



INFO 6245

Planning &

Managing

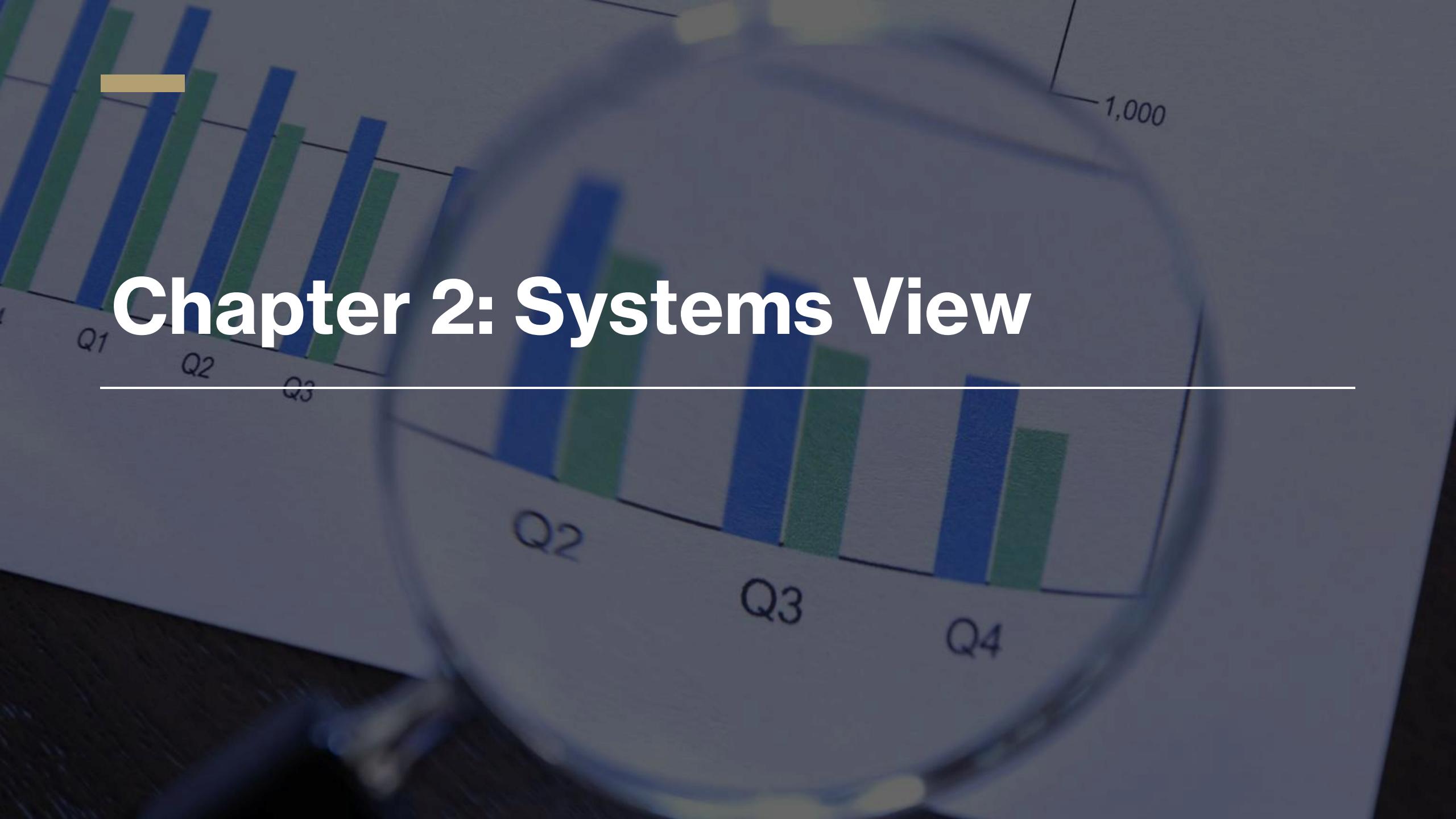
Information

Systems

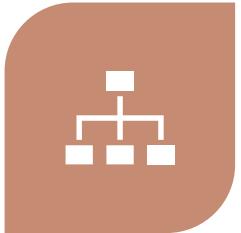
Development

Module 2

Chapter 2: Systems View



Systems View



SYSTEMS THINKING

DESCRIBES THIS HOLISTIC VIEW OF CARRYING OUT PROJECTS WITHIN THE CONTEXT OF THE ORGANIZATION

SYSTEMS APPROACH

DESCRIBES A COMPREHENSIVE AND ANALYTICAL APPROACH TO SOLVING COMPLEX PROBLEMS

SYSTEMS PHILOSOPHY

IS AN OVERALL MODEL FOR THINKING ABOUT THINGS AS SYSTEMS

SYSTEMS ANALYSIS

IS A PROBLEM-SOLVING APPROACH THAT DEFINES THE SYSTEM SCOPE, DIVIDES IT INTO COMPONENTS, AND THEN IDENTIFIES AND EVALUATES PROBLEMS, OPPORTUNITIES, CONSTRAINTS, AND NEEDS

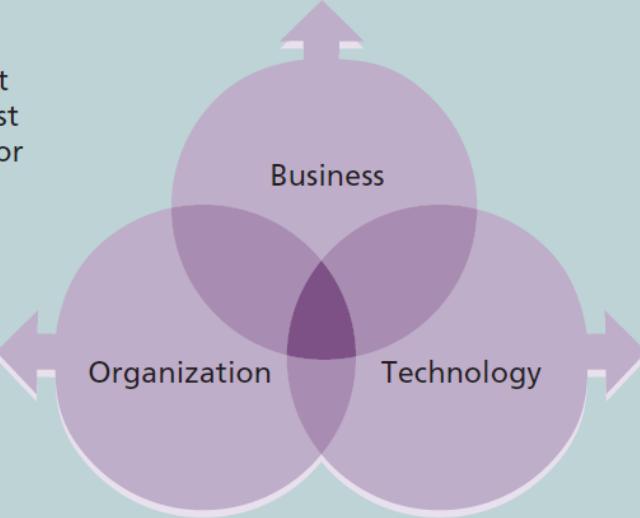
SYSTEMS MANAGEMENT

ADDRESSES THE BUSINESS, TECHNOLOGICAL, AND ORGANIZATIONAL ISSUES ASSOCIATED WITH CREATING, MAINTAINING, AND MODIFYING A SYSTEM

Systems Management Model

Case Study Synopsis:

Implementing Tablets at a college campus as the primary mode of information sharing for all students

- What will the tablet project cost the college?
 - What will it cost students?
 - What will support costs be?
 - What will the impact be on enrollments?
-
- Will the tablet project affect all students, just traditional students, or only certain majors?
 - How will the project affect students who already have tablets or laptops?
 - Who will develop special applications or books for the tablets?
 - Who will train students, faculty, and staff?
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- A Venn diagram consisting of three overlapping circles. The top circle is labeled 'Business', the bottom-left circle is labeled 'Organization', and the bottom-right circle is labeled 'Technology'. The overlapping area between all three circles is shaded dark purple, while the individual circle areas are light purple.
- Should the tablets be based on Apple, Microsoft, Android, or another system?
 - What applications will be required?
 - What will the hardware specifications be?
 - How will the tablets affect various networks and speed?
 - Will more power cords be required in the classroom?

Understanding Organizations

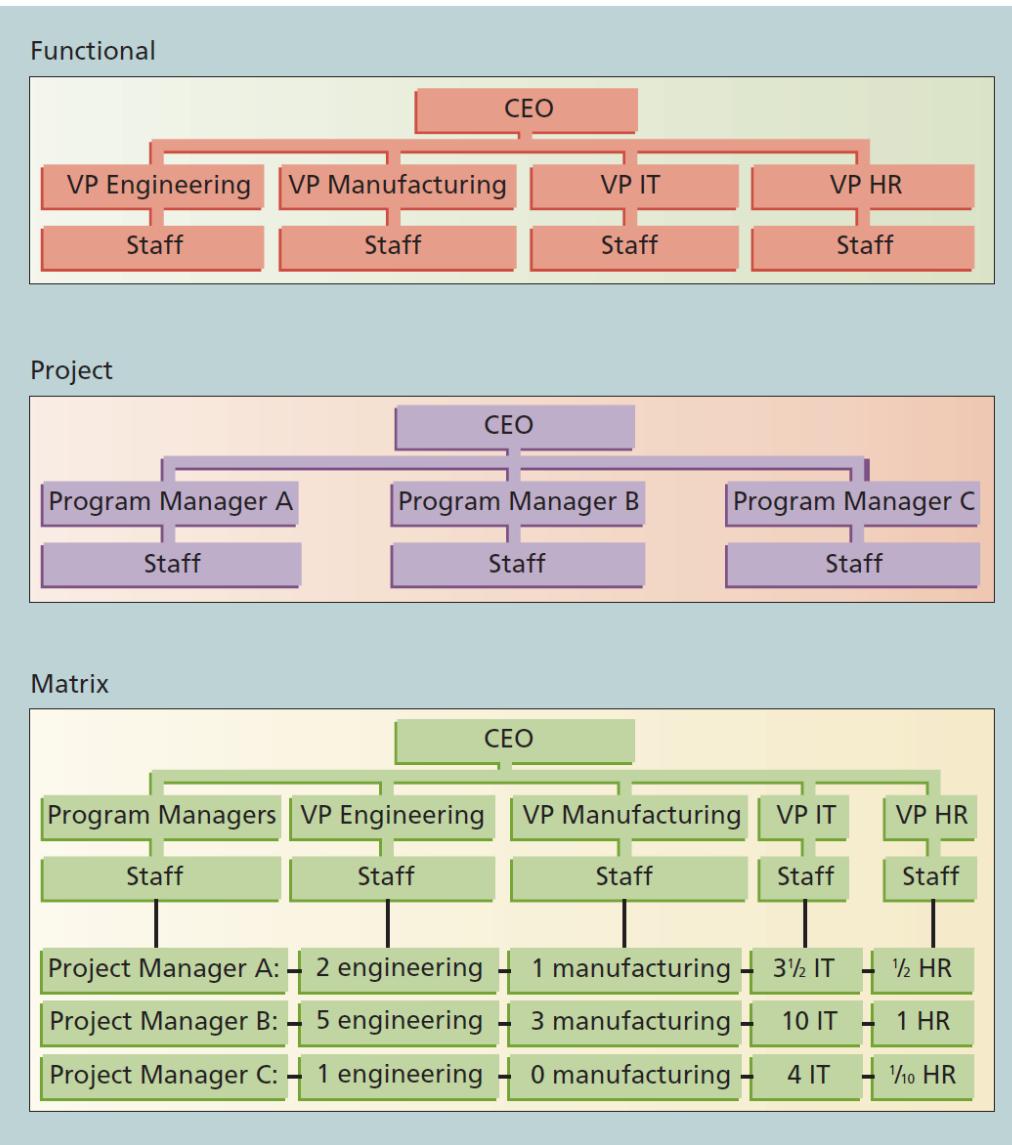
Structural frame: Roles and responsibilities, coordination, and control. Organizational charts help describe this frame.

Human resources frame: Providing harmony between needs of the organization and needs of people.

Political frame: Coalitions composed of varied individuals and interest groups. Conflict and power are key issues.

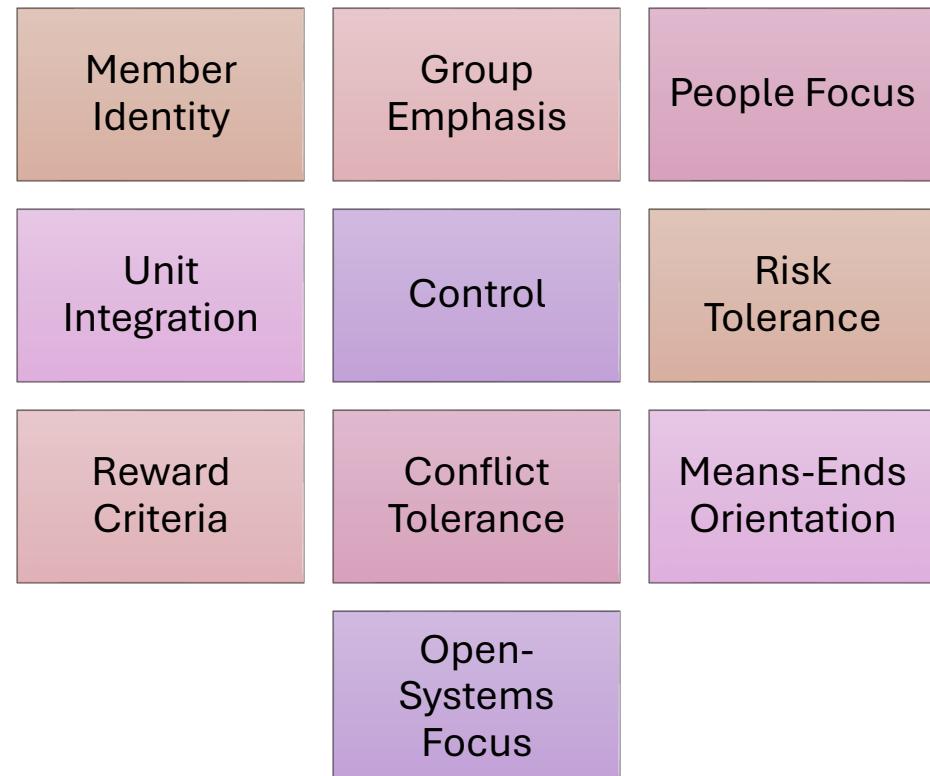
Symbolic frame: Symbols and meanings related to events. Culture, language, traditions, and image are all parts of this frame.

Organization Structures



Organization Culture

- Set of shared assumptions, values, and behaviors that characterize the functioning of an organization
- Many experts believe the underlying causes of many companies' problems are not the structure or staff, but the culture
- Project work is most successful in an organizational culture these 10 characteristics are strong and balanced



Organization Commitment

- Top management positions are key stakeholders in projects; their level of commitment and support can make or break a project
- A Champion is a senior manager who acts as a proponent of the project
- Top management can help project managers by:
 - Providing adequate resources
 - Approving unique project needs in a timely manner
 - Getting cooperation from other parts of the organization
 - Mentoring and coaching on leadership issues



IT Governance

IT governance address authority and control on IT infrastructure and its use; a CIO can be a champion for IT Projects



IT Standards and guidelines are necessary for effective project management



Senior management can encourage:

The use of standard forms and software for project management

The development and use of guidelines for writing project plans or providing status information

The creation of a project management office or center of excellence

Nature of IT Projects

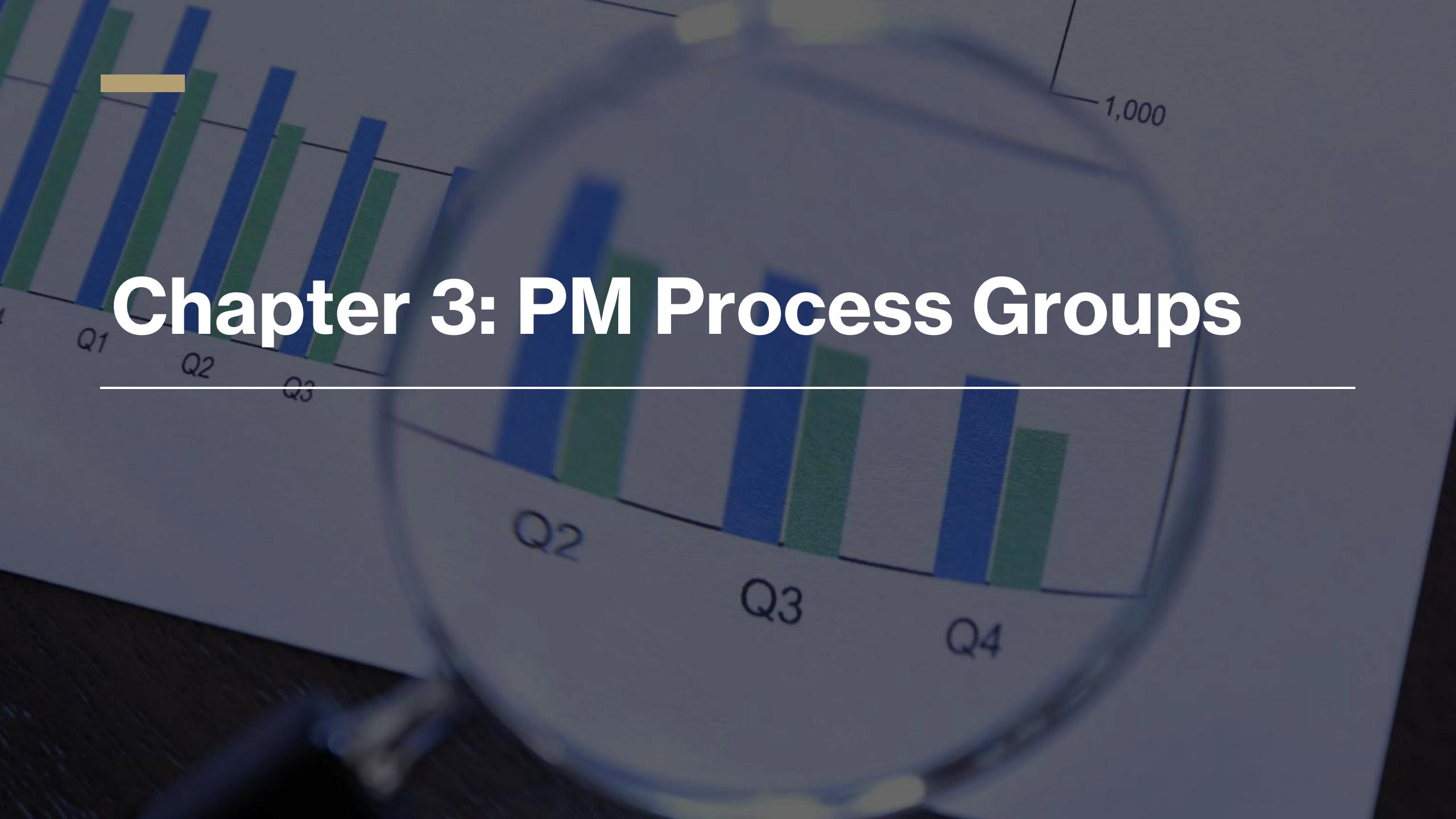
Diversity: Diversity in terms of size, complexity, products produced, application area, resource requirements, industry and business function

Team Members: Diverse backgrounds, cultures, skill sets, and perspectives

Technologies: Rapid change, shortened timelines, communication pathways, dynamic knowledge sharing

Trends: Globalization, Outsourcing, Virtual Teams, Agile

Chapter 3: PM Process Groups



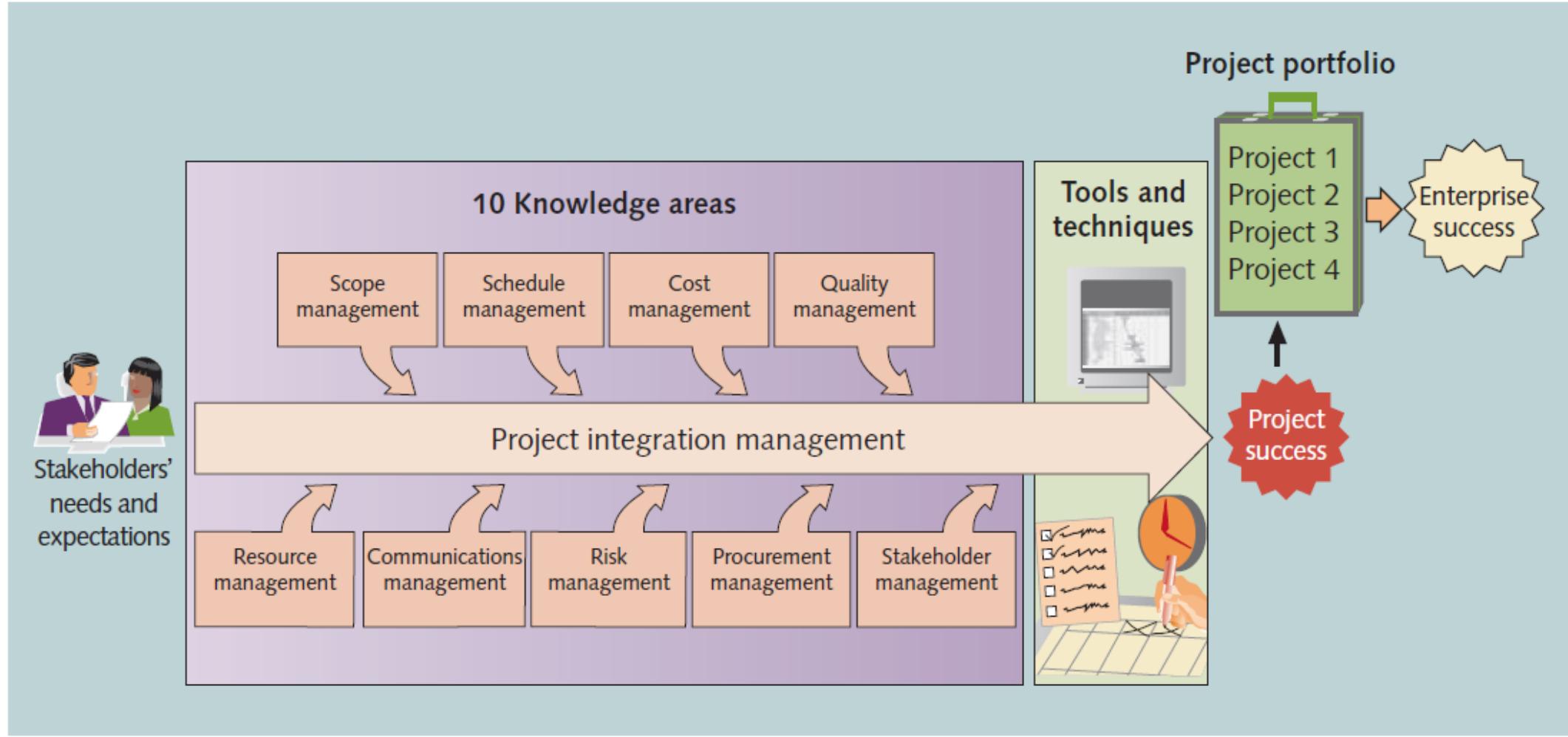
Process Groups

Project management consists of 10 knowledge areas

- Integration, scope, schedule, cost, quality, resource, communications, risk, procurement, and stakeholder management

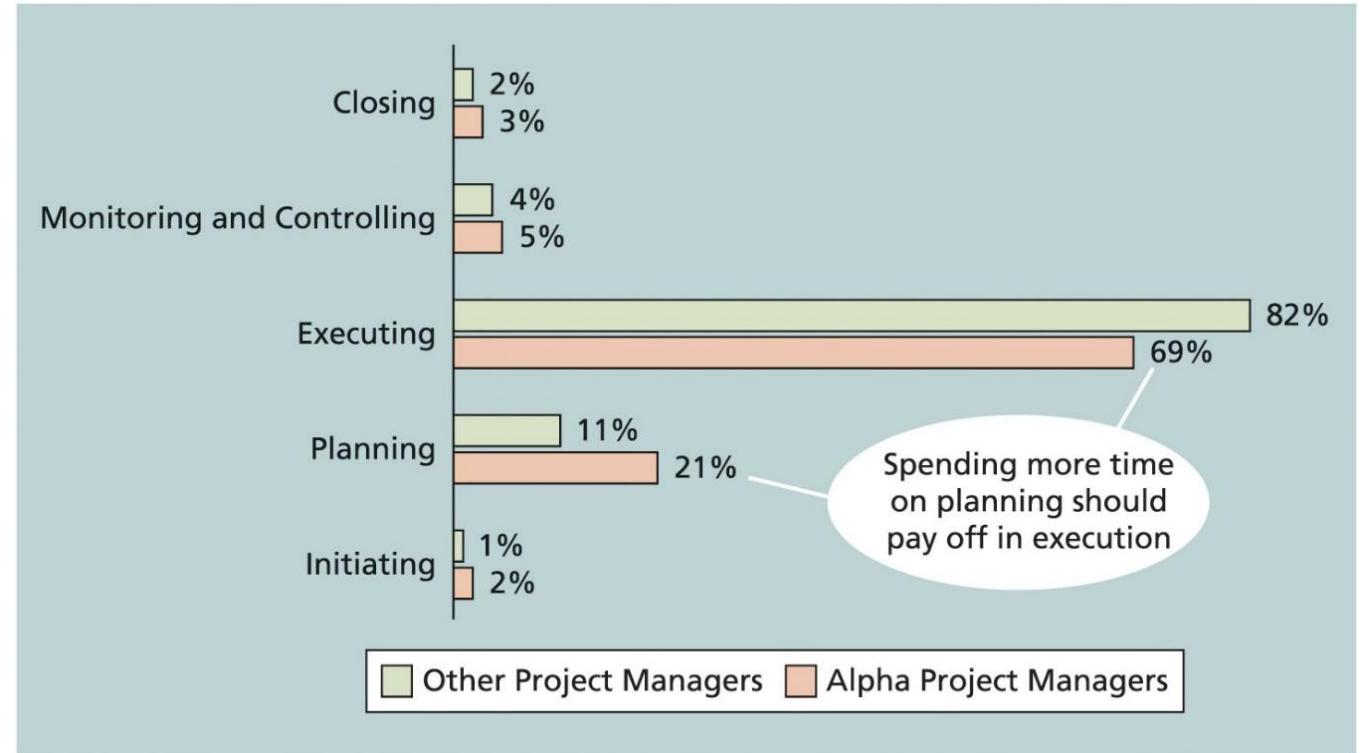
Projects involve five project management process groups

- Initiating, planning, executing, monitoring and controlling, and closing



PM Knowledge Areas

Importance Of PM Processes



Enterprise Architecture



EA in the Business World

- **Balancing Innovation and Operations:** Organizations face the challenge of delivering innovation while maintaining fast-paced, reactive operations.
- **Delivery vs. Operations Tension**
 - *Delivery:* Slow, cautious, strategic
 - *Operations:* Fast, reactive, execution-focused

This tension often leads to gaps in documentation and clarity.
- **Complexity and Documentation Loss:** As systems grow more complex, documentation is often neglected—making improvement difficult without a clear baseline.
- **EA as a Structured Framework:** Enterprise Architecture breaks down complexity using standardized layers and terminology.
- **Holistic Organizational View:** EA defines and aligns business structure, processes, systems, and technology infrastructure.
- **Strategic Alignment:** EA ensures technology investments support business goals, enhancing agility and sustainability.
- **Benefits of EA**
 - Optimizes operations
 - Improves decision-making
 - Enables innovation and long-term growth

Importance of EA



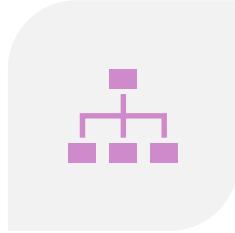
IMPROVED AGILITY:
EA enables organizations to quickly adapt to changes in the business environment.



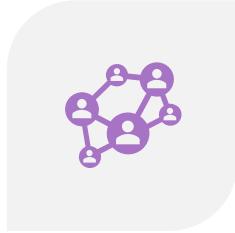
ENHANCED EFFICIENCY:
Streamlining processes and aligning IT with business goals leads to more efficient operations.



COST REDUCTION:
By optimizing resources and eliminating redundancies, EA helps reduce costs.

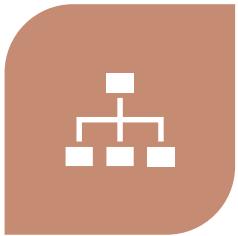


RISK MANAGEMENT:
EA provides a structured approach to identifying and mitigating risks associated with IT projects.



INCREASED COLLABORATION:
IT fosters better communication and collaboration across different business units.

EA Principles



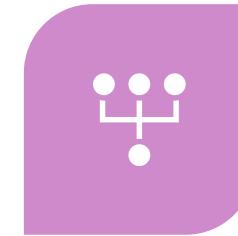
ALIGNMENT WITH BUSINESS GOALS AND STRATEGIES: ENTERPRISE ARCHITECTURE MUST ALIGN WITH BUSINESS OBJECTIVES TO EFFECTIVELY SUPPORT ORGANIZATIONAL NEEDS THROUGH STRATEGIC GOALS, TECHNOLOGY, AND PROCESS DESIGN.



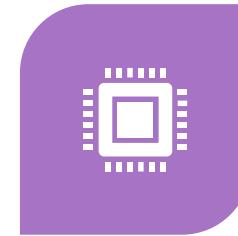
SCALABILITY: ENSURING THAT THE ARCHITECTURE CAN GROW AND ADAPT TO INCREASING DEMANDS WITHOUT COMPROMISING PERFORMANCE.



SECURITY: IMPLEMENTING ROBUST SECURITY MEASURES TO PROTECT DATA AND SYSTEMS FROM THREATS.

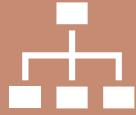


FLEXIBILITY: DESIGNING SYSTEMS THAT CAN EASILY ADAPT TO CHANGES IN THE BUSINESS ENVIRONMENT.



INTEROPERABILITY: ENSURING THAT DIFFERENT SYSTEMS AND COMPONENTS CAN WORK TOGETHER SEAMLESSLY.

Popular EA Frameworks



TOGAF (The Open Group Architecture Framework): TOGAF provides a comprehensive approach to designing, planning, implementing, and governing enterprise architectures. It is widely used for its detailed methodology and best practices.



Zachman Framework: This framework offers a structured way of understanding and defining an enterprise from different perspectives. It focuses on the intersection of various viewpoints, such as data, function, network, people, time, and motivation.



FEAF (Federal Enterprise Architecture Framework): FEAF is a government-wide framework that aligns IT investments with business goals. It is used primarily by the U.S. federal government to ensure that IT systems meet mission requirements.

Enterprise Architecture Creates **Big Benefits**

Financial

BETTER...

Business solutions
Business technologies



Techn



Strategic

BETTER...

Customer experience
Supply-chains



Operations

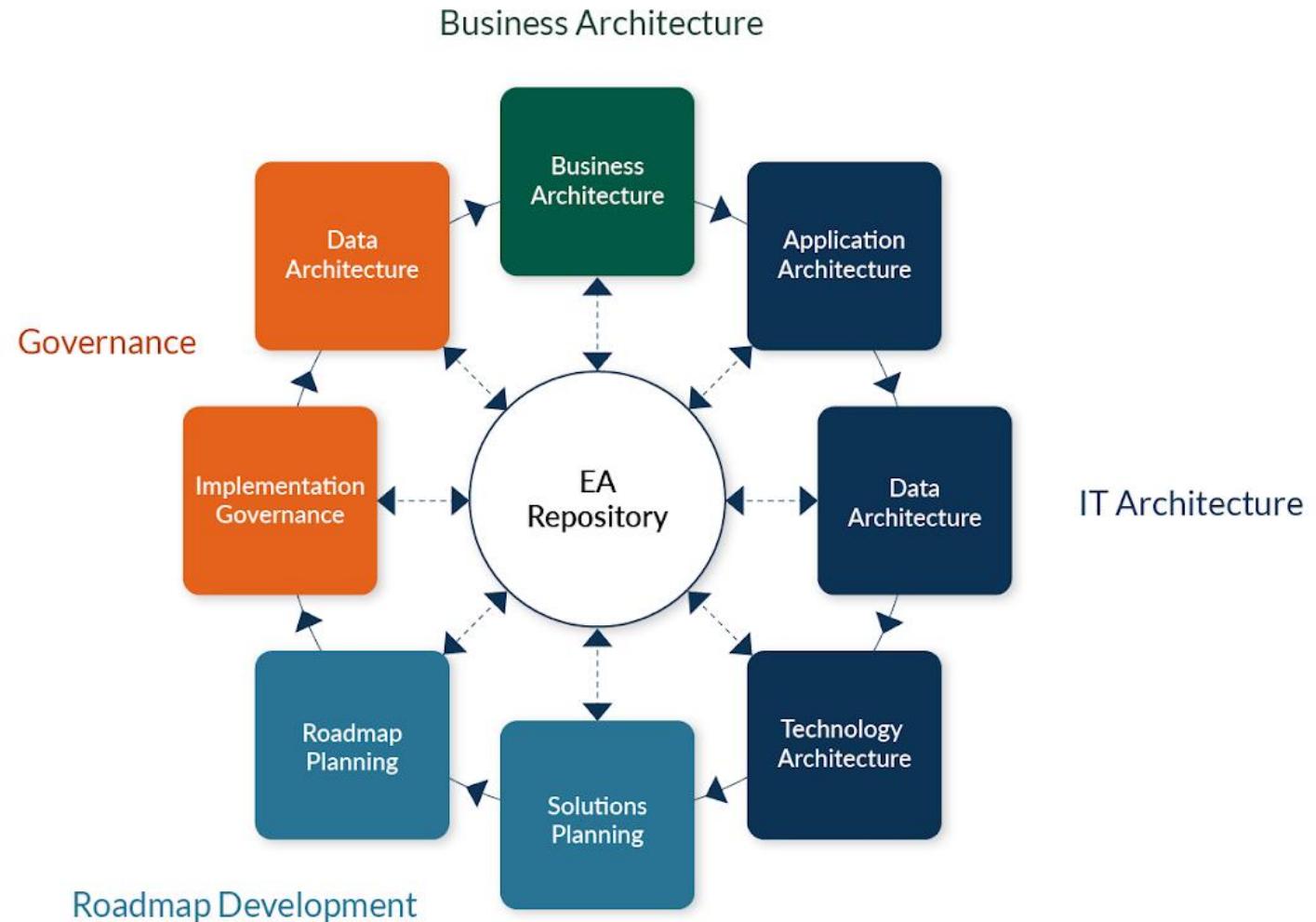
BETTER...

Processes
Data and Reporting

EA Domains

Enterprise architecture (EA) is structured around four main domains, each playing a crucial role in ensuring that an organization's IT and business strategies are aligned and effective.

Enterprise Architecture Domains



Business Architecture

Focus: This domain focuses on the business processes and organizational structure.

Business Processes: Defines how the business operates, including workflows, activities, and tasks.

Organizational Structure: Outlines the hierarchy and roles within the organization.

Business Capabilities: Identifies the core functions and abilities that the business needs to achieve its goals.

Importance: By mapping out business processes and structures, organizations can identify inefficiencies and areas for improvement, leading to better performance and customer satisfaction.

Application Architecture

Focus: This domain deals with the software applications and their interactions.

Application Portfolio: A catalog of all applications used within the organization.

Application Interactions: How different applications communicate and integrate with each other.

Application Lifecycle: The stages through which applications pass, from development to retirement.

Importance: Proper application architecture helps in reducing redundancy, improving integration, and ensuring that applications can scale with the business. It ensures that applications are aligned with business needs and can support business processes effectively.

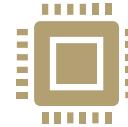
Data Architecture



Focus: This domain concerns the management and structure of data.



Data Models: Representations of how data is structured and related.



Data Governance: Policies and procedures for managing data quality, security, and accessibility.



Data Flows: How data moves within the organization, including data sources, storage, and destinations.



Importance: Effective data architecture enables organizations to make data-driven decisions, enhancing their ability to innovate and respond to market changes. It ensures that data is accurate, accessible, and secure.

Technology Architecture

Focus: This domain involves the hardware and software infrastructure.

Infrastructure Components: Servers, networks, storage, and other hardware elements.

Technology Standards: Guidelines and standards for technology use within the organization.

Technology Lifecycle: The stages through which technology components pass, from acquisition to decommissioning.

Importance: A robust technology architecture provides the foundation for reliable and scalable IT services, supporting the overall business strategy. It ensures that the technology infrastructure can support the applications and data needs of the organization.

Success Stories



Amazon Web Services (AWS):

Challenge: AWS faced scalability challenges due to its rapid growth, managing a vast array of services and infrastructure components.

Opportunity: AWS integrated its EA framework, aligning business goals, technology, and operations. This allowed them to scale efficiently while maintaining service quality.

Impact: AWS now provides seamless cloud services to millions of customers worldwide. Their integrated EA ensures robust security, agility, and innovation.



Netflix:

Challenge: Netflix needed to deliver content globally while maintaining high availability and performance.

Opportunity: They integrated EA principles into their streaming platform, including microservices architecture, content delivery networks, and data analytics.

Impact: Netflix now serves millions of viewers with personalized recommendations, smooth streaming, and minimal downtime. Integrated EA fuels their entertainment empire.



General Electric (GE):

Challenge: GE's vast portfolio included aviation, healthcare, energy, and more. Siloed systems hindered cross-business collaboration.

Opportunity: GE implemented a unified EA framework, integrating data, applications, and infrastructure. This allowed them to optimize operations and reduce costs.

Impact: GE transformed into a digital industrial company. Integrated EA enabled predictive maintenance, streamlined supply chains, and enhanced customer experiences.



Team Project Topic

Team Formation

- Prof will randomly breakout the class into Teams of 3-4 students.
- Teams Breakout Rooms
- As a Team:
 - Validate your team in Canvas
 - Change the name of your project team to what you choose as a group



Project Topic

Activity

- Meet your Teammates
- Brainstorm Project ideas and come up with a list of 5 ideas
- Prepare a short pitch for the project idea you like the most (1-2 minutes) to advocate to your team during next class

Guidelines

- Choose a topic within bounds of the IT/IS Field (related to your degree).
- Make sure that the project is simple and achievable.
- Team can choose a sub-project within a larger development effort, or a new project, or a startup idea. Anything goes!

PROJECT SELECTION PROCESS

4-Step Project Selection Process



Suggested Domains



Software Development (e.g., productivity tools, educational apps)



Data Analytics (e.g., dashboards, predictive models)



Cybersecurity (e.g., threat detection, secure authentication)



Cloud Computing (e.g., migration strategies, cost optimization)



AI/ML Applications (e.g., recommendation systems, chatbots)



IT Infrastructure (e.g., network design, system upgrades)



Tech for Social Good (e.g., accessibility tools, nonprofit platforms)

Examples

- Develop an app – pick any app in the market and create a competitor app
 - E.g. Instacart grocery delivery, Robin room booking, Mint expense tracking, Weather app, diet planner, game app, bandwidth monitor, etc.
- Network Connectivity
 - IOT, Smart home, GPS tracking system, HW dependent (fitness tracker, etc).
- Database
 - Migration, Collocation, Structured Data, etc.

Examples from Copilot



Software Development Projects

Task Management App for Remote Teams
Build a web or mobile app that helps distributed teams manage tasks, deadlines, and communication.

Campus Navigation App
Create an app using GPS and mapping APIs to help new students navigate university buildings and services.



Data Analytics & Visualization Projects

Student Performance Dashboard
Analyze anonymized academic data to visualize trends in student performance across departments.

Social Media Sentiment Analysis
Use NLP to analyze public sentiment on a topic (e.g., climate change, AI ethics) across platforms.



Cybersecurity Projects

Phishing Detection System
Create a browser extension or email filter that flags potential phishing attempts using ML.

Secure File Sharing Platform
Design a system for encrypted file sharing with access control and audit logs.



Cloud & DevOps Projects

Cloud Cost Optimization Tool
Build a tool that analyzes cloud usage and recommends cost-saving strategies.

CI/CD Pipeline for Student Projects
Set up a GitHub-based CI/CD pipeline for automated testing and deployment of student code.



AI/ML Projects

Resume Screening Bot
Train a model to evaluate resumes based on job descriptions and rank candidates.

AI-Powered Study Assistant
Build a chatbot that helps students study by answering questions and generating quizzes.



Tech for Social Good

Disaster Relief Coordination App
A platform to connect volunteers, donors, and victims during natural disasters.

Accessibility Enhancer for Websites
A browser plugin that improves accessibility features (e.g., text-to-speech, contrast adjustment).

Weighted Decision Matrix

Criteria	Weight (%)	Description
Feasibility	25%	Can it be done within the semester?
Innovation	20%	Is it creative or unique?
Technical Complexity	20%	Does it challenge the team appropriately?
Stakeholder Value	20%	Is there a clear user or client benefit?
Team Interest	15%	Are team members excited about it?

Framing the Project

Who are the sponsors? What are their expectations?

What problem are you solving? What gap are you addressing? What need are you fulfilling?

Who are the customers/consumers/end-users? What are their requirements?

Is it a product or a service? What exactly are you developing?

How long will the development take?

What is the end-goal of your project?