

Managing and Using Information Systems: A Strategic Approach – Fifth Edition

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Chapter 5



Information Systems for Managing Business Processes

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Learning Objectives

- List how IT enables business change.
- Identify ways in which IT can impede business change.
- Understand the problems that are caused by the functional (silo) perspective of a business.
- Identify how the process perspective keeps the big picture in view and how IT can be used to facilitate this perspective.
- Define TQM and BPR, and explain how they are used to transform a business.
- Explain an enterprise system and how it is used to implement organizational change.



Real World Examples

- Sloan Valve Company, a family-owned global manufacturer of plumbing products, was launching a range of new products every year.
- The **new product development** (NPD) process was both a core process and a strategic asset.
- The process was complex:
 - Over 16 functional units involved.
 - Slow, taking 18-24 months to bring a new product to market.
- The process of initiating and screening new product ideas was broken; over 50% of new ideas didn't make it through.
- No one was accountable for the process.
 - Difficult to get a handle on process management and improvement.
 - Formation flow was blocked in part because of the organizational structure.



Real World Examples (Cont.)

- Management initially invested in an enterprise system to automate their internal processes.
- Despite successful implementation, the communication and coordination problems continued.
- Management realized that the enterprise system was working fine, but the underlying process was broken.
- Top management decided to redesign the process.
- A team spent nine months assessing the current process and proposing a new end-to-end NPD process.
- The quality, timing, and output of the NPD process greatly improved.
- Time-to-market was reduced to less than 12 months.

Silo Perspective Versus Business Process Perspective



- When effectively linked with improvements to business processes, advances in IS enable increased **competitiveness**.
- IS can:
 - inhibit change when managers fail to adapt business processes because they rely on inflexible systems.
 - drive change.
- Transformation requires discontinuous thinking.
 - Recognizing and shedding outdated rules and fundamental assumptions that underlie operations.



Functional (Silo) Perspective

- A typical hierarchical structure is organized by **function** or core competency (Figure 5.1).
- Silos are self-contained functional units that:
 - optimize expertise and training.
 - avoid redundancy in expertise.
 - are easier to benchmark with outside organizations.
 - utilize bodies of knowledge created for each function.
 - make it easier to understand the role of each silo.

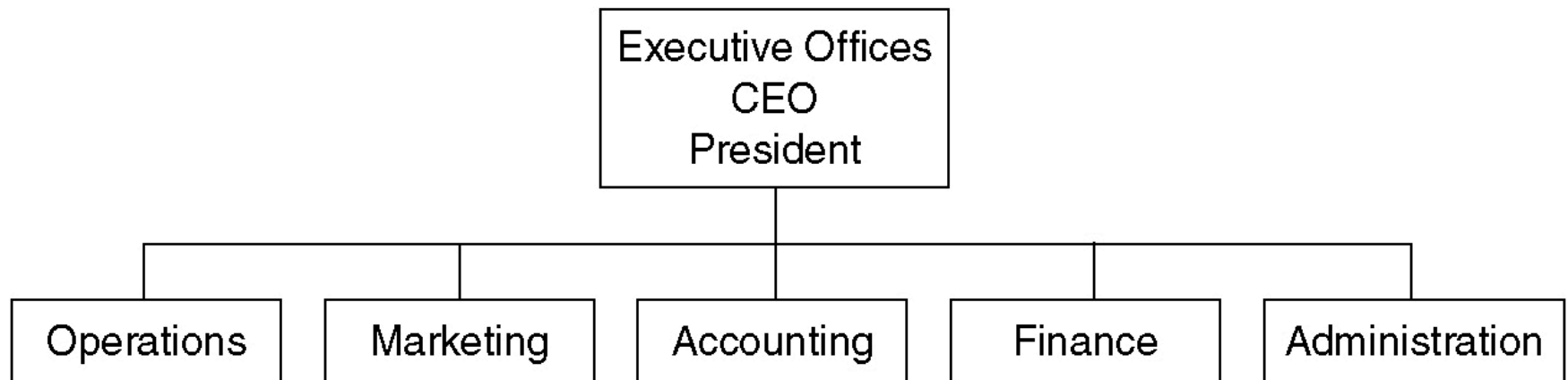


Disadvantages of Functional (Silo) Perspective

- Silo organizations can experience significant suboptimization.
- Communication gaps between departments are often wide.
- Hand-offs between silos are often a source of problems.
 - Finger-pointing and lost information in business processes.
- Silos tend to lose sight of the overall objective of the organization and operate in a way that maximizes their local goals.
- Each group is primarily concerned with its own set of objectives.
- Losing the **big picture** means losing business effectiveness.
- Customers and stakeholders are not being well served.

Figure 5.1 Hierarchical structure.

Typical Hierarchical Organization Structure



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Process Perspective

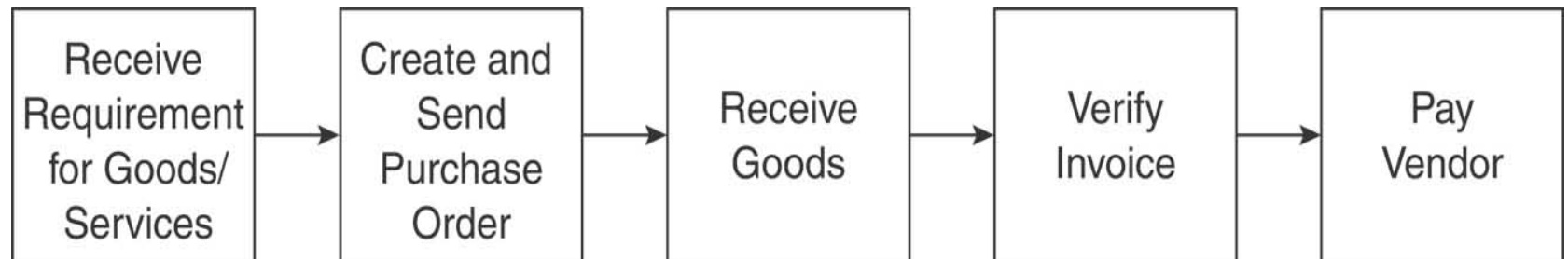
- Allows the manager to concentrate on the work that must be done to ensure optimal creation of value.
 - Avoid or reduce duplicate work, facilitate **cross-functional** communication, optimize business processes, and best serve the customers and stakeholders.
- A **process** is defined as an interrelated, sequential set of activities and tasks that turn inputs into outputs and have:
 - a beginning and an end.
 - inputs and outputs.
 - a set of **tasks** (subprocesses or activities) that transform the inputs into outputs.
 - a set of **metrics** for measuring effectiveness.



Business Process and Work Flow

- A **workflow** is a sequence of activities that take place in a **process**.
- Metrics help to focus managers on the critical dimensions of the process.
 - Throughput, outputs, customer satisfaction, revenue per output, profit per output, and quality of the output.
- Examples of **business processes** include customer order fulfillment, manufacturing, planning and execution, payroll, financial reporting, and procurement (Figure 5.2).

Figure 5.2 Sample business process.



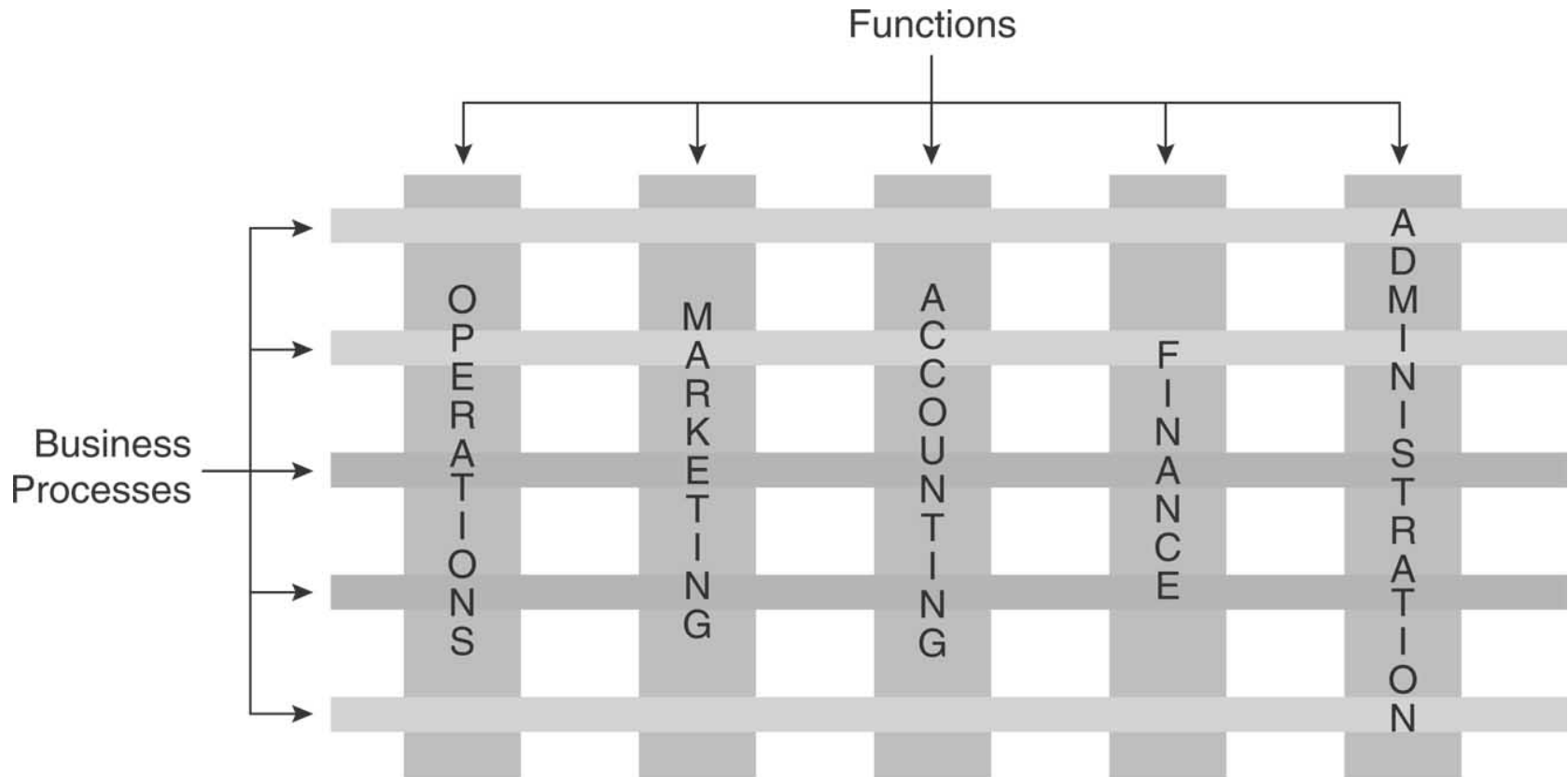
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Management Approach to Process Perspective

- Focus on the **process** ensures focus on the business's goals—the “**big picture**.”
- Each process has an “endpoint”—a deliverable to a customer, supplier, or other stakeholder.
- A process perspective recognizes that processes are often **cross-functional** (Figure 5.3).
- Functional departments must work together to optimize processes in light of the business's goals.
- When managers gain the process perspective, they begin to lead their organizations to **change** and optimize the **value** received by customers and stakeholders.

Figure 5.3 Cross-functional nature of business processes.



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Zara's Cross-Functional Processes

- Spanish clothing retailer Zara (introduced in Chapter 2) has over 1,600 stores in 78 countries around the world.
- A well-designed set of **cross-functional processes** (Figure 5.4).
- Zara is able to design, produce, and deliver a garment within 15 days.
- Managers must regularly create and rapidly replenish small batches of goods all over the world.
- Zara's organization, operational procedures, performance measures, and office layout are all designed to easily transfer information.
- **Cross-functional teams** enable information sharing among everyone who "needs to know."
- Able to change quickly to respond to new market trends.

Figure 5.4 Comparison of silo perspective and business process perspective.

	Silo Perspective	Business Process Perspective
Definition	Self-contained functional units such as marketing, operations, finance, etc.	Interrelated, sequential set of activities and tasks that turn inputs into outputs
Focus	Functional	Cross-functional
Goal Accomplishment	Optimizes functional goals, which might be suboptimal organizational goals	Optimizes organizational goals or the “big picture”
Benefits	Highlighting and developing core competencies; functional efficiencies	Avoiding work duplication and cross-functional communication gaps; organizational effectiveness

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Building Agile and Dynamic Business Processes

- **Dynamic business processes** (or agile business processes).
 - Processes that iterate through a constant renewal cycle of design, deliver, evaluate, and redesign.
- **Agile processes**
 - Designed with the intention of simplifying redesign and reconfiguration.
 - Flexible and easily adaptable to changes in the business environment.
 - Can be incrementally changed with little effort.
- Dynamic processes reconfigure themselves as they “learn” and are utilized in the business.
- As more of the process is done with software, the easier it is to change and the more likely it can be designed to be agile or dynamic.



Building Agility - Using the Internet and Social Technologies

- Building agility into **business processes** is increasingly common.
 - Run entirely on the Internet (e. g., order management, service provisioning, software development, and human resource support).
 - Incorporate the latest innovations offered by vendors on the Internet.
- **Dynamic IT applications** are required for dynamic business processes.
- When the underlying IT is not designed with this goal in mind, the business process cannot adapt to changing requirements in the business environment.
- Agile and dynamic business processes enable **operational efficiency** through incremental and quick, game-changing, innovative processes.



Changing Business Processes

- Two techniques are used to transform business processes:
 - **Radical process redesign.**
 - Also called **business process reengineering** (BPR) or simply reengineering.
 - Incremental, continuous process improvement.
 - Includes **total quality management** (TQM), also called quality management and Six Sigma.
- Radical and incremental improvement concepts enable a manager to affect change in the way his or her organization does business.
- These approaches view the business as a set of **business processes** rather than using a silo perspective.



Incremental Change

- Managers improve business processes through small, **incremental changes**.
 - Choosing a business process to improve.
 - Choosing a metric by which to measure the business process.
 - Enabling personnel to improve the process based on the metric.
- Workers often react favorably to **incremental change**.
 - Gain control and ownership of improvements.
 - Render change less threatening.



Total Quality Management

- Based on **W. Edwards Deming's** key principles to transform business processes—**Deming's 14 Points**.
- A set of activities for increasing quality and improving productivity.
- Advocates small, **incremental changes**.
- **Six Sigma** is an incremental approach to quality management.
 - A data-driven approach and methodology for eliminating defects from a process.
 - Promotes a low rate of defects—close to **zero defects**.



Six Sigma Methodology

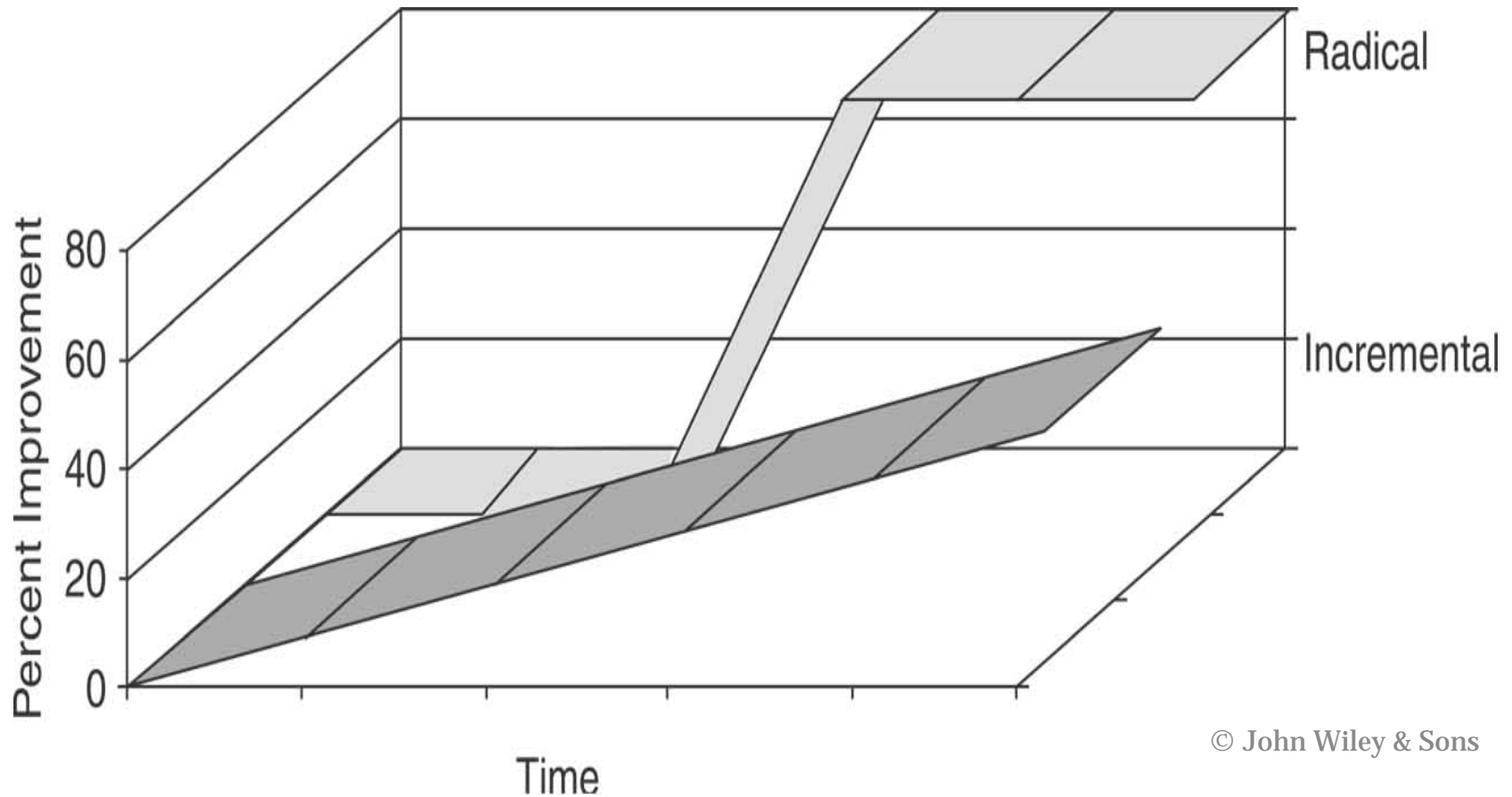
- **Six Sigma** methodology is a very specific set of steps to be followed called **DMAIC** and **DMADV**.
 - **DMAIC** (define, measure, analyze, improve, control) is an improvement system for **existing** processes falling below specification and looking for incremental improvement.
 - **DMADV** (define, measure, analyze, design, verify) is an improvement system used to develop **new** processes or products at Six Sigma quality levels.
- Carried out by experts known as Green Belts.
- More experienced experts, known as Black Belts, have taken special Six Sigma training and have worked on numerous Six Sigma projects.

Radical Change



- Appropriate for addressing **cross-functional processes**.
- Helps attain **aggressive** improvement goals.
- The goal is to make a rapid, breakthrough impact on key metrics (Figure 5.5).
- Radical change typically faces **greater internal resistance** compared with incremental change.
- Requires careful planning.
- Used only when major change is needed in a short time.

Figure 5.5 Comparison of radical and incremental improvement.



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Key Aspects of Radical Change Approaches



- Thinking from **a cross-functional** process perspective.
- Challenging old assumptions.
- Networked (cross-functional) organizing.
- **Empowerment** of individuals in the process.
- Measurement of success via **metrics** tied directly to business goals and the effectiveness of new processes (e.g., production cost, cycle time, scrap and rework rates, customer satisfaction, revenues, and quality).



Workflow and Mapping Processes

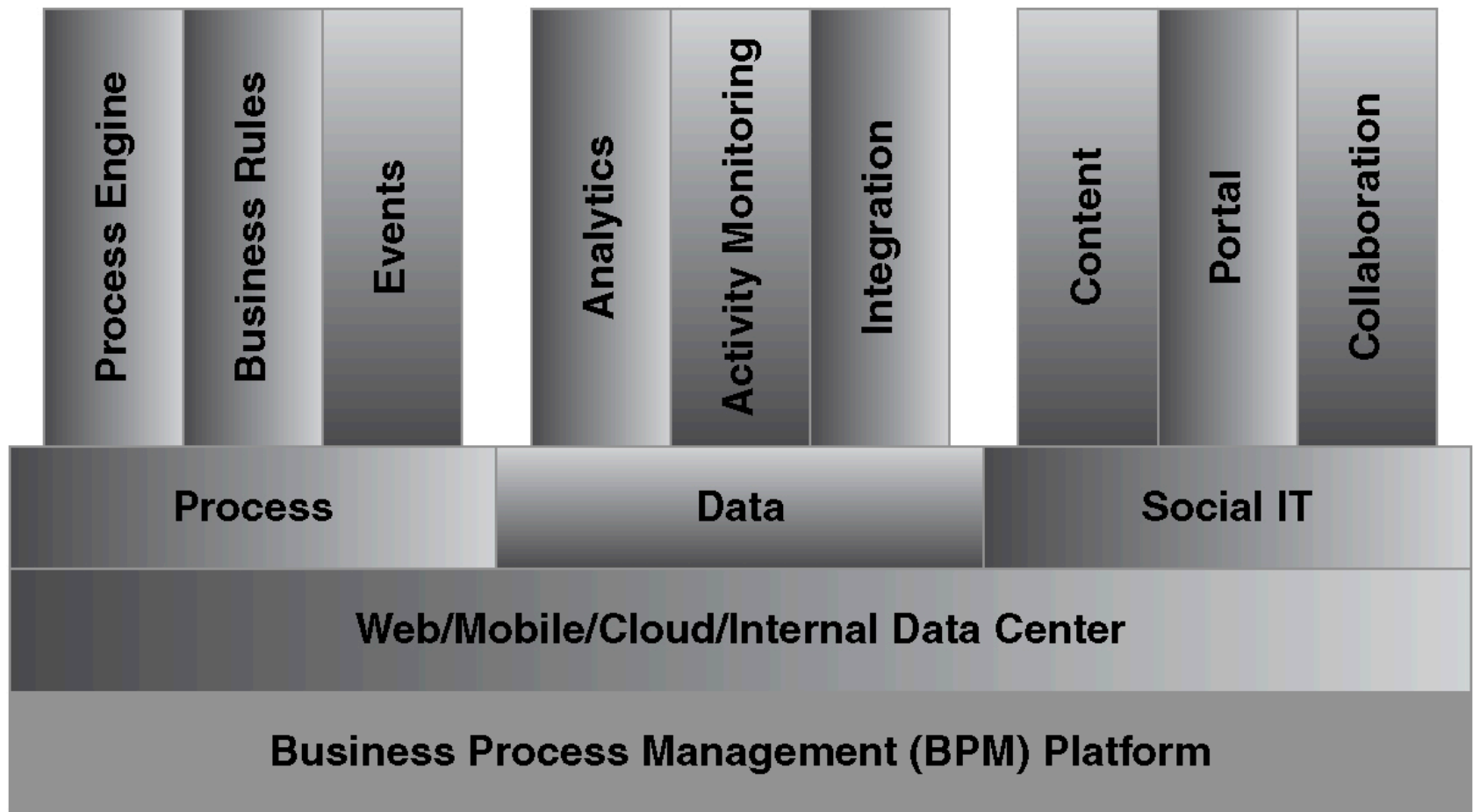
- **Workflow** is a way to look at a **cross-functional** process.
 - A series of connected tasks and activities done by people and computers to form a business process.
 - Workflow includes **software** products that document and **automate processes**.
 - Workflow software facilitates the design of business processes and creates a **digital workflow diagram**.
- When combined with business process management modules, processes can be managed, monitored, and modified.
- Workflow diagrams show a picture, or map, of the sequence and detail of each process step.

Business Process Management - BPM



- In the 1990s, a class of systems emerged to help manage business **workflows**.
- They primarily helped track document-based processes where people executed the steps of the workflow.
- Beyond document-management, BPM includes features that (Figure 5.6):
 - manage person-to-person process steps, system-to-system process steps, and those processes that include a combination of both.
 - include process modeling, simulation, code generation, process execution, monitoring, and integration capabilities for both company-based and web-based systems.
- The tools allow an organization to actively manage and improve its **processes** from beginning to end.

Figure 5.6 Sample BPM architecture.



Source: Adapted from www.appian.com



BPM Systems

- **BPM** systems are a way to build, execute, and monitor automated processes that span organizational boundaries.
- **Enterprise applications** include ERP, CRM, and financial software.
- BPM systems go outside a specific application to help manage **across processes** (e.g., front office applications).
- Appian's BPM product includes components to help companies design, manage, and optimize **core business processes**.
- Figure 5.7 summarizes the components of their system.

Figure 5.7 Appian BPM suite.

Appian BPM Suite	
Process	Process modeling platform to design, execute, manage, and optimize enterprise business processes
Rules	Audit policies, practices, and business rules can be managed, automatically monitored, and enforced and tracked for audits
Content	Documents, process contents and metrics stored and managed and integrated with other enterprise systems
Data Access	Enterprise data systems are included in the modeling capability and connected to processes as needed
Social and Collaboration	Using threaded discussion boards, targeted content, and content sharing, users monitor, discuss, and take action on business processes using social BPM feeds that combine real-time collaboration, key event monitoring, and direct action.
Portal	Customizable user interface providing each user a personalized view of the content and applications in the suite
Analytics	Algorithms for analyzing real-time process performance data, creating customized dashboards, identifying bottlenecks in processes, and predicting future issues
Forms	Reports built dynamically and interactively
Mobile	Application interfaces available for mobile devices such as iPhone, iPad, Android, and Blackberry devices to allow monitoring, collaborating, alerts, and taking action
Service Oriented Architecture (SOA) and Integration	Users, enterprise data systems, and external services are integrated and managed with a set of pre-built connectors for common system interfaces and frameworks



Enterprise Systems

- Enterprise systems:
 - Are a set of IS tools used to enable **information flow** within and between processes across an organization.
 - Ensure **integration** and coordination across functions such as accounting, production, customer management, and supplier management.
 - Include:
 - Enterprise Resource Planning (ERP), Supply Chain Management (SCM), Customer Relationship Management (CRM), and Product Lifecycle Management (PLM) systems (Figure 5.8).

Figure 5.8 Enterprise systems and the processes they automate.

Enterprise System	Sample Processes
Customer Relationship Management (CRM)	Marketing (resource management, brand management, campaign management, segmentation management) Lead management Loyalty program management Sales planning and forecasting Territory and Account management Quotes, Contract, order capture management Sales team performance management Customer service and support history Return and repair management Field service management Warranty and claim management Installation and maintenance management
Enterprise Resource Planning (ERP)	Financial Management (accounting, financial close, treasury management, Invoice to pay process, receivables management) Human Capital Management (talent management, Core HR, payroll, workforce management, succession planning) Operations Management (Procurement, logistics management, product development and manufacturing life cycle, requisition-invoice payment, parts inventory and logistics management)
Supplier Chain Management (SCM)	Supply chain design Order fulfillment Warehouse management Demand planning, forecasting Sales and operations planning Service parts planning Source-to-pay/procurement process Supplier lifecycle management Supply contract management
Product Lifecycle Management (PLM)	Innovation management (strategy and planning, idea capture and management, program/project management) Product development and management Product compliance management

Enterprise Resource Planning (ERP)



- Two of the largest vendors of enterprise systems are German-based **SAP** and California-based **Oracle**.
- Designed to help large companies manage the fragmentation of information stored in hundreds of individual desktop, department, and business unit computers across the organization.
- Change from **mainframe** systems to client-server environments.
- A **Y2K**-compliant enterprise solution.
- Makes company information immediately available to **all** departments throughout the company.



ERP II

- **ERP II:**
 - makes company information immediately available to **external stakeholders** (e.g., customers and partners).
 - enables **e-business** by integrating business processes with the enterprise and its trading partners.
- Integrating the **cloud** calls into question the design of some business processes.
- ERP systems include all of the ERP II functionality plus **social** and **collaboration** features.
- SAP's ERP solution includes SAP ERP Financials, SAP ERP Human Capital Management, and SAP ERP Operations.
- Oracle's ERP solution, EnterpriseOne, offers these same functions.

Characteristics of Enterprise Systems



- ERP systems:
 - are designed to seamlessly **integrate** information flow throughout the company.
 - Modules include: manufacturing, accounting, human resources, and sales.
 - require long-term relationships with software vendors.
 - have complex systems that must typically be modified on a continual basis to meet the organization's needs.
 - reflect industry best practices.
 - need to be integrated with the existing hardware, OSs, databases, and telecommunications.
 - are evolving as the systems continue to change to fit the needs of the diverse marketplace.



Managing Customer Relationships

- **Customer relationship management** (CRM) is a set of software programs that support management activities performed to obtain, enhance relationships with, and retain **customers**.
 - Includes: sales, support, and service processes.
 - Consists of technological components as well as many pieces of information about customers, sales, marketing effectiveness, responsiveness, and market trends.
- Optimized CRM processes and systems can lead to better customer service, more efficient call centers, product cross-selling, simplified sales and marketing efforts, more efficient sales transactions, and increased customer revenues.



Common CRM Systems

- Three common CRM systems are **Oracle**, **SAP**, and **Salesforce.com**.
- Oracle and SAP have CRM systems that integrate nicely with their other enterprise systems.
- Modules include pricing, sales force automation, sales order management, support activities, customer self-service, and service management.
- SAP's CRM also has marketing support modules such as resource and brand management, campaign management, real-time offer management, loyalty management, and e-marketing.
- Oracle and SAP evolved from **enterprise systems**, whereas Salesforce.com began as a **Web-based cloud system**.
- **Social IT** is increasingly integrated into CRM solutions.
- These additional channels of data are useful for building customer relationships.



The Process for Radical Redesign

- The different approaches for radical redesign all include:
 - Beginning with a vision of which performance metrics best reflect the success of the overall business strategy.
 - Making changes to the existing process.
 - Measuring the results using the predetermined metrics.
- Figure 5.6 illustrates a general view of radical design.
- Figure 5.7 illustrates a method for redesigning a business process.
- A workflow diagram is the tool used to understand a business process.



Managing Supply Chains

- Supply chain management (SCM) systems manage the integrated supply chain.
- Processes are linked across companies; a companion process at a company's customer or supplier creates an integrated supply chain.
- Web-based technology links customers and suppliers through a single network.
- Costs and opportunities are optimized for all companies in the supply chain.
- Globalization of business, ubiquity of communication networks, and IT have enabled businesses to use suppliers from almost anywhere in the world.
- Supply chain integration is the approach of **technically** linking supply chains of vendors and customers to streamline the process and to increase efficiency and accuracy.



Integrated Supply Chains Challenges

- Challenges may be caused by **different degrees of integration** and coordination among supply chain members.
- Information integration.
 - Partners must agree on:
 - the type of information to share.
 - the format of that information.
 - the technological standards they will both use to share the information.
 - the security they will use to ensure that only authorized partners access the information.
 - Trust must be established so the partners can solve higher-level issues that may arise.
- **Synchronized planning**
 - A joint design of planning, forecasting, and replenishment.



Additional Integrated Supply Chains Challenges

- **Workflow coordination**
 - The coordination, integration, and automation of critical business processes between partners.
- Using a **third party** to link the procurement process to the preferred vendors or communities of vendors who compete virtually for the business.
- The integration leads to **new business models**.
- **Demand-driven** supply networks are the next step for companies with highly-evolved supply chain capabilities.
- Integrated supply chains are **global** in nature.

Product Lifecycle Management (PLM)



- **PLM** systems **automate** the PLM steps starting with the idea for a product and ending with the “end-of-life” of a product.
 - Includes the innovation activities, new product development and management, design, and product compliance.
- PLM contains all the information about a product.
 - Design, production, maintenance, components, vendors, customer feedback, and marketing.



Benefits of Enterprise Systems

- All modules easily communicate together with **efficiency**.
- Useful tools for effectively centralizing operations and decision making.
- Reinforce the use of **standard procedures** across different locations.
- Redundant data entry and duplicate data may be eliminated.
- Standards for numbering, naming, and coding enforced.
- Data and records can be cleaned up through **standardization**.

Disadvantages of Enterprise Systems



- Implementation requires an enormous amount of work.
- Requires **redesigning** business processes to achieve optimal performance of the integrated modules.
- Organizations are expected to **conform** to the approach used in the enterprise system (e.g., change organization structure, tasks).
- A hefty **price tag**: additional costs for project management, user training, and IT support.
- Sold as a **suite** rather than individual modules.
- Enterprise systems are **risky**.



When the System Drives the Change

- It is appropriate for an organization to let the enterprise system drive business process redesign when:
 - it is just starting out and processes do not yet exist.
 - operational business processes are not a source of competitive advantage.
 - current systems are in crisis and there is not enough time, resources, or knowledge in the firm to fix them (e.g., **Y2K**).
- It is inappropriate to let the enterprise system drive business process change when:
 - changing processes that are relied upon for strategic advantage.
 - the features of available packages do not fit the needs of the business.
 - there is a lack of top management support.



Challenges for Integrating Enterprise Systems Between Companies

- Deciding what to share, how to share it, and what to do with it when the sharing takes place.
- Agreeing on **security** and encryption or other measures to protect data integrity and ensure that only authorized parties have access.
- The complexity of the integration can be reduced by insisting on **standards**—either at the industry level or at the system level.
- The increasing use of **cloud-based** systems with standard interfaces makes the integration easier.



Chapter 5 - Key Terms

Agile processes (p. 142) - designed with the intention of simplifying redesign and reconfiguration.

Business process management (BPM) (p. 146) - a well-defined and optimized set of IT processes, tools, and skills.

Business process reengineering (BPR) (p. 143) - radical process redesign.

Customer relationship management (CRM) (p. 154) - a set of software programs that support management activities performed to obtain, enhance relationships with, and retain customers.

Chapter 5 - Key Terms (Cont.)



DMADV (p. 144) - an improvement system used to develop new processes or products at Six Sigma quality levels. Stands for define, measure, analyze, design, verify.

DMAIC (p. 144) - an improvement system for existing processes falling below specification and looking for incremental improvement. Stands for define, measure, analyze, improve, control.

Dynamic processes (p. 142) - **agile business processes**; processes that iterate through a constant renewal cycle of design, deliver, evaluate, and redesign.



Chapter 5 - Key Terms (Cont.)

Enterprise resource planning (ERP) (p. 151) - designed to seamlessly integrate information flow throughout the company. Modules include: manufacturing, accounting, human resources, and sales.

Horizontal integration - looking beyond individual business processes and considering the bigger, cross-functional picture of the corporation.

Supply chain management (SCM) (p. 156) - Web-based technology that allows the supply chains of a company's customers and suppliers to be linked through a single network that optimizes costs and opportunities for all companies in the supply chain.

Middleware (p. 153) - software used to connect processes running on one or more computers across a network.



Chapter 5 - Key Terms (Cont.)

Process (p. 139) - an interrelated, sequential set of activities and tasks that turns inputs into outputs.

Process perspective (p. 139) - keeps the “big picture” in view and allows the manager to concentrate on the work that must be done to ensure the optimal creation of value.

Silos (p. 138) - self-contained functional units that are useful for several reasons.

Six-Sigma (p. 144) - a data-driven approach and methodology for eliminating defects from a process.

Chapter 5 - Key Terms (Cont.)



Total quality management (TQM) (p. 143) - incremental, continuous process improvement.

Workflow (p. 145) - a series of connected tasks and activities done by people and computers that form a business process.

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