tracking can be done with spreadsheets or databases
- Communication software can facilitate communications
- Project management software can pull everything together and show detailed and summarized information